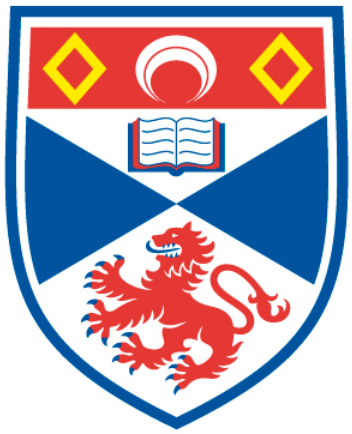
PAINTINGS BY NUMBERS: APPLICATIONS OF BIVARIATE CORRELATION AND DESCRIPTIVE STATISTICS TO RUSSIAN AVANT-GARDE ARTWORK

VOL. I: THESIS AND BIBLIOGRAPHY

James Paul Strugnell

A Thesis Submitted for the Degree of PhD
at the
University of St Andrews



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Paintings by Numbers: Applications of Bivariate Correlation and Descriptive Statistics to Russian Avant-Garde Artwork

Vol. I of II: Thesis and Bibliography

James Paul Strugnell

University of
St Andrews

This thesis is submitted in partial fulfilment for the degree of PhD
at the
University of St Andrews

11th November 2016

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I, James Paul Strugnell, hereby certify that this thesis, which is approximately 78,224 words in length, has been written by me, and that it is the record of work carried out by me, or principally by myself in collaboration with others as acknowledged, and that it has not been submitted in any previous application for a higher degree.

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Abstract

In this thesis artwork is defined, through analogy with quantum mechanics, as the conjoining of the nonsimultaneously measurable momentum (waves) of artwork-text (words within the primary sources and exhibition catalogues) with the position (particles) of artwork-objects (artist- productivity/exhibition-quantities). Such a proposition allows for the changes within the artwork of the Russian avant garde to be charted, as such artwork-objects are juxtaposed with different artwork-texts from 1902 to 2009.

The artwork of an initial period from 1902 to 1934 is examined using primary-source artwork-text produced by Russian artists and critics in relation to the contemporaneous production-levels of various types of Russian-avant-garde artwork-objects. The primary sources in this dataset are those reproduced in the artwork-text produced by the 62 exhibitions described below, and those published in John E. Bowlt's 1991 edition of *Russian Art of the Avant Garde: Theory and Criticism*. The production of artwork in the latter period from 1935 to 2009 is examined through consecutive exhibitions, and the relationship between the artwork-text produced by these exhibitions and the artwork-objects exhibited at them. The exhibitions examined within this thesis are 62 containing Russian avant-garde artwork, held in Britain from 1935 to 2009.

Content analysis, using an indices-and-symptom analytical construct, functions to convert the textual, unstructured data of the artwork-text words to numerical, structured data of recording-unit weighted percentages. Whilst artist-productivity and exhibition-quantities of types of artwork-object convert the individual artwork-objects to structured data. Bivariate correlation, descriptive statistics, graphs and charts are used to define and compare relationships between: The recording units of the artwork-texts; the artist-productivity/ exhibition-quantities of types of artwork-objects; the structured artwork-text data and structured artwork-object data.

These various correlations between structured artwork-text data and structured artwork-object data are calculated in relationship to time (Years) to chart the changes within these relationships. The changes within these relationships are synonymous with changes within Russian avant-garde artwork as presented from 1902 to 1934 and within the 62 British exhibitions from 1935 to 2009. Bivariate correlations between structured artwork-texts data and structured artwork-objects data express numerically (quantitatively) the ineffable

relationships formed over time by large sets of unstructured data in the continued (re)creation of artwork.

Acknowledgements

I would like to express my sincere gratitude to my supervisor Dr Jeremy Howard. Without Dr Howard's continued support and encouragement over the last four years this thesis would not have been written. I would like to thank him, not only for his knowledge, advice and support, but also for his patience.

I must, also, thank Dr Howard, Dr Katheryn Rudy, and Dr Grant Macaskill for their assistance and support in my securing an AHRC Studentship from the Scottish Graduate School for Art and Humanities (SGSAH), which funded the third year of this research project. I would like express my sincere gratitude to them all and, also, to the SGSAH for the awarding of this studentship.

As well as Dr Rudy, thanks must go to both Dr Natalie Adamson and Dr Linda Goddard in their positions as Postgraduate Directors within the School of Art History during my four years of study. Their support academically and, at times, emotionally has been greatly appreciated.

In the same vein, I would also like to thank all the staff of the School Office within the School of Art History. As a first-point of call their advice and support over the years has been invaluable. The School of Art History must also be thanked for providing the opportunity to both tutor and work within the Visual Resource Centre. Such opportunities have allowed me to gain valuable experiences, both, academically and professionally.

Outside of the School of Art History, I would like to express my gratitude to the Student Services department at the University of St Andrews for providing me with the opportunity to work as an Assistant Warden for the first three years of my research. The role not only provided me with much valued professional and life skills, but also enabled me to study on a full-time basis within St Andrews.

Finally, special thanks must go to my parents and family for all their support, on many levels, over the last four years, and especially during this year.

Contents

UNIT 1

1.0 – Introduction: Data

> Canons, in other words, can be considered as objects or artists or movements of interest, but they can also be considered as texts about those objects or artists or movements; both can be enumerated.[1]

The enumeration of a canon. But for what purpose? To allow for a greater "accuracy" of understanding of the form and forming of the canon. To allow for the greater use of "quantitative research" methods within the field of art history. To demonstrate the applications for "statistics" within art history: Bivariate correlation; descriptive statistics; charts and graphs. Statistics that allow for objects and texts within and outside of a canon to be "correlated" as numerical date, and for the "significance" of these various relationships to be compared as mathematical and standardized expressions of data.[2] These are the aims of this thesis.

The canon that is enumerated and examined with these intentions and methods contains objects, and texts about these objects, their artists and movements. The canon can be defined as the exhibition of the Russian avant garde (RAG) in British galleries from 1935 to 2009, and enumeration focuses on the two main elements remaining from these exhibitions: The exhibition catalogue, termed the "artwork-text", and the objects that are displayed within these exhibitions, termed the "artwork-objects".[3] Initial enumeration of the canon:

> - **75** years of British exhibitions containing Russian avant-garde artwork-objects (1935-2009);
> - **62** exhibitions/exhibition catalogues (artwork-text)[4];

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[1] James Elkins, "Canon and Globalization in Art History", in Anna Brzyski (ed.), *Partisan Canons*, Duke University Press, 2007[a], pp. 64-65

[2] Elkins, 2007[a]: "accuracy" and "quantitative research", p. 55; "statistics" and "correlate" p. 56; "significance" p.61.

[3] "Section 1.1" will explain the insistent use of the terms "artwork-text" and "artwork-object", as opposed to "text" and "artwork".

[4] A complete list of the 62 exhibitions is included in appendix *App.3-[Exhibition List]-01* ("Exhibitions and Dates"). A complete list of the 58 exhibition publications for these 62 exhibitions is included in the "Bibliography" in the section "The 62 Exhibition Catalogues". The discrepancy between the number of catalogues and number of exhibitions is due to four of the exhibitions' catalogues being contained within the same publication: Causey, S.,

- **150** contributors to the exhibition catalogues;
- **1,661,620** words written by catalogue contributors in the 62 exhibition catalogues;
- **309** Russian avant-garde artists represented at these exhibitions;
- **4,871** Russian avant-garde artwork-objects displayed and catalogued;
- **23** Russian avant-garde artists represented by ≥ 30 artwork-objects in these exhibitions from 1935 to 2009 (T23Artist).[5]

This is the foundational raw data that this thesis is built upon. Yet, it can all be incorporated into one line, taking into account and reflecting every single datum of it.

ANoRAG and ANRAG: $T = .083$, $N = 32$, $p > .05$ (.506), BCa 95% CI [-.205, .371]

This line, each of its elements, and their parameters will be defined in "Section 1.2" of this unit. The line states the bivariate correlation, using Kendall's Tau, of the relationship between the total number of RAG artwork-objects displayed in the **62** exhibitions per Year (ANoRAG), and the average weighted percentage of the exhibition catalogues' artwork-text per Year accounted for by RAG artists' names (ANRAG). ANoRAG must take into account all **4,871** RAG artwork-objects created by the **309** RAG artists, including the **23** represented by ≥ 30 artwork-objects (T23Artist). Whilst ANRAG is derived through content analysis ("Unit 2") as a percentage in reference, at some stage, to each of the other **1,661,620** words. This relationship is calculated in relation to the **75** Years from 1935 to 2009, the **62** exhibitions occurring in 32 ($N = 32$) of these Years.

The *ANoRAG-and-ANRAG* line means, succinctly, there is a weak and not significantly, positive relationship between the variables of ANoRAG and ANRAG, the result of which little confidence can be held in. But what *is* significant about this line, is that in six figures (four of

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(ed.), *Tradition and Revolution in Russian Art*, Manchester Free Press: Manchester, 1990 [This contains the catalogues for four of exhibitions included in this study: *Russian Faces, Soviet Lives*; *The Russian Lubok: Two Hundred Years of Popular Prints*; *Bolshevik Posters*; *Street Art of the Revolution: Petrograd 1918*.]

[5] RAG is defined by the exhibitions' own artwork-texts. This means that the list 4,871 RAG artwork-objects, by 309 RAG artists, is formed in a self-perpetuating, evolutionary manner, by the RAG artists being defined as such by the exhibitions' own artwork-texts. If an exhibition's artwork-text categorizes an artist as RAG, and that artist is exhibited in a second, non-permanent, British exhibition, then that second exhibition is also included within this study. Although, for all other artists within the second exhibition to, also, be categorized as RAG within this thesis, they would have to be stated as such, either in that or another exhibition.

importance) it expresses the relationship between two variables spanning 75 years and being derived from more than 1.5 million units of data.

What the results of bivariate correlation also produce, is a standardized set of expressions of a relationship that can be compared or contrasted with other such relationships. Either, relationships between different pairs of variables from the same dataset, or between the same variables derived from a different dataset. These applications – in conjunction with the use of descriptive statistics, charts and graphs – are what will be demonstrated within this thesis in reference to the RAG exhibited and defined by the 62 exhibitions/exhibition catalogues held/produced in Britain from 1935 to 2009. It is this application of bivariate correlation to the examining of the relationships between the co-occurrences of artwork-objects and artwork-text of a canon, as well as within the artwork-text and between the artwork-objects, that contributes to the uniqueness of this investigation.

Focusing on the 62-British-exhibition canon, this thesis intentionally acts as a case study demonstrating a methodology that can be productively applied to any period/canon within art-historical research. The decision to concentrate examination on the 62-British-exhibition canon defined above, and use the information included within its catalogues as one dataset, is advantageous in producing a focussed and detailed understanding/demonstration of how artwork-text, specifically selected to be read in conjunction with the exhibiting of identifiable artwork-objects, changes over a defined period. The changing trends within the artwork-text being read in conjunction with the exhibiting of the RAG artwork-objects, in turn, alters understanding/perception of the RAG artwork through this period.

As well as applying such a method to other periods/canons of interest within art history, it would also be possible to increase the size of the potential dataset used in this study. In addition to the artwork-text produced by the exhibitions' catalogues, through the incorporating of other contemporaneous texts, it is possible to produce an ever more accurate understanding of the changing trends affecting the presentation of RAG artwork during the twentieth century in Britain. Such additional text could include a range of contemporaneous material: Art criticism of the artists and artwork-objects included in exhibition; art reviews of the exhibitions published in journals or newspapers; art historical text and publications other than the exhibition catalogues; additional information pertaining to the exhibitions such as attendance figures or financial reports; public feedback from visitor books or online review services. The scope of the project could even be expanded to give a

more global perspective, by examining exhibitions and additional artwork-texts from an increasing number of countries. The potential inclusiveness for the future applications of this thesis's methodology are written of further in "Section 4.0" in relation to "big data" and the use of data mining software programmes to identify trends in ever expanding amounts of data.

Limits will always have to be set on the extensiveness of the data included within a dataset. The use within this case study of the 62 British exhibitions' catalogues as an initial dataset allows for trends within a manageable and definable group of artwork-texts and artwork-objects to be examined. Even with the potential expansion of such a dataset in the future, the results of this investigation, through juxtaposition/comparison with future results, will still be of value in demonstrating and isolating the impact of these future, additional artwork-texts upon previously identified trends.

The ability to observe the changing impact upon the representation of artwork through juxtaposition of datasets is also demonstrated within this thesis by introduction of a second dataset spanning a period from 1902 to 1934. The second dataset used within this thesis is produced from content analysis of primary sources produced by or connected contemporaneously with the RAG. So that there are enough sources within the second dataset to produce meaningful results, in addition to the primary sources reproduced within the British exhibitions' catalogues, all the primary sources published in John E. Bowlt's 1991 edition of *Russian Art of the Avant Garde: Theory and Criticism. Revised and Enlarged Edition* are also incorporated. *Russian Art of the Avant Garde* contributes 66 pieces of published writing by Russian artists and critics to the primary-source database, spanning a period from 1902 to 1934.

Bivariate correlation, descriptive statistics, graphs and charts are used and compared in this thesis between this primary-source dataset and that produced by the 62-British-exhibition canon to examine whether significant changes in trends exist between the two presentations of RAG artwork. Particularly, a canon produced by and/or contemporaneously with the artists of the artwork-objects, and a canon producing artwork-text in conjunction with the same artwork-objects but, what might be termed, anachronistically to the artwork-objects origin. Combining these two datasets will, potentially, allow changing trends within the artwork-text produced in conjunction with RAG artwork-objects to be charted for a period from 1902 to 2009, and this will also be examined by this thesis.

A note of caution on what the use of bivariate correlation does not define: Causation. This is an investigation into what relationships exist, and not why they exist. It is an investigation that asserts the probability of particular relationships occurring, but has nothing to contribute on the psychological and philosophical reasoning behind such relationships. At its heart this thesis is *match.com*; it is *eharmony.co.uk*; it is online dating; it quotes relationship-compatibility via algorithm. This has the effect of abruptness in places due to a lack of an attempt at a romantic cause-and-effect storyline. It would be possible to combine both statistical correlation and cause-and-effect storylines, have them as supportive of one another, and this has been demonstrated in places within this thesis. But this is not the main aim of this thesis, which is to act as a case study showcasing the strengths and applications of bivariate correlation for art history via a focused examination of a specific canon. This thesis uses its statistical methodology to focus on the fact of the relationship, expressing it as a probability of its significance compared to the other possible relationships that are able to be derived from the data being examined.

In regard to the examination of the artwork-text, the use of statistical techniques in conjunction with content analysis is well established, and this thesis uses variations of these techniques when analysing the artwork-text of the catalogues ("Unit 2" onward). Although not the aim of this thesis, content analysis has previously been applied directly to the visual properties of artwork-objects, and the images within artwork-text: For example, in Charlotte O'Kelly's 1983 article "Gender Role Stereotypes in Fine Art: A Content Analysis of Art History Books"[6]; or briefly discussed in William Paisley's earlier article "Identifying the Unknown Communicator in Painting, Literature and Music"[7].

O'Kelly's study involves the analysis of "971 works of art found in three major Western art history textbooks".[8] Its focus is the features of the images and the images' subject matter. It is not a content analysis concerning the "gender role stereotypes" of the accompanying text, or the accompanying text's description of the images. One of the aspects that this thesis

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[6] Charlotte G. O'Kelly, "Gender Role Stereotypes in Fine Art: A Content Analysis of Art History Books", in *Qualitative Sociology*, Vol. 6, Issue 2 (Summer 1983), pp. 136–148

[7] William J. Paisley, "Identifying the Unknown Communicator in Painting, Literature and Music", 1964, originally in *Journal of Communication*, 14(4), pp. 219–237 [reprinted in Krippendorff, K. and Bock, M. A. (eds.), *The Content Analysis Reader*, Sage Publications Ltd: London, 2009, pp. 177–188)

[8] O'Kelly, 1983, p. 136 (The textbooks were: Canaday, J., *Mainstreams of Modern Art*, Holt: New York, 1959; Gardner, H., *Art Through the Ages (sixth edition, revised by Horst de la Choix and Richard G. Tansey)*, Harcourt, Brace, Jovanovich: New York, 1975; Hanson, H. W., *History of Art*, Prentice-Hall: Englewood Cliffs, N. J., 1969.)

does examine is the correlation between gender within the artwork-texts and the artwork-objects exhibited ("Section 3.1.3" and "Section 3.1.5"). It also examines the changing relationships between gender and various recording units within the artwork-texts over time (Years) ("Section 2.6"). Paisley's article is, again, concerned with content analysis applied to the artwork-object, rather than the artwork-text. His paper examines the use of content analysis in three fields of the Arts – painting, literature, music – as a tool for identifying authorship of the artwork-object. In relation to painting he writes of the nineteenth-century innovations brought by Giovanni Morelli in the (re)attributing of Renaissance artwork-objects to their correct creators. In particular of Morelli's revolutionary focus on the minutia within the paintings in identifying the artist, leading to his moniker as "the connoisseur of fingernails".[9] Although this type of content analysis is not what is intended for this study – where the artwork-objects are being enumerated as quantities, areas (cm^2), volumes (cm^3), or percentages – such attention to minutia in the identification of authorial-traits is used within this study in the content analysis of the artwork-text and the production of *fingerprints* to identify changing trends between the Years of the text ("Unit 2"), or between artwork-text by different contributors ("Section 4.1").

As suggested by the initial citations from James Elkins's 2007 essay "Canon and Globalization in Art History", the methods used within this thesis are more comparable, although not identical, to some of those used by Elkins. In his, 2006, introductory essay to *Is Art History Global?*, Elkins uses statistics in conjunction with content analysis of art-historical texts.[10] Receiving entries from the *Bibliography of the History of Art* spanning the years' of two decades (1972-1987), Elkins "collated" the data to discover which Artist Name(s) (AN [as in ANRAG]) are cited most frequently.[11] This data is used to assert whether art history, as a discipline, is becoming broader in the number of different artist it is studying ("extensive scholarship"), or focussing on a smaller number of "major" artists ("intensive scholarship").[12] Elkins equates the broadening, "extensive scholarship" to art history becoming more global in its approach. This approach being contrasted to the "intensive scholarship" of a narrow-focused, Western-oriented canon. A conclusive judgement is difficult to accept, from the data presented in Elkins's essay, due to the account not relating the AN-citation increases and decrease within the articles to the dates of the articles publications. This creates a

[9] Paisley, 1964, p. 178
[10] James Elkins, "Art History As A Global Discipline", in James Elkins (ed.), *Is Art History Global?*, Routledge: New York, 2006, p. 17 [The dates for the span of Years, 1972-1987 is derived from: Elkins, 2007[a], p. 65]
[11] Elkins, 2006, p. 16
[12] Elkins, 2006, p.16

difficulty in knowing the direction of any trends in extensive and intensive scholarship for the 16-year period of articles.

This difficulty, in knowing the direction of extensive and intensive trends, is acknowledged by Elkins in 2007, in his more extensive study of the art-historical canon and its relationship with globalisation: "Canon and Globalization in Art History". Elkins states, regarding the extensive and intensive trends: "It is still an open question as to which part of art history is growing faster."[13] Elkins, also, considers time (Years) within this, 2007, investigation offering further exploration of the *Bibliography of the History of Art* in relation to trends within art "Theory".[14] This investigation is written of further in "Section 3.1.3". But, again, Elkins's investigations do not concern the relationship between the artwork-objects and art-historical texts (artwork-text), such relationships/correlations are not the aim of his study. The relationships within Elkins's investigation remain inter-textual.

This thesis differs from previous studies in its use of descriptive and analytical statistics to examine the relationships, the correlations, between the co-existences/co-occurrences of artwork-objects and artwork-texts in relation to themselves, each other, and to periods of time. The previously cited articles focus on the analysis of either the artwork-text or the artwork-object, but not the co-occurrences and continuing relationships between the two. This thesis uses the application of bivariate correlation and descriptive statistics to express, with accuracy and clarity, the probable significance and strength of co-occurring relationships that are evidenced within the RAG canon of the exhibiting of RAG artwork-objects and producing exhibition-specific artwork-text in Britain from 1935 to 2009.

In addition, the statistical information relating to the dates of production and dimensions of the RAG artwork-objects collated from the exhibition catalogues, is used to demonstrate trends that occur in the RAG's production of different types of artwork-object at different points during Russia's first three decades of the twentieth century. In this respect, the overall scope of this thesis is expressible as an examination of the changing relationships: Between RAG artwork-objects; between RAG and catalogue-contributor artwork-texts; between RAG artwork-objects and these artwork-texts. With these various relationships and juxtapositions between artwork-objects and various artwork-text authorship comparable over a timespan

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[13] Elkins, 2007[a], p. 69

[14] These trends within art Theory are discussed repeatedly in Elkins's writings: Elkins, 2007[a], pp.70-73; Elkins, J., "Series Preface", in Elkins, J., (ed.), *Photography Theory*, Routledge: New York, 2007[b], pp. vii-x

beginning at the artwork-objects' creation and continuing through the entire twentieth century and into the twenty-first.

The remaining two sections of introductory "Unit 1" will be used: Firstly, to describe the concept of "quantum" art history ("Section 1.1"), which is implicitly expressed in the *ANoRAG-and-ANRAG* line and its separation of artwork-objects (ANoRAG) and artwork-texts (ANRAG). "Section 1.1" also explains the insistent uses of the terms "artwork-object" and "artwork-text", rather than "artwork" and "text". Secondly, the final section of "Unit 1" ("Section 1.2"), introduces the statistical methodology used within this thesis, and will bring clarity to the six figures of the *ANoRAG-and-ANRAG* line. It advances in "Section 1.2.1" with a case study demonstrating the practical/applied use of the statistical methodology; using it to investigate the correlation between artwork-objects size, artwork-object auction prices, and artistic "productivity". "Section 1.2", and "Unit 1", terminates with "Section 1.2.2", which applies the demonstration from "Section 1.2.1", to data extracted from the 62 exhibitions' catalogues in an examination of Years of "peak" artistic "productivity" occurring during the RAG artists' lifetime.

There are two further units within this thesis before the concluding "Unit 4", and its terminating "Postscript" section. Each of these units are further divided into sections, but, in brief, each unit covers the following:

- **Unit 2** begins by introducing the methodology for content analysis, which will further clarify the ANRAG variable of the *ANoRAG-and-ANRAG* line. The remainder of the unit applies this methodology – in conjunction to bivariate correlation, descriptive statistics, charts and graphs – to the 62 exhibition catalogues' artwork-text, examining changes, in contrast to the RAG artwork-text, in the artwork-text element of RAG "artwork" from 1935 to 2009.
- **Unit 3** examines, through bivariate correlation, the relationships between the "recording units" defined in "Unit 2" and the artwork-objects exhibited in the 62 exhibitions from 1935 to 2009. In doing so it investigates how the RAG "artworks" change during the 75-year period due to their creation within the intersection of artwork-objects and artwork-text.

As stated, the sources from which the majority of the raw data used within this thesis derives are the catalogues that accompany each of the 62 exhibitions.[15] These catalogues allow for the discovery of what artwork-objects, produced by the RAG, are displayed in non-permanent exhibitions in Britain throughout the majority of the twentieth century and the beginning of the twenty-first. These discoveries are compiled into a list of all 10,702 artwork-objects exhibited at these exhibitions, from which the list of 4,871 artwork-objects by 309 RAG artists is extracted.[16] The lists include, for each artwork-object, as much of the following information as is available:

- Dimensions (height, width, depth);
- Artist's name;
- Title of work;
- Year of Production (Year);
- Medium in which it is produced;
- Whether it is an "Original" or a "Reproduction";
- Each of the 62 exhibitions in which it is displayed;
- Total number of times it is displayed from 1935 to 2009.

The list of RAG artwork-objects, as well as the non-RAG artwork-objects, also, displayed within the 62 exhibitions, is produced on the accompanying CD.[17] This CD also contains the raw data from the content analysis – a list of words, the frequencies and the weighted percentages – and an electronic copy of the "Appendices".[18] The "Appendices" contains three sections: The first contains the "Coding Sheet" and "Coded Word List" pertaining to the content analysis. The second section contains the bivariate correlation results, produced via *IBM SPSS Statistics (Version 23)* software. Some of the tables that have been printed are rather too large to fit readably onto an A4 sheet of paper, these can be enlarged if viewed

[15] For a complete list of these catalogue see *Bibliography*.
[16] For complete list of artwork-objects exhibited in each exhibition, including both RAG and non-RAG artwork-objects, see *Strugnell-ThesisCD* and *Excel* file: *Strugnell-A-O1 (All artwork-objects in the 62 exhibitions)*. For complete list of RAG artwork-objects exhibited in each exhibition see *Strugnell-ThesisCD* and *Excel* file: *Strugnell-A-O2 (RAG artwork-objects in the 62 exhibitions)*.
[17] For complete list of RAG artwork-objects exhibited in each exhibition see *Strugnell-ThesisCD* and Excel file: *Strugnell-A-O2 (RAG artwork-objects in the 62 exhibitions)*. For complete list of artwork-objects exhibited in each exhibition, including both RAG and non-RAG artwork-objects, see *Strugnell-ThesisCD* and *Excel* file: *Strugnell-A-O1 (All artwork-objects in the 62 exhibitions)*.
[18] For complete content-analysis data for the artwork-text of each Year see *Strugnell-ThesisCD* and *Excel* file: *Strugnell-A-T1 (Content analysis of artwork-text per Year)*. For the electronic copy of the *Appendices* see *Strugnell-ThesisCD* and PDF: *Strugnell-Appendices*.

via the CD. The final section of the “Appendices” contains additional charts and graphs, many of which are used in the creation of the *fingerprints* examined in “Unit 2” and “Unit 4”.

1.1 – "Quantum" Art-History: Expanding the Wavepacket of "Classical" Art History

Between the idea
And the reality
Between the motion
And the act
Falls the Shadow.[19]

These five lines, essentially, describe the driving force behind this thesis: The "Shadow". This thesis is the investigation of the shadow that falls between the exhibited artwork-object and the ideas that form their written histories (artwork-texts). It is an investigation into the shadow of an artwork that falls between the act of hanging an object in a gallery and the object's continuing accumulation of ideas, in this case, via artwork-text. In the act of exhibiting the RAG objects, one side of this investigation is a series of static positions. Whilst the continuous accumulation of artwork-texts surrounding each of these acts, in the forms of the exhibition catalogues, is a state of continued motion and evolution.

The next section ("Section 1.2") presents the statistical methodology employed to discover and define the shadow/artworks. This section introduces the theoretical justification for the treatment of the data as artwork-objects and artwork-text and explains the existent relationship between these two elements under examination that forms the artwork. The relationship considered between the RAG objects exhibited and their accompanying text draws on the language of quantum physics, which might be contrasted with that of classical (Newtonian) physics when describing many of the features of more traditional relationships between artworks and their histories. By "art history", within this investigation, is meant specifically the study and understanding of the relationship between the object, traditionally called the "artwork", and the written sources relating and related to it.

Classical physics corresponds to "real" world experiences directly. John C. Polkinghorne writes: "In classical physics I can know both where an electron is and what it is doing. In more technical language, its position and momentum can both simultaneously be known."[20] In "classical" art history the object of the "artwork" (artwork-object) and the history of the artwork (artwork-text) are simultaneously known: Its present reality and its accompanying

[19] T. S. Eliot, "The Hollow Men" (1925), in *Collected Poems 1909-1962*, Faber and Faber Ltd: London, 2002, p.81
[20] John C. Polkinghorne, *The Quantum World*, Penguin Books Ltd: London, 1990, p.3

ideas are not, routinely, distinguished. Werner Heisenberg's uncertainty principle undermines classical physics by asserting that you can either know where an electron is, **or** you can know what it is doing; if you know its position you cannot know its momentum.[21] This uncertainty principle is stated as the first property of quantum physics that distinguishes it from classical physics. It is returned to below.

The second property of the quantum mechanics states that electrons satisfy a "superposition principle".[22] The superposition principle is less immediately relatable to this thesis's investigation, and to artwork-objects and artwork-histories/artwork-texts, but is important, later, to the coherence of the argument. Superposition, rather simplistically, is the addition of quantities of different sorts. An example provided by Polkinghorne:

> Suppose I walk five steps in the direction of 53.1˚ east of north. I end up in exactly the same spot as if I had first walked four paces due east (which is one sort of displacement, an easterly sort) and then three paces due north (which is another sort of displacement, a northerly sort). I can, therefore, think of my movement as a superposition, or addition, of these easterly and northerly movements.[23]

When this principle is applied to the quantum mechanical state of an electron, the electron can be in a superposition of the state in which it is "here" (four paces due east) and the state in which it is "there" (three paces due north), but the resulting combination does not correspond to the electron being somewhere in the middle between (53.1º east of north). Rather, it has a certain probability of being found "here" and a certain probability of being found "there". Or expressed more succinctly:

> States of motion in quantum mechanics can be superposed in a way that is analogous to the compounding of displacements in space or, more generally, to the addition of vectors in an abstract vector space. The result of such superposition produces a state whose properties are related to

[21] Polkinghorne, 1990, p.3
[22] Polkinghorne, 1990, p.17
[23] Polkinghorne, 1990, p.17

> those of its component parts in a probabilistic sense.[24]

However, returning to the "here" and "there" vectors, although the probability can be calculated through the examination of many electrons – examining where an electron ends up, and, if enough data is collected, the average might be 53.1˚ east of north – on a particular occasion of measurement, which possibility will occur is unable to be predicted with certainty.

Using the analogy of quantum physics to describe this thesis's approach to thinking about artwork-objects and their associated ideas (artwork-text). Artworks can be compared to electrons traveling along vectors, each vector being a "path" extending either "here" or "there", and in this analogy it is the vector that encompasses the motion of ideas, the advance of histories. Using this approach there is no point at which an artwork-object can be predicted, with certainty, to be associated with one, non-moving, group of ideas. Such stability would be the average of the vectors: 53.1˚ east of north. The closest it is possible to come to this is to calculate the various probabilities that the electron will be on one of the various vectors, that through addition form the path 53.1˚ north of east. These various vectors and their associated probabilities are the components of Heisenberg's uncertainty principle. These are the components, the vectors – that behave and can be described as waves – that Richard Feynman suggests are at the heart of all physics, including classical physics.[25] Newtonian classical physics presents "clear trajectories, unique paths of motion connecting the starting point A to end point B".[26] In brief, the route between A and B represents the route that requires the least energy to complete, and as such the principle is known as the "principle of least action".[27] Feynman reimagines the principle of least action as the "sums over histories", whereby the route A to B described in classical physics is the average of all of the possible paths (vectors) predicted in quantum physics.[28] The various "vectors" of quantum physics being describable as waves, the translation of the multiple waves of quantum physics to the averaged, one route of classical physics is known as the collapse of the wavepacket.[29]

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[24] Polkinghorne, 1990, p.23
[25] R.P. Feynman, R.B. Leighton, M. Sands, *The Feynman Lectures on Physics (The New Millennium Edition): Volume III: Quantum Mechanics*, Basic Books: New York, 2011, p.1-9
[26] Polkinghorne, 1990, p.66
[27] Polkinghorne, 1990, pp.66-67
[28] Feynman, Leighton, Sands, 2011, p.1-9 and Polkinghorne, 1990, p.67
[29] Polkinghorne, 1990, p.32

This thesis proposes that “classical” art history is viewed as a collapsed wavepacket. It is macroscopic, and, in being so, “classical” art history approaches the artwork as an object with one history. As such, object and history/text are viewed simultaneously as the artwork without contradiction. In viewing the artwork as an object with one history, “classical” art history has collapsed the wavepacket by taking an “average” of all the various ideas and histories associated with the object. The intention of this thesis is to illustrate the expanded wavepacket of art history. A collapsed wavepacket of classical art history serves a purpose, it allows for the simultaneous studying of the object and its history. But how accurate is such a description of an artwork supposing that a quantum belief in the impossibility of measuring position and movement simultaneously is correct? Firstly, focus needs to be directed in more detail to why simultaneous measurement is deemed impossible.

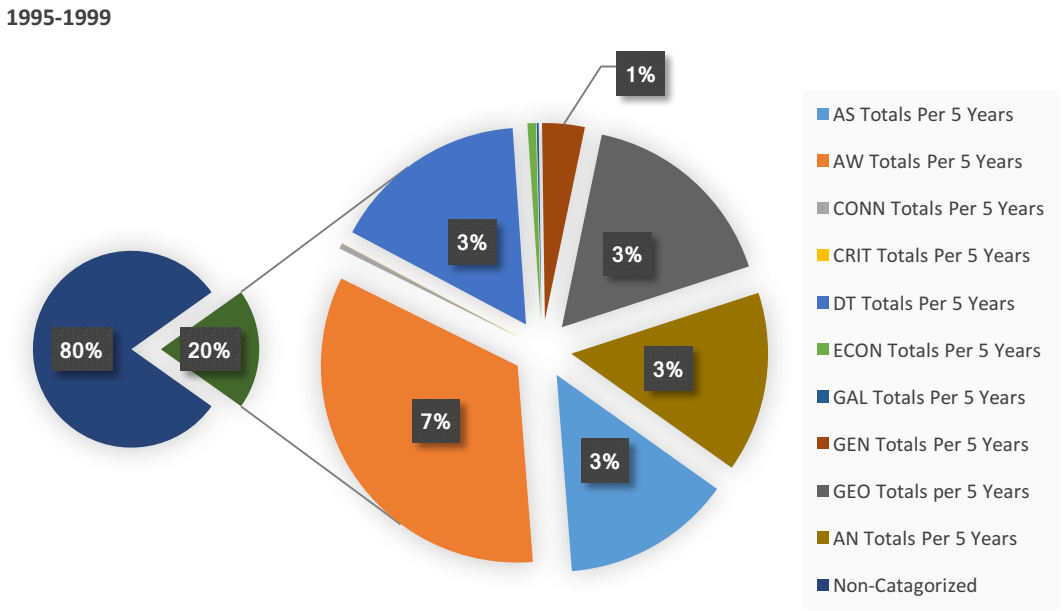
Examination of this begins by introducing the idea of operators, before progressing to eigenvalues and eigenvectors, and their lack of commutability in quantum physics and thus quantum art history.

“An operator is simply something which turns one vector into another. An example would be the operation of anticlockwise rotation through 90˚, which turns ‘three steps east’ into ‘three steps north’.”[30] In the case of the art history being proposed, it is the exhibitions’ accompanying texts that are viewed as the operators. These are the operators that turn one established vector (set of ideas pertaining to particular artworks) into another. In this thesis through content analysis, “Unit 2”, these related texts (artwork-texts) have been reduced to numbers (word counts, weighted percentages). This in turn allows these operations to be described numerically, which allows for their conceptualizing in terms of eigenvalues and eigenvectors.

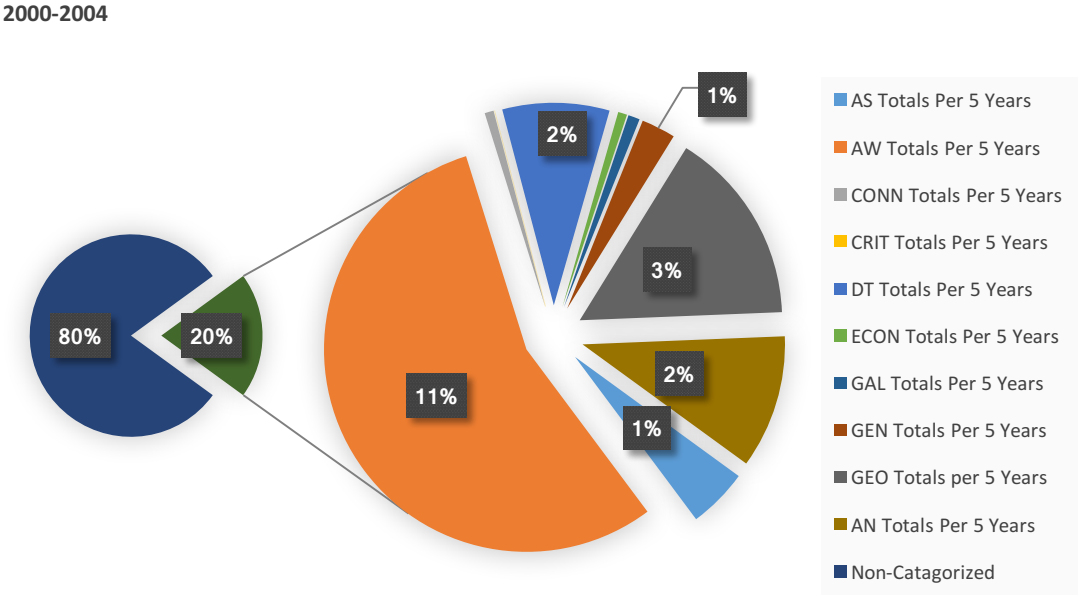
Given that, for this investigation, an operator is a function that allows one vector/exhibition’s artwork-text to be associated with another vector/exhibition’s artwork-text, it can “be expressed that an operator O corresponds to a rule for turning a vector V into another vector V^1.”[31] This could be written as:

$$O : V \rightarrow V^1$$

[30] Polkinghorne, 1990, p.25
[31] Polkinghorne, 1990, p.25



Graph 1.1.1: Left-hand side: Pie chart of proportion of artwork-text produced from 1995 to 1999 "categorized" by the content-analysis recording units. Right-hand side: Pie chart illustrating proportion of "categorized" artwork-text (1995-1999) defined by each first-level recording unit. (The percentage figures on the right-hand pie chart express these first-level recording units as a percentage of the left-hand pie chart.)



Graph 1.1.2: Left-hand side: Pie chart of proportion of artwork-text produced from 2000 to 2004 "categorized" by the content-analysis recording units. Right-hand side: Pie chart illustrating proportion of "categorized" artwork-text (2000-2004) defined by each first-level recording unit. (The percentage figures on the right-hand pie chart express these first-level recording units as a percentage of the left-hand pie chart.)

Examined in detail in "Unit 2", and illustrated through the comparison of *Graph 1.1.1* and *Graph 1.1.2*, this means that the exhibitions' artwork-texts for the five-year period 2000-2004, acting as operators ($O^{2000\text{-}2004}$), transform "vector 1995-1999" ($V^{1995\text{-}1999}$) into "vector

2000-2004" ($V^{2000\text{-}2004}$). Where $V^{1995\text{-}1999}$ and $V^{2000\text{-}2004}$, in this instant, represent the proportion of text accounted for by the first-level of inclusion within the content analysis (left-hand pie chart), and, in the right-hand pie chart, denote what percent each of these first-level concepts account for the total artwork-text, whilst illustrating them proportionally in relation to the other first-level concepts.

Graph 1.1.1 and *Graph 1.1.2* illustrate the transformative power of the exhibitions' artwork-texts as operators upon the construct of RAG ideas/history that become the new vectors upon which the RAG artwork-objects "travel". For example, the inclusion of Art Words (AW) is increased from representing 6.29% to representing 10.79%, whilst the inclusion of Socio-Political Words (SPW) is reduced from representing 4.75% to 2.98%. This demonstrates the impact of exhibitions' artwork-texts as operators in turning one vector ($V^{1995\text{-}1999}$) into another vector ($V^{2000\text{-}2004}$).

This example is useful in demonstrating the transformative power of operators through comparison of two vectors, before and after an operator. Such a transformation might also be suggestive of "how it comes about that observable qualities can be associated with certain operators".[32] For example, the operator described above as turning $V^{1995\text{-}1999}$ into $V^{2000\text{-}2004}$ could also be seen as a filter; enhancing some of the constituent parts (first-level concepts) and diminishing others. In this respect $V^{2000\text{-}2004}$ could be expressed in terms of $V^{1995\text{-}1999}$. Or, in other words $V^{1995\text{-}1999}$ could be expressed as a multiple of itself: For example: SPW of $V^{2000\text{-}2004}$ (SPW$V^{2000\text{-}2004}$), 2.98%, could be express as a multiple of the SPW constituent part of $V^{1995\text{-}1999}$ (SPW$V^{1995\text{-}1999}$) as such: 0.63(SPW$V^{1995\text{-}1999}$) [.63x4.75].

This could be summarized as:

$$\text{SPW}O^{2000\text{-}2004} : \text{SPW}V^{1995\text{-}1999} \rightarrow (.63)\text{SPW}V^{1995\text{-}1999}$$

This is an example of an eigenvector relation. When "an operator O turns a vector V into a multiple v of itself."[33] This is also expressed by the general formula:

$$O : V \rightarrow vV$$

[32] Polkinghorne, 1990, p.26
[33] Polkinghorne, 1990, p.27

Where, *V* is an *eigenvector* of *O* with *eigenvalue v*. This formula is important as it provides a notion of eigenvalues demonstrating operators to be acting on vector space, as described in relation to sums of histories and the uncertainty principle. "It thus affords a way in which the results of measurement can be associated with quantum mechanical observables: the possible results of measuring an observable are just the set of eigenvalues of the corresponding operator."[34]

This notion of eigenstates is, also, of fundamental importance to understanding why the information pertaining to states of motion and position is restricted in quantum physics, and, by association, within the concept of a "quantum" art history. If it were possible to know, simultaneously, where a particle (artwork-object) was and also what it was doing (artwork-history/artwork-text), "it would then have to be in a state which was simultaneously an eigenstate of the position operator *x* and also an eigenstate of the momentum operator *p*"[35]. Such a state is only possible if the operators *x* and *p* were to commute. By commute is meant that they could be multiplied together in either order to produce the same result – *3x2* and *2x3* both equal *6*. In quantum mechanics operators *x* and *p* do not commute, and this is why "there cannot be a state in which they both take definite values".[36] Essentially what is being stated is that if operators *x* and *p* were able to commute it would not matter which was encountered first by the electron/artwork-object. If the artwork encountered *3* followed by *2* the product of its "journey" will be the same as if it encounters *2* followed by *3*, the product will still be *6*. In this example both *2* and *3* are being conceived as operators along the vector of the electron/artwork-object.

For an example of operators that do not commute consideration could be given to the action of two polarisers P_1 and P_2 whose optical axes make an angle *a* with each other as they are encountered by a photon (photons can be thought about in the same way as electrons) which is polarised parallel to optical axis P_1:

> If it first encounters P_1 it cannot get through at all, since it is the state which is extinguished by P_1. However, if it encounters P_2 first, then there is a chance ($\sin^2 a$) of transmission and, since the transmitted photon is then polarised in a new direction (perpendicular to the optical axis of P_2)

[34] Polkinghorne, 1990, p.27
[35] Polkinghorne, 1990, p.28
[36] Polkinghorne, 1990, p.28

there is a further chance ($\cos^2 a$) that it could subsequently be transmitted by P_1. Thus encountering the polarisers in the order (P_1 then P_2) completely blocks our initial photon, whilst encountering them in the order (P_2 then P_1) gives it a chance of transmission.[37]

This is important as the order in which the two polarisers are encountered dictates the order in which the corresponding operators will be multiplied together. As the order will give two different results, demonstrating that order does matter, this demonstrates that operators do not commute.

This can also be thought about in terms of an artwork-object's exhibition texts. The exhibitions' artwork-texts differ from the exhibitions themselves. Whereas the exhibitions have occurred, and have a set chronology, the artwork-texts are preserved and can, theoretically, be applied like the polarisers to the photons of artwork-objects. At its simplest, this ordering of exhibition-artwork-text filters can be placed into operation with an artwork-object simply by the order in which they are first read by the observer. With the various ordering building-up, through enhancement and diminishment, a different history (or sums of histories) surrounding a particular object. A more objective approach is the content analysis introduced in "Unit 2", which will illustrate, numerically, the changes. The notion of non-commutability between the exhibitions' artwork-texts is also demonstrated below, simply due to the fact quantum physics' subject lies between motion and position, between idea and reality.

Karl Popper writing on quantum physics and specifically Heisenberg's uncertainty principle notes: "Every physical measurement involves an exchange of energy between the object measured and the measuring apparatus (which might be the observer himself)."[38] This has some important consequences: "Any such exchange of energy will alter the state of the object which, after being measured, will be in a state different from before. Thus the measurement yields as it were, knowledge of a state which has just been destroyed by the measuring process itself."[39] This once again confirms the belief that the simultaneous fixing of both the position and momentum of an object is impossible, even if the positon is of an artwork-object and its momentum is the artwork-history/artwork-text. For if the artwork

[37] Polkinghorne, 1990, p.28
[38] Karl R. Popper, *The Logic of Scientific Discovery*, Routledge: London, 1995, p.218
[39] Popper, 1995, p.218

consists of these two elements that can only be grasped shadow-like, then as the text/momentum is examined it changes that which has gone before including its very own foundations. The examination acts as an operator on the very thing it is attempting to examine producing an eigenvector of itself (*V*) with eigenvalue *v*. The object-text relationship is ungraspable: To attempt to illuminate the shadow is to destroy it.

Popper, again, asserts that position can only be discovered at the expense of momentum. The implication being that "it is in principle impossible to predict *the path of a particle.*"[40] Feynman agrees in the impossibility of predicting a "path". Writing: "*We do not know how to predict what would happen in a given circumstance,* and we believe now that it is impossible – that the only thing that can be predicted is the probability of different events."[41] This suits the enquiry of this thesis perfectly. This thesis does not want to produce a sum of histories as with "classical" art history, but to expand the wavepacket of the "classical" art history to understand the various vectors, and the impact of exhibition-text operators, upon the photonic artwork-objects. This thesis collects together, numerically, where the artwork-objects have been; It collects together their reality at points in time. Through content analysis, it calculates their momentum. By its conclusion it will present numerous probable relationships between the vectors/recording units of the artwork-text and between these paths and the artwork-object. But it cannot present one single defining conclusion, as that will lead to the collapse back to the "classical" art history it wishes to expand.

[40] Popper, 1995, p.219
[41] Feynman, Leighton, Sands, 2011, p.1-10

1.2 – Bivariate Correlation and Its Uses Within Art History: Methodology

Much of what is written in this section would not be noteworthy in other disciplines and subject areas. Psychology, economics, social sciences, the sciences and some humanities subjects (geography, social anthropology) routinely use the *IBM SPSS Statistics* software and/or the statistical analyses discussed in the following section. This methodology, in its application, is uncommon to art history, and as such a more in-depth method section has been provided. Although this thesis uses some descriptive and analytical statistics to explore the production and, later, exhibition of Russian avant-garde (RAG) artworks, it is hoped that it might, rather, act as a case study demonstrating the potential usefulness of such techniques' application to the field of art history in general.

"Correlation analysis is used to describe the strength and direction of the linear relationship between two variables."[42] Discussion will occur shortly with regard to what variables are examined in relation to the production and exhibition of the RAG artworks. Firstly, there is an introduction to the statistics and methods that are used in conjunction with these variables.

The descriptive and analytical statistics used within this investigation are calculated and generated using *IBM SPSS Statistics* software. There are three types of bivariate correlation (correlation between two variables) available to be calculated on *IBM SPSS Statistics*: Pearson's Correlation Coefficient (*r*); Spearman's Correlation Coefficient (*rho* or r_s); Kendall's Tau (*tau* or *T*). Pearson's Correlation Coefficient is a parametric test, and assumes (among other things) a "normal" and "linear" distribution of data. By "normality" is meant that the scores of each variable should be "normally" distributed; if inspected upon a histogram they should produce a bell-shaped curve.[43] By "linearity" is meant that the relationship between the two variables should be "linear" in distribution; if plotted against one another on a scatterplot a, roughly, straight line should be produced.[44] If these assumptions are violated, a non-parametric statistic can be used. Both Spearman's Correlation and Kendall's Tau are non-parametric tests.[45] As the data pertaining to the RAG in this thesis does not present "normality", due to a high frequency of lower scores in most variables, creating skewed histograms, Kendall's Tau is used. According to Andy Field, Kendall's Tau "should be used

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[42] Julie Pallant, *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using IBM SPSS (5th Edition)*, McGraw-Hill Education: Maidenhead, 2013, p.133
[43] Pallant, 2013, p.130
[44] Pallant, 2013, p.130
[45] Andy Field, *Discovering Statistics Using IBM SPSS Statistics - And Sex And Drugs And Rock 'N' Roll*, Sage Publications Ltd: London, 2013, p.276

rather than Spearman's coefficient when you have a small data set with a large number of tied ranks. This means that if you rank all the scores and many have the same rank, then Kendall's Tau should be used."[46] This is the case with the RAG data relating to the 62-British-exhibition canon data, which in most cases has a relatively small number of 32 cases (*N*), and, if one was to rank the scores of these cases, there would be many, at the lower end, sharing the same rank/score. It is also suggested by David Howell that Kendall's statistic used within sample-data provides a better estimate of the correlation found in the "population".[47] The "sample", within an experiment, being used to model and predict relations within the larger population from which it derived, but from which it is being studied in isolation.

The output from running Kendall's Tau on *IBM SPSS Statistics* is expressed in three figures: The correlation coefficient (*tau* or *T*); the significance in a two-tailed test (*Sig. (2-tailed)* or *p*); and the number of cases tested within the sample (*N*).

The correlation coefficient (*T*) is a value ranging from -1 to 1. It indicates the strength of the relationship between the two variables. A correlation of zero indicates that there is no relationship. A correlation of 1 indicates a perfect positive relationship; as one variable increases (or decreases) in value, the value of the other variable does likewise. A correlation of -1 indicates a perfect negative relationship; as one variable increases the other variable decreases in value, or *vice versa*. On interpreting the level of strength of a correlation coefficient that lies between 0 and 1 (or -1)[48] Jacob Cohen suggests the following guidelines:

- small *T* = .10 to .29
- medium *T* = .30 to .49
- large *T* = .50 to 1.0[49]

The significance level (*Sig. (2-tailed)*) "does not indicated how strongly the two variables are associated (this is given by *r* or *rho* [*T* or *tau*]), but instead it indicates how much confidence we should have in the results obtained".[50] The significance values inform of the probability of getting the calculated correlation coefficient if there is no relationship between the two

[46] Field, 2013, p.278
[47] David Howell, *Statistical Methods For Psychology (4th Edition)*, Duxbury Press: Belmont, CA, 1997, p.293
[48] The sign (+/-) has no impact on the strength, just the direction of correlation.
[49] Jacob Cohen, *Statistical Power Analysis For The Behavioral Sciences (2nd Edition)*, Lawrence Erlbaum Associates: Hillsdale: NJ, 1988, pp.79-81
[50] Pallant, 2013, p.140

variables.[51] Therefore, a significance of .01 indicates a probability of 1%, of the given correlation coefficient being calculated if there was in fact no relationship between the two variables. In this research, for a correlation to be deemed statistically significant, a criterion of $p < .05$ has been set for the significance value. This means that, at most, there is a 5% probability of calculating a significant correlation coefficient when there is in fact no actual relationship to be found between the two variables.

There are some problems with the significance of *tau* (or *r* and *rho*):

> The significance of *r* or *rho* [or *tau*] is strongly influenced by the size of the sample. In a small sample (e.g. $N = 30$), you may have moderate correlations that do not reach statistical significance at the traditional $p < .05$ level. In large samples ($N = 100+$), however, very small correlations (e.g. $r = .2$ [$T = .2$]) may reach statistical significance.[52]

Field also notes significance as potentially problematic, especially within variables lacking in normality.[53] He states that "we should be more concerned with the bootstrapped confidence intervals than the significance *per se*: this is because the bootstrap confidence intervals will be unaffected by the distribution of scores, but significance value might be".[54]

Confidence Intervals (CIs) for correlation coefficients are expressed as two values: A lower and an upper one. They denote the range of values "that we are 95% confident that the 'true value' (if we actually could have measured it!) actually lies".[55] As Daniel Wright, Kamala London, and Andy Field note, though, the formulae for calculating CIs "are often only appropriate if the user is willing to make certain assumptions; for example, the residuals being normally distributed".[56] But non-parametric tests for correlation are being used in this thesis due to the data not being normally distributed. Bootstrapping, as set-out by Wright, London, and Field, resolves this problem, "and can be used to find CIs for any statistic".[57]

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[51] Field, 2013, p.275
[52] Pallant, 2013, p.140
[53] Field, 2013, p.275
[54] Field, 2013, p.275
[55] Pallant, 2013, p.140
[56] Daniel Wright, Kamala London, Andy Field, "Using Bootstrap Estimation and Plug-in Principles for Clinical Psychology Data", in *Journal of Experimental Psychopathology*, 2(2), 2011, p.253
[57] Wright, London, Field, 2011, p.253

Bootstrapping is a computer intensive procedure introduced by Bradley Efron in 1977. It works on the principal that populations are normally distributed, and that the populations can be divided up into samples. If enough samples are taken, regardless of their individual distributions – normal or not – they will, *en masse*, be representative of a population with a normal distribution. Bootstrap sampling works by randomly selecting a case from the sample being tested, making a note of its value, and replacing it back into the sample ("sampling with replacement").[58] A second case is then randomly sampled and replaced, and could be the same case as the first one, which was replaced after selection. This is continued until a complete, new sample containing, usually, the same quantity of cases as the original sample has been noted. This is one bootstrap sample, but "most researchers recommend at least 2,000" bootstrap samples be taken.[59] This recommendation has been adhered to whenever possible in this study. Kendall's Tau, which is used to calculate the correlation coefficient (*tau* or *T*) for the original sample, is then calculated for each of the bootstrap samples, and the 95% CI range produced for these values. These values are known as the "percentile bootstrap confidence interval (because it is based on the values between which 95% of the bootstrap sample estimates fall)".[60] Bradley Efron and Robert Tibshirani argue that a slightly more accurate bootstrap CI is one called a bias-corrected and accelerated confidence interval (BCa).[61] It is this CI that is used in this study: BCa 95% CI. All bootstrap calculations are conducted using *IBM SPSS Statistics*.

Within this thesis, the calculated BCa value is compared to Kendall's Tau (*T*) for the original sample in conjunction with significance value (*p*-value). The main point of note with regard to the BCa 95% CI value, is that it should not cross zero. A value of zero means that within the 95% CI there is a chance that the "true value" could be zero, regardless of what the *p*-value is, and that the two variables have no relationship/correlation with one another.[62] If the BCa 95% CI crosses zero, it also means that the "true value" could be either positive or negative, which does not enable a useful conclusion to be drawn of the relationship between two variables. In this study, in nearly all cases, both criteria are met for discussion upon a significant correlation coefficient to be occur: The Kendall's Tau must have both a

[58] Wright, London, Field, 2011, p.256
[59] Wright, London, Field, 2011, p.256
[60] Field, 2013, p.199
[61] Bradley Efron and Robert Tibshirani, *An Introduction to the Bootstrap*, Springer Science and Business Media: Dordrecht, 1993, pp.184-198
[62] Field, 2013, p.275

significance value of $p < .05$, and a BCa 95% CI that does not cross zero. Although, in some cases preference will be given to the BCa 95% CI value if the *p*-value is close to $p < .05$.

A Note on the Expression of Cases (*N*) in this Thesis:

In this thesis, as stated above, bivariate correlation is calculated between two variables: These variables are calculated from yearly averages. As stated on page 2, the data from the 62 exhibitions occurring from 1935 to 2009 is expressed as 32 yearly averages. Whilst data including additional primary-source artwork-text as well as the artwork-text data from the 62 exhibition catalogues, covering a period from 1902 to 2009, is expressed as 58 yearly averages when used to calculate bivariate correlations: 26 yearly averages pertaining to the period 1902 to 1934, and 32 yearly averages for the period 1935 to 2009. The use of 58 yearly averages for calculating correlations for the period from 1902 to 2009 as opposed to the 70 yearly averages used in the creation of graphs, charts and "fingerprints" for this period is explained in "Section 2.0" (pages 54-55).

With regard to the period from 1935 to 2009 expressed as 32 yearly averages: When bivariate correlation is calculated between two variables from this data it will produce a maximum number of 32 cases ($N = 32$), or a maximum sample size of 32 cases ($N = 32$). But the number of cases (*N*) between two variables has the potential to not always equal the maximum possible sample size: This is due to *excluded pairwise cases*. When using *IBM SPSS* to calculate the correlation between two variables that, for example, occur in the exhibitions from 1935 to 2009, expressed as 32 yearly averages (cases [*N*]), if there is no data for one or both variables within one of the 32 potential pairs of yearly averages (*N*) then this pair/case is excluded from the calculation. If a pair/case (*N*) is excluded from the bivariate correlation calculation due to there being no data in that instant, then the number of cases (*N*)/sample size (*N*) from which the resulting correlation is produced will be reduced. Therefore, the *N*-value from calculating the correlation between two variables derived from data containing many variables has the potential to be less than the maximum possible sample size based on the number of yearly averages (cases) for which there is data pertaining to one of the many variables, but where for some of the variables there is no data for some yearly averages (cases).

This is demonstrated in the top three rows of *table 2.8.1* (page 131). The top three rows of this table show the correlation between various aspects (recording units) of the primary-source artwork-text and Year for the period from 1902 to 1934. As stated above, there are 26 yearly averages pertaining to the period 1902 to 1934. Therefore, the maximum number of cases/maximum sample size (*N*) is 26. As described by the top three rows of *table 2.8.1* the number of cases (*N*) is not 26 but 15. This is due to there being no data for "variable 1" and/or "variable 2" of the top three rows of *table 2.8.1* in 11 of the 26 years (cases) for which yearly averages are calculated. As bivariate correlation is calculated only between cases containing pairs of variables for which there is data this reduces the actual sample size to 15 (*N* = 15) in *table 2.8.1*. This explains why throughout this thesis the actual sample sizes displayed within the tables of data have the potential to be different from the maximum possible sample size stated in the text. The maximum sample size being the number of years within the specific timespan being considered for which there is data available to calculate yearly averages for some or but not necessarily all the variables under examination within this thesis.

1.2.1 – Case Study: Artwork-Object Size as Equivalent to Artistic Productivity (A Practical Application of Bivariate Correlation to Art History)

"Section 1.2.1" and "Section 1.2.2" are case studies that demonstrate the statistical method of "Section 1.2" to the discussion of "measuring" art, both, quantitatively and objectively. "Section 1.2.1" examines various elements of artwork believed to be measurable, from "quality" to artistic productivity, and it examines the processes used to "extract" this information. It uses some of these methods and techniques to demonstrate and argue for an equivalence between artwork-object size and artistic productivity. As a case study demonstrating the method, conclusions arrived at by this section are not necessarily intended to be followed through the rest of this thesis.

The ambition to "measure" the arts is not a new one: Alvin Toffler published his article, "The Art of Measuring the Arts", in the *Journal of Aesthetic Education* in 1970. This article pursues a trend that continues throughout the twentieth century, and into the twenty-first, of attempting to measure ephemeral concepts, in this case, "quality". Toffler states: "[I]n the arts we need to devise objective, even – where possible – quantitative measures of cultural 'quality'."[63] He laments the fact that "in *no* other significant field is the existing data base flimsier", placing this down to "the bone-deep conviction among artists and critics that art and data are somehow antagonistic".[64]

Toffler continues the task of attempting to transform cultural quality into a measurable quantity through his list of fifteen attributes that might be used to distinguish between potential "high-quality culture", and, by implication, low-quality culture.[65] The difficulty in attempting to quantify and combine these attributes to give a scale of the cultural quality of a sample in comparison to the calculated quality of another sample, is that all of these attributes' values are derived at through an element of subjectivity. For example, the third attribute on Toffler's list is the phrase "technically outstanding", by which is meant "that the work displays high competence in the purely technical sense".[66] Toffler believes that this attribute could be best "judged by an artist's peers", and suggests the potential of forming panels consisting of "artists and, perhaps, critics, who would be asked to judge a sampling of

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[63] Alvin Toffler, "The Art of Measuring the Arts", in *Journal of Aesthetic Education*, Vol. 4, No. 1, Special Issue: The Future and Aesthetic Education (Jan., 1970), pp. 53-72, University of Illinois Press. [http://www.jstor.org/stable/3331493 (accessed: 07-08-2015)], p. 54
[64] Toffler, 1970, p. 59
[65] Toffler, 1970, p. 63
[66] Toffler, 1970. p. 65

output and to render a judgement in quantitative terms".[67] On the notion of "excellence" – number four on the attribute list – again, peer review is used, but this time through the noting of awards received by various works.[68] In conjunction with this Toffler writes that "content analyses" of reviews and critical essays could be made "for all references to individual works of art, and derive[d] from this a categorization of these works as 'bad', 'good', or 'excellent'".[69] The problems with deriving measurements of technique and excellence from direct peer review, or the analysis of textual peer judgements, are twofold. Firstly, all of these attributes of cultural quality are, ultimately subjective, deriving as they do from people's judgements. Secondly, by relying on a society to judge itself, with regards to accepted notions of these values through "consensus", it excludes from these categories any avant-garde artwork and cultures presently not contained within accepted notions.[70] As well as acknowledging that the system he is proposing "suffers from many shortcomings", Toffler also confesses to the latter of the two weaknesses above.[71] Concluding that:

> It is easier, for example, to keep tabs on the output of continuing, established institutions than on the output of ephemeral or ad hoc avant garde groupings. Yet such groups may, in the long run, turn out to be important.[72]

Toffler's conclusion also has great implication on the validity of another one of his aims. As well as attempting to calculate cultural quality, Toffler sees the potential to use these objective and quantitative measures to predict the future. In this case how the current "culture explosion" might be used to predict future trends within society as it transitions from an industrial to a post-industrial age.[73] Toffler believes that his method of empirically measuring the arts might contribute to an important "insight into the ways in which people and institutions adjust to change".[74] But by his own concluding admission the future that Toffler is able to predict is one that continues current trends by "established institutions": It is a prediction unable to account for change. As with "quantum" art history, it is able to chart points along the path travelled, but not the path to come. In this sense Toffler demonstrates

[67] Toffler, 1970. p. 65
[68] Toffler, 1970, p. 65
[69] Toffler, 1970, p. 66
[70] Toffler, 1970, p. 65
[71] Toffler, 1970, p. 71
[72] Toffler, 1970, p. 71
[73] Toffler, 1970, p. 54
[74] Toffler, 1970, p. 54

the allure of the application of quantitative research, but also the limitations: A more accurate understanding of the past, rather than of the future.

David Throsby, in 2006, also pursues the objective-ephemeral in his article "An Artistic Production Function: Theory and an Application to Australian Visual Artists". Throsby, treating artists in economic terms as "small businesses", attempts to apply economic production function to "artistic output in which quantity and quality of output are specified as joint products from the inputs of labour and capital provided by individual artists".[75] It appears that Throsby, too, attempts to quantify "quality" (as well as "quantity"). Although in Throsby's case it is not the cultural quality of society, but the creative quality of the artist that is attempting to be measured.[76]

In Throsby's formula,[77] creativity does not just appear as an output associated with quality, but also as an input in connection with capital. Throsby terms creative capital the "talent" of the artist.[78] To measure the "varying degrees of creativity", Throsby utilises many of the techniques/measurements proposed by Toffler. [79] Throsby uses "an artist's professional standing as a means of assessing the quality of an artist's work", and, similarly to Toffler's fifteen attributes, develops a list of twenty "artistic achievements".[80] Throsby asks the artists to not only select the achievements appropriate to themselves, but also rank them in the order of personal perceived importance.[81] As with Toffler, Throsby uses data derived through peer review in calculating artistic achievement and thereby artistic quality, noting whether an artist, in his study, has received "a grant to support their creative work" from "the Australia Council […] or a State agency".[82] His argument:

> These grants are peer assessed according to strictly controlled procedures and are awarded for high-quality artistic activity. Thus receipt of a grant

[75] David Throsby, "An Artistic Production Function: Theory and an Application to Australian Visual Artists" in *Journal of Cultural Economics*, Vol. 30, No. 1 (March, 2006) pp. 1-14, Springer [http://www.jstor.org/stable/41810904 (accessed: 07-08-2015)], pp. 1-2
[76] Throsby, 2006, p. 3
[77] Throsby's formula: "[…] for the j-th artists (j = 1,…,n): $y_j^{cr}, q_j^{cr} = f_1(L_j^{cr}, PK_j^{cr}, HK_{ij})$ [… and] $y_j^{co} = f_2\left(L_j^{co}, PK_j^{co}, HK_{ij}\right)$ […] where y = quantity of output; q = output quality; L = labour input; PK = input of physical capital; HK_i = vector of human capital (i = 1,…,m); and where the superscripts cr and co denote creative and commercial artistic production respectively." (Throsby, 2006, p. 3)
[78] Throsby, 2006, p. 2
[79] Throsby, 2006, p. 2
[80] Throsby, 2006, p. 4
[81] Throsby, 2006, p. 4
[82] Throsby, 2006, p. 5

> is a clear recognition of quality in the recipient artist's work.[83]

Again, the same argument with regard to subjectively-derived data being processed into implied, empirical fact could be levelled at Throsby's calculations of creative artistic quality. Throsby, as does Toffler, acknowledges this weakness in concluding: "[T]he incorporation of the creative talent variable as specified above is a crude approximation […]"[84]

As for measuring quantity, which is of more relevance to this investigation, Throsby believes that "the only practicable way to represent the quantity of output [for an artist] is in terms of a market valuation over the time period considered", which in his article's case is the financial year 2000-2001.[85] He opposes, as making "little sense", the "count[ing] up numbers of paintings produced, exhibitions mounted, etc.".[86] The use of market forces to denote, quantitatively, an element of artistic production is also used in Christiane Hellmanzik's 2009 text, "Artistic styles: revisiting the analysis of modern artists' careers".[87]

Hellmanzik bases her paper on a "global sample of the 214 most prominent modern visual artists born 1850–1945".[88] Hellmanzik's article aims to demonstrate common trends in the "peak ages" of artists within, both, different "year-of-birth cohorts" and "stylistic groups".[89] By "peak age" is meant the "timing of an artist's best work", and Hellmanzik uses the "assumption that market prices reflect the true quality of painting".[90] The market values used are derived from *http://www.artvalue.com*, and those artists in the sample of 214 "had a minimum of 10 sold paintings during the period of 1988–2007".[91] Regardless of how valid this method in judging the quality of an artist's work, rather than the tastes and preferences of a later audience, Hellmanzik also notes the sizes of the artwork-objects as these too are provided on *artvalue.com*. *Artvalue.com* provides the dimensions for each sold artwork-object – *height x width* – but, so that these dimensions can be compared, Hellmanzik represents them as an area of an artwork-object (cm^2).[92]

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[83] Throsby, 2006, p. 5
[84] Throsby, 2006, p. 11
[85] Throsby, 2006, p. 4
[86] Throsby, 2006, p. 4
[87] Christiane Hellmanzik, "Artistic styles: revisiting the analysis of modern artists' careers" in *Journal of Cultural Economics*, Vol. 33, No. 3 (2009), pp. 201-232, Springer [http://www.jstor.org/stable/41811027 (accessed: 07-08-2015)]
[88] Hellmanzik, 2009, p. 201
[89] Hellmanzik, 2009, p. 201
[90] Hellmanzik, 2009, pp. 202-203
[91] Hellmanzik, 2009, p. 204
[92] Hellmanzik, 2009, p. 214

Both the articles by Throsby and Hellmanzik are of use to this thesis in conjunction with the data from the 62 British exhibitions, and the examination of the productivity of RAG artists, which will be described as the quantity of artwork-object being produced by a particular artist in a particular Year. As there are no economic values available for the RAG artwork-objects exhibited in the 62 exhibitions, many of which have not entered the commercial/auction market, it is proposed to conduct Hellmanzik's investigation into "quality" by creating a new sample derived from a selection of RAG artists, and the listing for auction sales of their artworks from *artvalue.com*. If it is demonstrated that a correlation between economic value and size exists in the RAG sample, then as Throsby equates economic value to "quantity", it is not unreasonable to use size as indication of quantity/productivity. It is then proposed to use the size of the artwork-objects in the 62-exhibition canon as an indication of productivity in comparison to the dates of their creation. In an ideal world, it would be possible to view the complete *oeuvres* of each artist to enumerate artistic productivity, but this task, in nearly all circumstances, is impossible due to the number of lost and destroyed artwork-objects, and, with many of the artists, the sheer volume of work produced would make this task unachievable in even the most generous of timescales. Therefore, the use of the two samples that this thesis will generate is a practical way of dealing with this task.

This thesis's replication of Hellmanzik's investigation uses *artvalue.com* to attain the auction prices of sold artwork. It collates auction prices (USD) for sales between 1988 and 2009. These prices are then converted to the "Real Price" as of 2009. This is achieved by multiplying each Year's price at date-of-sale by the percentage increase in Consumer Price Index (CPI) that has occurred between each Year and 2009.[93] Auction prices are collected for the 10 most exhibited female-RAG artists, and the 10 most exhibited male-RAG artists.[94] These groups are derived from the data collected from the 62 exhibitions' catalogues being studied in this research. Only two-dimensional, non-reproducible (2DNR) artwork-objects are included. This includes paintings, drawing, and mixed media pieces. The reason for the limitation in the examination of two-dimensional artwork-objects to 2DNR objects is to limit additional factors that might have a bearing on price, factors other than the physical qualities

[93] These calculations were done via *www.measuringworth.com/uscompare/* (accessed 09-09-2015)
[94] The ten female artists are: Lyubov Popova, Vavara Stepanova, Natalia Goncharova, Alexandra Exter, Olga Rozanova, Nadezhda Udaltsova, Zinaida Kobyletskay, N. F. Kiselova, Ksenia Ender, L. V. Mayakovskaya. The ten male artists are: Aleksandr Rodchenko, Naum Gabo, Kasimir Malevich, Lazar (El) Lissitzky, Vladimir Mayakovsky, Ivan Kliun, Wassily Kandinsky, Mikhail Larionov, Gustav Klucis, Sergei Chekhonin. Also included in the male artists is Vladimir Tatlin.

(i.e. size) of the artwork-object that might skew the data. An example of such two-dimensional artworks with the capacity to skew data in this way are two-dimensional, reproducible (2DR) artwork-objects. This category includes photography, printed media, and typographical media, where factors such as number of editions affect the value reached at auction.

This creates a sample containing the prices and sizes of 860 2DNR artworks by the 21 artists.[95] From this sample the average price and size of artwork for each Year of Production (Year) is calculated. This is done for all 21 artists, the 11 male artists, the 10 female artists, and for each of the 21 artists individually. The correlation (Kendall's Tau) between auction price and size is then calculated. The resulting correlations are then used to state whether the null hypothesis (H_0) should be rejected and the hypothesis (H_1) accepted. The null hypothesis is:

> H_0 – There is no relationship between the variables of auction price and size of RAG artwork-objects sold from 1988 to 2009.

Whilst, the hypothesis is:

> H_1 – There is a significant, positive relationship between the variables of auction price and size of RAG artwork-objects sold from 1988 to 2009.

Although the rest of this thesis uses two-tailed tests, as the direction of the relationship has been stated in H_1 as positive a one-tailed test is suitable. This is due to it only being interested in the positive half of the bell-shaped curve of a normal-population distribution. The "whole" bell-shaped curve is centred around zero on the x-axis, with one tail in the negative numbers to the left of x = 0, and one tail in the positive numbers to the right of x = 0. In the rest of this thesis the direction of significant correlation being searched for is not stated as either negative or positive, hence a two-tailed test is used due to the interest in both halves of the bell-shaped curve.

The sample of 860 2DNR RAG artwork-objects contains objects produced from 1900 to 1961. The correlations are calculated in relation to the artwork-objects' Year of Production (Year) (1900-1961), between the average real price achieved from 1988 to 2009 for artwork-objects from the same Year of Production (Year) and their average size. As the correlations are based on the averages from the number of artwork-objects produced in a particular Year that have been sold from 1988 to 2009, the initial sample of 860 2DNR RAG artworks,

[95] For complete datasets for 860 2DNR RAG artwork-objects, see *Strugnell-ThesisCD* and *Excel* file: *Strugnell-A-O3 (2DNR RAG artwork-objects auctioned 1988-2009)*.

spanning a production period from 1900 to 1961, has been reduced to a sample of 810 2DNR RAG artworks that spans a production period from 1903 to 1940. The period 1903 to 1940 is defined by the first and last Year for which there are available ten or more (≥ 10) 2DNR RAG artworks from which to calculate the averages of real price and size.

Year of Production [Sample size of the number of artwork-objects sold from 1988 to 2009 produced in that year]	AucPrRAG (USD)	AucSiRAG (cm^2)	Year of Production [Sample size of the number of artwork-objects sold from 1988 to 2009 produced in that year]	AucPrRAG (USD)	AucSiRAG (cm^2)
1940 [18]	150731.75	1561.40	1921 [32]	64418.06	980.43
1939 [9]	366085.47	6755.96	1920 [56]	75735.36	1476.63
1938 [12]	181445.40	1864.56	1919 [23]	56595.08	840.59
1937 [6]	1261008.57	4005.10	1918 [25]	406851.86	2746.33
1936 [3]	199754.90	1193.81	1917 [23]	120555.45	956.41
1935 [3]	327827.91	2085.99	1916 [68]	137499.28	2440.93
1934 [14]	203411.95	944.96	1915 [35]	1768205.32	1243.75
1933 [7]	86666.93	981.47	1914 [26]	1320266.18	2300.09
1932 [19]	1596867.10	2318.23	1913 [36]	577711.58	1511.24
1931 [30]	533171.83	1874.76	1912 [23]	657992.54	1634.58
1930 [47]	319910.51	1666.39	1911 [15]	292917.57	3490.74
1929 [31]	370763.60	2946.23	1910 [13]	1422784.41	4167.66
1928 [17]	187730.21	1126.04	1909 [15]	2449992.61	3104.91
1927 [16]	800926.89	2096.08	1908 [28]	1163427.05	2734.53
1926 [8]	716425.90	2897.80	1907 [10]	103995.04	4363.38
1925 [27]	216143.51	1840.31	1906 [18]	420307.91	1761.42
1924 [29]	423346.68	1023.24	1905 [11]	479324.85	2623.48
1923 [19]	996590.58	2105.17	1904 [5]	450533.50	2972.36
1922 [21]	332128.65	938.90	1903 [12]	261253.46	986.30

Table 1.2.1.1: Two-dimensional, non-reproducible (2DNR) RAG Artwork-objects sold at auction from 1988 to 2009: The date of the original artwork-objects (Year of Production); The average real price, as of 2009, achieved at auction for artwork-objects produced in a specific Year (AucPrRAG); The average size (cm^2) of the artwork-objects sold at auction produced in a specific Year (AucSiRAG)

Table 1.2.1.1 contains, for the 810 2DNR RAG artwork-objects produced from 1903 to 1940 and sold at auction from 1988 to 2009, their average real price as of 2009 (AucPrRAG) and their average size (AucSiRAG). There is a significant, positive correlation between the two variables of AucPrRAG and AucSiRAG: $T = .340$, $N = 38$, $p < .05$ (.001), BCa 95% CI [.098, .549]. A *p*-value of .001 means that there is a .1% chance that there is no relationship between auction price and size; .1% probability that a false positive result has been discovered between these two variables. A *p*-value of .001 equates to a confidence level of 99.9%. As the confidence level for this thesis has been set at 95% – i.e. *p*-value (level of significance) at $p < .05$ – the null hypothesis (H_0) can be rejected, and it can be stated that there is a significant, positive relationship between the variables of price and size (AucPrRAG and AucSiRAG) (H_1). On average, the larger the artwork-object the higher the price achieved at auction is likely to be.

If the RAG artwork-objects produced from 1903 to 1940 and auctioned from 1988 to 2009 are divided into those objects produced by male-RAG (RAGM) artists and those produced

female-RAG (RAGF) artists, and the same calculations conducted, similar relationships are observed between the variables. These results are presented in *table 1.2.1.2*.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[96]	*p*-value	Lower	Upper
AucPrRAGM	AucSiRAGM	.377	38	.000	.142	.561
AucPrRAGF	AucSiRAGF	.512	29	.000	.242	.736

Table 1.2.1.2: Bivariate correlation (Kendal's Tau) between the average real price, as of 2009, achieved at auction from 1988 to 2009 for 2DNR artwork-objects produced by male and female RAG artists (AucPrRAG[M/F]), and the average size (cm^2) of the 2DNR artwork-objects sold at auction produced by either male or female RAG artists (AucSiRAG[M/F]).

Although there is a slightly stronger relationship between the variables of AucPrRAGF and AucSiRAGF, than the variables of the male-RAG artists, both, sets of variables exhibit significant, positive correlations. This, again, means that the null hypothesis (H_0), that there is no relationship between auction price and size, can be rejected for the artwork-objects created by, both, male-RAG and female-RAG artists.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[97]	*p*-value	Lower	Upper
AucPrCheS	AucSiCheS	.111	9	.338	-.865	.862
AucPrGonN	AucSiGonN	.527	27	.000	.282	.717
AucPrKanW	AucSiKanW	.438	37	.000	.236	.623
AucPrKliI	AucSiKliI	.333	19	.023	-.053	.663
AucPrLarM	AucSiLarM	.581	23	.000	.276	.818
AucPrLisL	AucSiLisL	.905	7	.002	.294	1.000
AucPrMalK	AucSiMalK	.600	16	.001	.339	.830
AucPrPopL	AucSiPopL	.389	9	.072	-.484	.935
AucPrRodA	AucSiRodA	.143	8	.310	-.826	1.000
AucPrUdaN	AucSiUdaN	.572	8	.024	-.043	1.000

Table 1.2.1.3: Bivariate correlation (Kendal's Tau) between the average real price, as of 2009, achieved at auction from 1988 to 2009 for 2DNR artwork-objects produced (1902-1940) by specific individual RAG artists (AucPrRAG[Artist])[98], and the average size (cm^2) of the 2DNR artwork-objects sold at auction produced (1903-1940) by specific individual RAG artists (AucSiRAG[Artist]).

The trends among individual artists will now be examined. Only individual artists with 10 or more recorded sales on *artvalue.com* are examined. Of the 21 artists previously included, 10 have 10 or more recorded auction sales relating to artwork dating from 1903 to 1940. These artists are: Chekhonin (CheS); Goncharova (GonN); Kandinsky (KanW); Kliun (KliI); Larionov (LarM); Lissitzky (LisL); Malevich (MalK); Popova (PopL); Rodchenko (RodA); Udaltsova (UdaN). The 10 artists that fulfil this criteria – the same criteria used by

[96] Cases (*N*) derive from 38 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)
[97] Cases (*N*) derive from 38 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)
[98] Those artists with ≥ 10 recorded sales from 1988 to 2009 on *artvalue.com*.

Hellmanzik in 2009[99] – account for the creation of 803 of the 810 2DNR RAG artwork-objects used within these calculations. The results of calculating Kendall's Tau for each of these 10 artists' sets of variables are presented alphabetically in *table 1.2.1.3*.

Of these 10 artists, Goncharova, Kandinsky, Larionov, Lissitzky and Malevich demonstrate a significant, positive correlation between their average real prices as of 2009 and size of artwork-objects produced from 1903 to 1940. These five artists, although only equating to half of those individually tested, account for 654 of the 810, or 80.6%, of the 2DNR RAG artwork-objects used within these calculations. For these five artists, the null hypothesis (H_0) can be rejected, and it can be stated that the larger a painting by these artists the more it is likely to sell for at auction. Two of the remaining five artists, Kliun and Udaltsova, demonstrate a significant, positive correlation in terms of *T*-values and *p*-values, but their BCa 95% CI values cross zero. The BCa 95% CI is the range in which there is a 95% certainty that the "true" value for the population is to be found. If the BCa 95% CI crosses zero it means that, regardless of the results fulfilling the requirements of the level of significance to be $p < .05$, there is still a chance that the true value could be negative and this would drastically alter the interpretation of the results. It is for this reason that within this thesis, for a result to be stated as significant, in nearly all cases, both, the requirements of $p < .05$ and BCa 95% CI not crossing zero must be met. If exceptions are made, leniency is toward the *p*-value criteria and not the rules regarding BCa 95% CI range.

In replicating Hellmanzik's investigation in relation to RAG artists, rather than assuming "that market prices reflect the true quality of painting"[100], it is demonstrated statistically that the market prices reflect – via a significant, positive relationship – the area (cm^2) of an artwork-object.[101] This has been demonstrated for 2DNR RAG artwork-objects overall, for both male-RAG and female-RAG artists' artwork-objects when examined independently, and demonstrated to be true in 50% of cases when the variables of both AucPr and AucSi of 10 individual RAG artists' artwork-objects were correlated separately. These significant, positive correlations between economic value and size can be used in comparison to Throsby's article, and its belief that "the only practicable way to represent the quantity of output [for an artist] is in terms of a market valuation"[102]. As evidenced, there is a significant and meaningful correlation between RAG artworks' economic value and size. Throsby equates

[99] Hellmanzik, 2009, p. 204
[100] Hellmanzik, 2009, p. 203
[101] Size being defined as by Hellmanzik as cm^2. (Hellmanzik, 2009, p. 214)
[102] Throsby, 2006, p. 4

artworks' economic value with artists' quantity of output. Therefore, it can be reasoned that average artwork-object size for a period is equivalent to an artist's quantity of output (productivity) for the same period. To summarise:

For Hellmanzik: ***market price (economic value) (x) = true quality of painting***

Hellmanzik's method reveals: ***market price (economic value) (x) = size (cm^2)***

Or: ***x = cm^2***

For Throsby: ***market price (economic value) (x) = artist's quantity of output***

Or: ***x = artist's quantity of output***

Through substitution: ***x = x***

Or: ***cm^2 = artist's quantity of output***

It is this definition of artist productivity – that it is equitable to the average size of the output from a given Year – that will be used in this thesis.

1.2.2 – Correlation between Production-Date Size (SiPr) and Year of Production (Year): 2DNR and 2DR Artwork-Objects within the 62 Exhibitions

This section builds on the equivalence between average size (cm^2) and artistic productivity introduced in "Section 1.2.1", and introduces the application of bivariate correlation to data particular to the 62-British-exhibition canon of this thesis. Initially, this section examines and tests the changing relationship between the artistic production of two different types of artwork-object produced by the RAG artists in relation to the Years from 1911 to 1932, in which these artwork-objects were produced. The two categories of artwork-object are two-dimensional non-reproducible (2DNR) artwork-objects and two-dimensional reproducible (2DR) artwork-objects. The former category contains artwork-objects of a "one-off"/unique nature: Paintings; drawings; mixed-media. As average area is used to denote artistic productivity, as demonstrated in "Section 1.2.1", all artwork-objects in both categories are of a two-dimensional nature.[103] The latter, 2DR, category contains artwork-objects that are able to be reproduced, making the notion of originality (both of production and size) more complex. This category includes: Lithographs (normally in the form of posters); photographs; text/typography (primarily books and pamphlets). The data for the two-dimensional artwork-object types – the production dates and the dimensions – are collated from the artwork-objects exhibited and catalogued in the 62 exhibitions' catalogues used throughout this investigation.

This sample contains the exhibited RAG artwork-objects that are two-dimensional, produced from 1911 to 1932, and for which dimensions are supplied: A total of 2,996 objects. This sample is divided into those artwork-objects that are 2DNR (2,141 objects) and those that are 2DR (855 objects). These groups are further segregated into those 2DNR and 2DR artwork-objects produced by male-RAG (RAGM) artists, and those produced by female-RAG (RAGF) artists. For each of these variables the average area of all the 2DNR and 2DR artwork-objects produced in each Year from 1911 to 1932 is calculated. Kendall's Tau (T) is then used to calculate correlation coefficients and levels of significance to assess the types of relationships occurring between these variables. Bootstrapping is used to produce the corresponding BCa 95% CI for the correlation of each pair of variables.

[103] Calculating the size, as volume, of a three-dimensional artwork-objects (e.g. a sculpture) is a task impossible to perform precisely with the data provided by the artwork-texts. Most exhibition catalogues provide the dimensions of width, height, and depth for three-dimensional artwork-objects, which transforms all such objects into over-simplified solid cuboid forms.

One important result that is demonstrated to be significant – i.e. has a *p*-value of $p < .05$ – is the relationship between the production-date size of 2DNR RAG artwork-objects (SiPr2DNRRAG), and the production-date size of 2DR RAG artwork-objects (SiPr2DRRAG). There is a significant, medium strength, negative correlation between these two variables: $T = -.351$, $N = 22$, $p < .05$ (.03). The lower and upper values of the BCa 95% CI are -.643 and -.012 respectively.[104] These do not cross zero, and, therefore, it can be stated with 95% confidence that the "true value" of Kendall's Tau correlation coefficient is negative. This negative correlation indicates that as the average size of 2DNR RAG artwork-objects increases, the average size of 2DR RAG artwork-objects decreases, and *vice versa*. As argued previously, in "Section 1.2.1", this means that it can be inferred, through the convention of using average size as equivalent to artistic productivity, that there is a negative relationship between artistic productivity with regard to the production of 2DNR and 2DR artwork-objects by RAG artists; as 2DNR RAG artistic productivity increases, 2DR RAG artistic productivity decreases, and *vice versa*.

Calculating Kendall's Tau for the relationship between the variables of Year of Production (Year) and SiPr2DNRRAG, and between Year and SiPr2DRRAG provides indicators as to the, general, overall direction and movement of the RAG's productive energies between 2DNR and 2DR artwork-objects from 1911 to 1932. Both the relationship between Year and SiPr2DNRRAG, and between Year and SiPr2DRRAG have particular results meaning that they cannot be declared significant. But both are instructive and indicative of a certain relationship that will be shown to be significant within certain groups of RAG artists and within the artistic productivity of an individual RAG artist.

There is a weak, negative correlation between the two variables of Year and SiPr2DNRRAG: $T = -.290$, $N = 22$, $p > .05$ (.059). This could potentially mean that as the Years progress – i.e. the figure of the Year gets numerically larger – that the size and, therefore, productivity within the field of 2DNR artwork-objects by the RAG decreases. As shown by the results, this is not a significant correlation with *p*-value .059, and BCa 95% CI crossing zero.[105] There is, though, a medium strength, positive result for the correlation between the two variables Year and SiPr2DRRAG: $T = .333$, $N = 22$, $p < .05$ (.03). These results initially indicate that as the Years progress from 1911 to 1932, the size and artistic productivity of 2DR RAG artwork-objects increases. But, again, a BCa 95% CI that crosses zero means it

[104] From here on the lower and upper BCa 95% CI limits will be expressed: [-.643, -.012]
[105] BCa 95% CI [-.648, .096.]

cannot be stated with 95% confidence that the positive correlation calculated in this instance is representative of the "true" correlation of the population – i.e. if it were possible to calculate this from all the 2DR RAG artwork-objects, rather than from a sample.[106]

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
SiPr2DNRRAG[M/F]/ Year of Production	SiPr2DRRAG[M/F]/ Year of Production	Tau (*T*)	Cases (*N*)[107]	*p*-value	Lower	Upper
SiPr2DNRRAGM	SiPr2DRRAGM	-.239	16	.297	-.569	.125
SiPr2DNRRAGF	SiPr2DRRAGF	-.400	16	.031	-.639	-.101
SiPr2DNRRAGF	Year	-.533	16	.004	-.852	-.088
Year	SiPr2DRRAGF	.400	16	.031	.047	.691

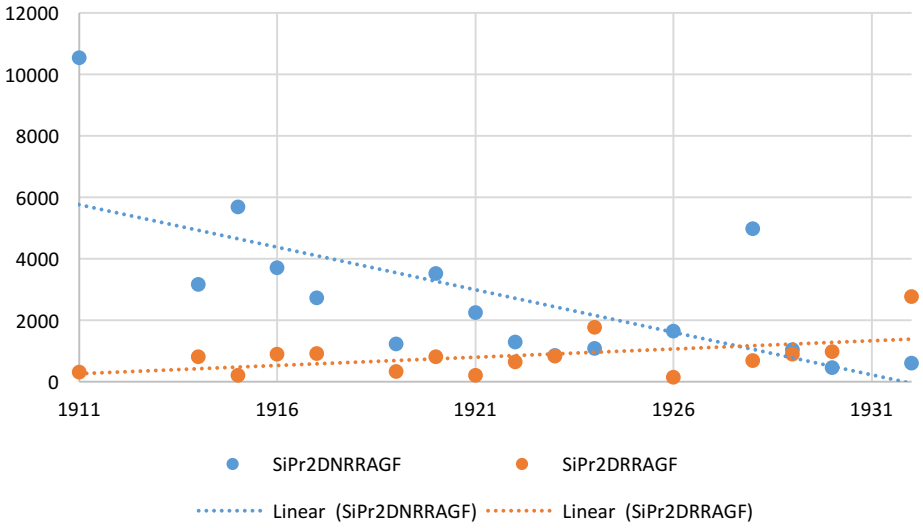
Table 1.2.2.1: Bivariate correlation (Kendal's Tau) between the average size (cm^2) of 2DNR artwork-objects produced by either male-RAG or female-RAG artists (SiPr2DNRRAG[M/F]) from 1911 to 1932 (Year) and the average size (cm^2) of two-dimensional, reproducible (2DR) artwork-objects produced by either male-RAG or female-RAG artists (SiPr2DRRAG[M/F]) from 1911 to 1932 (Year). Also, correlation between SiPr2DNRRAG[M/F] and Year (1911-1932), and between SiPr2DRRAG[M/F] and Year (1911-1932).

If these relationships seem "hazy", by focussing on the two genders of RAG artists separately it is possible to remove some of the "interference". If the correlation is calculated for the two variables of the production-date size of male-RAG artists' 2DNR artwork-objects (SiPr2DNRRAGM) and their 2DR artwork-objects (SiPr2DRRAGM), and then also calculated for the female-RAG artists' equivalent: SiPr2DNRRAGF and SiPr2DRRAGF, it is discovered that there is a much stronger, negative relationship between 2DNR artwork-objects and 2DR artwork-objects produced by the female-RAG artists from 1911 to 1932 than by the male-RAG artists during the same period. *Table 1.2.2.1* shows that, whilst there is only a weak, negative relationship between the male-RAG artistic production of 2DNR and 2DR objects, with the correlation coefficient between the variables SiPr2DNRRAGM and SiPr2DRRAGM having no statistical significance, the same variables relating to the female-RAG artists – SiPr2DNRRAGF and SiPr2DRRAGF – demonstrate, via the same calculation of Kendall's Tau, a significant, medium strength, negative correlation. Therefore, it can be stated with a high level of confidence that, during the period from 1911 to 1932, there is a relationship between female-RAG artists shift in productivity – measured by average area of artwork-object produced per Year – away from producing 2DR artwork-objects and the level of productivity increasing of their production of 2DNR artwork-objects, and *vice versa*.

The overall direction of this movement, for the period 1911-1932, is provided by the correlation of each variable, SiPr2DNRRAGF and SiPr2DRRAGF, with that of the Year of

[106] BCa 95% CI [-.054, .653.]
[107] Cases (*N*) derive from 22 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

Production (Year). The results are presented in *table 1.2.2.1*, and demonstrate a strong, significant, negative correlation between the variables of SiPr2DNRRAGF and Year. This opposes the slightly less strong (medium), but still significant, positive correlation between the variables of Year and SiPr2DRRAGF. These statistics demonstrate that as the Years progress from 1911 to 1932 – i.e. the value of the Year becomes numerically larger – the average area per Year of 2DNR artwork-objects being produced by female-RAG artists decreases. Whilst during the same period the average area per Year of 2DR RAGF artwork-objects produced increases. Producing a scatterplot charting both SiPr2DNRRAGF and SiPr2DRRAGF against Year, and including linear trend lines for both relationships, demonstrates this phenomenon visually (*graph 1.2.2.1*).



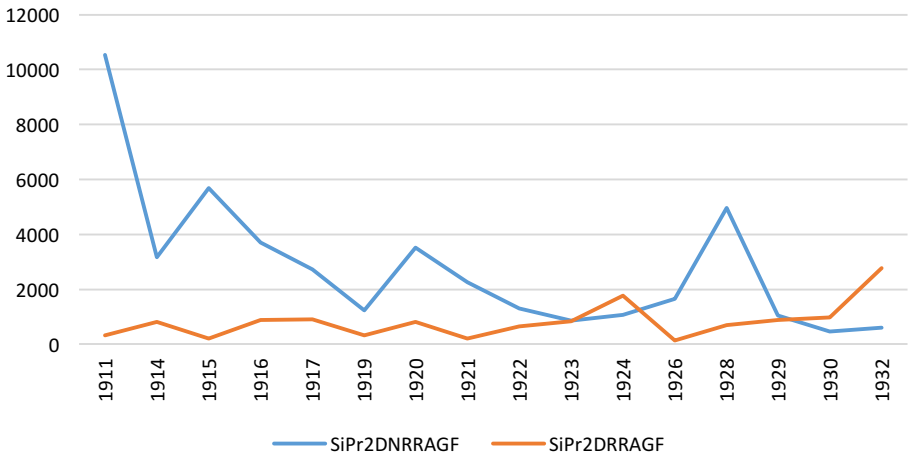
Graph 1.2.2.1: Scatterplot of the relationship between SiPr2DNRRAGF (cm^2) and Year (1911-1932), and between SiPr2DRRAGF (cm^2) and Year (1911-1932), with linear trend lines.[108]

Graph 1.2.2.1 illustrates SiPr2DNRRAGF plotted against Year as blue dots, and plots SiPr2DRRAGF against Year as orange dots. The dotted-blue line is the linear trend line for SiPr2DNRRAGF–Year, and the dotted-orange line is the linear trend line for SiPr2DRRAGF–Year. "Read" from left-to-right, the downward slope of the dotted-blue line indicates the negative correlation between SiPr2DNRRAGF and the Year of Production. Whilst the upward slope of the dotted-orange line is indicative of the positive correlation between SiPr2DRRAGF and Year. From 1911 to 1932 there is a shift in the dominant form of artwork-object on which the female-RAG artists' artistic productivity is being focused:

[108] The dotted lines of *graph 1.2.2.1* represent the best fitting line describing the relationships between SiPr2DNRRAGF and Year (dotted-blue line), and SiPr2DRRAGF and Year (dotted-orange line) obtained via linear regression.

From producing paintings, drawings, and mixed-media pieces, to producing photographs, lithographs, and textual pieces. This shift in the dominant focus of artistic production is indicated by the point at which the two lines cross at Year 1928.

Although *graph 1.2.2.1* proves useful in illustrating the overall trend from 1911 to 1932, as expected, reality does not run as smoothly as the straight, linear trend lines imply. *Graph 1.2.2.2* provides a better indication of the year-by-year realities of the productivity levels of female-RAG artists in producing two-dimensional artwork-objects. *Graph 1.2.2.2* illustrates the year-by-year changes in average area of, both the 2DNR (blue line) and 2DR (orange line) artwork-objects produced by the female-RAG artists from 1911 to 1932.



Graph 1.2.2.2: Line graph of the relationship between SiPr2DNRRAGF (cm^2) and Year (1911-1932), and between SiPr2DRRAGF (cm^2) and Year (1911-1932).

Graph 1.2.2.2 shows the initial discord between the productivity levels of 2DNR artwork-objects and 2DR artwork-objects in 1911 by female-RAG artists. With the respective average areas per Year for 1911 being 10,530.18cm^2 for 2DNR RAGF objects and 317.40cm^2 for 2DR RAGF objects. This chasm of difference narrows from 1911 to 1919. But this is mainly due to a decrease in the productivity levels concerning 2DNR RAGF objects during this time period, rather than an increase in the productivity levels of 2DR RAGF objects. The average area of 2DNR RAGF artwork-objects is shown to fall from 10,530.18cm^2 in 1911 to 1,226.00cm^2 in 1919. Whilst the average area of 2DR RAGF artwork-objects only increases from 317.40cm^2 in 1911 to 326.52cm^2 in 1919. It is from 1921 to 1924 that there is an actual increase in the productivity regarding the production of 2DR artwork-objects by female-RAG artists: Rising from an average area of 216.56cm^2 in 1921, to 1,779.73cm^2 in 1924. In 1923 there is a point of parity between the productivity levels in

producing 2DNR RAGF objects (Ave. Area: 849.81cm^2) and 2DR RAGF objects (Ave. Area: 843.82cm^2). This is indicated by the lines representing SiPr2DNRRAGF and SiPr2DRRAGF crossing. There is a second point of parity between 1929 and 1930, which also coincides closely to the trend-line crossover point in *graph 1.2.2.1*. From this point onward 2DR artwork-object productivity levels by female-RAG artists supersede that of 2DNR RAGF artwork-objects: With the average area of 2DR RAGF artwork-objects increasing from 888.44cm^2 (1929) to 2,774.67cm^2 (1932), whilst the average area of 2DNR RAGF artwork-objects decreases from 1,041.80cm^2 (1929) to 596.50cm^2 (1932).

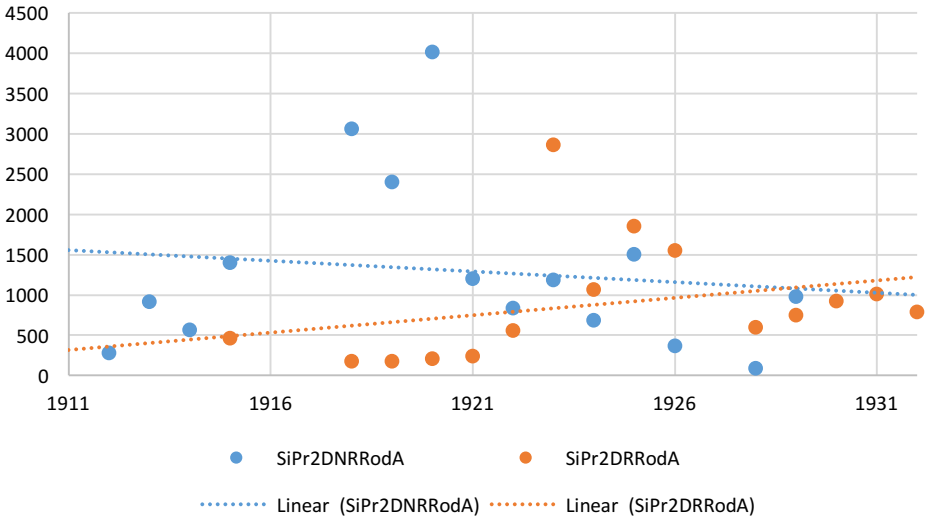
As demonstrated in *table1.2.2.1*, there is only a weak, negative relationship between the male-RAG artistic productivity in the production of 2DNR and 2DR artwork-objects, with the correlation coefficient of the variables SiPr2DNRRAGM and SiPr2DRRAGM having no statistical significance. If, though, the male-RAG artists are examined individually some do conform more strongly to the pattern that has been demonstrated within female-RAG artistic productivity: For example, Aleksandr Rodchenko (1891-1956). Calculating the correlation between the two variables of Rodchenko's average production-date size of 2DNR objects (SiPr2DNRRodA), and the average size of his 2DR objects (SiPr2DRRodA) provides evidence to suggest a meaningful, negative correlation. The results of Kendall's Tau are: T = -.385, N = 13, $p > .05$ (.067). This implies that the relationship between SiPr2DNRRodA and SiPr2DRRodA, although of medium strength, is not significant. But the bootstrap BCa 95% CI [-.706, -.014] does not cross zero, and, therefore, supports the medium strength correlation coefficient of the relationship between Rodchenko's production of 2DNR and 2DR artwork-objects being a negative one; as Rodchenko's artistic productivity in the production of one form of artwork-object increases, the productivity levels regarding the other form of artwork-objects decreases.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
SiPr(Artist)2DNR/ Year of Production	SiPr(Artist)2DR/ Year of Production	Tau (*T*)	Cases (*N*)[109]	*p*-value	Lower	Upper
SiPr2DNRRodA	SiPr2DRRodA	-.385	13	.067	-.706	-.014
SiPr2DNRRodA	Year	-.528	13	.010	-.826	-.224
Year	SiPr2DRRodA	.436	13	.038	-.122	.812

Table 1.2.2.2: Bivariate correlation (Kendal's Tau) between the average size (cm^2) of 2DNR artwork-objects produced by Aleksandr Rodchenko (SiPr2DNRRodA) from 1911 to 1932 (Year) and the average size (cm^2) of two-dimensional, reproducible (2DR) artwork-objects produced by Rodchenko (SiPr2DRRodA) from 1911 to 1932 (Year). Also, correlation between SiPr2DNRRodA and Year (1911-1932), and between SiPr2DRRodA and Year (1911-1932).

[109] Cases (*N*) derive from 22 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

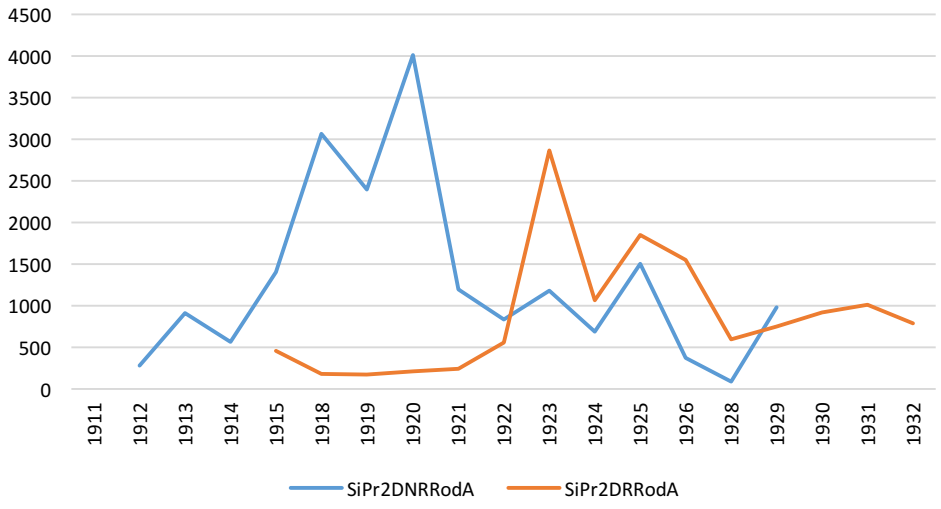
Evidence of the general trends of Rodchenko's artistic productivity of 2DNR and 2DR artwork-objects from 1911 to 1932, is provided through calculation of Kendall's Tau and the bootstrap BCa 95% CI for the two sets of variables SiPr2DNRRodA–Year and SiPr2DRRodA–Year. The results, noted in *table 1.2.2.2*, show a strong, significant, negative correlation between SiPr2DNRRodA and Year. This indicates that as the Years progress from 1911 to 1932 the average size of Rodchenko's 2DNR artwork-objects decreases. This opposes a significant, medium strength, positive correlation between SiPr2DRRodA and Year. The confidence, though, that can be held in this latter result must be tempered by the fact the bootstrap BCa 95% CI does cross zero.



Graph 1.2.2.3: Scatterplot of the relationship between SiPr2DNRRodA (cm^2) and Year (1911-1932), and between SiPr2DRRodA (cm^2) and Year (1911-1932), with linear trend lines.

Examination of scatterplot *graph 1.2.2.3* supports, not only the negative correlation between Rodchenko's productivity levels regarding the production of 2DNR and 2DR artwork-objects, but also that there is a positive relationship between SiPr2DRRodA and Year, and a negative relationship between SiPr2DNRRodA and Year. This is indicated by the linear trend lines. "Read" from left-to-right the dotted-blue line representing the linear trend of SiPr2DNRRodA–Year slopes downward, indicating that as the Years progress that the average area of 2DNR decreases. Whilst the dotted-orange line, representing the linear trend for SiPr2DRRodA–Year, slopes upward, indicating that, as the Years progress, the average area of Rodchenko's 2DR artwork-objects increases.

Graph 1.2.2.4 provides a more in-depth analysis of the relationship between Rodchenko's productivity in the production of 2DNR and 2DR artwork-objects. From 1912 to 1920, Rodchenko's productivity level in regard to his production of 2DNR artwork-objects increase from an average area of 282.90cm^2 (1912) to 4,011.34cm^2 (1920), his productivity levels in regard to the production of 2DR artwork-objects do not reach significant levels until 1915 (461.50cm^2) and then continue at this level until 1922 (559.84cm). It is from this date that the focus of Rodchenko's artistic productivity changes from 2DNR artwork-objects to 2DR artwork-objects. By 1923, productivity levels of 2DR artwork-objects are up to 2,863.49cm^2, whilst the average area of 2DNR artwork-objects is down to 1,184.41cm^2. From this point onward, with the exceptions of the Years 1927 and 1929, Rodchenko's productivity levels of 2DR artwork-object production are higher than those of 2DNR objects.



Graph 1.2.2.4: Line graph of the relationship between SiPr2DNRodA (cm^2) and Year (1911-1932), and between SiPr2DRRodA (cm^2) and Year (1911-1932).

Continuing the examination of individual RAG artists, but in respect to female-RAG artist and over the extended period of 1902 to 1934, significant observations can be made of the average production-date size of 2DNR artwork-objects produced by four, individual, female artists of the RAG. The four, female artists are: Lyubov Popova (1889-1924) (PopL); Olga Rozanova (1886-1918) (RozO); Alexandra Exter (1882-1949) (ExtA); Natalya Goncharova (1881-1962) (GonN).

All four artists conform to the evidence that as the early part of the twentieth century progresses the RAG artists' productivity levels decrease in regard to the production of 2DNR artwork-objects. This is demonstrated for these four artists through calculation of the

correlations between the variables of SiPr2DNR[Artist] and Year (Date of Production). The results are presented in *table 1.2.2.3*.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
SiPr2DNR[Artist]	Year of Production	Tau (*T*)	Cases (*N*)[110]	*p*-value	Lower	Upper
SiPr2DNRPopL (Popova)	Year	-.727	12	.001	-.966	-.429
SiPr2DNRRozO (Rozanova)	Year	-.643	8	.026	-1.000	-.083
SiPr2DNRExtA (Exter)	Year	-.567	16	.004	-.804	-.246
SiPr2DNRGonN (Goncharova)	Year	-.516	14	.010	-.786	-.233

Table 1.2.2.3: Bivariate correlation (Kendal's Tau) between the average size (cm^2) of 2DNR artwork-objects produced by specific individual female-RAG artists (SiPr2DNR[Artist]) from 1902 to 1934 (Year).

In all four cases there are significant, negative correlations between the variables of SiPr2DNR[Artist] and Year. In all four case the bootstrap BCa 95% CI does not cross zero and, therefore, confidence can be had in these results; there being less than a 5% chance that the "true value" of any of them would be positive. This means that for each of these female-RAG artists as time progresses from 1902 up to 1934 the average area of 2DNR artwork-objects being produced by them decreases.

This is also demonstrated in *graph 1.2.2.5*, on which the results of SiPr2DNR[Artist] are plotted against Year for each of the four female-RAG artists. *Graph 1.2.2.5* illustrates that maximum, artistic productivity in the production of 2DNR artwork-objects for all these artists occurs from 1910 to 1913.[111] All four of these artists then experiences a sharp decline in the average area of 2DNR artwork-objects that they produce, which reaches a low from 1914 to 1915.[112] This is then followed by a period of fluctuation with an overall trend of decreasing productivity in the production of 2DNR artwork-objects.

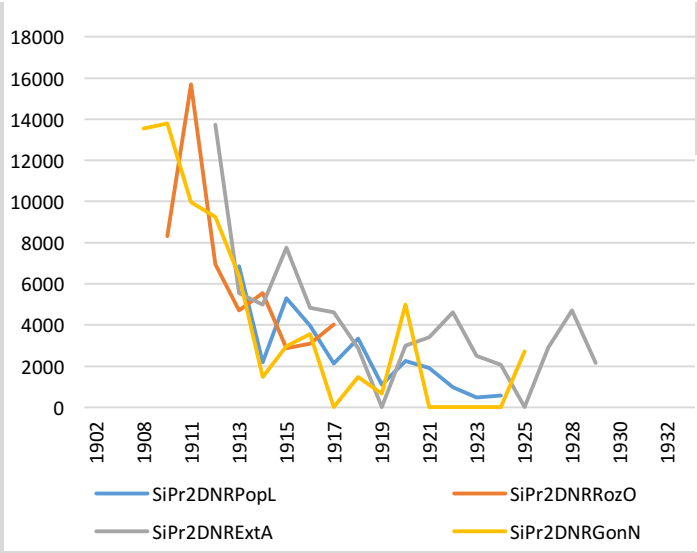
In some cases, the study of the artists' individual graphs provides a clearer image of the common downward trend. *Graph 1.2.2.6* presents Popova's rather steady negative relationship between size of 2DNR artwork-objects and Year from 1913 up until her premature death in 1924. The line graph pertaining to Rozanova's results (*graph 1.2.2.7*), is another one that terminates prematurely due to her death in 1918. Whereas, Goncharova's chart (*graph 1.2.2.8*) shows more clearly the sharp decline in her production of 2DNR

[110] Cases (*N*) derive from 33 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

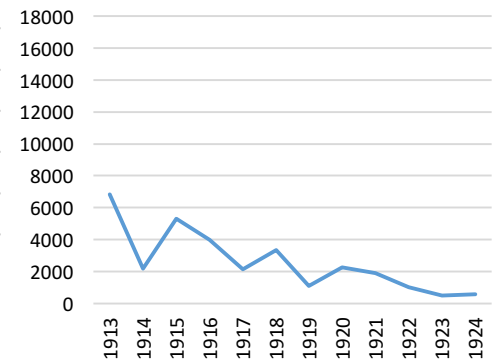
[111] Popova, 1913 (6,850.88cm^2); Rozanova, 1911 (15,707.00cm^2); Exter, 1912 (13,747.39cm^2); Goncharova, 1910 (13,779.44cm^2)

[112] Popova, 1914 (2,187.50cm^2); Rozanova, 1915 (2,886.03cm^2); Exter, 1914 (4,992.19cm^2); Goncharova, 1914 (1,465.50cm^2)

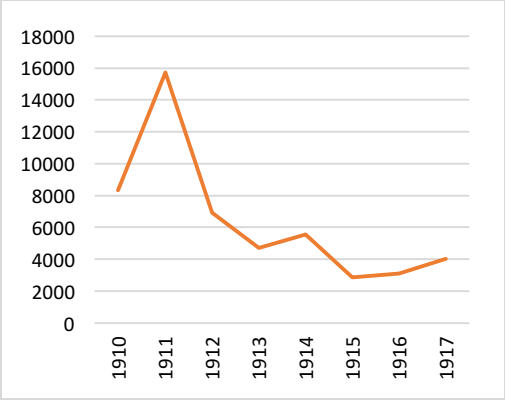
artwork-objects from 1910 to 1914: 1914 coinciding with the date that she and her partner, Mikhail Larionov, leave Russia for France.



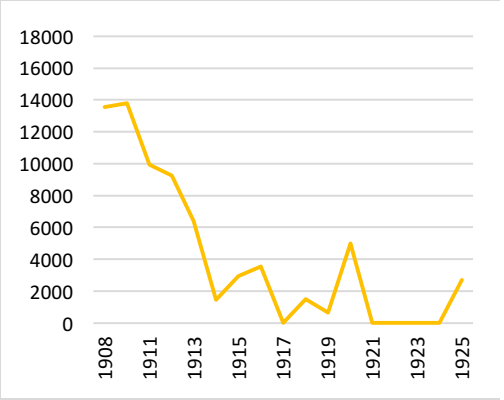
Graph 1.2.2.5: Line graph of the relationships between SiPr2DNR[Artist] (cm^2) from *table 1.2.2.1* and Year (1902-1934).



Graph 1.2.2.6: Line graph of the relationship between SiPr2DNRPopL (cm^2) and Year (1902-1934).



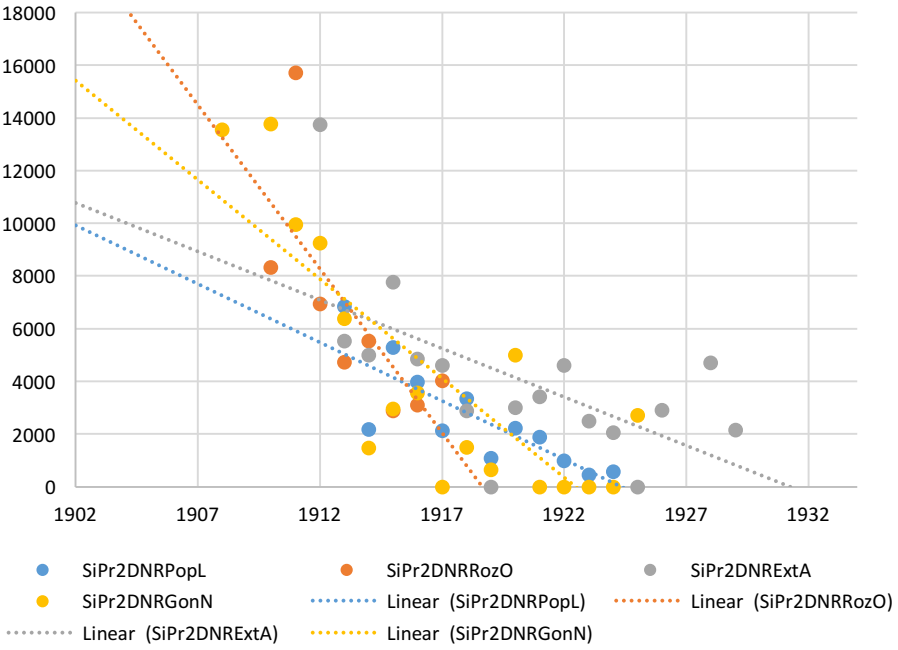
Graph 1.2.2.7: Line graph of the relationship between SiPr2DNRRozO (cm^2) and Year (1902-1934).



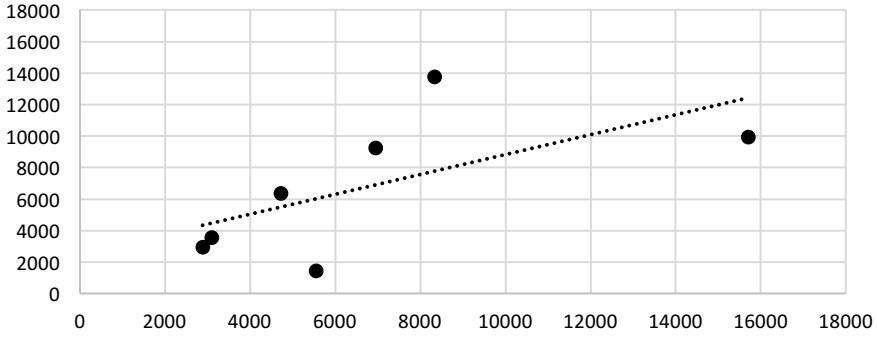
Graph 1.2.2.8: Line graph of the relationship between SiPr2DNRGonN (cm^2) and Year (1902-1934).

Although the scatterplot *graph 1.2.2.9* – on which all four artists' SiPr2DNR[Artist] have been plotted against Year, with linear trend lines added for each – demonstrates the common, negative correlation coefficients between the two variables of SiPr2DNR[Artist] and Year. The only two pairs of artists of these four individuals, whose production of 2DNR artwork-objects from 1902 to 1934 might be argued to have a strong positive correlation are Rozanova and Goncharova, and Popova and Exter. SiPr2DNRGonN has been plotted against SiPr2DNRRozO, and SiPr2DNRPopL has been plotted against SiPr2DNRExtA, on scatterplots *graph 1.2.2.10* and *graph 1.2.2.11* respectively. Linear trend lines have been added and suggest strong, positive correlation in both cases. For example, in the case of SiPr2DNRGonN–SiPr2DNRRozO, this positive correlation indicates a demonstrable trend

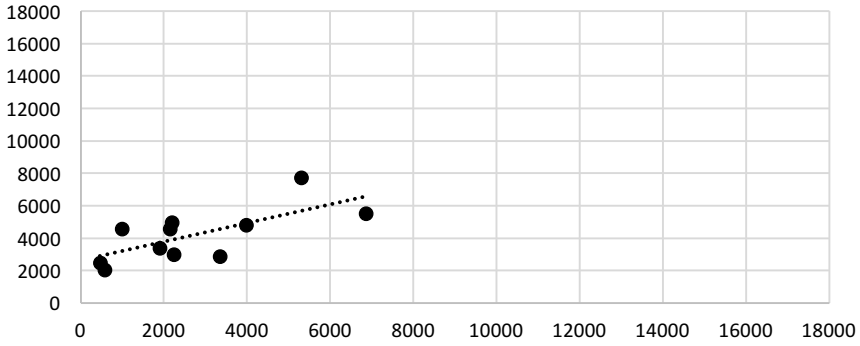
that as one artist's 2DNR artwork-object productivity increases, or decreases, so does the production of the other artist's 2DNR artwork-object. *Table 1.2.2.4* contains the results of calculating Kendall's Tau for the pairs of variables depicted in *graph 1.2.2.10* and *graph 1.2.2.11*.



Graph 1.2.2.9: Scatterplot of the relationships between each SiPr2DNR[Artist] (cm^2) from *table 1.2.2.3* and Year (1902-1934), with linear trend lines.



Graph 1.2.2.10: Scatterplot of the relationships between SiPr2DNRGonN (cm^2) and SiPr2DNRRozO (cm^2) (for Years 1902-1934), with linear trend lines



Graph 1.2.2.11: Scatterplot of the relationships between SiPr2DNRPopL (cm^2) and SiPr2DNRExtA (cm^2) (for Years 1902-1934), with linear trend lines

Table 1.2.2.4 indicates that both pairs of variable exhibit strong positive correlation coefficients. In the case of SiPr2DNRPopL–SiPr2DNRExtA the correlation is also significant, with a *p*-value of < .05. But its BCa 95% CI crosses zero, meaning that the range of scores for which there is 95% confidence that the "true value" can be found could be either negative, positive, or zero.[113] SiPr2DNRGonN–SiPr2DNRRozO cannot be described as significant as $p > .05$, but only by .001. Its BCa 95% CI, though, does not cross zero; both scores being positive. This means that in this case, especially as the correlation coefficient fails significance by only .001, there can still be a level of confidence that the artist productivity in regard to the production of 2DNR artwork-objects by Goncharova and Rozanova from 1902 have a positive relationship to one another.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
SiPrArtist2DNR	SiPrArtist2DNR	Tau (*T*)	Cases (*N*)[114]	*p*-value	Lower	Upper
SiPr2DNRPopL	SiPr2DNRExtA	.527	11	.024	-.102	.936
SiPr2DNRRozO	SiPr2DNRGonN	.619	7	.051	.263	1.000

Table 1.2.2.4: Bivariate correlation (Kendal's Tau) between SiPr2DNRPopL and SiPr2DNRExtA, and between SiPr2DNRRozO and SiPr2DNRGonN (for Years 1902-1934).

This section demonstrates what relationships can be evidenced through the examination of only the quantitative elements of RAG artwork-objects within the 62-British-exhibition canon. It also demonstrates the application of bivariate correlation, descriptive statistics, charts and graphs to the artwork-objects within this canon. "Unit 2" introduces the content-analysis methodology, before applying it, and the statistics used within this unit, to the artwork-text of the 62 exhibitions' catalogues from the canon and to primary-source artwork-texts of the RAG.

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[113] SiPr2DNRPopL–SiPr2DNRExtA presents a large CI (-.102, .936) in comparison to the small *p*-value (.024). The reason for this seeming anomaly is, in part, be due to the small sample size ($N = 11$), and the large standard deviations of both variables being studied: SiPr2DNRPopL presents a mean for the sample of 2,723.28cm^2 and a standard deviation of 1,997.20cm^2; SiPr2DNRExtA presents a mean for the sample of 4,201.25cm^2 and a standard deviation of 1,648.39cm^2. Larger sample sizes generally lead to "more confidence" and narrower confidence intervals, with the inverse being true of smaller sample sizes. Whilst if dispersion is high, as represented by the large standard deviations, a precise conclusion is less certain and the confidence interval has the potential of becoming wider. (Jean-Baptist du Prel, Gerhard Hommel, Bernd Röhrig, and Maria Blettner, "Confidence Interval or P-Value?: Part 4 of a Series on Evaluation of Scientific Publications" in *Deutsches Ärzteblatt International*, (May, 2009) 106(19), pp. 335-339 [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2689604/ (accessed: 08-02-2017)])

[114] Cases (*N*) derive from 33 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

UNIT 2

2.0 – Content Analysis: Introduction

The 62 exhibitions and their changing (re-)presentation of RAG artwork within Britain: Artwork-text. "Section 1.1" separates "artwork" into its two constituent parts of "artwork-object" and "artwork-text". Content analysis allows the changes in the latter, artwork-text to be charted through the 62 exhibition catalogues from 1935 to 2009. Klaus Krippendorff would describe such texts as "*by-products* of the phenomena of interest" still available in the present.[1] It is, firstly, proposed that as consequences of exhibitions, within the context of time (Years), these texts can be used to determine the characteristics between these exhibitions based on the years in which they are held. Secondly, by demonstrating the changing characteristics, this thesis proposes the viewing of the artwork-texts as instruments used by their authors in and for the evolution of our knowledge and understanding of the RAG artwork.[2] The desire is that through content analysis of the exhibitions' written artwork-texts significant aspects of this evolutionary path can be substantiated. This section defines the process of content analysis used upon the written artwork-texts (catalogues) of the exhibitions examined within this thesis. For comparative purposes, the unit also includes content analysis of RAG primary sources. This extends the timeframe of the analysis from the period 1935-2009 to the period 1902-2009, and allows the 62-British-exhibition canon to be compared to another textual canon formed around the RAG.

In regard to the initial sampling of exhibitions/exhibition catalogues to be included within this study, every effort has been made to create a census. Collecting catalogues for all exhibitions that meet all of the following criteria:

- 1. The exhibition occurs in Britain (England, Scotland, Wales) from 1935 through to 2009.
- 2. The exhibition is non-permanent: Meaning that, although the exhibition can contain artwork-objects from permanent collections and/or be held in galleries with permanent collections, the exhibition being studied is not permanent. The catalogue pertains to only the non-permanent event(s), and not permanent collections.

[1] Klaus Krippendorff, *Content Analysis: An Introduction to Its Methodology (3rd Edition)*, Sage Publications Ltd: London, 2013, p.361
[2] Krippendorff uses the word "manipulation" rather than evolution. (Krippendorff, 2013, p.361)

- 3. The exhibition contains RAG artwork-objects, as defined by the exhibitions' own artwork-texts. Although, the exhibition does not have to consist exclusively of RAG artwork-objects.[3]

Upon meeting these criteria, it is the "by-product" of the exhibition, the exhibition catalogue (artwork-text) that is used to denote the exhibition within the context of content analysis: Artwork-objects are also by-products of the exhibition, but are not subjected to content analysis. If an exhibition tours to more than one site within Britain, the exhibition is counted as one event, and not as a separate event for each site. For the purpose of content analysis, it is the individual catalogues that are defined as the *sampling units*, not the individual, touring-exhibition sites.

Figure 2.0.1 depicts *Exhibition Catalogues and Primary Sources for Year$_n$* (grey box) on the left as the sampling unit. As a sampling unit *Exhibition Catalogues and Primary Sources for Year$_n$* is a mutually exclusive unit of text.[4] Therefore, each of the 62 catalogues being examined is treated as a separate sampling unit. The multiple *recording units* that follow the sampling unit in *figure 2.0.1* specify segments of content – from within the sampling unit – characterised by particular category headings.[5]

Figure 2.0.1 shows the recording units for each sampling unit arranged over three *levels of inclusion* (each denoted by a different colour).[6] The recording units within the same level of inclusion are mutually exclusive. Although derived from the same sampling unit or recording unit of a higher level of inclusion, recording units of the same level of inclusion do not share content. The mutual exclusivity of recording units within the same level of inclusivity is important. It is only when this is the case that "counting them leads to comparable frequencies".[7] This point will be expanded upon later in this section, with a more detailed account of the recording units being used within this thesis. But, briefly, it is this

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[3] This means that the list of 4,871 RAG artwork-objects, by 309 RAG artists, is formed in a self-perpetuating, evolutionary manner, by the RAG artists being defined as such by the exhibitions' own artwork-texts. If an exhibition's artwork-text categorizes an artist as RAG, and that artist is exhibited in second exhibition, which also fulfils criteria 1 and 2, then that second exhibition is also included within this study. Although, for all other artists within that second exhibition to, also, be categorized as RAG within this thesis, they would have to be stated as such, either in that or one of the other exhibitions.

[4] Krippendorff, 2013, p.364

[5] Krippendorff, 2013, p.100 (citing Ole Holsti, *Content Analysis for the Social Sciences and Humanities,* Addison-Wesley: Reading, MA, 1969, p.116)

[6] The recording units of *figure 2.0.1*, are expressed as acronyms. For the key to these see "Coding Sheet": *App.1-[Content Analysis]-01*.

[7] Krippendorff, 2013, p.365

comparability that is required to chart, via the catalogues, the changes in the (re-)presentation of the RAG in the exhibitions from 1935 to 2009.

The blue lines traversing and connecting the recording units of different levels of inclusion within *figure 2.0.1* demonstrate how the multi-levels of recording units deriving from the sampling unit form "inclusion hierarchies".[8] Progressing from entire catalogues to the first-level, second-level and third-level recording units that are formed via ever more refined collections of syntactically disconnected words. This indicates that the *context units*, which are the "units of textual matter that set limits on the information to be considered in the description of recording units" will remain constant across the levels of inclusion.[9] As each level of recording units is based on the frequency of individual words the context units will be that of a sentence: Bearing in mind that all sentences under analysis are derived from the particular context of an exhibition catalogue.

It is the comparison between artwork-text from a specific Year that will be of use in addressing the question of the changes in the (re-)presenting of RAG artwork. It is, therefore, the mutually exclusive recording-unit frequencies that will be used for comparison. This means that in most cases the *unit of enumeration*, although coinciding with the recording units (words), will be expressed in the form of numerical measurements (frequencies/weighted percentages). This allows for correlation coefficients to be calculated between recording units, expressing and comparing trends between artwork-text of different Years in terms of significance and strength.

Clarification: Although it is noted that the sampling units are mutually exclusive units of artwork-text deriving from the same Year (*Exhibition Catalogues and Primary Sources for* $Year_n$), for the purpose of this thesis, the individual sampling units (and the recording units defined within them) are connected by time (Years). "Year", as a definition of time, is fundamental for this thesis's charting of change and its calculation of correlation coefficients between the weighted percentages of recording units. Correlation, the "bring[ing] into mutual relation or dependence",[10] must occur within a construct of a past time (Years), because what, ultimately, will be measured through this content analysis is to be found between contents rather than within.

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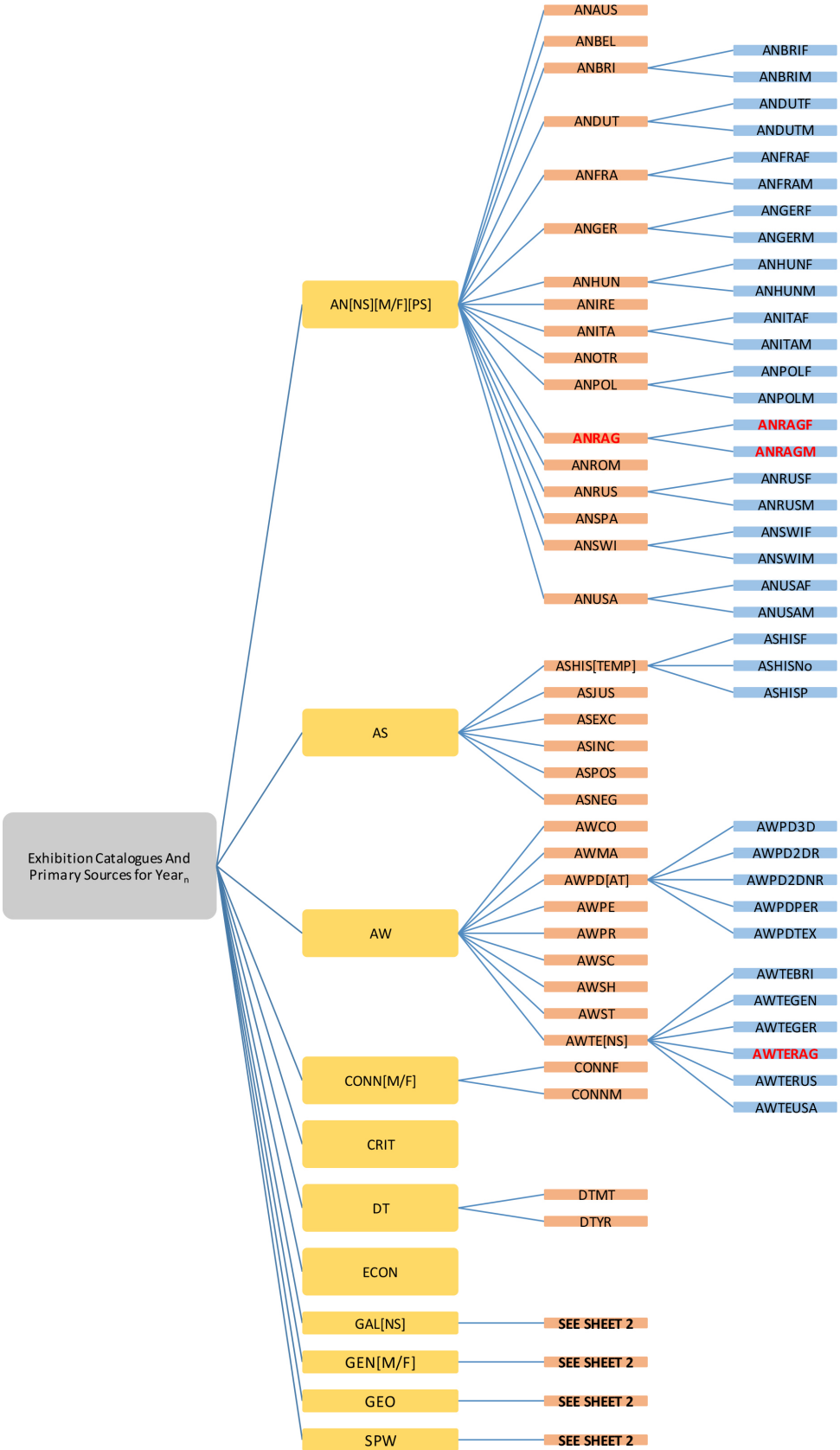
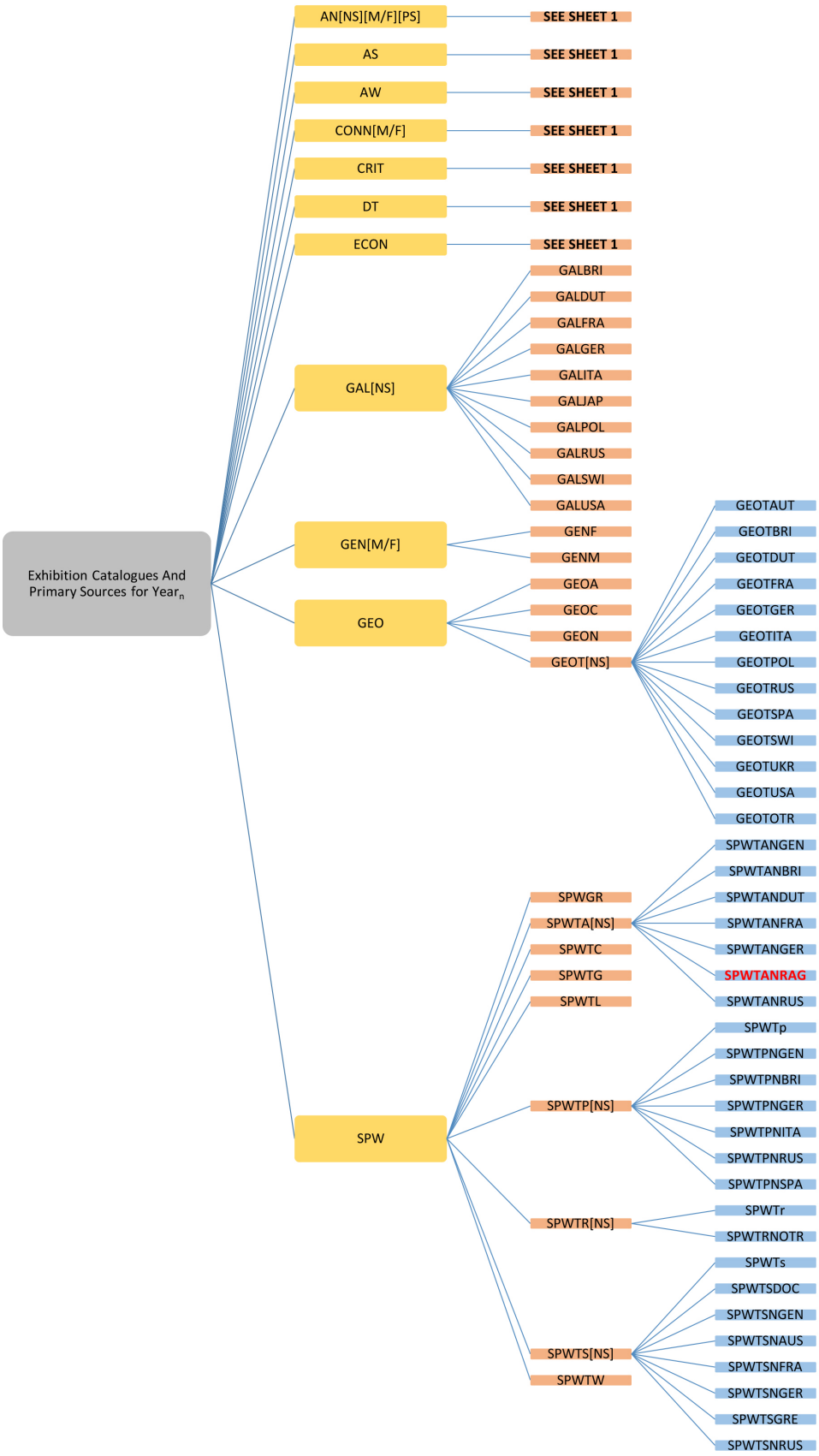
[8] Krippendorff, 2013, p.101
[9] Krippendorff, 2013, p.101
[10] Della Thompson (ed.), *The Oxford Quick Reference Dictionary (Revised Edition)*, Oxford University Press: Oxford, 1998, p.188


Exhibition Catalogues And Primary Sources for Year$_n$
AN[NS][M/F][PS]
ANAUS
ANBEL
ANBRI
ANBRIF
ANBRIM
ANDUT
ANDUTF
ANDUTM
ANFRA
ANFRAF
ANFRAM
ANGER
ANGERF
ANGERM
ANHUN
ANHUNF
ANHUNM
ANIRE
ANITA
ANITAF
ANITAM
ANOTR
ANPOL
ANPOLF
ANPOLM
ANRAG
ANRAGF
ANRAGM
ANROM
ANRUS
ANRUSF
ANRUSM
ANSPA
ANSWI
ANSWIF
ANSWIM
ANUSA
ANUSAF
ANUSAM
AS
ASHIS[TEMP]
ASHISF
ASHISNo
ASHISP
ASJUS
ASEXC
ASINC
ASPOS
ASNEG
AW
AWCO
AWMA
AWPD[AT]
AWPD3D
AWPD2DR
AWPD2DNR
AWPDPER
AWPDTEX
AWPE
AWPR
AWSC
AWSH
AWST
AWTE[NS]
AWTEBRI
AWTEGEN
AWTEGER
AWTERAG
AWTERUS
AWTEUSA
CONN[M/F]
CONNF
CONNM
CRIT
DT
DTMT
DTYR
ECON
GAL[NS]
SEE SHEET 2
GEN[M/F]
SEE SHEET 2
GEO
SEE SHEET 2
SPW
SEE SHEET 2

Sheet 1



Sheet 2

Figure 2.0.1: The sampling unit, recording units, and inclusion hierarchies of content analysis. (Also see "Coding Sheet": *App.1-[Content Analysis]-01*.)

The *analytical construct*, discussed below, is used to investigate this notion of the changing contents surrounding the RAG found between Years. Krippendorff, paraphrasing Alexander George's assertion, justifies the abductive inference:

> [B]y the assumption that the analytic construct is a true or heuristic model of context. In adopting an analytical construct for the purpose of an analysis, a researcher is led to distinguish [...] between the stable or unchanging conditions [exhibitions], which are the ones modelled, and the unstable or variable conditions, which become fixed once the analyst obtains a body of relevant text [exhibition catalogues (artwork-text)] ... [11]

The type of construct used in this research, which fits with the uses of data presented in *figure 2.0.1*, is an indices-and-symptoms analytical construct. J. Zvi Namenwirth uses American political "party platforms to assess magnitude and direction of changing values in American society".[12] This he does by defining the words, occurring in party platforms in America from 1844 to 1964, as one, or more, of seventy-three categories.[13] These categories are assigned to particular "value concern[s]".[14] For each Democratic and Republican platform, and for each of the thirty-one campaigns from 1844 through to 1964 seventy-three observations are made. These seventy-three observations correspond to the seventy-three categories (or variables), and each observation is the frequency of that observation (words within that variable) within a particular platform. Namenwirth expresses these frequencies "as a percentage of words in that category of all words in the document, since manipulation controls for the fact that campaign documents are of varying length".[15] He then uses these frequencies as indicative of the concerns expressed by the political parties during the various campaigns. By plotting all of the frequencies, from 1844 to 1964, for one concern value (variable), and equating political concern as symptomatic of societal concern, Namenwirth is able to chart changes in the various concerns of the American population, which he determines to be cyclical in nature.[16] At its most reductive, for Namenwirth, political words become the indices for symptoms of social concern.

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[11] Krippendorff, 2013, pp. 171-172 [references: Alexander L. George, *Propaganda Analysis: A Study of Inferences Made From Nazi Propaganda in World War II*, Roe, Peterson: Evanston, IL, 1959]
[12] J. Zvi. Namenwirth, "Wheels of Time and the Interdependence of Value Change in America" in *The Journal of Interdisciplinary History*, Vol. 3, No. 4 (Spring 1973) [pp. 649–683], p.651
[13] Namenwirth, 1973, p.650
[14] Namenwirth, 1973, p.651
[15] Namenwirth, 1973, p.653
[16] Namenwirth, 1973, p.674

It is this model that is used in the following thesis for the content analysis of the exhibition catalogues. It is used to examine the changes and trends in information deemed of concern and written as representative of the RAG by the contributors to these exhibition catalogues. As well as these changes and trends being plotted against time, the relationship between variables is calculated for significance and strength, via the calculation of correlation coefficients. The intention behind this is to discover how various artwork-text characteristics are symptomatic of various times, authors and artists. It also allows for the examination of co-occurrence between these recording-unit categories, and will, in "Unit 3", allow for the bivariate correlation between the recording units of the artwork-text and the artwork-object exhibition-quantities to be calculated and their relationships examined.

> It is the spectator, and not life, that art really mirrors.[17]

This line succinctly explains this section's importance in understanding RAG artwork. The line implies that, if it is the spectator that artwork-objects mirror, then artwork-objects change depending upon who is reflecting upon them. This "reflected-upon" artwork-object is what "Section 1.1" terms the "artwork"; the conjoining of artwork-object with artwork-text. The following content analysis charts the changing reflections upon RAG artwork-objects from 1902 to 2009. Charting the changes in content surrounding the RAG artwork-objects also charts the changes that have occurred to the artworks themselves by their being placed within different contexts and contents.

The method of content analysis being used is that of Namenwirth's indices-and-symptom analytical construct, as outlined. The remainder of this section defines the method used to apply Namenwirth's indices-and-symptom analytical construct methodology to data specific to this thesis. The remaining sections of "Unit 2" explore significant relationships between various recording units, defined at the end of this section ("2.0"), using bivariate correlation, descriptive statistics, charts and graphs.

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[17] Oscar Wilde, "The Picture of Dorian Gray" in *The Complete Works of Oscar Wilde*, Harper Collins Publishers: London, 2003, p.16

The texts that are being analysed are the 62 exhibitions catalogues and the primary sources contained within John E. Bowlt's *Russian Art of the Avant Garde: Theory and Criticism*.[18] These texts are scanned onto a computer as PDF files, separated out into their various authors, and categorized further into the dates of when they were originally written. In the following content analysis these various units of text are processed via Optical Character Recognition (OCR) software, and then grouped into chronological order, with all texts written in the same Year being in the same group. For the 108 year-period from 1902 to 2009, samples of text have been found for 70 years. There are some earlier Years for which no text, within the above mentioned sources, is attributed.[19] There is also a significant gap between 1943 and 1957, for which no primary sources or exhibition catalogues are attributable. A full list of the Years for which text is attributed, and therefore also those other Years for which there is none, is found on the supplementary CD, which contains a full list of words, and their proportion representation in each Year.[20]

It is important to note that although the graph, charts and "fingerprints" used to describe changes within the recording units of content analysis over five-year periods, are based on the artwork-text data found for the 70 years, the calculation of bivariate correlations for the period from 1902 to 2009 is based on data from 58 years. The reason for this is so that for each Year that there is artwork-text data there is also data pertaining to artwork-objects. This allows for the relationships between artwork-text and artwork-object to be calculated via bivariate correlation using the same dataset, in terms of sample units (Years) available, within the calculations of the inter-relationships within the artwork-text dataset and artwork-object dataset for the period from 1902 to 2009.

For the period formed solely of primary-source artwork-text from 1902 to 1934 there are 26 years for which artwork-text data is present within Bowlt's *Russian Art of the Avant Garde*. The relationship between these 26 years of artwork-text data and artwork-object data can be calculated, via bivariate correlation, by using, for the artwork-object data, the average yearly size of various groups of artwork-objects (2DR/2DNR) produced in each of the 26 years, which has been equated to artistic productivity in the case study presented in "Section 1.2.1".

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[18] John E. Bowlt (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991

[19] 1903, 1904, 1905, 1907, 1909

[20] For complete content-analysis data for the artwork-text of each Year see *Strugnell-ThesisCD* and *Excel* file: *Strugnell-A-T1 (Content analysis of artwork-text per Year)*.

The artwork-text dataset for the period from 1935 to 2009 is formed from both the artwork-text from Bowlt and the artwork-text from the 62 exhibition catalogues. Although these two sources of artwork-text combine to provide artwork-text data for 44 years, artwork-object data for this period is based upon the yearly averages of artwork-object quantity exhibited within the 32 years accounted for by the 62 exhibitions of the 62-British-exhibition canon examined in this thesis. This leaves 12 years for which there is primary-source artwork-text data but no artwork-object data for relationships between the two to be calculated. The 12 years, and their data, have been removed from the calculation of bivariate correlation. Therefore, in the calculating of correlations between the recording units of content analysis the maximum number of case for the period from 1902 to 2009 is 58 ($N = 58$).

Figure 2.0.1 shows the flowchart of the sampling unit (grey box) of *Exhibition Catalogues and Primary Sources for Year*$_n$, followed by three levels of inclusion of recording units (yellow, orange, and blue boxes). Each of these recording units specifies a segment of content from within the sampling unit that is characterised by a particular category heading. As stated, the recording units within the same level of inclusion (each denoted by a different colour) are mutually exclusive. Although deriving from the same sampling unit or recording unit of a higher level of inclusion, recording units of the same level of inclusion do not share content.

For each sampling unit (which, essentially, denotes one Year in text) the software program *NVivo for Mac (Version 10.2.2)* is used to produce a list of the 1,000 most commonly recurring words of three letters or more in length. This list excludes “common” words, or “stop words” as *NVivo* labels them (see *App.1-[Content Analysis]-03* for full list of “stop words”). The resulting words are arranged in descending numerical frequency order. Frequency is given as both the number of times a particular word occurred within the sampling unit, and as, what *NVivo* terms, a “weighted percentage”, which is the frequency of the word relative to the total word count. So as the word frequencies from each sampling unit – each containing a different number of words – are comparable it is the weighted percentage value that is recorded in this thesis. The weighted percentage for all words (excluding “stop words”, and words of less than three letters in length) that have a numerical frequency of two or more are recorded for each sampling unit. In the eight cases where more than 1,000 words have a greater numerically frequency of two or more all of the top

1,000 words' weighted percentage are recorded.[21] In this respect *NVivo* and the texts/sampling units, not the reader/writer of this thesis, dictate which words are recorded and used within the content analysis. The weighted percentage of a total of 3,110 different words is recorded across the 70 sampling units. Across the 70 sampling units the words included within this content analysis account for an average of 28.7% of the total content. Appendix *App.1-[Content Analysis]-02* ("Coded Word Lists") contains the full list of these words, and indicates which are contained in each of the recording units, whilst a list of the codes for the recording units is produced in *App.1-[Content Analysis]-01* ("Coding Sheet").

The list of 3,110 words for which weighted percentages within the 70 sampling units are recorded is divided into recording units, and also arranged across three levels of inclusion. The first level of inclusion contains 11 recording units, and these describe the broadest categories. It is from these broad categories that the other two levels of inclusion derive, containing recording units of narrowing and more strictly defined categories: the third level of inclusion contains 119 recording units. Brief descriptions of the recording units and their various levels of inclusion along with their codings follow below:[22]

Artist Name (AN[NS][M/F][PS]): This category contains artist names (proper nouns) found within each of the sampling units (texts of a given Year). Each artist's name has been coded AN, this is followed by a three-letter Nation Suffix (NS) noting the artist's country of origin. The exception being RAG artists, for which the suffix "RAG" is used in place of a Nation Suffix. This is to distinguish them from other Russian artists: ANRUS. The Nation Suffix is followed by a "M" or "F" denoting whether the artist is male (M) or female (F). The final suffix is a Profession Suffix (PS). This two letter suffix indicates within which artistic field the artists work: There are 11 fields identified, and a complete list is provided in *App.1-[Content Analysis]-01* ("Coding Sheet").

At the first level of inclusion AN[NS][M/F][PS] is an unordered list of names, all categorized together under AN. At the second level of inclusion (orange boxes in *figure 2.0.1*) the various artists have been sub-categorized by their nation of origin, or by their belonging to the RAG as defined within the 62-British-exhibition canon examined in this thesis. This allows for examination of changes across sampling units/Years of which countries' artists are being

[21] The eight cases in the 70 years from 1902 to 2009 are Years: 1973, 1978, 1984, 1989, 1990, 1995, 1999, 2009.
[22] See, also, *figure 2.0.1*, *App.1-[Content Analysis]-01* ("Coding Sheet"), and *App-[Content Analysis]-02* ("Coded Word Lists").

referenced by the primary sources, or the changing construction of the artist-geographical landscape within exhibition catalogues. The coding used in this second level of inclusion of AN is AN[NS].

The third level of inclusion (blue boxes in *figure 2.0.1*) of AN divides, where possible, the artist names for each nation of the second level of inclusion (AN[NS]) into those artists of male and those of female gender. This categorization is denoted by the suffix “M” (male) or “F” (female). The coding of the recording units for the third level of inclusion of AN is AN[NS][M/F]. Where a recording unit of AN[NS] from the second level of inclusion is not divided, as with ANAUS on *figure 2.0.1*, and does not feature in the third level of inclusion, this is because all the artists in these AN[NS] recording units are male. This being the case, the recording unit is the same at both second and third levels of inclusion, and is able to be included in either. The third level of inclusion allows for the examination of the changes in male-artist and female-artist representation between sampling units/across the Years. It also allows cross-examination of the relationship between those artists of various gender being included in the artwork-text, and those represented in production and exhibition of artworks-objects. (This line of investigation is returned to in “Section 3.1”.)

Assertive Words (AS): Unlike the proper nouns found in the AN recording units, and also in much of the GEO recording unit, the meaning of many of the words within this, and other recording units, change with their context. It has, therefore, been necessary to examine these words, and the words within the other recording units, in their context within the sampling unit before coding them. This task is performed using the (Query > Text Search >)Word Tree function on *NVivo*. This function allows the viewing of a word within all its various contexts within a sampling unit, displaying, in this case, all the various five words that appear before and after the word to be coded. After this task is performed a word is coded as belonging to one of the recording units in the second level of inclusion that collectively form the first-level recording unit AS (*figure 2.0.1*).

There are six recording units on the second level of inclusion that combine to create the first-level AS recording unit. They consist of words used within the context of the sampling unit to assert a particular quality onto the subject or object of discussion, and in doing so lend to the overall assertive-quality of the artwork-text. The six recording units are:

Assertions of Historical/Temporal Placement (ASHIS): These words are used within the context of the sampling unit to place the object or subject of the text within a certain historical or temporal context. This second-level recording unit consists of three third-level-of-inclusion recording units:

> **Future (ASHISF):** Those words that "speak" of the future, and place the object or subject of the text in a relationship with this future.
> **Present/Now (ASHISN):** Those words that relate the text to the present or the "now"; The time contemporaneous with the writing of the text.
> **Past (ASHISP):** Those words that relate, or place the text/sampling unit into a relationship with the past.

Assertions of Justification (ASJUS): This recording unit includes words used, within the context of the sampling-unit texts, to justify the inclusion within that text (or exhibition) of particular artwork-objects, or used to justify the actions of particular subjects (artists).

Assertions of Exclusion (ASEXC): These words act or imply an exclusion or isolation of the object or subject of discussion from within or outside of a wider world/context/concept. This recording unit also includes words that act to categorize and, by implication, exclude from other categories.

Assertions of Inclusion (ASINC): These words act or imply an inclusion or connection between the object or subject of discussion with a wider world/context/concept and other objects and subjects.

Positive Assertions (ASPOS): This recording unit includes words that, within the context of the sampling-unit texts, are statement words describing, in a positive way, the nature or action of the object/subject under discussion.

Negative Assertions (ASNEG): This recording unit includes words that, within the context of the sampling-unit texts, are statement words describing, in a negative way, the nature or action of the object/subject being discussed.

Artwork Words (AW): As with the AS recording unit, the AW recording unit contains descriptive words. It contains words used specifically in the context of describing the creators (common noun), the processes, and the pictorial and physical qualities of artworks. The first-level AW recording unit is formed from nine second-level recording units. The second-level recording units that collectively form the first level recording unit (AW) are:

Artwork Words of Colour/Artistic Qualities (AWCO): This recording unit contains words that, either, describe: The colours used within an artwork-object; the informal way/style in which the artistic material has been handled within the artwork-object (whilst not assigning the artwork to an Artistic Group); the ephemeral quality used to describe a particular artwork-objects.

Artwork Words of Medium/Material (AWMA): This recording unit contains words naming the physical materials used within the artwork-objects.

Artwork Words of the Artistic Product (AWPD[AT]): This second-level recording unit is created from five third-level units. Each of these third-level recording units describes a particular type of final artistic product, or type of artwork-object (Art Type [AT]), and uses the second-level recording unit AWPD with the addition of the AT suffix. The five third-level recording units are:

Two-Dimensional Reproducible Artwork-Objects (AWPD2DR)
Two-Dimensional Non-Reproducible Artwork-Objects (AWPD2DNR)
Three-Dimensional Artwork-Objects (AWPD3D)
Performance Artwork-Objects (AWPDPER)
Textile-Objects (AWPDTEX)

Artwork Words of the Artist Profession (AWPE): This recording unit records the appearance within the sampling unit of the various artistic professions: The artist as common noun rather than proper noun as in AN.

Artwork Words of Process/Technique (AWPR): The words within this recording unit describe formal processes, or functional artistic techniques used within the creation of an artwork-object. As a concept it does not cover stylistic techniques, which are recorded in AWCO.

Artwork Words of Science/Engineering (AWSC): This recording unit contains words more usually used/derived from the disciplines of science and engineering. But that are being used in the sampling units within the context of artwork-object discussion.

Artwork Words of Shapes/Formal Qualities (AWSH): Similar, but in contrast to AWCO, this recording unit includes words describing the shapes and formal qualities of an artwork-object.

Artwork Words of State (AWST): This second-level recording unit collects together words used to describe the current state of an artwork-object. They can be linked to an artwork-object's authenticity (authentic, genuine, reproduction), to an artwork-object's production process (reprint, unpublished), or to an artwork-object's legal status (bequeathed, loaned).

Artwork Words of Institutions of Teaching/Artist Associations (AWTE[NS]): This final AW recording unit consists of institutes of artistic instruction (proper nouns), and artist-formed associations (proper nouns). AWTE has been further defined at the third level of inclusion by categorizing the institutions and associations by the nation of origin using the NS suffix.

Contributors (CONN[M/F]): At the first level of inclusion this recording unit contains the names (proper nouns) of the contributors who write the texts within the exhibition-catalogue related sampling units from 1935 to 2009. But only if these names appear in the text of the sampling unit. At the second level of inclusion, this unit is divided into male **(CONNM)** and female **(CONNF)** contributors.

Critic Names (CRIT): This recording unit contains the names (proper nouns) of art critics written in the exhibition-catalogue related sampling units from 1935 to 2009.

Dates (DT): Months and years are listed along with their frequencies in this recording unit at its first level of inclusion. At the second level of inclusion the Months **(DTMT)** and Years **(DTYR)** are separated into individual recording units.

Words Relating to Economics (ECON): As with AWSC this recording unit contains those words more normally used within the context of economics, or in relation to money and costings.

Galleries (GAL[NS]): The recording unit at the first level of inclusion contains the galleries (proper nouns) named in each of the sampling units. At the second level of inclusion these galleries have been grouped into nation units **(GAL[NS])**. These recording units, and the GEO recording units, allow for the examination of change occurring in the geographical-textual context surrounding the exhibition of RAG artwork-object.

Gender Words (GEN[M/F]): This recording unit, at the first level of inclusion, contains all words denoting both a masculine or feminine gender. At the second level of inclusion this initial recording unit is split into separate Masculine/Male **(GENM)** and Feminine/Female **(GENF)** recording units.

Geographical Locales (GEO): At its first level of inclusion this is another recording unit which is defined by being the sum of its second-level units, which each relate to a different geographical locale of varying size/scale. The four second-level recording units that form the first-level GEO units are:

> **General Areas (GEOA):** Words assigned to this recording unit are those that describe general geographical features, both human and physical. Rather than proper nouns, they are common nouns and adjectives such as: “avenue”, “street”, “town”, “city”, “rural”.
>
> **Areas Larger Than Nations (GEOC):** This recording unit contains proper nouns, and includes geographical locales: Continents; Oceans; Politically sanctioned geographical areas that cross more than one national boundary.
>
> **Countries/Nations (GEON):** This unit contains the proper nouns of countries’ and nations’ names.
>
> **Areas Smaller Than Nations (GEOT):** At the second level of inclusion this recording unit contains proper nouns denoting towns, provinces and counties. At

the third level of inclusion, these town, etc. are divided into 13 recording units, each denoting the specific nation **(GEOT[NS])**.

Socio-Political Words/Thought and Theory (SPW): This final, first-level unit is created from nine recording units at the second level of inclusion. Each of these units contains words that are used within in the context of the artwork-objects' creations or artworks' histories, but derive from other disciplines or contexts (with the exception of **SPWTA**). The nine, second-level units are:

Gratitude Words (SPWGR): This recording unit contains words of gratitude. Such words are included in the SPW unit due to the important roles that they play in the social and even political relations between exhibitions, donors and sponsors.

Art Thought and Theory Words (SPWTA): At a second level of inclusion this unit contains those words that describe particular schools of art, particular styles of art, particular movements in art and particular theories about art. At a third level of inclusion, these particulars are separated into those that relate to specific countries **(SPWTAN[NS])** and those of a more general nature **(SPWTANGEN)**.

Words Denoting Contemporaneity/the Modern (SPWTC): This recording unit contains words that are used within the sampling units to describe, denote, or promote a sense of the modern or contemporaneity in contrast to and in competition with the past.

Words Politicizing Gender/Gender Theory (SPWTG): This unit contains words describing thoughts and theories about gender. It also contains words used in the context of promoting thoughts about gender.

Judicial Words (SPWTL): This unit contains words more usually used within the legal field, but that in these sampling units are used in reference to artwork-objects.

Socio-Political Words, Thoughts, and Theories (SPWTP): The second-level recording unit SPWTP contains words that are further categorized in the seven

third-level units. The first of these recording units contains general words more usually used within a socio-political context, or that are used in such a context within the sampling unit **(SPWTp)**. The other six units contain particular terms, thought, and theories: These thoughts and theories are divided into those terms deriving from, or pertaining to a particular nation **(SPWTPN[NS])**, and those more general particulars applicable to more than one nation **(SPWTPNGEN)**.

Religious Thought and Theory Words (SPWTR): This unit contains words more usually used within theology or in conjunction with other religions.

History/Philosophy Thought and Theory Words (SPWTS): As with SPWTP, this second-level unit is constructed from third-level recording units. The first of these third-level recording units contains general words that are more usually used, or have been used within a historical or philosophical context **(SPWTs)**. The second, third-level unit contains words describing the different types of historical documents **(SPWTSDOC)**. The final six, third-level recording units contain words relating to historical/philosophical thought and theory deriving from particular nations **(SPWTSN[NS])**, or are particular thoughts and theories that cannot be assigned to a particular nation **(SPWTSNGEN)**.

Military/War Words (SPWTW): This final recording unit contains words used in the context of artwork and artwork-objects that are more commonly used within a military context or to describe war.

Having introduced the sampling units, recording units, and the levels of inclusion, what follows is an analysis of this data. By examining the sampling unit data, where each sampling unit represents the artwork-text written either by the RAG artists whilst they were producing the artwork-objects, or within the catalogues accompanying the, later, exhibiting of the artwork-objects, the changes and differences in the artwork-text that surrounds and has created the artworks as viewed now will be demonstrated.

2.1 – Analysis of the First-Level Recording Units

Initial statistical description within this section of the data described in "Section 2.0" is based on the examination of charts and graphs produced from the data. These charts focus on five-year timespans. Reducing the 70 years, for which there are data from 1902 to 2009, down to 20, five-year periods is done, primarily, to allow for a clearer overview of the period and for the easier, initial identification of trends.[23] Secondly, it is done due to time constraints, and the time required to produce sets of 70 graphs for each element of the different levels of inclusion rather than 20.

Appendix *App.3-[5Yr Periods 1900-2002]-01* contains 20 pie-chart diagrams. They illustrate the data recorded in the first level of inclusion (yellow boxes *figure 2.0.1*). Each pie-chart diagram contains two pie charts. The smaller, left-hand pie chart in each shows, in light blue, the percentage of the text from the sampling units within that particular five-year period that is categorized within the 11, first-level recording units. It is this percentage that, as previously stated, averages 28.7% across the 70 years for which there is data. The larger pie chart, on the right-hand side, illustrates two things: Firstly, the percentage values (in grey boxes) indicate what percentage of the smaller, left-hand pie-chart each of the 11 recording units account for. Secondly, the right-hand pie chart illustrates, via the relative size of each recording unit's segment to one another, the proportion of the accounted-for/categorized text represented by each of these 11 elements; i.e. what percentage of the light-blue segment, from the left-hand pie chart, each of the 11 first-level recording units accounts for.

Examination of the right-hand pie charts of *App.3-[5Yr Periods 1900-2002]-01* indicates that the recording units dominating the period from 1902 to 2009 are Artwork Words (AW), Assertive Words (AS), Socio-Political Words (SPW), and in later charts also Geographical Locales (GEO), Dates (DT) and Artist Name (AN). The recording unit AW has an average weighted percent across the 20, five-year periods of 10.79%. Whilst AS and SPW have averages of 3.66% and 4.82% respectively. GEO, DT and AN have average weighted percentages of 2.85%, 2.20% and 2.06% respectively.

Graph 2.1.1 and *graph 2.1.2* plot the average weighted percentages per five-year period of first-level recording units AW, AS, SPW, and GEO, DT, AN respectively.

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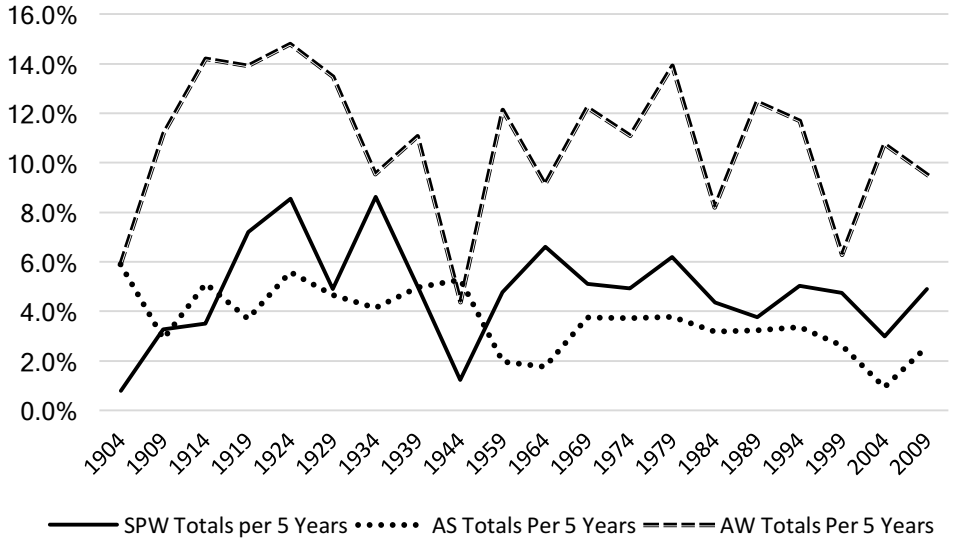
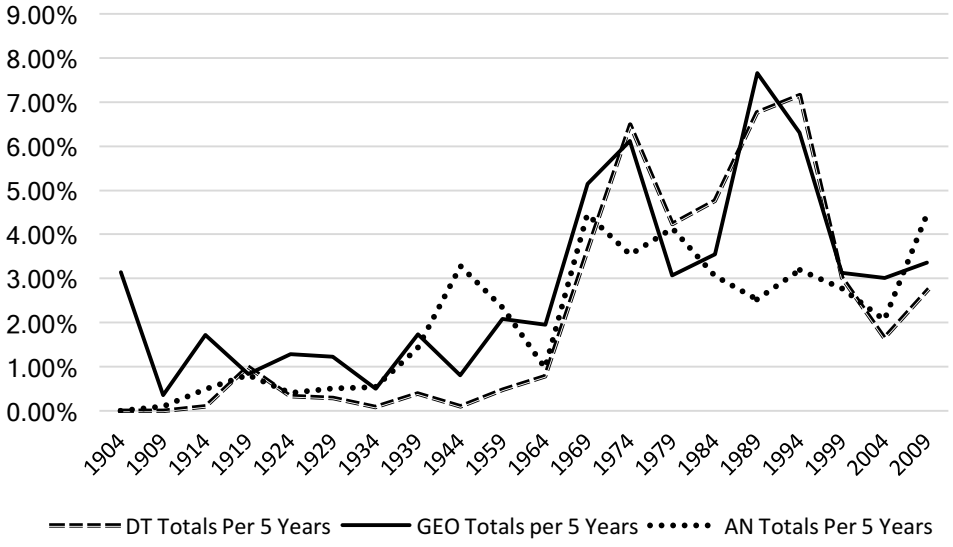
[23] The time period 1902 to 2009 has been reduced to 20 five-year time periods rather than 22, because for two of the periods – 1945 to 1949 and 1950 to 1954 – there are no data.



Graph 2.1.1: Line graph of the relationship between the first-level recording units SPW, AS, AW (average weighted percentage per five-year period) and Years (per five-year period from 1900 to 2009).



Graph 2.1.2: Line graph of the relationship between the first-level recording units DT, GEO, AN (average weighted percentage per five-year period) and Years (per five-year period from 1900 to 2009).

Graph 2.1.1 shows that the weighted percentages of recording units AW, AS and SPW from 1902 to 2009 are fairly consistent; their lines are fairly horizontal. This supports the previous assertion drawn from comparison of the individual pie charts of *App.3-[5Yr Periods 1900-2002]-01* that their segments always maintain a presence. The lines representing the average weighted percentage per five-year period of GEO, DT and AN, illustrated on *graph 2.1.2*, are not horizontal in nature. There is a marked increase in their average weighted percentages from the first half of the graph to the second. This increase occurs from 1935

for AN, and from 1965 for GEO and DT. There is a marked difference between the artwork-texts being produced in conjunction with RAG artwork-objects at the beginning to middle of the twentieth century and those being produced in the latter half and early twenty-first century in terms of the proportion of words that they dedicate to Dates, Artist Name, and Geographical Locales. With the earliest British exhibition, of the 62 in this study, dating to 1935 there is indicated a marked change between the artwork-text produced by the artists, or contemporaneously to the RAG artwork-objects' production (primary sources), and the artwork-text produced in conjunction with the later exhibiting of these RAG artwork-objects (secondary sources). This difference in the artwork-texts being produced is examined in greater detail below, but to take into account this potential difference, and to allow for greater comparison of these differences between primary and secondary sources, bivariate correlation is used to calculate, quantitatively, the relationship for three periods, represented by changing canons of artwork-texts: Both primary and secondary sources (1902-2009); Predominantly primary sources (1902-1934); Predominantly secondary sources (1935-2009).

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[24]	*p*-value	Lower	Upper
AN	Year	.476	58	.000	.334	.600
AS	Year	-.396	58	.000	-.558	-.227
AW	Year	-.226	58	.012	-.405	-.048
DT	Year	.537	58	.000	.412	.648
GEO	Year	.435	58	.000	.271	.596
AN	DT	.550	58	.000	.435	.656
AN	GEO	.494	58	.000	.336	.640
AS	AW	.318	58	.000	.148	.473
AS	DT	-.310	58	.001	-.470	-.135
AS	SPW	.248	58	.006	.034	.453
DT	GEO	.630	58	.000	.471	.767

Table 2.1.1: Significant results of bivariate correlation (Kendal's Tau) between the first-level recording units (average weighted percentage per Year from 1902 to 2009), and between first-level recording units (average weighted percentage per Year) and Year (1902-2009).

As this section is concerned with providing an overview, bivariate correlation ("Section 1.2") is used to the examine the period from 1902 to 2009 as a whole. In calculating Kendall's Tau and Bootstrap BCa 95% CI this, and the following sections, use the weighted percentages of each recording unit in the 58 individually available sampling units – each sampling unit containing all text produced in one particular Year: The calculations do not use sampling units of 20, five-year periods.[25] This produces samples, even allowing for excluded pairwise

[24] Cases (*N*) derive from 58 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

[25] The reason for the use of the 58 sampling units in the calculating of bivariate correlation rather than the 70 sampling units used within the graphs, charts and "fingerprints" is stated in "Section 2.0" (pages 54-55).

cases, of much greater size and accuracy, than being reliant on the relatively small sample of a maximum of 20 cases (*N*).

Table 2.1.1. contains some of the results from calculating, across the sampling units, the correlations between the weighted percentage values of the six first-level recording units shown in *graph 2.1.1* and *graph 2.1.2*: AW, AS, SPW, GEO, DT, and AN. Kendall's Tau is also calculated between each of these variables and the Years (dates of the sampling units).

A full table of results is produced in *App.2-[1902-2009]-01*, and, as is seen in the appendix, although a selection of significant results are shown in *table 2.1.1* none of the results in the full table contradict the findings. *Table 2.1.1* contains those results of significance. *Table 2.1.1* demonstrates that when the correlation coefficients (*T*) and confidence intervals (BCa 95% CI) for the six recording units are calculated in relation to Year (1902-2009), all of those recording units (GEO, DT, AN) charted on *graph 2.1.2*, that are describable as becoming more of a "feature" of the artwork-texts written in the second half of the twentieth century, have significant, positive correlations with Year. This means that as the value of one increases, so does the value of the other. In this case, as the Years progress (increase in numerical value), so the weighted percentage increases of the text concerning Geographical Locales (GEO), Dates (DT), and Artist Names (AN). The inverse is true of the relationships between Year and AW, and between Year and AS. There are significant, negative relationships between Assertive Words (AS) and Year, and between Artwork Words (AW) and Year: As the twentieth century progresses a lesser percentage of artwork-text is given to words describing the RAG artwork-objects. The implications of proportionally less artwork-text being used for Assertive Words as the twentieth century progresses, is investigated with reference to the second-level AS recording units in "Section 2.7".

The relationships between the recording units also supports an assertion that AN, DT, GEO, and AS, AW, SPW increase and decrease in their weighted percentages in relation to each other. *Table 2.1.1* contains significant, positive correlations calculated between AN and DT, AN and GEO, and DT and GEO. As one of these recording units increases or decreases as a proportion of the artwork-text, so does the other. Significant, positive correlation is also calculated between some of the recording units illustrated on *graph 2.1.1*: There is positive correlation between recording units AS and AW, and between AS and SPW. *Table 2.1.1* also shows a significant, negative correlation between two recording units that appear on different graphs: AS (*graph 2.1.1*) and DT (*graph 2.1.2*). Not only do these two first-level

recording units have opposing significant relationships with Year, but they also have a significant, negative relationship with one another. Assertive Words (AS) decrease as a proportion of artwork-text from 1902 to 2009, whilst the proportion of artwork-text used to write Dates (DT) increases.

Focus now shifts to examination of the second and third levels of inclusion of the first-level recording units. Examining the various recording units that form the first-level units, introduced in this section, enables a more detailed, in-depth discussion upon the various concepts and their changing relationships within the sampling units over the Years. It will allow for more of the subtleties of the relationships and temporal changes within the artwork-texts to be revealed and for such changes to be demonstrated with reference to the original artwork-texts.

2.2 – Analysis of Second-Level GEO Recording Units: Fingerprints

Whilst the first level of inclusion of the GEO recording unit groups all terms relating to geographical locale together, its second level of inclusion categorizes these terms into four, separate recording units: General Areas (GEOA); Areas Larger Than Nations (GEOC); Nations and Countries (GEON); Areas Smaller Than Nations (GEOT) (*figure 2.0.1*). *App.3-[5Yr Periods 1900-2009]-02* contains pie charts illustrating these second-level recording units for each five-year period of sampling units. The pie charts illustrate what percentage of the first-level recording unit GEO, illustrated in the right-hand pie charts of *App.3-[5Yr Periods 1900-2002]-01*, is represented by each of the four, second-level recording units that form GEO. The percentages on the charts in *App.3-[5Yr Periods 1900-2009]-02* are not the weighted percentages; they are not the percentage that these recording units account for of the text within the sampling units. The percentages on the charts in *App.3-[5Yr Periods 1900-2009]-02* are the percentage that each of these four, second-level recording units account for of the first-level recording unit GEO from that particular sampling unit. As such, the analysis of these charts is an analysis of the changing construction of the geography at use within the artwork-text accompanying the RAG artwork-objects.

The pie charts in *App.3-[5Yr Periods 1900-2009]-02*, and, thus, the geographical focus of the artwork-texts, change noticeably during the course of the twentieth century. It is a change that the reductional-effect of averages do not do justice. If the averages of GEOA, GEOC, GEON, and GEOT are calculated across the 20, five-year period, in effect for the entire period from 1902 to 2009, GEO would appear to be constructed of, roughly, equal parts GEOA, GEON, and GEOT – 29.71%, 32.10%, and 35.10% respectively. But in line with the discussion of "Section 2.1", if the averages are calculated separately for those sampling units containing artwork-texts produced between 1902 and 1934 and those containing artwork-texts produced between 1935 to 2009 a stark difference in the geography being discussed/created is revealed. *Table 2.2.1* contains these averages for comparison.

Recording Unit Code	Average % from 1902 to 2009	Average % from 1902 to 1934	Average % from 1935 to 2009
GEOA	29.71	49.84	18.87
GEOC	3.09	2.88	3.20
GEON	32.10	38.37	28.73
GEOT	35.10	8.90	49.2

Table 2.2.1: Average weighted percentage per Year of second-level GEO recording units for different periods.

Examination of *table 2.2.1* reveals that the percentage of GEO consisting of GEOC and GEON remains similar between the artwork-text of the primary sources of 1902 to 1934, and the, predominantly, secondary-source artwork-texts produced from 1935 and 2009. But there are large changes in representation of GEOA and GEOT within the geographical landscape of the artwork-texts. GEO changes focus, from focusing on the general features that go into forming the towns or the countryside from 1902 to 1934 (GEOA: 49.84%; GEOT: 8.9%), to naming of towns, and not their features, from 1935 to 2009 (GEOA: 18.87%; GEOT: 49.2%). Is this indicative of the difference and contrast between artists living and working in a particular town, engaging with their local landscape whilst producing artwork-objects, and the curator/academic attempting to re-situate an artwork-object from the foreignness of the gallery space, in which it is now resides, back to its "native" landscape? If this is the case, then, perhaps, such attempts are evidence of a decreasing interest in the subtle evocation of place, and an increase in taste for broad categorization. Or, it could be that writing retrospectively of the details of a locale that no longer exists as it was when the artwork-object was created is viewed as futile, and all that remains the same is the locale's name.

The Geographical Locale (GEO) of the RAG primary-source artwork-text provides numerous examples of the perfusion of the GEOA recording unit. The RAG artists, within their artwork-texts, demonstrably relate their artwork-objects and their artwork as drawing from the local landscape, mainly urban, and, also, being for this local landscape. Aleksandr Rodchenko, engages with the problems of photographing the features of the contemporary urban landscape, and the problems of imposing traditional viewpoints. In 1928, he writes:

> Buildings which you see from below when walking in the street, or the street that you see with its busy traffic and pedestrians from one of the upper floors, or things that you catch sight of from the tram window or car window, or objects that you see in the theatre or lecture hall from above downwards, all must be transformed and constrained into a classical view from 'the navel'.[26]

Rodchenko continues, in this text, to respond to the local geographical environment, commenting, not just on the problems it creates for those that implement the "classical view",

[26] Aleksandr Rodchenko, "Trends in Contemporary Photography", 1928[a], in Carrell, C., Young, K., McArthur, E., and Lodder, C., (eds.), *The Rodchenko Family Workshop*, New Beginnings and Serpentine Gallery: Glasgow and London, 1989, p. 62

but prescribing new photographic techniques as the only way to truly capture this contemporary environment:

> The new fast and real reflection of the world is in photography. It seems to me that considering its potential, photography should begin to depict the world from all angles of vision and to develop our ability to look at it from all sides.[27]

As well as allowing the general features of their contemporary, urban environment to influence how this environment was portrayed within their artwork-objects, other RAG artwork-texts describe these general features as the artistic medium itself. El Lissitzky demonstrates a similar distain for the classical artistic engagement with the built environment. In contrast to Rodchenko, though, Lissitzky, through Suprematism, does not want to use contemporary artwork to reveal the urban landscape, but wants to use architecture to change it. Lissitzky, in 1920, writes of the primary artistic engagement with "nature":

> First of all the artist painted the natural scene which surrounded him. Then this was obscured by towns roads canals and all the products of man for this reason the artist began to paint artificial nature […][28]

Lissitzky proceeds to declare the ambitions of Suprematism's new "dynamic architecture":

> We left to the old world the idea of the individual house individual barracks individual castle individual church. We have set ourselves the task of creating the town. The centre of collective effort is the radio transmitting mast which sends out bursts of creative energy into the world.[29]

In contrast to the primary-source artwork-texts' inclusion of the urban features that surround the RAG's everyday lives, the exhibition-catalogue artwork-texts from 1935 to 2009 focus to a lesser extent upon listing particular features of the built environment. Instead, these

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[27] Aleksandr Rodchenko, 1928[a], p. 57
[28] El Lissitzky, "Suprematism in World Reconstruction", 1920, in Bowlt, J. E., (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991, p. 155
[29] El Lissitzky, 1920, p. 155

secondary-source texts insist upon naming the town or city from which such features derive. This place naming is rarely observed in the artwork-text of the RAG, and is not evident in either the Aleksandr Rodchenko's or El Lissitzky's cited texts. This, evident, secondary-source artwork-text requirement of geographical positioning (GEOT), over geographical description (GEOA) is demonstrated by Vavara Rodchenko:

> Thanks to its novelty and variety, the art of photography fascinated Rodchenko from the year 1924. It became an integral part of his life, loves and passions. He made his own photo laboratory, painting the walls and ceiling black, setting up tables for the tanks and enlarger. He often went into this "dark room" to perform his "magic", to make the faces of his friends and family, the **Moscow streets** and photo reportages appear on the white paper.[30]

Aleksandr Rodchenko's urban description of "street", "traffic", "upper floor", "tram", "car", "theatre", "lecture hall" is reduced in his daughter's account to "**Moscow streets**".

This reduction of specific architectural detailing of the artwork-text is also evident in a reference to Lissitzky by John Milner. In contrast to the cited artwork-text by Lissitzky, Milner's artwork-text foregoes detailing the of the new urban environment, focusing on Lissitzky's influences and location whilst developing "**architectural projects**" during 1920:

> Malevich produced little politicized work. After squeezing out Chagall from the Vitebsk Free Studios, he established the working collective Unovis to develop the potential of suprematism […] Malevich himself developed architectural versions of suprematism in plaster architectural studies (architectonics), and his brilliant student and colleague Lazar (El) Lissitzky developed suprematism in lithography, graphic design, painting, photography, exhibition design and

[30] Vavara Rodchenko, "A Few Words about My Father", 1996, in Lavrentiev, A., (ed.), *Alexander Rodchenko: Revolution in Photography*, Multimedia Complex of Actual Arts: Moscow, 2008, p. 9 (Emphasis added by James Strugnell)

architectural projects, as well as through his books and travel.[31]

The way that the recording unit of geographical locales changes in make-up as it progresses through the twentieth century and into the twenty-first, can be most simply visualised by taking the pie charts from *App.3-[5Yr Periods 1900-2009]-02*, and removing from them all extraneous details. This is shown in *image 2.2.1*.

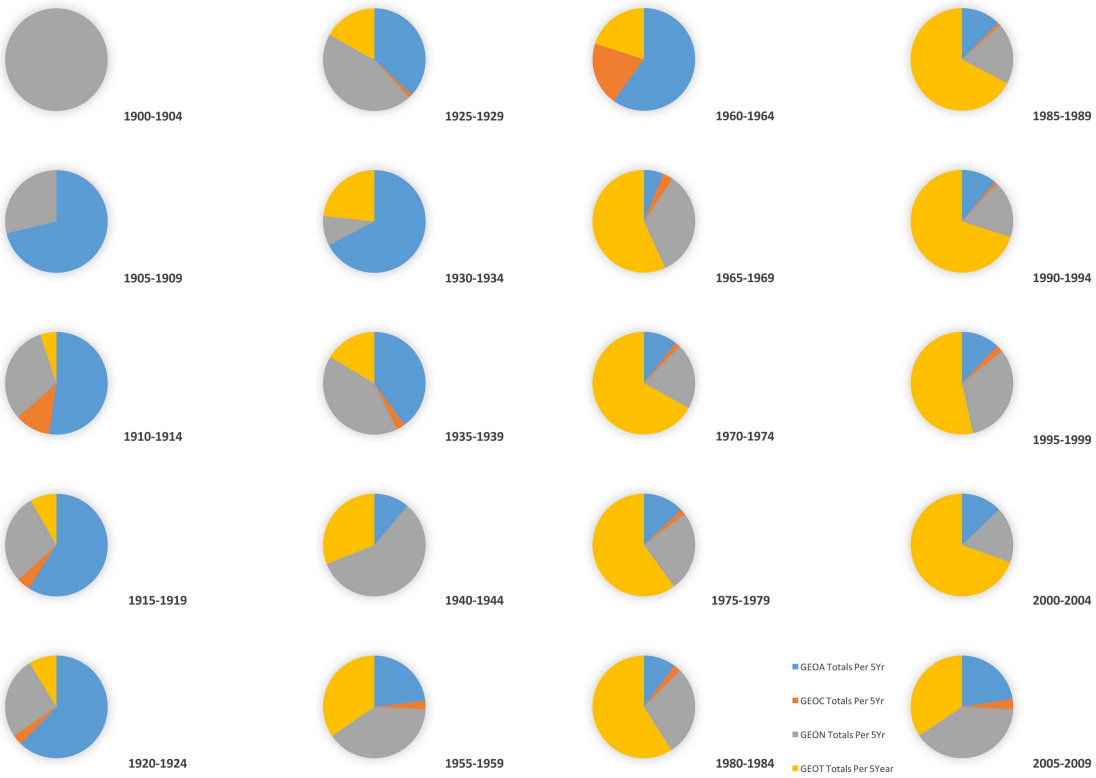


Image 2.2.1: *Fingerprints* of the changes in average proportional representation of second-level GEO recording units within the first-level recording unit GEO per five-year period from 1900 to 2009.

These reduced pie charts will be termed *fingerprints*. They are unique, identifying marks left within the textual structure of sampling units of artwork-text. They allow for quick identification of changes in the proportional construction of recording units. The *fingerprints* in *image 2.2.1* highlight the fundamental change in the proportions of the constituent parts of the first-level GEO recording unit, from one dominated by the blue segments of GEOA (1905-1924), to one where the yellow of GEOT dominates (1965-2005). What is also striking, is the consistency of these *fingerprints* across the artwork-text of large spans of

[31] John Milner, *A Slap in the Face! Futurists in Russia*, Philip Wilson: London, 2007, p. 37 (Emphasis added by James Strugnell)

time: Decades. The proportional construct of the GEO recording unit for the three, five-year period from 1910 to 1924 is noticeably consistent. As are the similarities between the six *fingerprints* from 1965 to 1994. The difference between the 1910-1924 *fingerprints* and the 1965-1994 *fingerprints* also demonstrates the switch in focus of the GEO unit from defining a town by its street, to defining a country by its town, which is demonstrated in *table 2.2.1*. These *fingerprints* in their startling and consistent contrast between those deriving from the primary sources from 1902 to 1934 and those from later secondary sources, even suggest an opportunity to identify and test the validity of source-type by their *fingerprints*.

2.3 – Analysis of Third-Level GEO Recording Units: GEOT[NS]

The third level of GEO inclusion focuses in more detail on the previous section's second-level recording unit of GEOT. It categorizes the towns and areas (proper nouns) smaller than countries into 13, national, recording units (GEOT[NS]) (*figure 2.0.1*). Within each of these recording units are the towns and areas located in that particular nation. This level of inclusion allows for the examination of the changes in the nations discussed in the artwork-texts accompanying the production and exhibition of RAG artwork-objects. It allows for the charting of changes in the international-contextual placement of the artwork-objects.

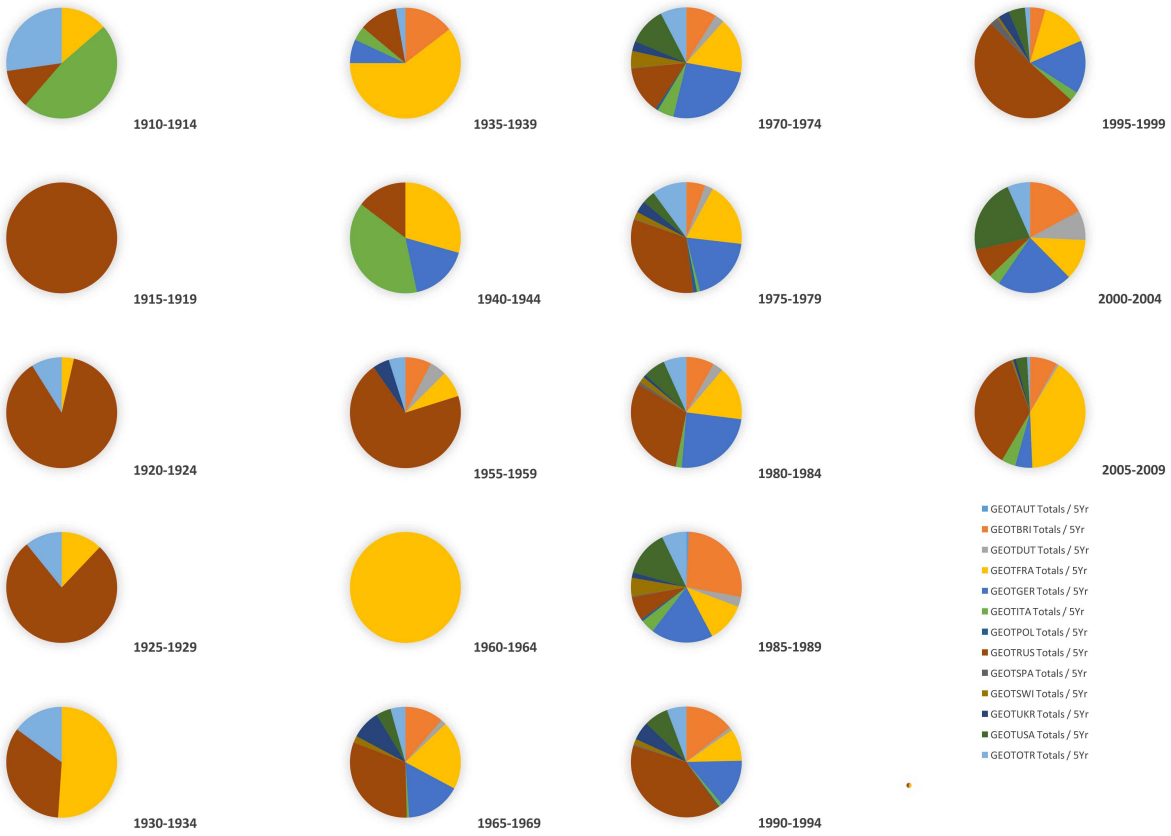


Image 2.3.1: *Fingerprints* of the changes in average proportional representation of third-level GEOT recording units within the second-level recording unit GEOT per five-year period from 1900 to 2009.

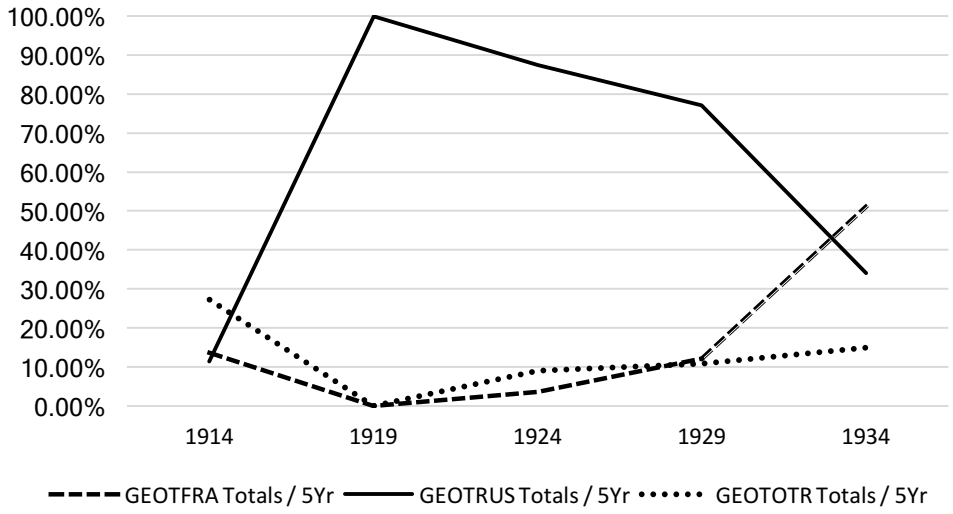
App.3-[5Yr Periods 1900-2009]-03 contains pie charts illustrating the third-level GEOT[NS] recording units for each five-year period of sampling units. As with *App.3-[5Yr Periods 1900-2009]-02*, the percentages on the charts in *App.3-[5Yr Periods 1900-2009]-03* are not the weighted percentages; they are not the percentage that these recording units account for of the text within the sampling units. The percentages on the charts in *App.3-[5Yr Periods 1900-2009]-03* are the percentages that each of these 13, third-level recording units

accounts for of the second-level recording unit GEOT from each five-year period of sampling units. As such, analysis of these charts is an analysis of the changing national construction of the conceptual "town" that accompanies the RAG artwork-objects in the artwork-text. How multinational is the "town" that is used to contextualise the RAG artwork-object? *App.3-[5Yr Periods 1900-2009]-03* contains the percentage values, but as in “Section 2.2” the most effective way to view the changes in the national make-up of the concept of “town” is to view these pie charts as *fingerprints*. *Image 2.3.1* exhibits these *fingerprints*.

Initial observations describe an increasing number of nationalities being brought together within the “town” written of in the artwork-texts accompanying the RAG artwork-objects. As with the first-level GEO recording unit of “Section 2.2”, there is a marked distinction between the text accompanying the production phase of the RAG artwork-objects (primary sources) – in this case 1910 to 1934 – and that accompanying the exhibition phase (secondary sources) – 1935 to 2009. There is much greater diversity of nations within the recording unit GEOT in the latter exhibition phase then there is in production phase. This is demonstrated by the increase in the number of differently coloured segments within the *fingerprints* of this latter phase: Each colour representative of a different nation.

Examining the artwork-object-production period (1910-1934) in more detail, it is observable that from 1910 to 1914 the artwork-text of the RAG contextualises its artwork in relation to towns from France (GEOTFRA [yellow segment]) and Italy (GEOTITA [green segment]), as well as towns from a number "other" nations[32] (GEOTOTR [light blue segment]) and towns within Russia (GEOTRUS [brown segment]). This is contrasted with the following five-year period, 1915 to 1919, during which discussion of their artwork in relation to towns outside of Russia is of much less significance. In fact, this period is dominated exclusively by a Russian contextualisation; 100% of towns mentioned two or more times in any given Year being Russian. The remaining three, five-year periods' *fingerprints* (*image 2.3.1*), from 1920 to 1934, illustrate an increasing, but limited, internationalizing of the context in which RAG artists discuss artwork. Each period shows an increase in the proportion of the GEOT recording unit being constructed of both towns and areas of France and "other" countries, and a decrease in the proportion represented by towns from Russia. This is demonstrated in *graph 2.3.1*.

[32] Third-level recording unit GEOTOTR contains towns and areas smaller than countries (proper nouns) from countries with two or fewer entries within the unit GEOT. All entries for countries with two or fewer entries are grouped together into recording unit GEOTOTR. A full list of these entries is produced in *App.1-[Content Analysis]-02*.



Graph 2.3.1: Line graph of the changing construction of the GEOT recording unit: The relationships between Five-Year Periods (1910-1914 to 1930-1934) and the proportion (%) that the third-level recording units GEOTFRA, GEOTRUS, GEOTOTR account of the second-level recording unit GEOT.

Graph 2.3.1 illustrates the decline in the proportion of GEOT consisting of Russian-town names from 1919 to 1934, and increase in the French-town names (GEOTFRA) and towns from "other" countries (GEOTOTR) being discussed in the artwork-texts by RAG artists. This data identifies the increase in the forging of a mono-nation national identity by the RAG artists for their artwork between 1910 and 1919, but it might also indicate a diversifying of this identity from 1920 onward. If this is the case, it should be supported through examination of the artwork-text from which this data derives.

The majority of artwork-text of the five, five-year periods from 1910 to 1934 discusses two nations, Russia (GEOTRUS) and France (GEOTFRA), in respect to GEOT. There are two exceptions: The first exception is the 1915-1919 period during which no towns outside of Russia are discussed, and, therefore, the examination is only of Russian towns/recording unit GEOTRUS. The second exception is the 47.72% Italian (GEOTITA) proportion of the 1910-1914 GEOT recording unit. This identifies and is explainable by the visit to Russia of the Italian Futurist Filippo Marinetti in 1914. It is known that when in Russia, Marinetti met Kasimir Malevich, and that Natalia Goncharova is, also, in communication with him during this period.[33] This is demonstrated by her letter to him of 1914 in which she states that, at this time, Marinetti is a "guest" in Russia:

[33] Bowlt, 1991, p. 116

> Monsieur Marinetti, Our country is a beautiful country. It is bigger and younger than yours. Italy used to be a beautiful, young matron [sic], then a beautiful, fifty-year old courtesan, and then a beautiful beggar-woman. Being a beggar-woman after such a beautiful career means the end, even if one has a Futurist son or daughter. Our country, of which you are a guest, is still a child. For her everything is in the future as [illegible]. [She is] a fantastic, but not exotic, creature [whom] Europe may exploit, but can never comprehend...[34]

From 1910 to 1914 the genesis of the more predominantly Russian identification by RAG artists – that is to follow in the next three, five-year periods – is demonstrable within their artwork-text. Firstly, there are assertions by the RAG comparing and aligning Russia's influence as an artistic centre to that of artistic epicentre of Paris, France. In 1912 Natalia Goncharova writes a letter to the editor of the *Russkoe Slovo* (*Russian Word*):

> The Cubist Picasso is great and, in France (above all, Paris), stands at the very centre of contemporary painting. In this respect, the destiny of the Russian centre of painting, Moscow, coincides with that of Paris. Both cities are besieged by foreign theorists with their big theories and little accomplishments.[35]

The RAG soon begin to assert their/Russia's position as the European artistic avant garde. Ilya Zdanevich and Mikhail Larionov, in 1913, proclaim:

> It began in '05. Mikhail Larionov painted a nude standing against a background of a carpet and extended the design onto her. But there was no proclamation. Now Parisians are doing the same by painting the legs of their dancing girls, and ladies powder themselves with brown powder and

---

[34] Natalia Goncharova, "Letter to Filippo Tommaso Marinetti", 1914, in Bowlt, J. E., and Drutt, M., (eds.), *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova*, Royal Academy of Arts: London, 1999, p. 314

[35] Natalia Goncharova, "Letter to the Editor", 1912, in Bowlt, J. E., and Drutt, M., (eds.), *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova*, Royal Academy of Arts: London, 1999, p. 313

> like Egyptians elongate their eyes. But that's old age. We, however, join contemplation with action and fling ourselves into the crowd.[36]

Zdanevich and Larionov decry the "old age" of Parisian easel painting, in contrast to the decorating of their own faces, and, in a very literal sense, taking their artwork-objects into and amongst the crowds. Goncharova continues this usurpation by the RAG of the mantle of artistic avant garde from Paris and the rest of Europe. She writes in the preface to her 1913 solo exhibition:

> Greece, beginning with the Cretan period (a transitional state), with its archaic character and all its flowering, Italy right up to the age of the Gothic, represents decadence. Gothic is a transitional state. Our age is a flowering of art in a new form – a painterly form. And in this second flowering it is again the East that has played a leading role. At the present time Moscow is the most important centre of painting.[37]

The assertions of Russia's, particularly Moscow's, place as the new epicentre of twentieth-century artistic originality continues in the writings of the RAG from 1915 to 1919. This time, though, to the exclusion of any place outside of Russia. This is particularly noticeable in the writings post-1917 (October Revolution), where attempts are repeatedly made to write, what might be termed, a Russian History of Art. In 1919 Kasimir Malevich writes, historicizing his, and Russia's, artistic achievements:

> Suprematism appeared in 1913 in Moscow, and its first works were shown at an exhibition of painting in Petrograd; it provoked the indignation of the "venerable newspapers of those days" and of the critics, and also of professional people – the masters of painting.[38]

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[36] Ilya Zdanevich and Mikhail Larionov, "Why We Paint Ourselves: A Futurist Manifesto", 1913, in Bowlt, J. E., (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991, p. 81

[37] Natalya Goncharova, "Preface to Catalogue of One-Man Exhibition", 1913, in Bowlt, J. E., (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991, p. 57

[38] Kasimir Malevich, "Suprematism", 1919, in Bowlt, J. E., (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991, p. 144

This expression of fundamental Russianness, the home-grown nature of the RAG artwork and artists is also expressed by Vavara Stepanova in her diary entry of the same year (1919): “Our black fertile earth of Moscow has given art many faces.”[39] Elsewhere the entry alludes to the differences found between the work of the RAG artists and their Western-European counterparts, in her assertion of the RAG’s “individuality” and “absence of schools” leading to what she believes to be the “special characteristic of Russian painters”.[40]

Over the next two, five-year periods of sampling units (1920-1924 and 1925-1929) third-level units GEOTFRA and GEOTOTR, once more, account for an increasing proportion of the second-level unit GEOT. This also means that recording unit GEOTRUS accounts for a lesser proportion of the GEOT recording unit. The proportion GEOT accounted for by French-town names (GEOTFRA), increases from 3.57% in the 1920-1924 period, to 12.05% in the 1925-1929 period. But as well as an increasing proportion of GEOT being dedicated to areas outside of Russia, there is also a change in how the RAG write about Russia’s relationship to the rest of European.

The two previous five-year periods (1910-1914 and 1915-1919) demonstrate, that in terms of recording unit GEOT, the artwork-text being produced by the RAG artists focuses on what made their Russian artwork unique in contrast to Western-European art. It can also be read as an attempt to move RAG artwork to the “top” of a European-avant-garde-artistic hierarchy. This agenda is demonstrated in the artwork-text of the 1920-to-1924, five-year period. David Shterenberg in a 1920 journal article "Our Task", continues the post-Revolutionary assertions of the RAG that act to separate and promote their artwork “above” that of France. It also criticises the artwork of Western Europe and America as being too homogeneous. He describes Russia's geographical location as enabling its avant-garde artists to produce a uniquely Russian artwork:

> New ideas [...] remained outside the official academic schools and found refuge in the private schools of certain young artists. Paris owes its extremely rich development in the arts mainly to such schools, a development that made it the only city in Europe that virtually dictates new laws to

[39] Vavara Stepanova, "Excerpts from Stepanova's Diaries: 1919", 1919[a], in Carrell, C., Young, K., McArthur, E., and Lodder, C., (eds.), *The Rodchenko Family Workshop*, New Beginnings and Serpentine Gallery: Glasgow and London, 1989, p. 42
[40] Stepanova, 1919[a], p. 42

> the whole of Europe and exerts an immense influence on the art of all nations. England, Germany, and America, despite the high standard of their material culture, hardly possess their own art in the broad sense of the word. But Russia, thanks to the peculiar position it occupies in relation to the East and thanks to all the untapped resources of its culture, as yet in an embryonic state, has its own definite path on which it has only just embarked.[41]

The importance of the October Revolution of 1917 to the Russian RAG as fundamental to the germination of their new artwork is a belief repeated during the period 1920 to 1924. Shterenberg in "Our Task", writes: "The elimination of all forms of coercion in art at the time of the Revolution was the best possible decision, and now we can already see a definite result."[42] These themes are continued in Vladimir Mayakovsky's writing. As is the notion that Moscow, and not Paris, will be central to the new world order of art. In his "Lef Declaration, 1923: Comrades, Organisers of Life" he states:

> Comrades!
>
> Split leftist art from rightist everywhere!
>
> With leftist art prepare the European Revolution; in the USSR strengthen it.
>
> Keep in contact with your staff in Moscow (Journal 'Lef', 8 Nikitsky Boulevard, Moscow).
>
> Not by accident did we choose the First of May as the day of our call.
>
> Only in conjunction with the Workers' Revolution can we see the dawn of future art.
>
> We, who have worked for five years in a land of revolution, know:
>
> That only October has given us new, tremendous ideas that demand new artistic organization.

---

[41] David Shterenberg, "Our Task", 1920, in Bowlt, J. E., (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991, p. 187
[42] Shterenberg, 1920, p. 187

> That the October Revolution, which liberated art from bourgeois enslavement, has given real freedom to art.[43]

There is an optimism in the RAG's writing from 1910 to 1924. There is a belief that Moscow and Russia, and not Paris and France, will be the new source from which innovations in art theory and practice will be developed and flow out across the globe. This optimism slows, becoming more tempered in the period from 1925 to 1929. The increasing proportion of GEOT that is formed from French geographical origin (*image 2.3.1*), the rising dashed line of *graph 2.3.1*, is not accompanied, as in the previous period, by optimism. It is as if during this period the RAG begrudgingly, begin to doubt the promises of Revolution. N.N. Sobolev, writing in 1928 on the history of textile design in Russia for the catalogue of the *First Art Exhibition of Soviet Domestic Textiles*, describes the long-standing influence that Paris has had on the design and manufacture of textiles in Russia up to the outbreak of the First World War. He then finishes his article in faint optimism stating:

> For all these reasons, in spite of its long history our textile industry has not yet, with the exception of a few specially made articles, succeeded in creating a distinctive design style. It is our age, as we build a new life with the Soviet republic, that is called upon to create this style.[44]

This frustration with the present state of Russian art, although still with hope for a better future, is evident in Alexandra Exter's writing of this period. The overt optimism and force-of-words found in the RAG writing of the three, five-year periods covering the previous 15 years from 1910 to 1924, is once more tempered. Writing a letter to Vera Mukhina, 3rd March 1929, Exter reviews some of the sculptural work of the three Vesnin brothers:

> Apropos of individuality – I looked at the first issue of the *Cahiers d'art*, which has photographs of the contemporary Moscow sculpture by the Vesnin brothers and others. Well, with documents in hand I can show you what's been borrowed, and from where, or downright stolen both in the idea and in its parts. Nothing, nothing original. ...

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[43] Vladimir Mayakovsky, "Lef Declaration, 1923: Comrades, Organisers of Life", in Elliott, D., (ed.), *Mayakovsky: Twenty Years of Work*, Museum of Modern Art Oxford: Oxford, 1982, p. 32

[44] N.N. Sobolev, "The History of Design in Textile", 1928, in Elliott, D., and Ryan, J., (eds.), *Art into Production: Soviet Textiles, Fashion and Ceramics 1917-1935*, Museum of Modern Art Oxford: Oxford, 1984, p. 95

> I'd like to see Russians above everyone else, for I'm convinced that Russians are the strongest and most talented people. They're strongest in the theatre, but in the other plastic arts we are pathetic and clumsy imitators, always have been, but maybe one day we won't be like that.[45]

In the final, production-phase, five-year period of 1930-1934 recording unit GEOT is proportionally dominated by the third-level unit GEOTFRA; France and Paris dominates. With the exception of the five-year period from 1910 to 1914, it is the first five-year period in which Russian towns/areas (GEOTRUS) do not represent > 50% of the GEOT recording unit. French towns/areas (GEOTFRA), namely Paris, account for 51.06% of the GEOT recording unit for the period from 1930 to 1934. Whilst Russian towns (GEOTRUS), namely Moscow, account for 34.04%, and towns from "other" countries (GEOTOTR) account for 14.89%. The fact that GEOTFRA becomes the proportionally dominant segment of the GEOT unit within artwork-texts from 1930 to 1934 is, also, evidenced in *graph 2.3.1* by the point, between 1929 and 1934, at which the dashed line (GEOTFRA) and solid line (GEOTRUS) cross.

This period's attitude to both Paris and Moscow is different, again, to what has gone before. There is less discussion of Revolution/revolution, of optimism for the new, of the new art-world order emanating from Moscow. Instead, and in stark contrast to the us-and-them, Moscow-and-Paris attitudes of the first three, five-year periods, the context in which Paris is discussed now is one of collaboration, and as a place that presents opportunities to learn and develop as an artist. Even if, ultimately, the artist then decided to return to Russia, there is no denying Paris's importance. These are the views Nadezhda Udaltsova expresses in her recollections of her earlier life. Of searching for a Parisian studio in which to study:

> [...] Someone then told us about La Palette, the studio of Le Fauconnier. We went there and immediately decided that it was what we wanted. ... Le Fauconnier, Metzinger, and Segonzac used to visit the studio once a week. Le Fauconnier

[45] Alexander Exter, "Letter to Vera Mukhina", March 3, 1929, in Bowlt, J. E., and Drutt, M., (eds.), *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova*, Royal Academy of Arts: London, 1999, p. 305

> offered pictorial solutions for the canvas, while Metzinger spoke of Picasso' s latest accomplishments.
> [...]
> Le Fauconnier was a ferocious expert, and many a student trembled before the canvas. Both Le Fauconnier and Metzinger responded positively to my works, and I was so happy when Metzinger told me two weeks later, "Vous avez fait le progres extraordinaire" ["You have made extraordinary progress"]. How the students looked at me![46]

The second paragraph, in which Udaltsova writes that she “was so happy" to be praised by Metzinger, a French painter, is a paragraph that stands in stark contrast to the writings of the first three, five-year periods, and especially the sampling units covering the period from 1915 to 1924. These Years are marked by artwork-texts that want to distance the RAG's artwork from the influences of Paris, not acknowledging any indebtedness to Cubism and French Schools of painting. Udaltsova continues in her writing to do just this:

> A year of life with only art, and [living] in isolation, turned me into a conscious artist and a real individual. For the first time I now sensed my own "I." In my diary for that year, I wrote that Cubism was only a school for me, not a goal. I fully appreciated the extra-ordinary nature of Cubist achievements in painting [...][47]

Although as with the previous period from 1925 to 1929 in which the artwork-texts are of tempered exacerbation toward the progress of Russian art, Udaltsova does temper her acknowledgements of thanks to the Cubism by asserting a Russianness to it:

> [...] and it was not the decorative aspect that attracted me [to Cubism], but rather the severity of its construction and the severe laws of painting itself ... Oddly enough, after working through a

[46] Nadezhda Udaltsova, "My Recollections: My Life in Art", 1930, in Bowlt, J. E., and Drutt, M., (eds.), *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova*, Royal Academy of Arts: London, 1999, p. 343
[47] Udaltsova, 1930, p. 343

season in Paris, I felt that I just had to leave, that I could work only in my own country.[48]

In these final sentences, although Paris is named, it is the Russianness of the "construction", and her "own country" that are the final words in defining her art.

Regardless of the emphasis placed on the importance of France and/or Russia, by the RAG artists during the period from 1910 to 1934, the main feature of this period is an artwork-text of very limited worldview. The artwork-texts, as is illustrated by the *fingerprints* of *image 2.3.1*, contain discussion concerning places found predominantly within France or Russia. The exception being the 1910 to 1914 period, during which Italian places also become of interest to the writers. From 1935 onwards, though, the construction of the GEOT recording units becomes more varied and complex in their make-up: Two exceptions being the five-year periods of sampling units from 1940 to 1944 and 1960 to 1964.

Until 1965, whilst the diversity of places from different nations increases, there is still a very Eurocentric nature to the *fingerprints* and context in which the framing of RAG artwork in relation to other twentieth-century artwork occurs. Examination of the pie charts in *App.3-[5Yr Periods 1900-2009]-03* also confirms this, indicating that it is not until the period from 1965 to 1969, that locations outside of Europe, namely the USA (GEOTUSA) (dark-green segment), are included within the GEOT recording unit in numbers of any significance: 4.33% (GEOTUSA).

The RAG artist that is used as the initial trans-Atlantic bridge in the British exhibitions of RAG artwork-objects, during the five-year period from 1965 to 1969, is Naum Gabo. In 1966, the Tate Gallery, London held a one-man show of Gabo's constructions, paintings, and drawings: *Naum Gabo: Constructions, Paintings, Drawing*. It is in the accompanying catalogue that the first significant remarks are made to include, both, Western Europe and America within the history of the RAG. In the "Introduction" to the catalogue the influence of Paris is cited: "[I]n Paris Cubism was developing towards abstraction, and when Gabo visited Paris in 1912 and 1913 he saw the works of Picasso, Braque, Gris, Laurens, Lipchitz, Duchamp-Villon and Archipenko."[49] The catalogue then states the importance of the Russian Revolution on Gabo's art:

---

[48] Udaltsova, 1930, p. 343

[49] Herbert Read, "Introduction", 1966, in Arts Council of Great Britain, *Naum Gabo: Constructions, Paintings, Drawings*, Tate Gallery: London, 1966, n.p.

> At the outbreak of the Revolution (February 1917) Gabo [...] decided at once to return home and reached Russia at the end of April 1917. The revolutionary ferment affected the arts no less than any other aspect of life in Moscow.[50]

This statement aligns Gabo's artwork as becoming uniquely Russian: Although Gabo might have been influenced during his time in Paris, it was this Russian event that had just as much of an impact upon it. It also gives his artwork a revolutionary quality by proxy. This play, within the artwork-text, between Paris and Moscow, and the battle over influences and credit is reminiscent of the RAG's own writings.

Following the "Introduction", though, the "Biographical Notes and Principal Exhibitions" section is used to construct Gabo as a living link between Britain – the aforementioned revolutionary impetus of the RAG – and America. In the chronologically ordered bullet points, within the "Biographical Notes[...]", five are of significance to expanding discussion of the RAG outside of Europe:

> [...]
> 1935 First visit to England
> [...]
> 1938 One-man exhibition at the London Gallery, London. Visited the United States [...]
> 1939 At the outbreak of war moved to Carbis Bay, Cornwall [...]
> 1946 Left England for the United States.
> [...]
> 1965-66 Lives in Middlebury Connecticut.[51]

These five bullet points working with the statements made in the "Introduction", act to develop a new historical context for the artwork of the RAG. They act to connect the RAG artist and artwork-objects displayed within the exhibition to the country in which they are being shown, and for the first time of significance also to America. They also present the artwork-objects as being created by a still-living artist. A person, as well as artwork-object, able to provide a tangible link to Revolutionary Russia and the rest of the RAG.

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[50] Read, 1966, n.p.
[51] Arts Council of Great Britain, *Naum Gabo: Constructions, Paintings, Drawings*, Tate Gallery: London, 1966, n.p.

Examination of *image 2.3.1* shows the 1965-1969 period to be a significant turning-point in the evolution of the *fingerprint* of the GEOT recording unit, with similar *fingerprints* to it occurring throughout the proceeding periods: 1975-1979; 1980-1984; 1990-1994. The 1965-1969 *fingerprint* is the first to be representative of sampling units containing much greater diversity of nations, referenced by their towns and cities within the artwork-text. Excluding the recording unit GEOTOTR, there are nine nations represented by the segments of the 1965-1969 *fingerprint*. Before this period the most nations represented in a *fingerprint* was six (1955-1959). It signals a new era in the artwork-text accompanying the artwork-objects of the RAG. In the nine five-year periods preceding the 1965-1969 *fingerprint*, excluding GEOTOTR, there is an average of 2.78 different nations represented in each *fingerprint*. In the eight five-year periods proceeding the 1965-1969 *fingerprint* the average number of nations represented by each *fingerprint* increases to 9.25 nations. Even comparing just those periods (1935-2009) relating to the 62-British-exhibition canon reveals the 1965-1969 period to signal a significant change, with the average of the *fingerprints* of the four, five-years periods from 1935 to 1964 representing an average of 4.00 nations.

2.4 – Analysis of Second-Level AW Recording Units

As “Section 2.0” states, AW is a recording unit consisting of words used by the authors of artwork-text to describe: The artwork-objects’ creators; the artistic processes involved in the artwork-objects’ creation; the objects’ pictorial and physical qualities. As such, AW as a first-level recording unit is formed from nine second-level recording units. *Image 2.4.1*, containing the *fingerprints*, illustrates the changing average proportional representation of the various second-level AW units, as a percentage of the total first-level AW recording unit for each five-year period from 1900 to 2009.[52]

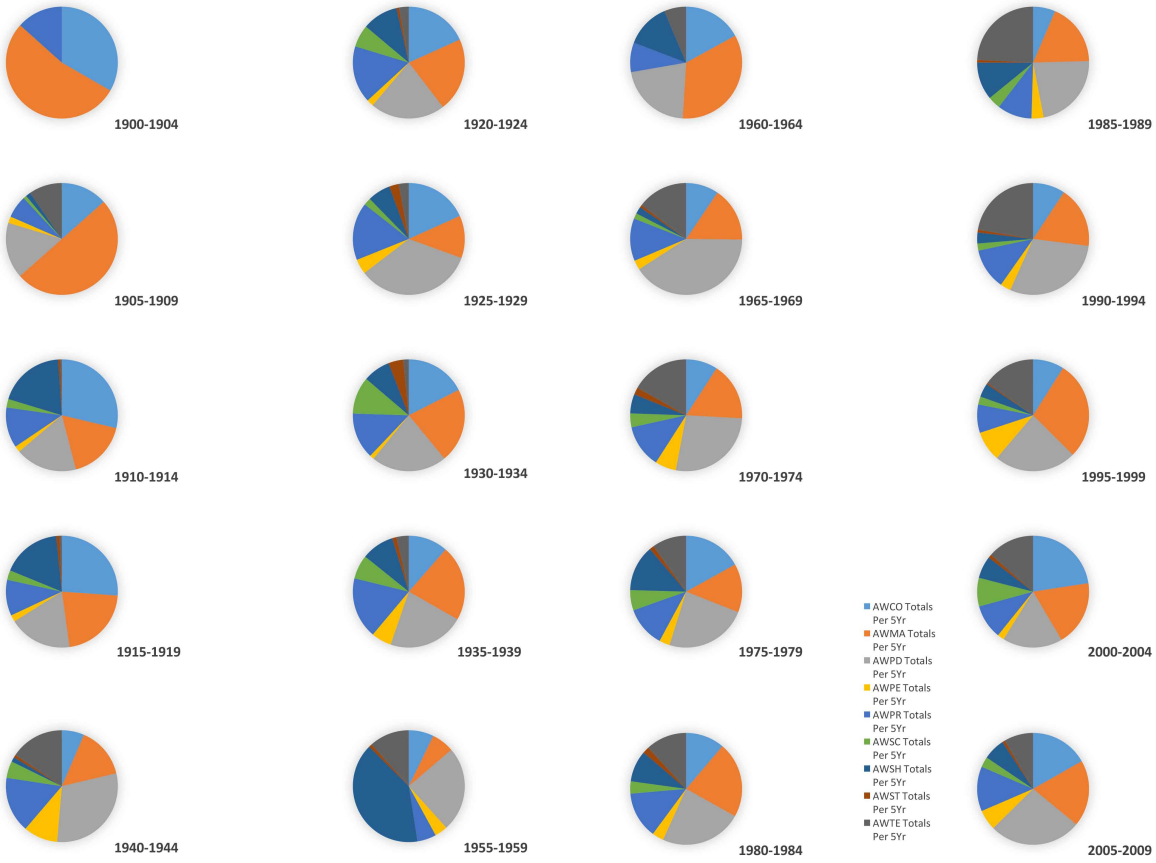


Image 2.4.1: *Fingerprints* of the changes in average proportional representation of second-level AW recording units within the first-level recording unit AW per five-year period from 1900 to 2009.

Initial observation suggests that, as with the GEOT recording unit of the previous section, how artwork is described (AW) becomes increasingly multifaceted as time proceeds. This is observed by the *fingerprints* of *image 2.4.1* becoming more multi-coloured as the five-year

[52] *App.3-[5Yr Periods 1900-2009]-04* contains the pie charts from which *image 2.4.1* has been created.

periods progress. Each colour representing a second-level AW recording unit of a different descriptive concept.

For the five-year period 1900-1904 artwork-objects are described, primarily, in terms of their colours/artistic qualities (AWCO), medium/materials (AWMA) and the processes/techniques involved in their creation (AWPR). These concepts account for an average of 33.33% (light-blue segment), 53.30% (orange segment) and 13.37% (mid-blue segment), respectively, of the first-level recording unit AW, for this five-year period.

After this initial five-year period the diversity of concepts within the recording unit AW increases. Although, AWCO and AWMA continue to remain significant elements in all of the following five-year periods. The other concept (second-level recording unit) that becomes, and continues to be significant in the description of the artwork-objects, is the categorizing of the artwork-objects into product types (AWPD). This second-level recording unit is illustrated by the grey segments in *image 2.4.1*. In addition to describing the colours within the artwork-objects (AWCO), the artwork-texts also describe the shapes and structural qualities within/of the artwork-objects (AWSH). This concept is represented by the dark-blue segment. There is a significant, and reasonably strong, positive correlation between the two recording units of AWCO and AWSH from 1902 to 2009. The results of Kendall's Tau between these two variables are: $T = .477$, $N = 58$, $p < .05$ (.000), BCa 95% CI [.282, .644]. This means that, in relation to the total artwork-text of a particular Year, as the weighted percentage of the words describing an artwork-object's colours/artistic-qualities increases so does the proportion of text consisting of words used to describe the object's shapes/structural qualities. The inverse also being true.

Whilst there is a significant, positive relationship between the recording units of AWCO and AWSH, each demonstrates a significant, negative correlation in relation to Year: $T = -.425$ and $T = -.256$ respectively.[53] Meaning that, as the Years proceed from 1902 to 2009 (increase numerically) the weighted percentages of AWCO and AWSH decrease within the artwork-texts; there is less description of the colours and shapes within an RAG artwork-object as the twentieth century advances. Perhaps, in opposition to this is the fact that there is an increase in describing the Artist Professions (AWPE) and their Institutions of Teaching/Artist Associations (AWTE). There would seem to be evidenced a shift from

[53] AWCO and Year: $T = -.425$, $N = 58$, $p < .05$ (.000), BCa 95% CI [-.559, -.275]. AWSH and Year: $T = -.256$, $N = 58$, $p < .05$ (.005), BCa 95% CI [-.448, -.058] (For complete set of results see *App.2-[1902-2009]-02*)

describing RAG artwork-objects in terms of their own physicality, to describing them in terms of being the end product of the artists' training and subsequent profession. There is an apparent shift in artwork-text focus from the artwork-object created, to the artwork-object's creator. Both, of these recording units, AWPE and AWTE, as would be expected if this assertion is true, share significant, positive correlations with Year: $T = .224$ and $T = .480$ respectively.[54] Meaning, that as the Years progress from 1902 to 2009 the proportion of the artwork-text dedicated to describing RAG artwork-objects in these terms increases.

These quantitative statements are demonstrable, qualitatively, through citation of passages from the artwork-texts. The writings of the RAG artists readily evidence a focus on describing artwork-objects in terms of colour and form. Demonstrated by Malevich's writing on Suprematism in 1919:

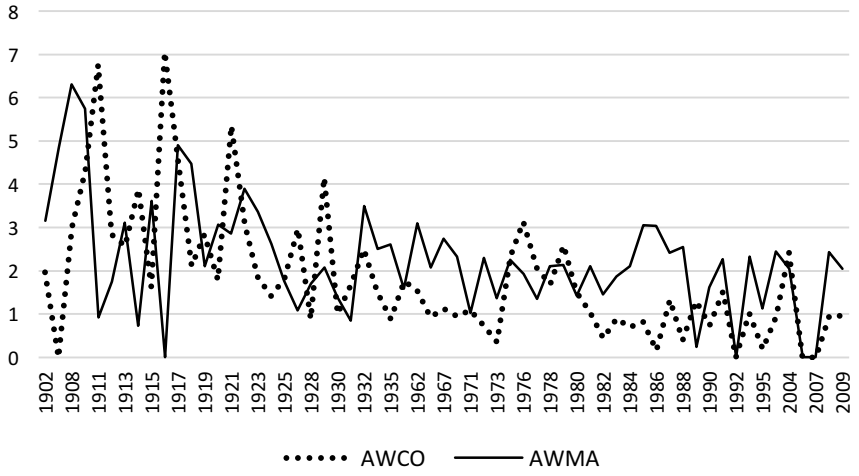
> It became clear to me that new frameworks of pure colour painting should be created that would be constructed according to the needs of colour; second, that colour in its turn should proceed from a painterly confusion into an independent unit – into construction as an individual part of a collective system and as an individual part *per se*.[55]

Stepanova, describing Malevich's resulting Suprematist artwork in her diary entry, 11th January 1919, writes: "Kliun and the boys are hanging up an enormous black square on a white canvas [...]".[56] Whilst, Nikolai Punin's article of 1923, explores colour and form within Malevich's artwork at even greater length:

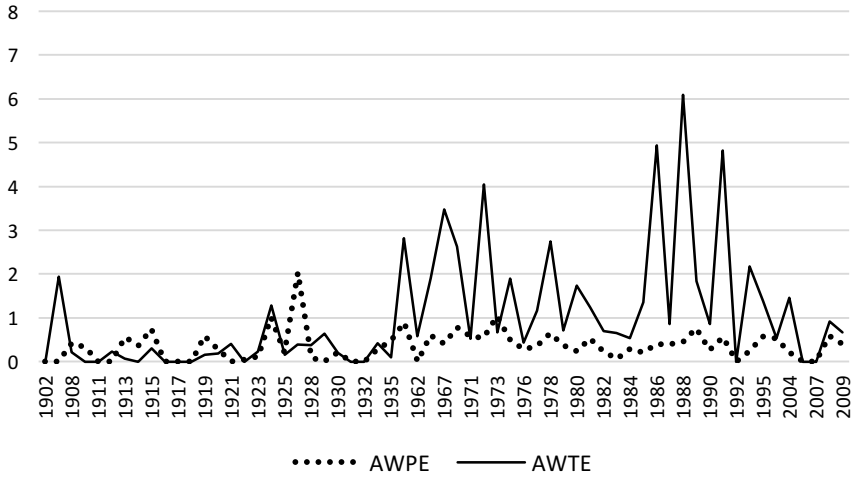
> The square is a constant form, inherent to man's initiative. The circle is the passive form of nature. Here one senses the painter, bringing order into the world by visual means. The black and red – the height of pure intensity, both of form and

[54] AWPE and Year: $T = .224$, $N = 58$, $p < .05$ (.015), BCa 95% CI [.033, .403]. AWTE and Year: $T = .480$, $N = 58$, $p < .05$ (.000), BCa 95% CI [.327, .613]
[55] Malevich, 1919, p. 144
[56] Vavara Stepanova, "Diary", 1919[b], in Bowlt, J. E., and Drutt, M., (eds.), *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova*, Royal Academy of Arts: London, 1999, p. 335

colour; white is the highest intensity of colour, hence the painterly origin is obvious.[57]



Graph 2.4.1: Line graph of the changing proportion (%) of the AW recording unit represented per Year, from 1902 to 2009, by second-level AW recording units AWCO and AWMA.



Graph 2.4.2: Line graph of the changing proportion (%) of the AW recording unit represented per Year, from 1902 to 2009, by second-level AW recording units AWPE and AWTE.

The describing of RAG artwork-objects in terms of colour and form also occurs in the artwork-text of the catalogues accompanying early, British exhibitions of their work. In Camilla Gray's "Introduction" to the 1959 Malevich exhibition, *Kasimir Malevich 1878-1935*, at the Whitechapel Gallery in London, Gray describes the breakthrough that occurred in

[57] Nikolai Punin, "A Review Of Painting Trends in Petersburg" [Originally published in *Russkoye Iskusstvo*, no. 1, 1923], in Gray, C., "Introduction", in Whitechapel Gallery, *Kasimir Malevich 1878-1935*, Whitechapel Gallery: London, 1959, p. 8

Malevich's artwork-objects in 1910: "He made his first stand: two-dimensional surface treatment of objects; immoveable compositions; space and form indicated by the juxtaposition of colour."[58]

Graph 2.4.1 illustrates the earlier artwork-texts and their focus on describing artwork-objects in terms of colour (AWCO) and form (AWMA). This can be contrasted with the later artwork-texts with their reduced proportion of text attributable to the AWCO and AWMA recording units, and increased proportion in the naming of Institutes of Teaching/Artist Associations (AWTE). *Graph 2.4.2* shows this to reach a "peak" from 1986 to 1991. This is evidenced within Valery Dudakov's contribution to the artwork-text of the 1989 exhibition *100 years of Russian Art 1889-1989: From Private Collectors in the USSR* at the Barbican Art Gallery, London. Of Mikhail Larionov and Natalia Goncharova he writes: "In 1911 they left the Knave of Diamonds, criticizing the association for blindly following French traditions, and created their Donkey's Tail (1912), Target (1913) and No.4 (1914) exhibitions."[59] A similar listing of Artist Associations is evidenced in the artwork-text for the 1991 catalogue accompanying the exhibition, *Russian Constructivism and Suprematism 1914-1930*, Annely Juda Fine Art, London. With reference to Olga Rozanova the catalogue states:

> From 1916 to 1917 member of the Supremus group and secretary of the journal of the same name, which never appeared. In 1918 became a member of IZO Narkompros and Proletkult. With Rodchenko was in charge of the Subsection of Applied Art of IZO Karkompros and helped to organize Svomas in several provincial towns.[60]

Regarding the proportion of artwork-text used to describe Artist Professions (AWPE), although this was demonstrated to have a significant, positive correlation with Year, suggestive of an increasing use of this recording unit within the artwork-text from 1902 to 2009, *graph 2.4.2* (dotted line) illustrates this to be less demonstrable with reference to actual artwork-text. There is not the obvious and pronounced rise in average weighted percentage demonstrative as within the AWTE recording unit (*graph 2.4.2*: solid line), nor

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[58] Camilla Gray, "Introduction", in Whitechapel Gallery, *Kasimir Malevich 1878-1935*, Whitechapel Gallery: London, 1959, p.5
[59] Valery Dudakov, "An Introduction to the Exhibition", in Elliott, D., and Dudakov, V., (eds.), *100 years of Russian Art 1889-1989: From Private Collectors in the USSR*, Lund Humphries: London, 1989, p. 31
[60] Annely Juda and David Juda, *Russian Constructivism and Suprematism 1914-1930*, Annely Juda Fine Art: London, 1991, p. 65

the proportional declines shown in *graph 2.4.1* by the downward trends of the lines representative of AWCO and AWMA.

In contrast to the significant, positive correlation between AWPE and Year, which does not translate onto *graph 2.4.2*, there is no significance, and almost no correlation, between AWPD[AT] (artwork-object type) and Year: $T = .005$, $N = 58$, $p > .05$ (.952), BCa 95% CI [-.159, .180]. These results are reflective of the consistency of this recording unit as a proportion of AW within all of the five-year-periods' *fingerprints* of *image 2.4.1*. The light-grey segment representing AWPD[AT] is a constant in all the *fingerprints* with the exception of 1900-1904. There is little increase or decrease in the size of the AWPD[AT] segment from one *fingerprint* to the next, and this lack of fluctuation/movement is reflected in the lack of correlation with progressing Years. Although, an examination in the proceeding section of the five, third-level AW recording units that form AWPD[AT], demonstrates that its own constituent units do not remain constant through the Years from 1902 to 2009.

2.5 – Analysis of Third-Level AW Recording Units: AWPD[AT]

The second-level AW recording unit AWPD[AT] consists of five, third-level recording units: AWPD2DNR; AWPD2DR; AWPD3D; AWPDPER; AWPDTEX.[61] Respectively, these units denote artwork-text references to: Two-Dimensional Non-Reproducible (2DNR) objects; Two-Dimensional Reproducible (2DR) objects; Three-Dimensional (3D) objects; Performance (PER) artwork-objects; Textile (TEX) objects. This section considers the bivariate correlations (Kendall's Tau) between these recording units as they appear in the artwork-texts from 1902 to 2009, and also between these recording units and artwork-object production and exhibition. Artwork-object production in the latter element of investigation is examined through calculation of the correlation between average artwork-object size (artistic productivity as argued in "Section 1.2.1") and the third-level AWPD[AT] units for the period from 1902 to 1934. Whilst, for the artwork-object exhibition from 1935 to 2009 the correlation is calculated between these recording units and the numbers/quantity of artwork-object being exhibited. The correlations between the AWPD[AT] units and Year are also calculated, which, as in previous sections, allows for the description of general trends occurring in/between the artwork-texts during the twentieth century. This allows for the exploration of the relationship between artwork-text being produced by artists and catalogue contributors, and between the artwork-texts and the type of artwork-objects being produced/exhibited.

Examining the period from 1902 to 2009, there is significant correlation between AWPD2DR and Year: $T = .382$, $N = 58$, $p < .05$ (.000), BCa 95% CI [.191, .542].[62] This is the only AWPD[AT] unit with a significant correlation with Year, and indicates that from 1902 to 2009 the percentage of the artwork-text being dedicated to the labels of artistic production referring to two-dimensional reproducible (2DR) artwork-objects increases. This relationship is examined further at the end of this section.

Between the AWPD[AT] recording units, it is AWPDTEX (Textiles) that has the greatest number of significant, positive relationships with other types of artistic product within the artwork-texts. Significant relationships are to be found between the writing on textile-objects in the artwork-texts from 1902 to 2009 and, both, the recording units pertaining to three-

[61] See "Section 2.0", *App.1-[Content Analysis]-01* and *App.1-[Content Analysis]-02* for further information on coding and words contained within each recording unit.
[62] A complete list of correlations between AWPD[AT] units and Year, and between AWPD[AT] and AWPD[AT] units (1902-2009) is produced in App.2-[1902-2009]-03.

dimensional (AWPD3D) and performance (AWPDPER) artwork-objects.[63] It should be stated that, although the relationship between AWPDTEX and AWPDPER is significant, the 95% confidence interval does cross zero by .003: BCa 95% CI [-.003, .383]. This means that the relationship cannot be stated, with 95% confidence, to be a positive one. The relationship between AWPDTEX and AWPD3D does not have this problem, and the results state, with 95% confidence, that the relationship is of positive correlation.

Examination of the artwork-text from 1902 to 2009 evidences the significant, positive correlations of AWPDTEX–AWPD3D and AWPDTEX–AWPDPER as being primarily due to the relationships between the designing of textiles and costumes (AWPDTEX), the designing of theatre-sets (AWPD3D), and performances of ballets and in films (AWPDPER). There is an additional factor that might contribute to the greater confidence demonstrated for the correlation between AWPDTEX–AWPD3D: Productivism.

Productivism, deriving from Constructivism, with the aim that the RAG artists' "studio work can be directed towards practical activity", encourages artistic involvement with "industrial realities".[64] This encouragement is demonstrated within the artwork-text by the types of products being produced by the RAG artists, which are a combination of both **textile pieces** and other three-dimensional **industrial products**. John Milner writes in his artwork-text for *Russian Constructivism Revisited* exhibition, 1973:

> Rodchenko and his productivist associates turned to designing objects for daily use ranging from **boiler suits** to **tubular chairs**. Tatlin too was involved in this development and designed a **suit** and a **stove**.[65]

Martyn Chalk, in his contribution to the *Configuration* exhibition's artwork-text, 1981, also references Vladimir Tatlin's affiliation to the Productivist movement and textile work:

> [Tatlin] was involved in stage design throughout this period but worked particularly within Productivism (the socially evolved form of

[63] AWPDTEX and AWPD3D: $T = .221$, $N = 58$, $p < .05$ (.021), BCa 95% CI [.023, .408]. AWPDTEX and AWPDPER: $T = .199$, $N = 58$, $p < .05$ (.040), BCa 95% CI [-.003, .386]

[64] Aleksandr Rodchenko and Vavara Stepanova, "Productivist Manifesto", 1921, in Elliott, D., (ed.), *Alexander Rodchenko 1891-1956*, Museum of Modern Art Oxford: Oxford, 1979, p. 130

[65] John Milner, *Russian Constructivism Revisited*, University of Newcastle: Newcastle, 1973, p. 2 (Emphasis added by James Strugnell)

> Constructivism) on the design of **clothing**, furniture and ceramic products.[66]

Tatlin's "stoves" are cited again by Christina Kiaer in addition to the fabric designs of Liubov Popova and Vavara Stepanova, and the packaging designed by Rodchenko, in her contribution to the *Rodchenko and Popova: Defining Constructivism* exhibition catalogue, 2009:

> Vladimir Tatlin (the so-called 'father of Constructivism') was designing **stoves** and **pots** and **pans** for proletarian kitchens; Popova and Stepanova were designing **fabrics** destined for women's dresses at the First State Cotton-Printing Factory; and Rodchenko was making cookie, sweets and cigarette **packaging** and advertisements to promote the 'socialist' products of Mossel'prom, the state-owned agricultural trust.[67]

The statement that the significant, positive relationship of AWPDTEX–AWPD3D can, in part, be credited to the juxtapositions of textile, costume design and theatre-set design, "stage design", is evidenced in the Martyn Chalk citation from 1981. Although this passage does not view Tatlin's theatre and Productivist clothing as congruent in terms of their artistic aims, the artwork-text of the *Rodchenko and Popova: Defining Constructivism* exhibition, citing Popova, does align theatre with the Productivist agenda: "A theatre spectacle is one of the most accessible realms for realising ... productivist aims."[68] Other examples of the positive relation between textile-work and stage design are demonstrable throughout the artwork-text from 1902 to 2009. In 1976 Andrei Nakov, in his artwork-text for the *Kasimir Malevich* exhibition at the Tate Gallery, writes of Kasimir Malevich's textile and theatre work with reference to the 1913 futurist opera, *Victory Over the Sun*: "In the group of drawings for costumes and sets […]"[69] Malevich's work on *Victory Over the Sun* is also referenced in the

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[66] Martyn Chalk, "Missing, Presumed Destroyed: Seven Reconstructions", in Juda, A., *Configuration 1910-1940 and Seven Tatlin Reconstructions*, Annely Juda Fine Art: London, 1981, n.p. (Emphasis added by James Strugnell)
[67] Christina Kiaer, "His and Her Constructivism", in Tupitsyn, M., (ed.), *Rodchenko and Popova: Defining Constructivism*, Tate Publishing: London, 2009, p. 146 (Emphasis added by James Strugnell)
[68] Liubov Popova, Untitled Text, 1921, in Tupitsyn, M., (ed.), *Rodchenko and Popova: Defining Constructivism*, Tate Publishing: London, 2009, p. 123
[69] Andrei B. Nakov, *Kasimir Malevich*, Tate Gallery Publications Department: London, 1976, p. 11

"Chronology" of the artwork-text for the 1999 exhibition, *New Art for a New Era: Malevich's Vision of the Russian Avant-Garde*:

> 1913 […] Victory over the Sun (*Pobeda nad solntsem*), staged 3 and 5 December at the Luna Park Theatre, St Petersburg; libretto by Kruchenykh (with a foreword by Khlebnikov), score by Matiushin, costumes and sets designed by Malevich. Stage designs by Malevich based on a black square presaged his radical, abstract works of a few years later.[70]

New Art for a New Era catalogue's artwork-text also references the costume and stage design work of Stepanova:

> [Stepanova] made sketches of costumes and sets for Meyerhold's staging of *Smert Tarelkina* ['The Death of Tarelkin'] (1922). She also made sketches of drawings for the First State Textile Print Factory (1923-5) and taught at the Textile Faculty of the Higher Artistic and Technical Institute (Vkhutemas) (1924-8).[71]

The relationship AWPDTEX–AWPD3D, with respect to theatre is observed once more in Lavrentiev's 2008 artwork-text for the *Alexander Rodchenko: Revolution in Photography* exhibition. Lavrentiev discusses the theatre with regard to, both, Rodchenko, Stepanova, and an earlier exhibition:

> The first exhibition devoted to Rodchenko's oeuvre, in March 1957, was held posthumously. The works were selected by Varvara Stepanova […] Visitors to the Central House of Journalists could view advertisements and posters for Vertov's and Eisenstein's films, theatrical costumes and stage designs for Mayakovsky's play *The Bedbug*, book covers, photomontages, drawings and, in the

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[70] "Chronology" in Evgenia Petrova et al. (eds.), *New Art for a New Era. Malevich 's Vision of the Russian Avant-Garde from the Collection of the State Russian Museum, St Petersburg*, Booth-Clibborn Editions: London, 1999, p. 2

[71] Liudmila Vostretsova, "Artists' Biographies and Details of Works", in Petrova, E., et al. (eds), *New Art for a New Era. Malevich 's Vision of the Russian Avant-Garde from the Collection of the State Russian Museum, St Petersburg*, Booth-Clibborn Editions: London, 1999, p. 131

> showcases, photo albums and over fifty still images.[72]

The relationship AWPDTEX–AWPDPER is also connected to the Productivism, and is observable in reference to Rodchenko's "boiler suit" / "production suit" designed in 1922,[73] and also Alexandra Exter's writings of the relationship between "production clothing" and the performance art of ballet in 1923. The traditional ballet-dancers' outfits of which Exter believes to be early examples of "production clothing":

> However, this kind of production clothing has existed for centuries: the "tutu," i.e., a costume constructed according to the movement of the body during a classical dance. Ballet shoes, leg tights, lightness of the skirt, flexibility of the torso – all these are logically connected with the dance and make the "tutu" the production clothing of classical ballet.[74]

The significant correlation AWPDTEX–AWPDPER, with reference to Exter's costumes, is, again, exemplified in 1975. Nakov writes of Exter's costumes designs for the, 1924, film *Aelita*, in his artwork-text for catalogue to the exhibition *2 Stenberg 2: The "Laboratory" Period (1919-1921) of Russian Constructivism*. In this artwork-text Nakov, also, further reveals the relationship between AWPDTEX and AWPD3D by relating Exter's costume designs to contemporaneous development in sculpture deriving from Exter, Naum Gabo, Rodchenko, and Tatlin.[75] Writing of the period c.1920:

> The structural reduction of three dimensional forms to their linear schema is visible in the costumes (e.g. those for Aelita's servant) for this film [*Aelita*], clearly revealing the transposition of real volume to a purely conceptual level and characterized by a

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[72] Alexander Lavrentiev, "Alexander Rodchenko: Beginnings of Photo Avant-Garde in Russia", in Lavrentiev, A. (ed.), Alexander Rodchenko: Revolution in Photography, Multimedia Complex of Actual Arts: Moscow, 2008[a], p. 204

[73] "Biography" in Alexander Lavrentiev (ed.), *Alexander Rodchenko: Revolution in Photography*, Multimedia Complex of Actual Arts: Moscow, 2008[b], p. 216

[74] Alexandra Exter, "In Search of New Clothing", 1923, in Bowlt, J. E., and Drutt, M., (eds.), *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova*, Royal Academy of Arts: London, 1999, pp. 301-302

[75] Andrei B. Nakov, *2 Stenberg 2: The "Laboratory" Period (1919-1921) of Russian Constructivism*, Idea-Books: London, 1975, p. 33 ("[…] sculpture is reduced to a structure of lines, the latter being considered at this time as "a totality of points of optimal tension" (Exter). This tensile quality was liberated around 1920 with the adoption of the kinetic principle. One sees this in the work of Gabo and Rodchenko as well as in the famous Tat/in tower (for the Third International) […]")

> dynamic and functional understanding of form after the manner of the first kinetic sculpture by Gabo (1920, exhibited in 1922 in Berlin at the Galerie Van Diemen, No. 550 in the catalogue).[76]

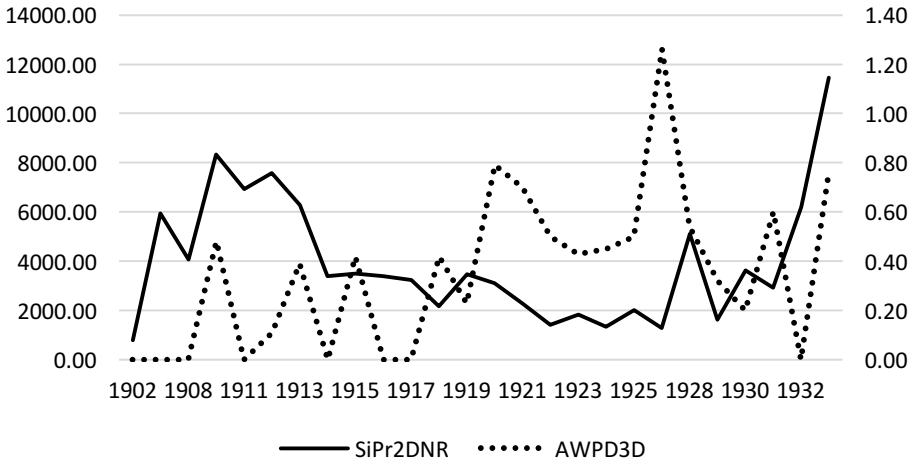
The section, up to this point, examines artwork-object type (AWPD[AT]) as it appears, as words, within the artwork-text of the primary sources and catalogues. It also examines the relationships between different AWPD[AT] recording units within the artwork-text, and the relationships between these individual units and Years. The section now progresses to examine whether significant relationships are calculable between the AWPD[AT] units and: Firstly, RAG productivities; Secondly, RAG exhibition-quantities.

Examination of the relationships between AWPD[AT] within the primary sources produced by the RAG (1902-1934), and their production of two-dimensional artwork-objects supports/demonstrates, in one particular case, a significant relationship between their writing and their productivity. There is a significant, negative correlation between SiPr2DNR and AWPD3D.[77] SiPr2DNR (introduced in "Section 1.2.2") is the average size of two-dimensional, non-reproducible artwork-objects being produced in a particular Year by the RAG. This measurement is positively equated to productivity ("Section 1.2.1"), with a larger average area equivalent to greater productivity. A negative correlation between SiPr2DNR and AWPD3D demonstrates that the as the recording unit containing words descriptive of three-dimensional artwork-objects (AWPD3D) increases, as a weighted percentage of the artwork-text produced in a given Year by the RAG, their productivity in relation to 2DNR artwork-objects decreases.

Graph 2.5.1 illustrates this negative relationship; it charts the changes in SiPr2DNR and AWPD3D against Years 1902 to 1934. At several Years the lines representing SiPr2DNR and AWPD3D "travel" in opposite directions to one another. Between 1912 and 1913, whilst there is an increase in the weighted percentage of AWPD3D from .11% to .39%, there is a decrease in the average area of 2DNR artwork-objects being produced from 7580.30 cm^2 to 6267.99 cm^2. A similar negative relationship is described between 1917 and 1918, with an increase in AWPD3D (.00% to .42%) and a decrease in SiPr2DNR (3229.78 cm^2 to 2177.17

[76] Nakov, 1975, p. 33
[77] SiPr2DNR and AWPD3D: $T = -.422$, $N = 15$, $p < .05$ (.031), BCa 95% CI [-.719, -.102] (A complete list of correlations between AWPD[AT] units and SiPr2DNR (1902-1934) is produced in *App.2-[1902-1934]-06*.)

cm^2), and again between 1919 and 1920, with an increase in AWPD3D (.23% to .79%) and a decrease in SiPr2DNR (3470.87 cm^2 to 3106.71 cm^2). 1920 coincides with Vladimir Tatlin's article "The Work Ahead of Us", which acts to describe the artistic evolution that has led to his *Monument for the Third International* (1920). The article charts the rise of artwork-objects' concern with "material, volume and construction", and also cites 1918 as the year that made it possible for "an artistic form, to begin to combine materials like iron and glass, the materials of modern Classicism, comparable in their severity with the marble of antiquity".[78]



Graph 2.5.1: Line graph allowing comparisons of the relationships between the average SiPr2DNR (cm^2 [left-hand side y-axis scale]) per Year from 1902 to 1934 and Year (1902-1934), and between the average weighted percentage (% [right-hand side y-axis scale]) per Year from 1902 to 1934 of AWPD3D within the artwork-text and Year (1902-1934).

It is logical, and evidential from the data here, that if the RAG are writing about three-dimensional artwork then it might be expected that the productivity in relation to two-dimensional artwork-objects would decrease. This case tempts the application of the adage of practicing what is preached. It is not possible, though, to apply the same criteria of productivity to three-dimensional artwork-objects to discover whether there is an opposing, positive correlation between their average volume and AWPD3D. This is due to the difficulty, if not impossibility, of calculating accurately the volume of three-dimensional artwork-objects from the three standard measurements of height, width, and depth. Unlike rectilinear and circular/ovoid canvases that can, in the majority of cases, be accurately measured for their height and width/diameter to calculate their area (cm^2), to assume that all sculptures are of a

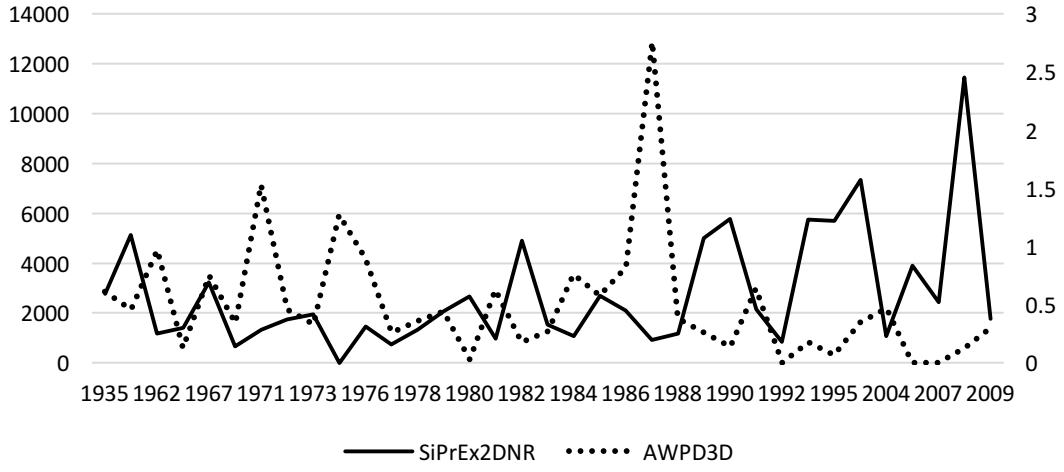
[78] Vladimir Tatlin, "The Work Ahead of Us", 1920, in Bowlt, J. E., (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991, p. 206

cuboid form, with their outer edges aligned with the dimensions of height, width, and depth is too much of a generalization to produce accurate and comparable results for productivity relative to their volume (cm^3). An attempt at calculating the correlation between AWPD3D and SiPr3D for 1902 to 1934 is presented here using cuboid-volumetric dimensions (SiPr3D), and it demonstrates no correlation with AWPD3D: $T = -.105$, $p > .05$ (.472), BCa 95% CI [-.451, .256]. But, for the reasons stated it would be difficult to be confident of the accuracy of this result.

The negative relationship between 2DNR artwork-object average size and the recording unit AWPD3D continues in the British exhibitions of RAG artwork from 1935 to 2009. In this case it is the average area of all the RAG artwork-objects exhibited in a particular Year (SiPrEx2DNR) that is calculated and compared to the recording unit AWPD3D as it appears within the exhibition catalogues of the 62-British-exhibition canon. The resulting correlation (AWPD3D–SiPrEx2DNR) is, again, significant and negative: $T = -.291$, $p > .05$ (.038), BCa 95% CI [-.498, -067.]. As the weighted percentage of AWPD3D increases within the exhibition catalogues (artwork-text), the average size (cm^2) of the RAG artwork-objects exhibited decreases, and *vice versa*. The slightly weaker, negative relationship between SiPrEx2DNR and AWPD3D as represented in the exhibition catalogues, than that between SiPr2DNR and AWPD3D within the primary sources of the RAG, might be indicative of the greater indexicality within the relationship between RAG author and artwork-object creators from 1902 to 1934, than that between catalogue contributor and artwork-object curator from 1935 to 2009. The negative correlation between average size of 2DNR artwork-object exhibited and the weighted percentage of recording unit AWPD3D could also be attributed to the fact the exhibition catalogues with a focus on three-dimensional artwork relate more to exhibitions focusing on sculpture rather than two-dimensional canvas or panel painting.

Graph 2.5.2 illustrates the significant, negative correlation between SiPrEx2DNR and AWPD3D from 1935 to 2009. In the majority of cases (five out of six), where there is a "peak" in AWPD3D (dotted line) corresponding to a "trough" in SiPrEx2DNR (solid line) evidencing the negative relationship, these correspond to exhibitions containing an above average proportion of sculpture and three-dimension artwork-objects. For the 62 exhibitions included within this study, the average percentage of the artwork-objects exhibited that are three-dimensional is 12.57%. The "peaks" and "troughs" of *graph 2.5.2* occur at Years 1962, 1975, 1981, 1984, 1987 and 2004. With the exception of 2004 coinciding with the exhibition *Naum Gabo and Colour*, at Annely Juda Fine Art in London, where the proportion of three-

dimension artwork-objects displayed is 1.64%, all of the other “peak-trough” Years correspond to exhibitions where above 12.57% of all the artwork-objects displayed are three dimensional in nature: 1962, *Two Decades of Experiment in Russian Art (1902-1922)* (Grosvenor Gallery, London), 14.29%; 1975, *2 Stenberg 2: The "Laboratory" Period (1919-1921) of Russian Constructivism* (Annely Juda Fine Art, London), 100.00%; 1981, *Configuration: 1910-1940* (Annely Juda Fine Art, London), 15.09%; 1984, *Art into Production: Soviet Textiles, Fashion and Ceramics 1917-1935* (Museum of Modern Art Oxford), 50.19%; 1987, *Naum Gabo: Sixty Years of Constructivism* (The Tate Gallery, London), 50.68%.



Graph 2.5.2: Line graph allowing comparisons of the relationships between the average SiPrEx2DNR (cm^2 [left-hand side y-axis scale]) per Year from 1935 to 2009 and Year (1935-2009), and between the average weighted percentage (% [right-hand side y-axis scale]) per Year from 1935 to 2009 of AWPD3D within the artwork-text and Year (1935-2009).

Of the eight exhibitions where the proportions of three-dimensional artwork-objects displayed are above 29%, three are one-man Naum Gabo exhibitions. As well as the 1987 *Naum Gabo: Sixty Years of Constructivism* there are the exhibitions: *Naum Gabo: Constructions, Paintings, Drawings*, 1962, The Tate Gallery, London, 29.63%; *Naum Gabo 1890-1977: Centenary Exhibition*, 1990, Annely Juda Fine Art, London, 50.00%. In total, from 1935 to 2009, there are four one-man Gabo exhibitions, of the four, three have high proportions of three-dimension artwork-objects on exhibit. The fourth, and final, one-man Gabo exhibition within the period 1935-2009 is *Naum Gabo and Colour*. This exhibition coincides with a “peak-trough” year on *graph 2.5.2* that is more common with exhibitions with a high proportion of three-dimensional objects on display, and not the 1.64% contained within this exhibition. The focus of *Naum Gabo and Colour* is the exhibiting of Gabo’s paintings and prints (two-dimensional artwork-objects), unlike those Gabo exhibitions that

went before, its aim is to "help people to see an important and different aspect of Naum Gabo's work".[79] Yet, as demonstrated in *graph 2.5.2* the exhibit corresponds to the trends of those previous Gabo exhibitions, where sculpture accounts for almost a third of exhibits; there is a "trough" in the line representing the average size of two-dimensional non-reproducible artwork-objects (SiPrEx2DNR), and a "peak" in the line illustrating the weighted percentage of artwork-text represented by the recording unit name three-dimensional artwork-objects (AWPD3D).

The 1984 "peak" in AWPD3D and a "trough" in SiPrEx2DNR corresponds to the exhibition *Art into Production: Soviet Textiles, Fashion and Ceramics 1917-1935* at the Museum of Modern Art Oxford before moving to the Crafts Council Gallery in London. The 50.19% of the total number of artwork-objects exhibited that are three dimensional comprise of 135 porcelain pieces. As well as exhibiting many pieces of Soviet ceramics, this exhibition also focuses on textile and fashion design from this period: 58 of the exhibition's total 269 artwork-objects are textile. The significant, positive correlation between the recording unit conceptualising textiles (AWPDTEX) and that of three-dimensional artwork-objects (AWPD3D) within the primary sources and exhibition catalogues produced in relation to RAG artwork-objects from 1902 to 2009 is already demonstrated this section. The results for Kendall's Tau between these two recording units are: $T = .221$, $N = 58$, $p < .05$ (.021), BCa 95% CI [.023, .408]. The fact that an exhibition with a focus on textiles, fashion, and ceramics corroborates the negative correlation between AWPD3D and SiPrEx2DNR, and that there is correlation within the written sources under examination between textiles and three-dimension artwork is suggestive to the view that textiles are viewed as three-dimensional artwork-objects, and not as flat, two-dimensional cloth.

Tat'iana Strizhenova's artwork-text for the *Art into Production* exhibition emphasizes the relationship between textile design and three-dimensional artwork-objects in two ways. Firstly, Strizhenova writes of the backgrounds of the designers involved in textile production:

> Apart from Stepanova and Popova, many other well-known artists, sculptors and architects began to turn their skills to textile design, among them K. Yuon, A. Vesnin, A. Ekster and S. Chekhonin […][80]

[79] Annely Juda and David Juda, *Naum Gabo and Colour*, Annely Juda Fine Art: London, 2004, n.p.
[80] Tat'iana Strizhenova, "Textile and Clothes Design in the Twenties and Early Thirties", in Elliott, D., and Ryan, J., (eds.), *Art into Production: Soviet Textiles, Fashion and Ceramics 1917-1935*, Museum of Modern Art Oxford: Oxford, 1984, p. 82

The influence of artists entering textile production from the fields of sculpture and architecture is, potentially, of importance to a second point made by Strizhenova in this artwork-text, emphasising the relationship between textiles and three-dimensional form: The consideration of textile design as the production of material to be modelled with:

> Sketches for textile designs and even the choice of models themselves are noteworthy for their sharp awareness of formal beauty, as well as their rhythms and contrasting colours.[81]

It is also possible to examine whether these third-level AW recording units (AWPD[AT]) of the catalogues produced from 1935 to 2009 form significant relationships with the number of artwork-objects being exhibited of particular artists, or groups of artists. From 1935 to 2009 recording unit AWPDTEX (textile words) exhibits contrasting relationships between it and the number of artwork-objects by male-RAG and female-RAG artists being exhibited. There is no significant correlation between AWPDTEX and the total number of artwork-objects by male-RAG artists (ANoRAGM) being exhibited per year: $T = -.030$, $N = 32$, $p > .05$ (.817), BCa 95% CI [-.250, .211]. But there is a significant, positive correlation between the total number of artwork-objects by female-RAG artists (ANoRAGF) being exhibited in a given Year and AWPDTEX: $T = .398$, $N = 32$, $p < .05$ (.003), BCa 95% CI [.128, .634]. This means that as words linked to the concept of textiles (AWPDTEX) increase in total weighted percentage in the catalogue artwork-texts, so do the number of artwork-objects by female-RAG artists (ANoRAGF) on display in the exhibitions.

The significant, positive relationship AWPDTEX–ANoRAGF that is demonstrable in the artwork from 1935 to 2009, holds a mirror to the views of the male-RAG artists who are cited in these texts. John Bowlt in his artwork-text accompanying the 1999 *Amazons of the Avant Garde* exhibition uses quotations from, both, Mikhail Tsetlin and Kasimir Malevich, each of whom align textiles as being female-produced artwork-objects:

> Mikhail Tsetlin, a friend of Goncharova, claimed that "women have bequeathed to Humanity's Treasury of Art incomparably more than might be supposed. It is they who have been the unseen, unknown collaborators of art. It is they who made the lace, embroidered the materials, wove the

[81] Strizhenova, 1984, p. 82

> carpet. They raised the artistic level of life by their aesthetic aspirations."[82]

Continuing:

> Malevich acknowledged his debt to this forgotten tradition [haberdashery] when he declared, in describing the clothes and fabrics produced by Ukrainian peasant girls, that "art belonged to them more than to the men."[83]

Whatever the veracity of the artwork being created by the significant, positive correlation AWPDTEX–ANoRAGF that juxtaposes the concept of “textile-object” within the artwork-texts against the exhibiting of increasing numbers of female-RAG artwork-object, it can only reinforce the cited views of the male-RAG. That the art of women is the art of textiles, despite the broader professional recognition that exhibitions such as *Amazons of the Avant Garde* might bring.

Logical validity of the significant relationships between the text-based recording units and the numbers of RAG artwork-objects being displayed in the exhibitions being identified in this thesis is demonstrated, again, in the following example. The artist-label "Rodchenko, Alexander/Rodchenko Archive" denotes works of art, usually photographs or linocuts, the originals of which are created by Aleksandr Rodchenko, but of which these artwork-objects are reprints, either from the original negative or block, created by the Rodchenko Archive. An example of such a piece, as it appears in the catalogue is: "22. *Untitled Composition*, 1918 linocut, reprinted by the Rodchenko archive from the original block".[84] The main feature of such pieces, for the purpose of this thesis, is that they belong to the two-dimensional reproducible (2DR) category of artwork-objects. Therefore, a positive correlation might be expected between the number of artwork-objects produced by the Rodchenko Archive being exhibited in a particular Year (ANoRepRArc) and the AWPD[AT] recording unit AWPD2DR: There is significant, positive correlation between the number of artwork-objects within an exhibition, produced by the Rodchenko Archive (ANoRepRArc), and recording unit AWPD2DR: $T = .369$, $N = 32$, $p < .05$ (.013), BCa 95% CI [.193, .537].

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[82] John E. Bowlt, “Women of Genius”, in Bowlt, J. E., and Drutt, M., (eds.), *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova*, Royal Academy of Arts: London, 1999, p. 25 (Citing: Amari [Mikhail Tsetlin], "Natalia Goncharova," in Winifred Stephens (ed.), *The Soul of Russia*, MacMillan: London, 1916), p. 76)

[83] Bowlt, 1999, p. 25 (Citing: Kazimir Malevich, "Glavy iz avtobiografii khudozhnika", in Vasilii Rakitin and Andrei Sarabianov (eds.), *N. I. Khardzhiev. Stati ob avangarde*, RA: Moscow, 1997, vol. 1, p. 114)

[84] David Elliott (ed.), *Alexander Rodchenko 1891-1956*, Museum of Modern Art Oxford: Oxford, 1979, n.p. (Pull-out list of "Work in the Exhibition")

Relationships between content analysis and the exhibiting of artwork-objects by individual/groups of RAG artists are examined further in “Unit 3”. The correlations between the number of artwork-objects exhibited by various RAG-artist genders (ANoRAG[M/F]) and the third-level recording units AWPD[AT] are continued in “Section 3.1”. Whilst discussion of the Rodchenko Archive is returned to in “Section 3.2”, and its topic of “Reproductions”.

2.6 – Analysis of Second-Level SPW Recording Units

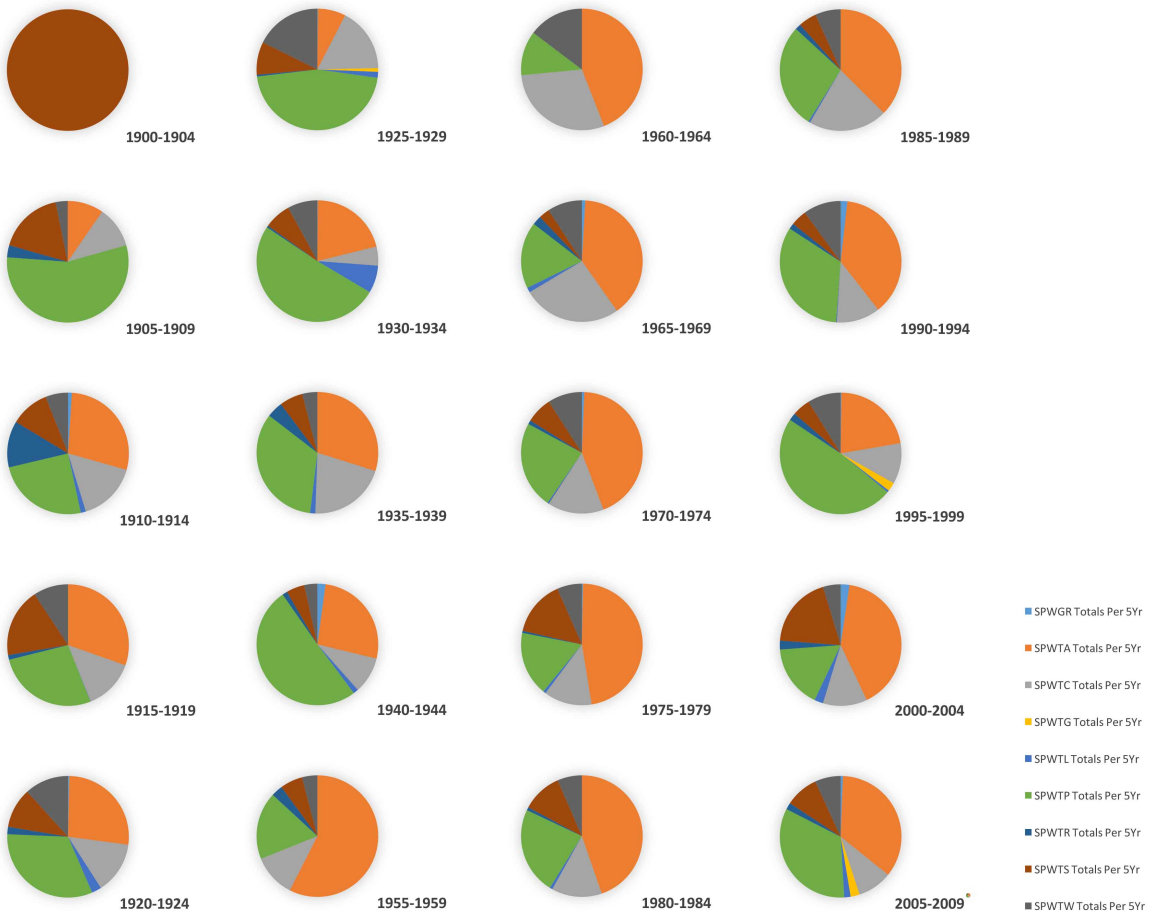
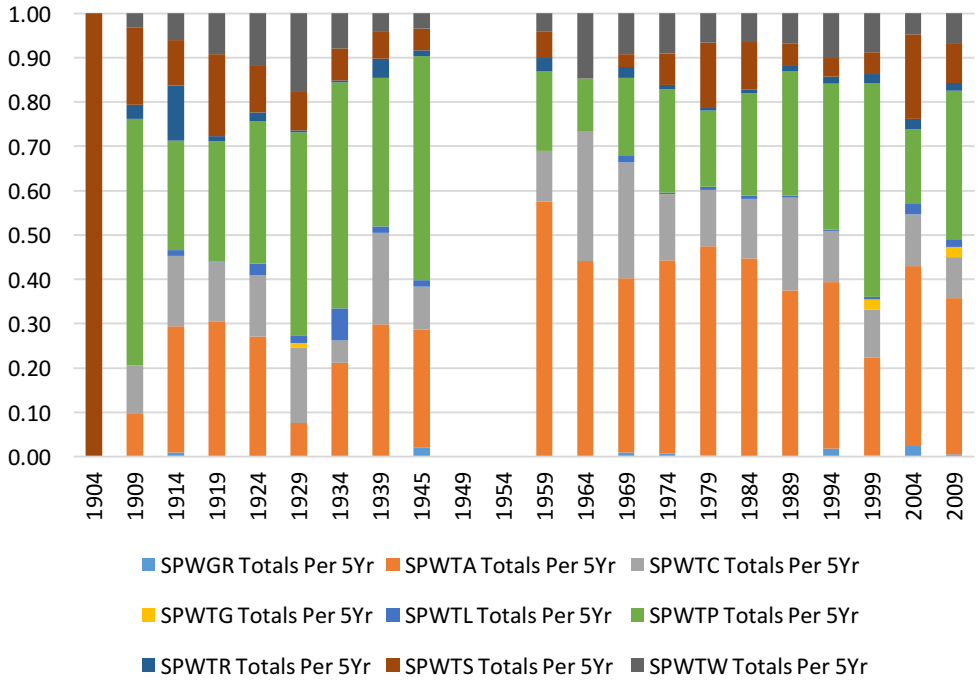


Image 2.6.1: *Fingerprints* of the changes in average proportional representation of second-level SPW recording units within the first-level recording unit SPW per five-year period from 1900 to 2009.

Image 2.6.1 displays the *fingerprints* of the second level of inclusion for Socio-Political Words (SPW). It shows the changing average proportional construction of the first-level SPW recording unit in respect of its nine, second-level recording units for each five-year period from 1900 to 2009. The complete set of pie charts on which *image 2.6.1* is based is produced in *App.3-[5Yr Period 1900-2009]-05*. Due to the number of different second-level recording units within SPW, this information is also illustrated in the stacked column *graph 2.6.1*. This graph, whilst showing the same information as *image 2.6.1*, allows for slightly easier comparison between the five-year periods. These are indicated by their terminating Years along the x-axis. *Graph 2.6.1* also includes some of the percentage information, on its y-axis, contained in the charts of *App.3-[5Yr Period 1900-2009]-05*.



Graph 2.6.1: 100% stacked column chart of the changes in average proportional representation of second-level SPW recording units within the first-level recording unit SPW per five-year period from 1900 to 2009

Observation and comparison of the *fingerprints* in *image 2.6.1* and the columns of *graph 2.6.1*, reveals five of the nine, second-level SPW units are dominant in the formation of the first-level recording unit SPW from 1900 to 2009. These are the second-level SPW units containing words referencing: Art Thought and Theory (SPWTA [orange]); Political Thought and Theory (SPWTP [green]); the socio-politics of Contemporaneity/Modernity (SPWTC [light grey]); Historical/Philosophical Thought and Theory (SPWTS [brown]); the socio-politics of Military/War (SPWTW [dark grey]). There is a marked difference between the proportion of SPWTA within SPW when comparing the primary-sources period (1900-1934) with the period dominated by exhibition catalogues/secondary sources that form the 62-British-exhibition canon (1935-2009). This is illustrated by the increase in size of the orange segments of the *fingerprints* from 1935 to 2009, compared with the earlier *fingerprints* for the period from 1900 to 1934. The average percentage that the second-level recording unit SPWTA accounts for within the first-level recording unit SPW, increases from an average of 20.61% from 1905 to 1934,[85] to an average of 38.91% from 1935 to 2009. In regards Socio-Political Words (SPW) there is a shift between the writings of the RAG and those of the later

[85] The 1900 to 1904 results from *image 2.6.1* and *graph 2.6.1* have been excluded from the average calculations. This due the first-level SPW recording unit consisting of only one second-level recording unit, SPWTS. When calculating proportional averages this drastically skews the results.

catalogue contributors. With the latter producing artwork-text with an SPW characterized by a far greater proportion-focus on Art Thought and Theory (SPWTA).

Discovering at which second-level SPW units' expense this increase occurs is more difficult. Examination of the *fingerprints* suggests that the increase in proportional representation of SPWTA within the recording unit SPW is not at the expense of words more normally used within the context of the military or war (SPWTW), or those alluding to contemporaneity/modernity (SPWTC). The dark-grey segment representing SPWTW, and the light-grey segment representing SPWTC are, relatively, consistent presences within *image 2.6.1*, and demonstrate no dramatic trends towards increases or decreases in proportional representation within *graph 2.6.1*. This consistency is also evidenced via comparison of the average proportion of SPW represented by both SPWTW and SPWTC from 1905 to 1934 and from 1935 to 2009: 9.30% and 7.30% respectively for SPWTW; 12.72% and 15.59% respectively for SPWTC.

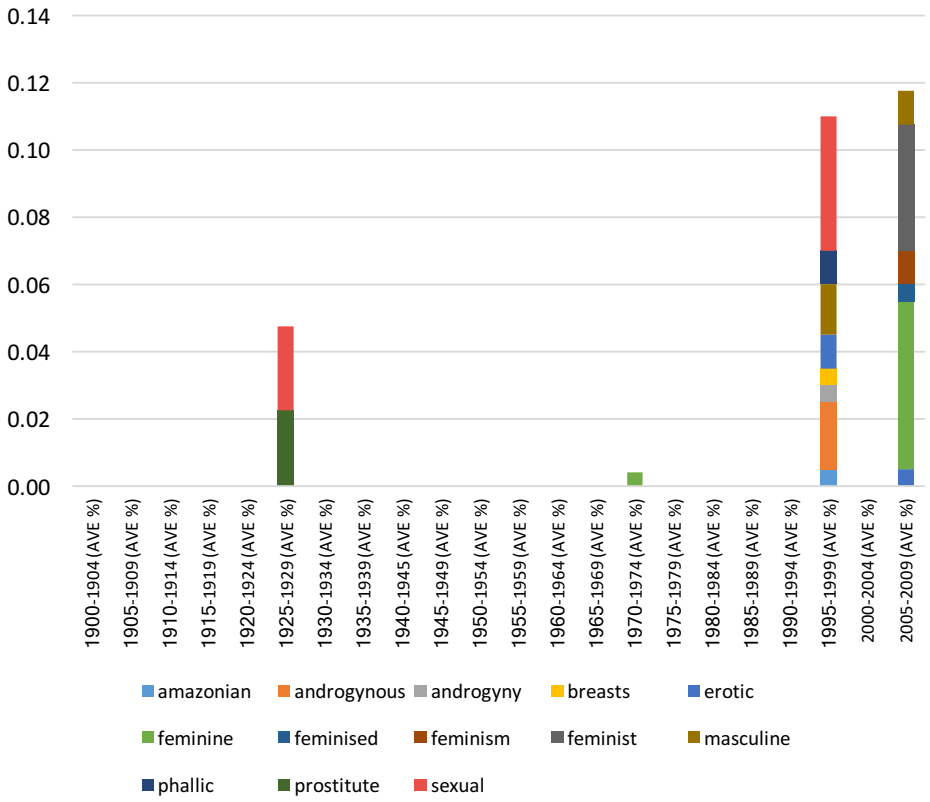
The second-level recording units that demonstrate a decrease in their representative proportion of SPW, accommodating an increase focus on SPWTA, are SPWTP and SPWTS. These are represented, respectively, by the green segments/divisions and brown segments/divisions in *image 2.6.1* and *graph 2.6.1*. It is, perhaps, easier to recognize this trend through examination of *graph 2.6.1*, where the green divisions (SPWTP) are noticeably shorter from 1955 to 1984 than any of the green divisions from 1905 to 1934. Regards the proportion of SPW consisting of SPWTS, it is less a noticeable/definite reduction and more characterized by a lack of consistency. SPW in some five-periods from 1935 to 2009 is constructed of 19.12% SPWTS (2000-2004), whilst in other five-year periods SPWTS's proportion of SPW is zero (1960-1964). These assertions are also borne out by the reduction in the average percent of SPW that both of these recording units account for comparing the period from 1905 to 1934 and from 1935 to 2009: 39.38% and 27.28% respectively for SPWTP; 12.11% and 7.25% respectively for SPWTS.

It is reasonable to deduce from examination of the data within *image 2.6.1* and *graph 2.6.1* that, in contrast to the primary-source artwork-text of the RAG, the SPW recording unit in the writing of those contributing to the artwork-text of the, later, British exhibitions of RAG artwork-objects focus increasingly on Art Thought and Theory (SPWTA) to the detriment of focusing on Historical/Philosophical and Political Thought and Theory (SPWTS and SPWTP).

In addition to the dominant second-level SPW recording units, SPWTG is of note due to its correlation with the exhibition, from 1935 to 2009, of particular RAG artwork-objects. Words associated with the politicization of gender (SPWTG) are also noteworthy due to their concentration toward the end of the twentieth century and the beginning of the twenty-first. This is demonstrated in *graph 2.6.2*, which illustrates the average weighted percentage of SPWTG and its component words for each of the five-year periods from 1902 to 2009, as an average percentage of all the artwork-texts from each Year of that five-year-period period. The total height of each column equates to the total, average, weighted percentage that SPWTG represents in relation to all of the artwork-text from each Year of that period. Whilst the separately coloured portions of each column represent the ratio that each of the words forming the concept SPWTG are accountable for the SPWTG of each five-year period. The list of words in the key beneath *graph 2.6.2* are all the words that form the concept of SPWTG; those words presented in the "Coded Word List" of *App.1-[Content Analysis]-02*.

As *graph 2.6.2* illustrates, the average weighted percentage of artwork-text classified by recording unit SPWTG, and which, therefore, consists of words that politicize gender, increases as the five-year periods progress. SPWTG increases in three ways: As a proportion of the average total artwork-texts for each Year within the five-year period; In diversity of the different words being written; in frequency of how close together the five-year periods in which they occur follow one another. In the five-year period from 1925 to 1929 the recording unit SPWTG accounts for an average of .05% of the artwork-text, and consists of only two, different words: "sexual" (.03%) and "prostitute" (.02%). In the period from 1970 to 1974 there is a very insignificant SPWTG recording unit of .004%. But in the periods from 1995 to 1999 and from 2005 to 2009, not only does the frequency of measurable levels of SPWTG increase, with only one five-year period between them,[86] the average percentage of the artwork-text represented by SPWTG more than doubles from that of the period from 1925 to 1929, to .11% and .12%. There is also a greater variety of words discoverable within the artwork-texts that are categorized by SPWTG: Although, both, the period 1995 to 1999, and 2005 to 2009 differ greatly in the words that form their average SPWTG recording unit.

[86] As opposed to the six five-year periods between 1925 to 1929 and 1970 to 1974, and the four between 1970 to 1974 and 1995 to 1999.



Graph 2.6.2: Stacked column chart of the average weighted percentage value per five-year period from 1900 to 2009 of recording unit SPWTG showing, within each column, the average weighted percentages per five-year period (1900-2009) of the words that form the concept/recording unit SPWTG.

The average SPWTG recording unit for the five-year period from 1995 to 1999 is dominated by the words: "sexual" (.04%); "masculine" (.02%); "androgynous" (.02%). The words "phallic", "erotic", "breasts", "androgyny" and "Amazonian" (each .01%) also feature within the concept of SPWTG for the period from 1995 to 1999. In contrast to references to "sexual", the average SPWTG recording unit for the period from 2005 to 2009 is dominated by the words "feminist" (.04%), and "feminine" (.05%). Although, in addition, this period's average SPWTG does also include, to a lesser extent, the words "masculine" (.01%) and "erotic" (.01%), as well as "feminism" (.01%) and "feminised" (.01%).[87]

Each period, 1995-1999 and 2005-2009, has one exhibition within it that accounts for the majority of its SPWTG weighted percentage. The artwork-text produced for *Amazons of the Avant Garde* (Royal Academy of Arts, London, 1999) accounts for 96.21% of the references

[87] All the average percentages are the average percentage of each of the years within the five-year period 2005 to 2009. The percentage for each year being in relation to all of the artwork-text for that year.

to SPWTG for the period 1995-1999.[88] Whilst the artwork-text produced for *Rodchenko and Popova: Defining Constructivism* (Tate Modern, London, 2009) accounts for 93.81% of the references to SPWTG for the period 2005-2009.[89] The latter (2005-2009) five-year period's increase in the predominance of the "feminine" over the "masculine" and "androgynous", perhaps, indicates a greater affiliation/relationship between Words Politicizing Gender and women rather than men within the artwork-text of the *Rodchenko and Popova: Defining Constructivism* (2009) compared to *Amazons of the Avant Garde* (1999). *Table 2.6.1* contains the correlations between: SPWTG and Male/Female Gender Words (GEN[M/F]); GEN[M/F] and Year.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[90]	*p*-value	Lower	Upper
SPWTG	GENF	.371	58	.001	.200	.525
SPWTG	GENM	.035	58	.750	-.160	.232
GENF	Year	.262	58	.007	.076	.455
GENM	Year	.169	58	.067	-.054	.378

Table 2.6.1: Bivariate correlation (Kendal's Tau) between the recording units SPWTG and GEN[M/F], and between GEN[M/F] and Year. (Per Year from 1902 to 2009.)

Table 2.6.1 supports a hypothesis of an increasing affiliation between Words Politicizing Gender and women, not just between these two exhibitions, but with the progression of Years from 1902 to 2009. The bars of *graph 2.6.2*, with the exception of period 1970-1974, demonstrate SPWTG increasing as a proportion of the artwork-text as the periods progress. *Table 2.6.1* shows that there is a significant, positive correlation between GENF and Year. Meaning, that as shown for SPWTG on *graph 2.6.2*, that the proportion of the artwork-text represented by Female Gender Words (GENF) increases as the Years progress. *Table 2.6.1* also states that there is a significant, positive correlation between SPWTG and GENF; as the proportion of one recording unit increases within the artwork-text so does the that of the other, and *vice versa*. These figures support an increasing affiliation/relationship between Words Politicizing Gender and women (Female Gender Words) as the Years progress. No such significant relationship is calculable between Words Politicizing Gender and men (Male

[88] 127 of the total 132 references to the recording unit SPWTG (1995-1999). "References" is defined as the number of times one of the words that forms the SPWTG recording unit is used within the artwork-text. A list of the individual words forming SPWTG is produced in the "Coded Word Lists" (*App.1-[Content Analysis]-02*).
[89] 91 of the total 97 references to the recording unit SPWTG (2005-2009). "References" is defined as the number of times one of the words that forms the SPWTG recording unit is used within the artwork-text. A list of the individual words forming SPWTG is produced in the "Coded Word Lists" (*App.1-[Content Analysis]-02*).
[90] Cases (*N*) derive from 58 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

Gender Words). Both, GENM–Year and SPWTG–GENM produce correlations of no significance.

This relationship between women and the concept of a politicized gender, as opposed to men, is further supported through the examination of the number of RAG artwork-objects by different artists being chosen for exhibition within the 62-British-exhibition canon from 1935 to 2009. *Table 2.6.2* contains some of the correlations, including all of the significant correlations calculated between the number of RAG artwork-objects being exhibited in a particular Year (ANoRAG[M/F]/ANo[T23Artist]),[91] and the recording unit SPWTG as a weighted percentage of exhibition-catalogue artwork-text of the same Year.[92]

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[93]	*p*-value	Lower	Upper
SPWTG	ANoRAG	.280	32	.057	.094	.466
SPWTG	ANoRAGM	.190	32	.197	-.008	.378
SPWTG	ANoRAGF	.365	32	.016	.143	.574
SPWTG	ANoExtA	.425	32	.008	.224	.645
SPWTG	ANoPopL	.385	32	.013	.123	.612

Table 2.6.2: Bivariate correlation (Kendal's Tau) between the recording units SPWTG and ANoRAG[M/F], between SPWTG and ANoExtA, and between SPWTG and ANoPopL. (Per Year from 1935 to 2009.)

There is, neither, a significant relationship between the recording unit of SPWTG and the total number of RAG artwork-objects (ANoRAG) displayed in a given Year, nor, is there a significant relationship between SPWTG and the total number of male-RAG artwork-objects (ANoRAGM) displayed within the exhibitions of a given Year. For each of these relationships, as *table 2.6.2* indicates by underscoring, $p > .05$. It is only the positive relationship between SPWTG and the total number of female-RAG artwork-objects (ANoRAGF) being displayed from 1935 to 2009 that is significant, with a $p < .05$ and BCa 95% CI that does not cross zero. This means that as the recording unit SPWTG increases as a percentage of the artwork-text, there is also an increase in the number of artwork-objects by female-RAG artists exhibited. This demonstrates a significant, positive relationship between artwork-text that includes words that politicize gender, and the exhibition of female-RAG artwork-objects. *Table 2.6.2* also demonstrates that this is not a

[91] "T23Artist" refers to the "top" 23 RAG artists; RAG artists who have ≥ 30 artwork-objects exhibited from 1935 to 2009 in the 62 British exhibitions studied in this thesis.
[92] A complete list of correlations between ANoRAG[M/F]/ANo[T23Artist] and SPWTG (1935-2009) is produced in *App.2-[1935-2009b]-13* and *App.2-[1935-2009b]-14*.
[93] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

relationship found between the exhibiting of male-RAG artwork-objects. It demonstrates SPWTG as a gender specific concept. This is further emphasised by the fact that, as listed in *table 2.6.2*, significant, positive correlations can also be found between SPWTG and the exhibition of artwork-objects by two individual, female T23Artist: Alexandra Exter and Lyubov Popova. No significant, positive correlation is found between SPWTG and the exhibition of any male T23Artist. *Table 2.6.2* contains all the significant relations between SPWTG and the RAG artwork-objects exhibited in Britain from 1935 to 2009. Discussion on the relationships between ANoRAG[M/F] and SPWTG is expanded in “Section 3.1.3”, which compares the results of this study, regarding SPWTG, to those of a study conducted by James Elkins into the changes within artwork-text regarding “theory in art history”.

2.7 – Analysis of Second-Level AS Recording Units

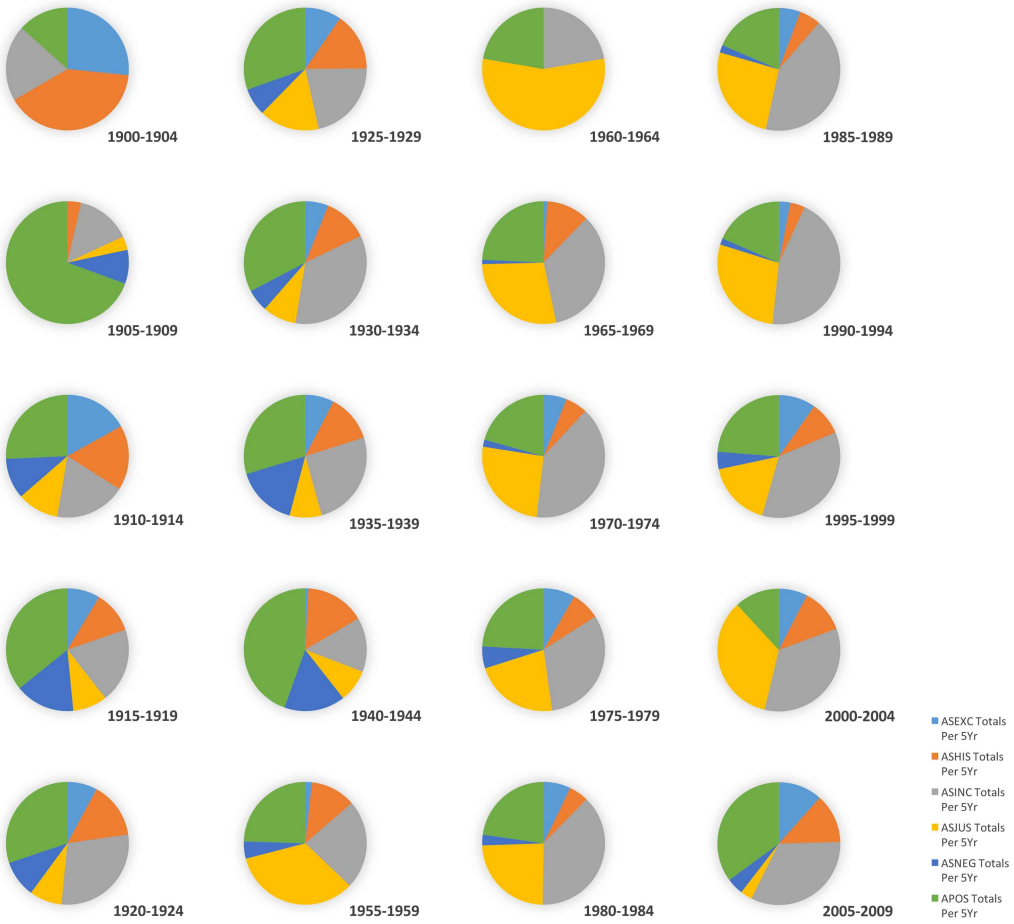


Image 2.7.1: *Fingerprints* of the changes in average proportional representation of second-level AS recording units within the first-level recording unit AS per five-year period from 1900 to 2009.[94]

As with the previous sections' *fingerprints*, *image 2.7.1* allows for comparison of the changing proportional construction of the first-level recording unit, in this case recording unit AS. The AS recording unit – formed from six, second-level recording units – contains assertive words. These are words that impart a particular assertion onto the object or subject being discussed by the artwork-text. There is a distinct change in the dominance of certain coloured segments between those *fingerprints* relating to the production/primary-source period and those deriving their data from the secondary-source period of the 62-British-exhibition canon. The *fingerprints* of *image 2.7.1* allow for the visualisation of how the emphases of assertion (AS) within the artwork-texts shift and change over the course of time from 1900 to 2009.

[94] Base on the pie charts of *App.3-[5Yr Periods 1900-2009]-06.*

It has been established in “Section 2.1” that the average weighted percentage that the AS recording unit represents per five-year period from 1900 to 2009 remains fairly constant; representing an average proportion of the artwork-text, per five-year period, of 3.66%. This consistency is visualized in *graph 2.1.1*, which plots the average weighted percentages per five-year period of first-level recording units of AW, AS, and SPW from 1900 to 2009, and shows that they remain relatively constant; the lines on the graph being horizontal in nature. This consistency of the AS recording unit is of note, as although *image 2.7.1* illustrates the second-level AS recording units as a percentage of the first-level recording unit, as the first-level AS units are fairly consistent in terms of their average weighted percentage, this means that the proportional representation of their second-level units, as displayed in *image 2.7.1*, are comparable between the separate five-year-period *fingerprints*, and with their actual average weighted values within the artwork-texts.

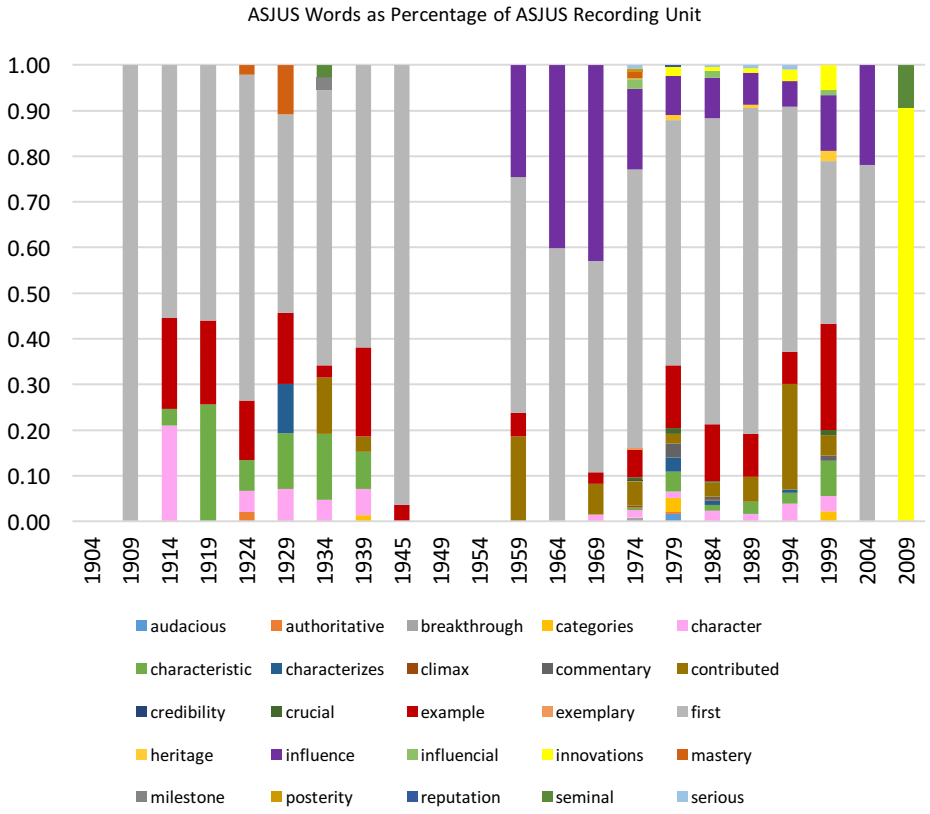
The most striking changes between the progression from the primary-source *fingerprints* to the secondary-source *fingerprints* is the increase in the area of the yellow and grey segments, and the decrease in area of the green and dark-blue segments. The yellow segment represents the second-level recording unit ASJUS (Assertions of justification). This recording unit includes words, that in the context of the object or subject they are being applied to within the artwork-text, act to justify that object’s or subject’s place within history/the exhibition. Words such as “innovative”, which is used repeatedly in the exhibition catalogues to justify the inclusion of particular artists and artwork-objects (see bright-yellow divisions of *graph 2.7.1*). Christina Lodder, in the 1983 catalogue for the *1st Russian Show – A Commemoration of the Van Diemen Exhibition, Berlin 1922*, Annely Juda Fine Art, London, writes: “Lissitzky’s use of photomontage and **innovative** display stands for exhibitions such as the Pressa in Cologne in 1928 are well known.”[95] Or, in the Royal Academy of Arts, 1999 catalogue for its exhibition *Amazons of the Avant Garde*, in which Nina Gurianova writes:

> Suprematism became a laboratory whose experiments led Rozanova to put her **innovative** ideas into seemingly contrary practices – by creating “color-painting” or, as she put it, a “painting of transfigured color far from utilitarian

[95] Christina Lodder, "Exhibitions of Russian Art After 1922", in Juda, A., and Juda, D., (eds.), *1st Russian Show - A Commemoration of the Van Diemen Exhibition, Berlin 1922*, Annely Juda Fine Art: London, 1983, p. 82 (Emphasis added by James Strugnell)

goals" – and by attempting to transform the everyday into a "living environment" for art, as was the case with the Suprematist designs for women's fashions, handbags, and embroideries.[96]

Other, ASJUS words include: "breakthrough"; "crucial"; "climax"; "seminal".[97] For example, Andrei Nakov writes in 1983 for the afore-cited *1st Russian Show*: "Even though Russian nonobjective art was beginning to be known, thanks to an increased circulation of articles and photographs very few actual works had been seen in Berlin, especially by the two **seminal** figures, Tatlin and Malevich."[98]



Graph 2.7.1: 100% stacked column chart of the changes in average proportional representation of the words that form the concept/recording unit ASJUS per five-year period from 1900 to 2009

ASJUS words are used within writings of the RAG, but to a lesser extent. There is also a

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[96] Nina Gurianova, "Olga Rozanova", in Bowlt, J. E., and Drutt, M., (eds.), *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova*, Royal Academy of Arts: London, 1999, p. 221 (Emphasis added by James Strugnell)
[97] Complete list of ASJUS words is produced in *App.1-[Content Analysis]-02*. (See also, *graph 2.7.1*.)
[98] Andrei B. Nakov, "This Last Exhibition which was the 'First'", in Juda, A., and Juda, D., (eds.), *1st Russian Show - A Commemoration of the Van Diemen Exhibition, Berlin 1922*, Annely Juda Fine Art: London, 1983, p. 16 (Emphasis added by James Strugnell)

subtly different proportional construct and emphasis to the ASJUS recording unit. *Graph 2.7.1* illustrates the different construct of the average ASJUS recording unit for each five-year period from 1900 to 2009. Each bar represents, through its coloured divisions, the proportion each word within ASJUS concept attributes, as a percentage, to the average ASJUS recording unit for that five-year period. It is shown in *graph 2.7.1* that the word forming the greatest proportion of ASJUS, is the word "first" (the light-grey division of each bar). Both, the RAG and the contributors to exhibition catalogues, believe that the idea of an object or subject being "first", as validation and justification for including it in their artwork-text. For example, when El Lissitzky writes "Suprematism in World Reconstruction" in 1920 he justifies the importance of Suprematism by its primary status:

> For us SUPREMATISM did not signify the recognition of an absolute form which was part of an already-completed universal system. On the contrary here stood revealed for the **first** time in all its purity the clear sign and plan for a definite new world never before experienced – a world which issues forth from our inner being and which is only now in the **first** stages of its formation.[99]

The use of the word "first" to justify, is also observed within the artwork-text of the 1967 exhibition catalogue, accompanying the *Aspects of Russian Experimental Art 1900-1925* exhibition held at the Grosvenor Gallery, London. In asserting the importance of the RAG artists in terms of the "story" of twentieth-century Western art the catalogue includes the lines: "It is claimed that Kandinsky painted the **first** abstract picture in 1910; a year later Larionov was moving towards abstraction; in 1913 Tatlin, a pupil of Larionov, made his **first** entirely abstract relief in glass, metal and wood […]"[100]

Graph 2.7.1 illustrates there are no ASJUS words that are exclusive to the primary-source period of the RAG (1900 to 1934). There are no ASJUS words that do not continue to appear in the later artwork-texts of the exhibitions' catalogues, if they first appear in the artwork-text of the RAG. *Graph 2.7.1* does show, though, that from 1955 to 2009 there are two words introduced into the concept of ASJUS, from the catalogues, that form a significant proportion of the ASJUS recording unit, which are not used within the primary sources of the

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[99] Lissitzky, 1920, p. 153 (Emphasis added by James Strugnell)
[100] Grosvenor Gallery, *Aspects of Russian Experimental Art 1900-1925*, Grosvenor Gallery: London, 1967, n.p. (Emphasis added by James Strugnell)

RAG. These two words, used in the artwork-text of the catalogues, but not the primary-source artwork-texts, to justify the inclusion of particular objects/subjects are, “influence” (purple divisions on *graph 2.7.1*) and, the already quoted, “innovations/innovative” (bright-yellow divisions on *graph 2.7.1*). Alexander Lavrentiev writing in the catalogue to the 2008 exhibition at The Hayward gallery, *Alexander Rodchenko: Revolution in Photography*, demonstrates the use of both of these word in justifying and validating the significance of the artist, the artwok-objects, and the exhibition:

> At the end of the decade [1920s] we see the emergence of a unique group of **innovative** photographers called October, led by Rodchenko and Ignatovich.
> […]
> Rodchenko’s works **influenced** the appearance of a whole new movement of experimental photography, much in the same way as his experimental painting and graphics of the 1910s had done.[101]

Although *image 2.7.1* illustrates the increase in ASJUS as a proportion of the first-level AS recording unit from the primary sources to the exhibition catalogues, its use/weighted percentage within the 62-British-exhibition canon’s artwork-text from 1935 to 2009, actually, decrease over this period. There is a significant, negative relationship between ASJUS and Year: $T = -.447$, $N = 32$, $p < .05$ (.000), BCa 95% CI [-.669, -.206].[102] This evidence supports a hypothesis that, as exhibitions of RAG artwork-objects in Britain advance through the twentieth century and into the twenty-first, the contributors to the contemporaneous artwork-texts feel less need to use words to justify the RAG artists’ and artwork-objects’ importance within the canon of art and their inclusion within exhibitions. This is also illustrated in *graph 2.7.2*, which plots the average ASJUS weighted percent per five-year period from 1900 to 2009. ASJUS, as it appears in *graph 2.7.2*, does not represent a proportion of the first-level AS recording unit, but represents its (ASJUS’s) average weighted percent in relation to artwork-texts per year of the five-year periods. *Graph 2.7.2* illustrates a general increase in Assertions of Justification (ASJUS), beginning 1900-1904 with the primary-source writings of the RAG, and continuing through to 1965-1969 with the secondary sources of the exhibition

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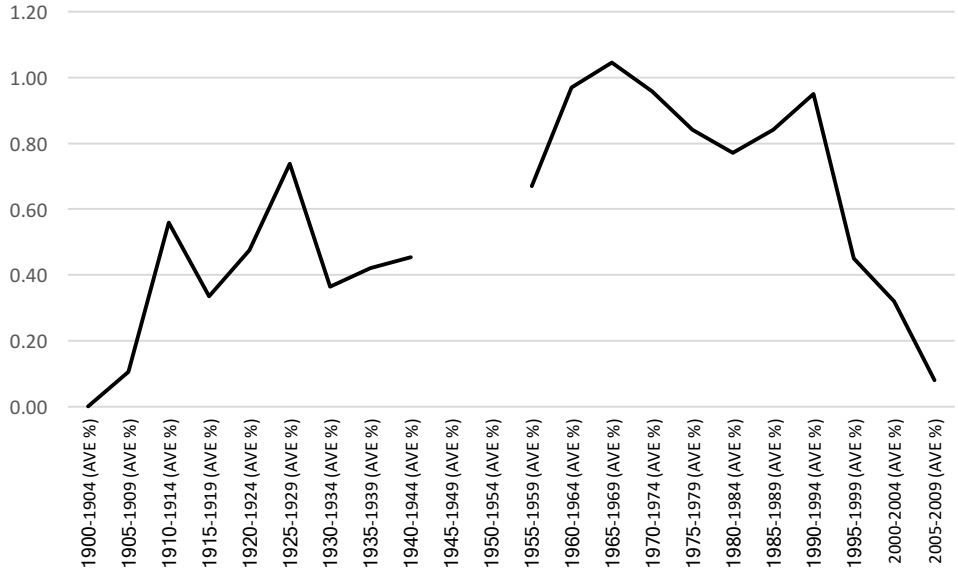
[101] Lavrentiev, 2008[a], p. 209 (Emphasis added by James Strugnell)
[102] A complete list of correlations between second-level AS units and Year (1935-2009) is produced in *App.2-[1935-2009a]-04*.

catalogues. From 1970-1974 through to 2005-2009, though, this upward trend is replaced by one of, general, downward momentum.



Graph 2.7.2: Line graph of the relationship between the average weighted percentage per five-year period from 1900 to 2009 of recording unit ASJUS and Five-Year periods (1900-1904 to 2005-2009).

Returning to *image 2.7.1*, the other portion of the AS unit that makes an observable increase from the primary-source period to the secondary-source period is the grey segment. This segment represents the second-level recording unit ASINC (Inclusive Assertions). This concept is formed from a collection of words that act within the artwork-texts to include/incorporate the artwork-object or RAG artist into a relationship with other artwork-objects and artists. The concept ASINC involves creating, via the artwork-text, a notion of unity between individual artists/artwork-objects. As a concept, ASINC is produced in opposition to the second-level recording unit ASEXC (Exclusive Assertion). ASEXC is a concept formed of words that act to individualize and separate artists/artwork-objects from one another. There is a significant, positive relationship between the recording units ASJUS and ASINC within the artwork-texts of the exhibition catalogues, evidenced through the correlation of their weighted percentages for the period (1935 to 2009): $T = .270$, $N = 32$, $p < .05$ (.031), BCa 95% CI [.017, .487]. This indicates that as the proportion of one concept increases or decreases within the catalogues' artwork-texts, the proportion of the other concept does likewise.

The 1967 catalogue for the exhibition *Aspects of Russian Experimental Art 1900-1925* demonstrates the deployment of the simultaneous use of the concepts of ASJUS and

ASINC:

> Constructivism, **rooted** in Cubism and Futurism, **related** abstraction to the three-dimensional plane. Later **joined** by Gabo and Pevsner, Tatlin experimented with suspended forms and monumental public structures, expressive of science and technology.
>
> **Together** with Kandinsky, these **movements** were to have <u>widespread influence</u> throughout Europe; the idea of "pure non-objectivity" has clearly been the <u>basis</u> of later developments in Europe and the United States[103]

The **bold** and <u>underscore</u> emphases within this citation exemplifies how these two concepts are used in collaboration, by the author, to assert and justify the importance of the RAG artists and their artwork-objects, not only in their/its own terms, but also by creating inclusions among RAG artists and between RAG artwork-objects and Western-European/Western artwork in general. The inclusion of the RAG's "Constructivism" into a Western-European art history is achieved through the inclusive word "**rooted**". The creation of a group of artists within the history of the RAG is achieved through deployment of the ASINC concept by the words "**joined**" and "**together**". Whilst the importance and relevance of RAG artwork to the Western tradition is achieved through the use of the ASJUS concept, via the words "<u>widespread influence</u>" and "<u>basis</u>".

The final two proportional components of the AS *fingerprints* of *image 2.7.1* that markedly change between the primary-source artwork-text of the RAG and the secondary-source artwork-text of the exhibition catalogues, are ASPOS (Positive Assertions) and ASNEG (Negative Assertions). These second-level AS units are represented by green (ASPOS) and dark-blue (ASNEG) colour segments. *Image 2.7.1* indicates that – as a percentage of the first-level AS unit – both ASPOS and ASNEG reduce from primary- to secondary-source artwork-text, with Negative Assertions (ASNEG) almost disappearing from the AS unit in six of the five-year periods after 1930-1934.[104] As well as a proportional decrease in the concepts of Positive and Negative Assertion as a proportion of the AS recording unit between the advancing five-year periods, there is evidence of a decrease in the weighted

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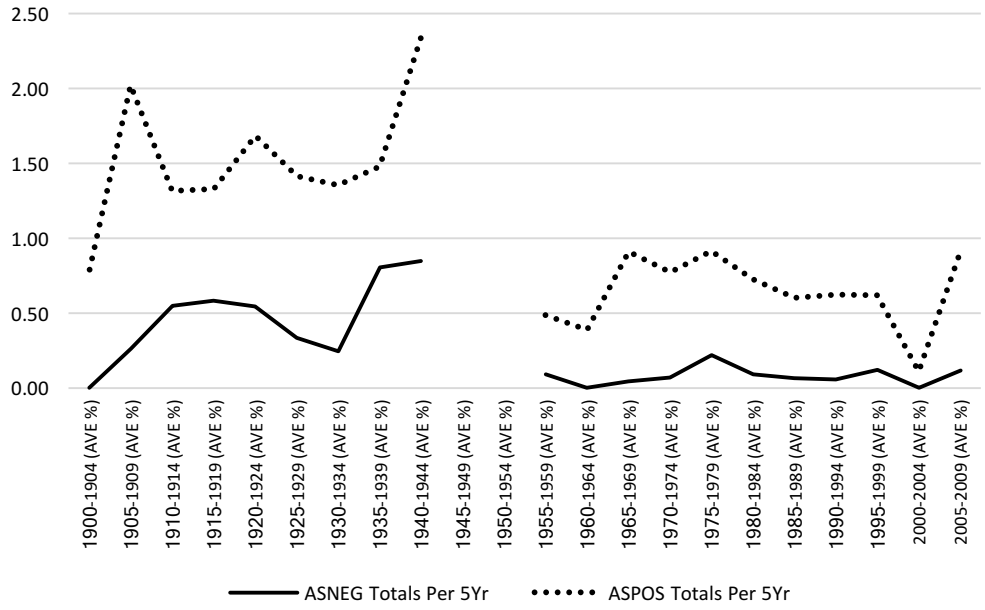
[103] Grosvenor Gallery, 1967, n.p. (**Bold** and <u>underscore</u> emphases added by James Strugnell)
[104] The periods in which ASNEG account for less than .03% of the AS unit are: 1960-1964; 1965-1969; 1970-1974; 1985-1989; 1990-1994; 2000-2004.

percentage that, both, ASPOS and ASNEG account for within in the artwork-text year-by-year from 1902 to 2009. There are significant, negative correlations found between, both, ASPOS and Year, and ASNEG and Year.[105] This indicates that as time progresses from 1902 to 2009 the proportion of artwork-text being used to juxtapose positive and negative assertions with the objects and subjects under discussion decreases. For this same period there is also evidence that the concepts of ASPOS and ASNEG, as well as each, individually, having significant, negative relationships with advancing Years, have a significant, positive relationship with one another. Meaning that as the weighted percentage of, either, ASPOS or ASNEG increases or decreases within the artwork-text, this trend is "echoed" by the other. The result of calculating the correlation (Kendall's Tau) between ASPOS and ASNEG for the artwork-texts produced from 1902 to 2009 is: $T = .474$, $N = 58$, $p < .05$ (.000), BCa 95% CI [.268, .649].



Graph 2.7.3: Line graph allowing comparisons of the relationships between the average weighted percentage per five-year period from 1900 to 2009 of recording unit ASNEG and Five-Year periods (1900-1904 to 2005-2009), and between the average weighted percentage per five-year period from 1900 to 2009 of recording unit ASPOS and Five-Year periods (1900-1904 to 2005-2009).

The use of both concepts ASPOS and ASNEG, within the artwork-texts, reduce through the Years. The reduction is more severe with regard to ASNEG, with a stronger and more significant, negative relationship between ASNEG and Year than ASPOS and Year: $T = -$

[105] ASPOS and Year: $T = -.296$, $N = 58$, $p < .05$ (.001), BCa 95% CI [-.479, -.096]. ASNEG and Year: $T = -.316$, $N = 58$, $p < .05$ (.001), BCa 95% CI [-.505, -.112] (A complete list of correlations between second-level AS units, and between second-level AS units and Year (1902-2009) is produced in *App.2-[1902-2009]-04*.)

.316 compared to *T* = -.296. The average weighted percentage per five-year period for both ASNEG and ASPOS are plotted on *graph 2.7.3*, for comparison. Observable from *graph 2.7.3*, particularly after the period of 1940-1944, the average weighted percentage within the artwork-text, per five-year period of both ASNEG and ASPOS decreases dramatically. But it is ASNEG that reduces to almost zero. This might be due to how Negative Assertions are used within the artwork-text, and for what purpose. The Negative Assertions are directed by the RAG, in their writings, against the traditional/old-fashioned practice of art and the traditional/old-fashioned views held to by the Russian population. This is contrasted to the use of many of the Negative Assertions within the later exhibition catalogues, which are used to express the negative views directed by the traditionalists against the artwork of the RAG. The relationship between ASNEG and the object/subject being discussed changes. From an earlier one, in which the aspersions are being cast by the RAG upon the traditionalists, to a later one, in which it is the traditionalists that are positioned as those casting dispersions upon the RAG.

In a letter to Boris Kushner, 1928, Aleksandr Rodchenko writes his objections to a letter published in the journal *Sovetskoye foto* (Soviet Photo). The letter, entitled "Here and Abroad",[106] criticises the use of foreshortening by Rodchenko in his photographs, whilst also questioning their originality by accusing him of plagiarising the work of Western-European artists, particularly Moholy-Nagy.[107] In reply Rodchenko writes: "Behind so much **dangerous** conventionality one discerns a preconceived routine and bias in visual thinking[...] The letter about me in 'Soviet Photo' is not only **stupid** slander, it is an attack on new photography."[108] Here the negative assertions – "**dangerous**" and "**stupid**" – are applied by the RAG to tradition, and organizations that do not agree with their point of view.

This standpoint reverses in the, later, contribution to exhibition catalogues. In the catalogue to the 2008 exhibition *Alexander Rodchenko: Revolution in Photography*, Alexander Lavrentiev writes:

> Daring artistic experiments were often met with **hostile** opposition. The vivid and energetic, innovative images of the October Group were in

[106] *Sovetskoye foto* (Soviet Photo) (No. 4, April, 1928)
[107] Aleksandr Rodchenko, "Large Scale Illiteracy or Dirty Little Tricks Open Letter" (originally published in *Novyi LEF*, No. 6, 1928), 1928[b], in Lavrentiev, A. N., *Aleksandr Rodchenko: Experiments For The Future: Diaries, Essays, Letters, and Other Writings*, The Museum of Modern Art: New York, 2005, p. 204
[108] Rodchenko, A., 1928[a], pp. 56-57 (Emphasis added by James Strugnell)

> those years severely criticized by the official press as harmful, bourgeois and formalist.
> [...]
> Rodchenko left the October Group. He was constantly accused of not being able to change his style, and for some time Soviet Photo and Proletarian Photo completely **ignored** him.[109]

Both Rodchenko and Lavrentiev describe the same events; the same objects (photographs) and the same subjects (RAG and "Soviet Photo"), during the same period (1920s). But due to Rodchenko being, both, one of the subjects within his artwork-text, as well as the author of it, there is a direction to the Negative Assertions. In this case the direction of ASNEG is from the author-subject of Rodchenko to the "**dangerous** conventionality" of *Soviet Photo's* "**stupid** slander". Rodchenko plays an active part, both, in creating his artwork-text, and as a subject within it. Lavrentiev's situation is different, there is a disjoin between the author of the artwork-text and the subjects/objects within the writing. There is also an anachronistic relationship between the writing of the artwork-text and the events it describes. Whilst the documents produced by Rodchenko are the events, and the future descriptions of these events, Lavrentiev's writing is devoid of the ability or hope of playing an active part on the past that it describes. There is no indexicality between the subjects and objects within Lavrentiev's artwork-text and the negative assertions: All are derived from a third party. The author and subject of Lavrentiev's text are separate entities, both in terms of their physicality and temporality. Therefore, in contrast to Rodchenko's artwork-text, the Negative Assertions do not derive from a combined author-subject of the piece. This removes such assertions ability of having expediency, hoped for or otherwise, upon the reality being portrayed within the artwork-text. This is due to the reality within the text being atemporal to any reality in which the Negative Assertions of Lavrentiev will/can be read. The writing of Rodchenko, regardless of the outcome of the Negative Assertions within it, does have the ability to impact upon the reality that it is writing of, due to the contemporaneous relationship between the artwork-text, its subjects and its objects, and the author being an active subject within the text. This, in part, explains the shift between the primary sources – where negative assertions are being cast upon the traditionalists by the active, and present, author-subject – to the latter secondary sources, where the traditionalists are set-up as the ones casting dispersions upon the RAG-subject by an active but non-present, non-subject author.

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[109] Lavrentiev, 2008[a], p. 209 (Emphasis added by James Strugnell)

The flow of negative assertions from the RAG outward is also peppered throughout Mikhail Larionov's and Natalya Goncharova's "Rayonists and Futurists: A Manifesto", 1913. They begin with an attack on various groups of artists:

> We, artists of art's future paths, stretch out our hand to the futurists, in spite of all their mistakes, but express our utmost **scorn** for the so-called egofuturists and neofuturists, **talentless**, banal people, the same as the members of the Knave of Diamonds, Slap in the Face of Public Taste, and Union of Youth groups.[110]

They then direct their hatred toward the West in general: "We are against the West, which is **vulgarizing** our forms and Eastern forms, and which is bringing down the level of everything."[111] These citations emphasize the reason for the general outward direction of negative assertions from the RAG to the rest of the world in their writings. The use of the word "we" emphasises the fact that such Negative Assertions are theirs to give, and their position as active authors/subjects of the artwork-text. In contrast, the ASNEG of later exhibition catalogues are purported Negative Assertions of someone else. They are Negative Assertions one step removed. They are no longer acting, but reporting. Jane Sharp writes of Goncharova in the catalogue to the *Amazons of the Avant Garde* exhibition: "We now know that she viewed her own creative practices as repetitive, exhausting work, and that her art directly engaged the conditions and **prejudices** of everyday life, particularly insofar as they determined her experiences as a woman."[112] In contrast to Larionov's and Goncharova's own artwork-text, in which they cast out their "**scorn**" upon the artists they view as "**talentless**", and a West they view as "**vulgarizing**" Russian art, Sharp's artwork-text inverts the flow of negativity. It is not the Negative Assertions of the artists that influence their work and beliefs, but the Negative Assertions acting upon them that influence them.

Whilst there is an inconsistency to the direction of impact and influence in which the Negative Assertions (ASNEG) flow outward from RAG to impact upon the traditionalist in their primary-source artwork-texts, contrasting to the flow inward from traditionalist impacting upon the RAG in the secondary-source artwork-texts of the exhibition catalogues, this is not

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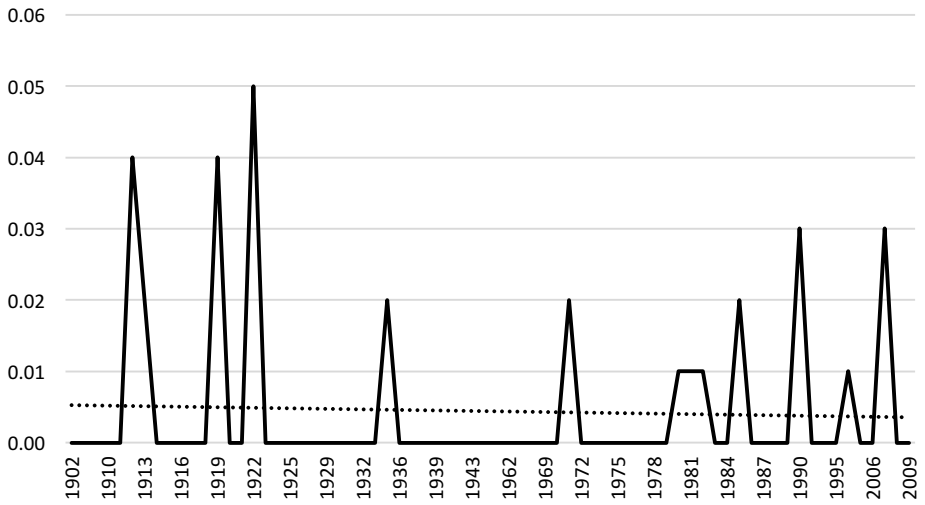
[110] Mikhail Larionov and Natalya Goncharova, "Rayonists and Futurists: A Manifesto", 1913 in Bowlt, J. E., (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991, pp. 88-89 (Emphasis added by James Strugnell)
[111] Larionov and Goncharova, 1913, p. 90 (Emphasis added by James Strugnell)
[112] Jane A. Sharp, "Natalia Goncharova", in Bowlt, J. E., and Drutt, M., (eds.), *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova*, Royal Academy of Arts: London, 1999, p. 155

evident with positive assertions (ASPOS). Although they decrease as a weighted percentage of the artwork-texts in relation to Years, their direction of flow remains constant from 1902 to 2009. Both, the primary sources of the RAG and the secondary sources of the 62-British-exhibition canon's contributors use the concept of ASPOS to enhance the reputation of the RAG. This is exemplified with examination of one of the words forming the concept ASPOS: "Brilliant". "Brilliant" is one of the 72 words within the concept ASPOS.[113] Its usage within the artwork-texts, both primary and secondary, occurs at regular intervals from 1902 to 2009 (*graph 2.7.4*), and its weighted percentage, although slightly higher in primary sources, remains fairly consistent. This consistency is demonstrated by the relatively horizontal trend line of *graph 2.7.4* (dotted-black line).



Graph 2.7.4: Line graph with linear trend line (dotted line) of the relationship between the average weighted percentage per year from 1902 to 2009 of the word "brilliant" and Year (1902-2009).

Examples of this consistency in the application of the word "brilliant" to the RAG are demonstrated repeatedly in the artwork-texts from 1902 to 2009. Ivan Aksenov writes in association with the Knave of Diamonds group in 1913: "The rapid and **brilliant** development of the new movement in Russian painting has long since been confirmed by the clarity of its tasks."[114] Similar sentiment is paid to Rodchenko by Osip Brik in 1926: "One of them is A.M. Rodchenko, once a **brilliant** painter, today a committed photographer."[115]

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[113] A complete list of the ASPOS words is produced in the "Coded Word List" (*App.1-[Content Analysis]-02*).
[114] Ivan Aksenov, "On the Problem of the Contemporary State of Russian Painting [*Knave of Diamonds*]", 1913, in Bowlt, J. E., (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991, p. 61 (Emphasis added by James Strugnell)
[115] Osip Brik, "Photography Versus Painting", (Originally published in *Sovetskoi Foto*, No. 2, 1926), in Elliott, D., (ed.), *Alexander Rodchenko 1891-1956*, Museum of Modern Art Oxford: Oxford, 1979, p. 91 (Emphasis added by James Strugnell)

The trend for the ASPOS to be directed toward the artwork-objects and persons of the RAG, continues in the artwork-text of the British exhibition catalogues. In 1959, Camilla Gray contributes to the catalogue of the *Kasimir Malevich 1878-1935* exhibition at the Whitechapel Gallery, London. Gray writes in reference to Malevich's painting:

> His early works naturally compare with those of his contemporary, Kandinsky. There is the same dynamic quality, the same **brilliant** unfamiliar colour inspired by Russian folk art, but in Malevich's work one is struck by the power of those immensely solid figures, hardly, one feels, contained within the frame, but moving out beyond.[116]

Whilst Gray directs her Positive Assertion of brilliance toward the RAG artwork-objects, the later catalogue contributions by Susan and Andrew Causey (1990), and John Milner (2007) direct their assertions of brilliance toward RAG artists. The Causeys' introduction to the catalogue *Tradition and Revolution in Russian Art*, accompanying a number of different exhibitions that coincide in 1990 to form the Leningrad in Manchester exhibitions, part of the Olympic Festival, states: "The artistic achievements of the first Soviet years are remarkable. A **brilliant** generation of artists under 40 at the time of the revolution broke new ground in *avant-garde* painting [...]."[117] Milner focuses his assertion on one RAG painter, Olga Rozanova, rather than a whole generation, in his extensive article "Zaum! Zaum!". The article is written to support the exhibition, *A Slap in the Face! Futurists in Russia*, at the University of Newcastle's Hatton Gallery. Milner writes of the collaborations between the Futurist poet Aleksei Kruchenykh and various RAG artists in the publication of books:

> Kruchenykh also worked with Goncharova on *Hermits* and with Larionov on *Half-Alive* and *Pomade*. But he worked most with the **brilliant** futurist painter and graphic artist Olga Rozanova. Together they produced *A Forest Rapidly* as well as *Explodity* and *Let's Grumble*.[118]

A final, second-level AS recording unit that will be examined is ASHIS[TEMP]. ASHIS[TEMP] as a concept is formed from words that function to place the object/subject of

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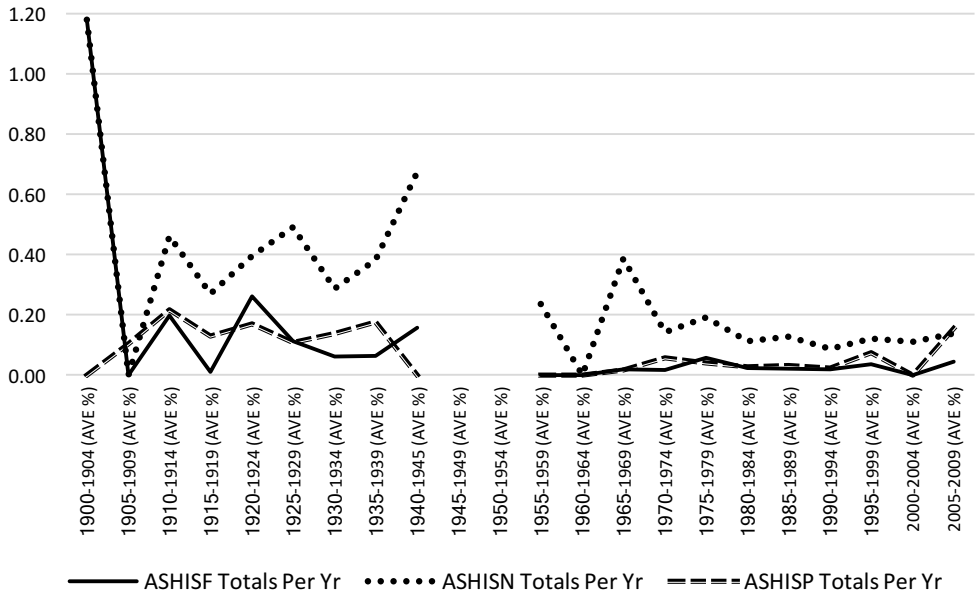
[116] Gray, 1959, pp. 10-11 (Emphasis added by James Strugnell)
[117] Susan Causey and Andrew Causey, "Introduction", 1990, in Causey, S., (ed.), *Tradition and Revolution in Russian Art*, Manchester Free Press: Manchester, 1990, p. 4 (Emphasis added by James Strugnell)
[118] Milner, 2007, p. 15 (Emphasis added by James Strugnell)

the text, either, historically or temporally. The positioning of an object/subject within the text temporally means placing it in the context of the past, present or future. As such, recording unit ASHIS[TEMP] is formed of three third-level AS recording units: ASHISP (Past); ASHISN (Present [Now]); ASHISF (Future). These three recording units are examined in more detail in the proceeding section.

2.8 – Analysis of Third-Level AS Recording Units: ASHIS[TEMP]

Image 2.7.1 illustrates that the second-level recording unit ASHIS remains a fairly consistent presence as a proportion of the first-level recording unit AS. For half of five-year periods from 1900 to 2009, 10 of the 20 for which there is data, it accounts for between 17.08% to 11.05% of the first-level AS recording unit.[119] In eight of the remaining ten, five-years period it accounts for between 3.68% and 8.81% of the AS unit.[120] There are two exceptional periods: 1900-1904 ASHIS accounts for 40% of the AS unit; 1960-1964 ASHIS accounts for zero percent.



Graph 2.8.1: Line graph allowing comparisons of the relationships between the average weighted percentage per five-year period from 1900 to 2009 of each third-level ASHIS recording unit (ASHISP, ASHISN, ASHISF) and Five-Year periods (1900-1904 to 2005-2009).

The ASHIS recording unit examines those words within the artwork-texts that function to place an object/subject, either, historically or temporally. It is constructed of three, third-level recording units: ASHISF (Future); ASHISN (Present [Now]); ASHISP (Past). These units are formed of words that positon the object/subject of the artwork-text, respectively, in a future, present, or past historical or temporal space. As these three temporal arenas are quite different from each other, it makes more sense to examine the interplay between the three, third-level units rather than examine their second-level unit ASHIS. *Graph 2.8.1* plots the

[119] These five-year periods are: 1910-1914; 1915-1919; 1920-1924; 1930-1934; 1935-1939; 1940-1944; 1955-1959; 1965-1969; 2000-2004; 2005-2009. (See also *App.3-[5Yr Period 1900-2009]-06*.)
[120] These five-year periods are: 1905-1909; 1970-1974; 1975-1979; 1980-1984; 1985-1989; 1990-1994; 1995-1999. (See also *App.3-[5Yr Period 1900-2009]-06*.)

average weighted percentage, per five-year period, of each of these third-level recording units against one another from period 1900-1904 to period 2005-2009. The graph presents their weighted percentage calculated in reference to the total artwork-text (RAG primary sources and exhibition catalogues) produced in each Year from 1902 to 2009, and not them as changing proportional representations of the ASHIS unit.

ASHISN (dotted line) *graph 2.8.1* accounts for the greatest percentage of ASHIS words within the artwork-texts. Both, words relating to the future (ASHISF [solid line]) and to the past (ASHISP [dashed line]) account for similar, lesser, proportions of the texts. Indeed, their average weighted percentages per year for the Years from 1902 to 2009 are identical, at .09% each. This compares to an average, yearly, weighted percentage of .28% for ASHISN. The data from *graph 2.8.1* indicates that regardless of the future ideation for an artwork, or its historical context it is the "now" that always dominates an author's temporal thinking.

There are three words that form the recording unit ASHISN: “now”; “present”; “today”. They are used in the artwork-text from 1902 to 2009 to add immediacy and contemporaneity, as well as an expedience to, both, the artwork-text and, via reference to artwork-objects, to the artwork. The use of the word “today” exemplifies this function in, both, the primary-source artwork-texts of the RAG and the secondary-source artwork-texts of the exhibition-catalogue contributors. In 1912, David Burliuk uses the immediacy of “**today**” to add expedience to the artists of his artwork-text: “Woe unto them who reject their *eyes*, for the Artists of **today** are the prophetic eyes of mankind.”[121] Ivan Aksenov uses “**today**” in 1913 to the same effect, but to promote the immediate importance of the “young” artists’ artwork-objects in rejecting all previous artwork: “All this increases the significance that the work of the young artists of **today** holds for the contemporary state of Russian painting; they are not only contemporary, but also, in the main, painters.”[122] As well as in primary-source artwork-text, the use of “**today**” exemplified by Aksenov – to add expediency to artwork-objects contemporaneous with the production/reading of the artwork-text – is observable in the 2008 artwork-text by Alexander Lavrentiev for the catalogue to the *Alexander Rodchenko: Revolution in Photography* exhibition:

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[121] David Burliuk, "Cubism (Surface–Plane)”, 1912, in Bowlt, J. E., (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991, p. 71 (Emphasis added by James Strugnell)

[122] Aksenov, 1913, p. 63 (Emphasis added by James Strugnell) (Aksenov is contrasting the young, contemporary painters with the current and past style where: “Literariness forced artists to abandon painting” [p. 62])

> Rodchenko was not photographing some relaxed holidaymaker, say, but individuals lost in thought, representing a certain professional type or inspired by the ideals of the future. Maybe this is the reason why these people and their images still, after so many years, capture our interest **today**.[123]

As expectations might suggest, there is a greater proportion of text focusing on the present within the artwork-text of the RAG; text produced contemporaneously to the artwork-objects. The correlation between Year (1902-2009) and ASHISN produces a significant, negative result: $T = -.281$, $N = 58$, $p < .05$ (.002), BCa 95% CI [-.472, -.079]. As time progresses from 1902 to 2009 the weighted percentage of the concept ASHISN within the artwork-text decreases; there is less focus upon the "now".

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[124]	*p*-value	Lower	Upper
ASHISF	Year (1902-1934)	-.114	15	.572	-.545	.347
ASHISN	Year (1902-1934)	.106	15	.585	-.354	.540
ASHISP	Year (1902-1934)	-.267	15	.182	-.643	.179
ASHISF	Year (1935-2009)	.071	32	.602	-.229	.377
ASHISN	Year (1935-2009)	-070	32	.580	-.326	.201
ASHISP	Year (1935-2009)	-.026	32	.843	-.352	.303

Table 2.8.1: Bivariate correlation (Kendal's Tau) between the third-level ASHIS recording units (ASHISP, ASHISN, ASHISF) and Year (1902-1934), and between third-level ASHIS recording units and Year (1935-2009).

Examining artwork-text for the periods from 1902 to 1934 (RAG primary sources) and from 1935 to 2009 (62-British-exhibition canon) separately, there are no significant correlation/relationships between any of the third-level ASHIS units and Year (*table 2.8.1*). Neither are there any significant, negative trends, between the variables of ASHISN and Year over the period from 1902 to 1934, nor over the period from 1935 to 2009. Therefore, the significant, negative relationship between the variables ANHISN and Year (1902-2009) is created by the difference between the two aforementioned periods of 1902-1934 and 1935-2009. There is less text devoted to the present in the secondary-source exhibition catalogues artwork-text (1935-2009) than in the RAG primary sources artwork-text (1902-1934).

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[123] Lavrentiev, 2008[a], p. 207 (Emphasis added by James Strugnell)

[124] For variable "Year (1902-1934)": Cases (*N*) derive from 26 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. For variable "Year (1935-2009)": Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

Examination of the relationships formed between the different third-level ASHIS units is of significance in understanding the temporal and historical spaces in which the authors are operating. Separate, examination of the primary-source period (1902-1934) and secondary-source period (1935-2009) reveals opposition in the significant relationships formed between the writing of the present (ASHISN), and the units ASHISP and ASHISF.

In the artwork-texts produced by the RAG between 1902 to 1934, there is no significant relationship between their "now" (ASHISN) and their writing on the past (ASHISP).[125] There is, though, a significant, positive relationship between the units ASHISN and ASHISF within the artwork-texts for the same period: $T = .398$, $N = 26$, $p < .05$ (.008), BCa 95% CI [.046, .680]. The opposite is true of the artwork-texts of the exhibition catalogues (1935-2009). Within these secondary sources there is no significant relationship between the concepts of ASHISN and ASHISF: $T = .133$, $N = 32$, $p > .05$ (.339), BCa 95% CI [-.115, .372]. There is no relationship between the "now" of the artwork-texts and the application of the concept of "future" being written about within them. Unlike the artwork-texts written by the RAG, there is no link between the "now" of the exhibition-catalogue author and the future in relation to the RAG subjects/objects in the text. It is this link that, in part, explains the significant, positive correlation between these two concepts within the RAG's own artwork-texts. The future that was hoped for, depicted, and projected in the writings by the RAG, is performed in the "present" (their "now"), but must, in the "now" of the catalogue contributors be written as "past". This explains the lack of correlation between ASHISN and ASHISF post-1934, and explains the significant, positive relationship between ASHISN and ASHISP within the artwork-text produced in the period from 1935 to 2009: $T = .332$, $N = 32$, $p < .05$ (.012), BCa 95% CI [.056, .575].

The significant, positive relationship between the use of ASHISN and ASHISF in the artwork-texts of the RAG is exemplified in the writings of Natalia Goncharova and Kasimir Malevich. They use the relationship between the **present** and **future**, to, either, define their present actions and to project the result of these actions, or to state their **future** hopes for the **present** situation. Goncharova writes of her present actions, in the preface to the catalogue of a one-man show, 1913: “**Now** I shake the dust from my feet and leave the West, considering its vulgarizing significance trivial and insignificant-my path is toward the source

[125] ASHISN (1902 to 1934) and ASHISP (1902 to 1934): $T = .041$, $N = 26$, $p > .05$ (.784), BCa 95% CI [-.326, .402]

of all arts, the East."[126] Before, then continuing to describe the future resulting from these continuing present actions: "I am convinced that modern Russian art is developing so rapidly and has reached such heights that within the near **future** it will be playing a leading role in international life."[127] Malevich uses the relationship between the present and the future to state, in 1915, the future's impact upon the present situation: "**Tomorrow** will wipe away the vestige of the **present**, and you are too late for the current of life."[128]

In contrast to the significant, positive ASHISN–ASHISF relationships evidenced within the artwork-texts of the RAG (1902-1934), which act to move-away-from or project destruction upon the RAG's present: The significant, positive relations between ASHISN and ASHISP calculated within the artwork-text of the exhibition-catalogue contributors (1935-2009) are demonstrated to tether the past to contributors' present. This is done in two ways, either, by using the **present** to judge the ***past***, or, by using the ***past*** to judge the **present**. The former of these ASHISN–ASHISP relationships is evidenced in Kenneth Frampton's 1971 contribution to the artwork-text for the exhibition *Art in Revolution: Soviet Art and Design Since 1917*. In his text Frampton judges the architecture of Vladimir Tatlin and El Lissitzky using the present to judge, favourably, the past. Of Tatlin's design/model for the *Monument to the Third International*, Frampton states:

> Tatlin's tower has **now** been generally acknowledged by architectural historians, yet even **today** few are willing to recognise the extent to which it crystallised a new consciousness which was to function as a continuous line of thought, sometimes covert, sometimes overt, in the development of European architecture ***between the two world wars***.[129]

Whilst, of Lissitzky's *Wolkenbügel* project of 1925, Frampton uses both the present and the recent past to judge the past of the RAG: "This is an avant-garde project even by **today's**

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[126] Natalia Goncharova, "Preface to Catalogue of One-Man Exhibition", 1913, in Bowlt, J. E., (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991, p. 55 (Emphasis added by James Strugnell)
[127] Goncharova, 1913, p. 57 (Emphasis added by James Strugnell)
[128] Kasimir Malevich, "From Cubism and Futurism to Suprematism: The New Painterly Realism", 1915, in Bowlt, J. E., (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991, p. 134 (Emphasis added by James Strugnell)
[129] Kenneth Frampton, "Notes on a Lost Avant-Garde", 1968, in Arts Council of Great Britain, *Art in Revolution: Soviet Art and Design Since 1917*, Art Council: London, 1971, p. 21 (Emphasis added by James Strugnell)

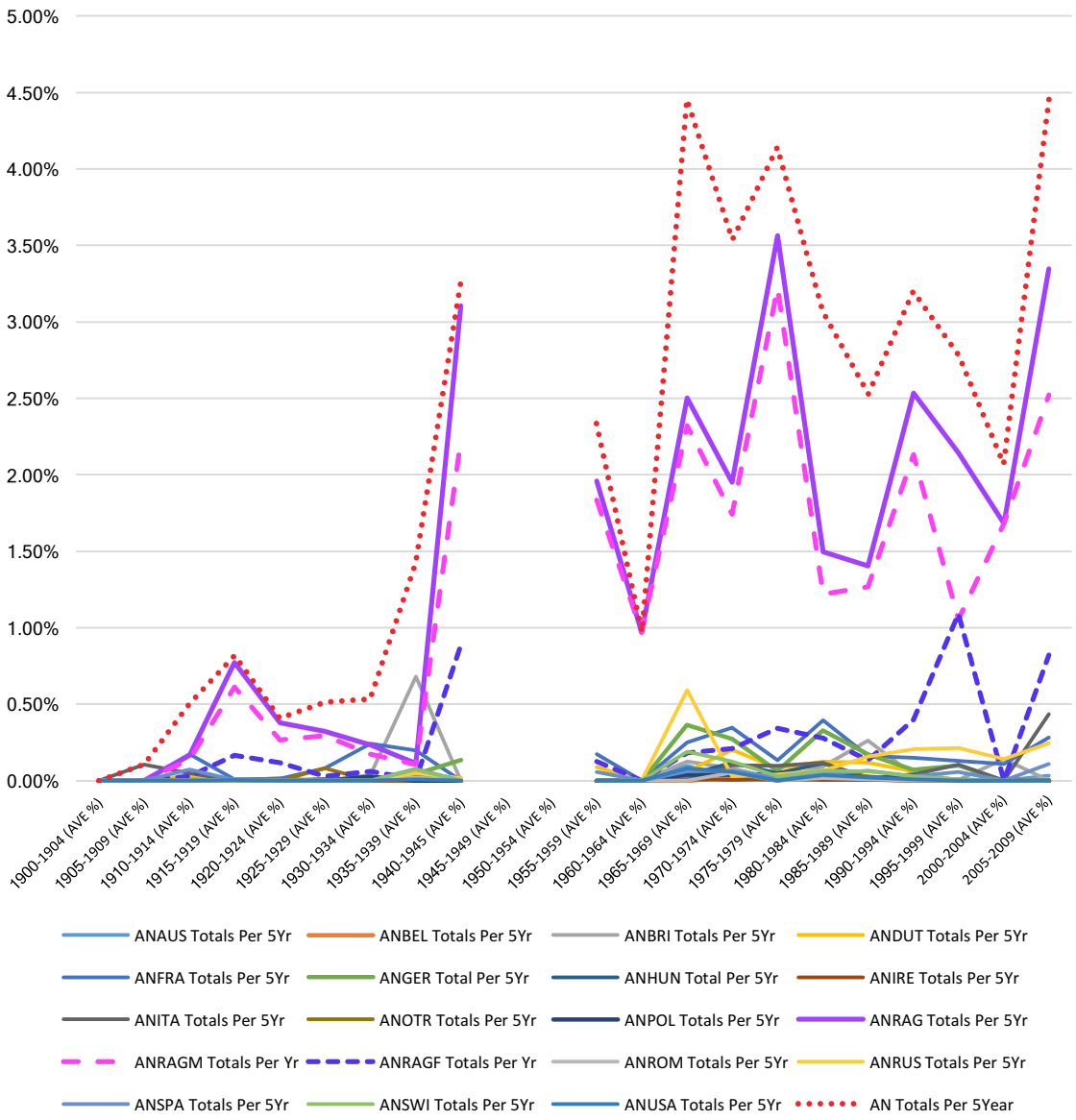
standards where the ***past*** decade has seen proposals for similar structures by Kenzo Tange and Yona Friedman."[130]

The "Foreword" to the exhibition catalogue that accompanies the *Rodchenko and Popova: Defining Constructivism* demonstrates the latter ASHISN–ASHISP relationship, that of the past's ability to be used to pass judgement upon the present. Vincente Todolí writes: "Tate is committed to creating exhibitions that simultaneously illuminate the ***past*** and offer insight into the **present** moment, and I would like to thank Margarita Tupitsyn once more for achieving this so brilliantly in this exhibition."[131]

The relationship between the concept of the "now" and, both, the "future" and the "past" within the artwork-text changes from the RAG primary sources to the catalogue-contributor secondary sources. Within the primary sources, produced from 1902 to 1934, the significant relationship is between the concepts of "present" (ASHISN) and "future" (ASHISF). Within the exhibition catalogues, produced from 1935 to 2009, the significant relationship is between the "present" (ASHISN) and "past" (ASHISP). Although the apparent relativity of such results is not surprising, the fact that such results are able to be calculated/obtained via bivariate correlation adds to the validity of the method, and its use as a diagnostic tool in assessing large quantities of data for fruitful avenues of investigation.

[130] Frampton, 1968, p. 26 (Emphasis added by James Strugnell)
[131] Vincente Todolí, "Forward", in Margarita Tupitsyn (ed.), *Rodchenko and Popova: Defining Constructivism*, Tate Publishing: London, 2009, p. 9 (Emphasis added by James Strugnell)

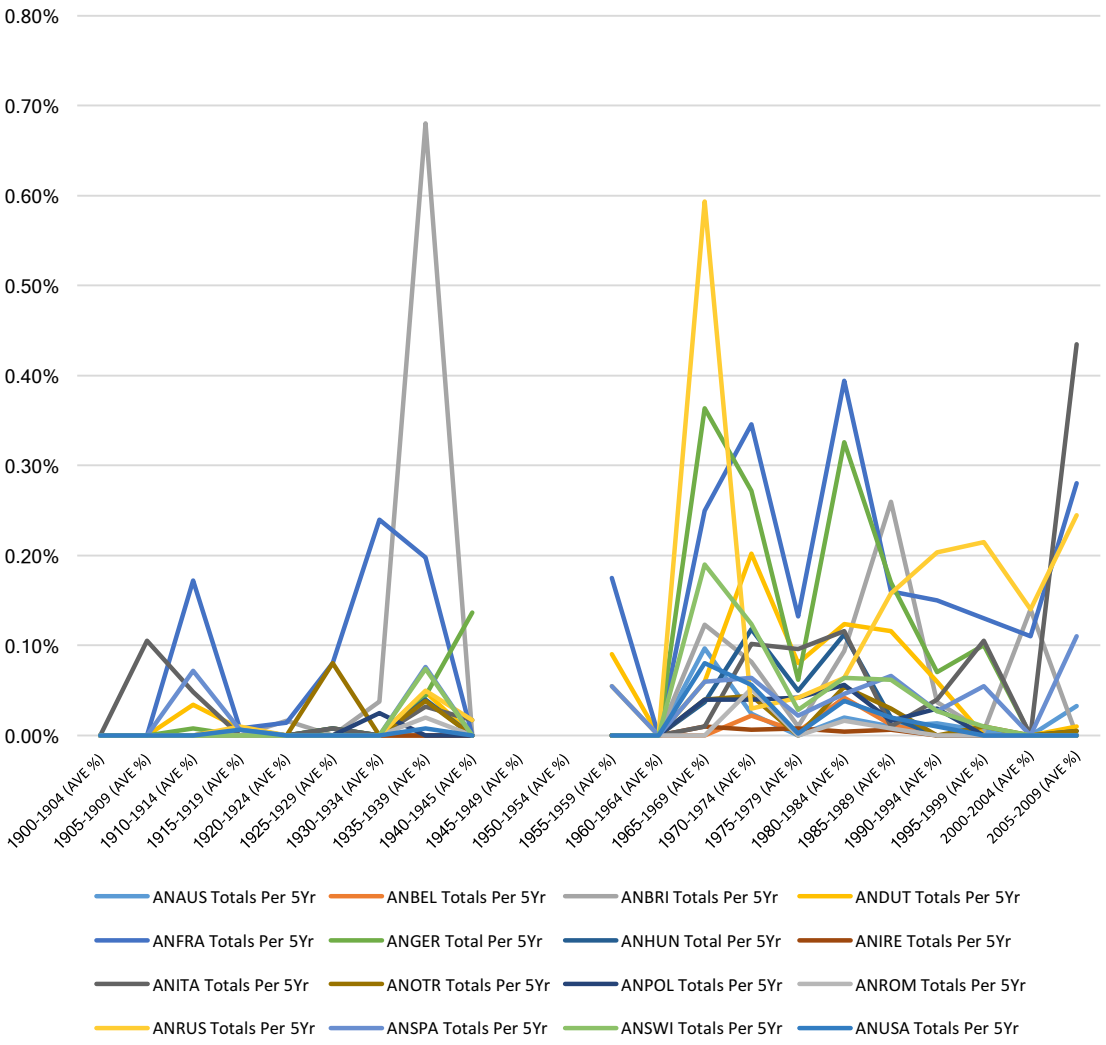
2.9 – Analysis of AN Recording Units



Graph 2.9.1: Line graph allowing comparisons of the relationship between the average weighted percentage per five-year period from 1900 to 2009 of first- and second-level AN recording units and Five-Year periods (1900-1904 to 2005-2009). Also included are the relationships between the average weighted percentage per five-year period from 1900 to 2009 of third-level AN recording units ANRAG[M/F] and Five-Year periods (1900-1904 to 2005-2009).

This final section of “Unit 2” examines the first-level recording unit AN (Artist Name). As “Section 2.0” describes, AN is constructed from all of the artists' names (proper nouns) written in the artwork-texts. These artists' names are divided into their separate nationalities: The [NS] suffix added to AN to form the second-level AN recording units AN[NS]. There are a total of 17, second-level AN recording units. Where applicable/possible, these AN[NS] units are further divided into male and female artists [M/F], and form AN[NS][M/F] recording units of a third level of inclusion. “Section 2.9” focuses on AN[NS], examining the

relationships between the artists of different nations as written about within the artwork-texts from 1902 to 2009. The third-level of inclusion, AN[NS][M/F], is also examined, but only in regard to the exhibition of RAG artwork.



Graph 2.9.2: Line graph allowing comparisons of the relationship between the average weighted percentage per five-year period from 1900 to 2009 of second-level AN recording units AN[NS] (excluding ANRAG) and Five-Year periods (1900-1904 to 2005-2009).

Graph 2.9.1 plots the average weighted percentages, per five-year period, of the various AN[NS] found within the artwork-texts. These second-level units are compared to the first-level AN, represented on *graph 2.9.1* by the dotted-red line. The ANOTR category contains the artists' names from nations that are represented by two or fewer different artists over the period from 1902 to 2009.[132] The other AN[NS] categories are represented by solid lines, each representing all the artists, of both sexes, named within the artwork-texts from that

[132] A full list all the artist names within AN is produced in *App.1-[Content Analysis]-02*.

individual nation. The only exception to this, is the category of ANRAG (Artist Name Russian Avant Garde). This category does not represent a nation, but the group of artists that this thesis focuses on.[133] Those artists from Russia, whom are not classed as being part of the RAG, are categorized under the ANRUS (Artist Name Russia). ANRUS does not include those artists categorized under ANRAG. ANRAG, as a category, is also exceptional in that it is the only category, on *graph 2.9.1*, to have been subdivided into male and female artists. The naming of male-RAG and female-RAG artists within the artwork-texts – expressed as average weighted percentage, per five-year period – is represented on *graph 2.9.1*, respectively, by the dashed-pink and dashed-blue lines. *Graph 2.9.2* contains exactly the same data as *graph 2.9.1*, with the exclusion of AN and ANRAG[M/F]. It is, essentially, a close-up of the lower part of *graph 2.9.1*, to allow for easier distinction between the lines of the various AN[NS] recording units.

Graph 2.9.1 illustrates that a much greater percentage of the artwork-text is used to name RAG artists (solid-purple line) in the five-year periods post-1934. Indicating that more reference is being made to the RAG artists by name in the exhibition catalogues than in the RAG's, self-penned, primary sources. Although, it is worth noting that simply by being the authors of their primary sources the RAG might be seen to place themselves into relationship with the artists from other countries of which they write: Just because the RAG do not write of themselves in the third person, does not mean that relationships between them and the named artists within their artwork-texts do not exist. This presents problems in this section of the investigation, and is discussed in more detail below. It is also the reason for, initially, viewing the inter-AN[NS] relationships separately for the periods 1900-1934 and 1935-2009.

A second observation from *graph 2.9.1*, and more clearly shown in *graph 2.9.2*, is the fact that as the periods progress from 1900 to 2009, there is a greater number of different nationalities represented by the artists named within the artwork-texts. As with the *fingerprints* for recording unit GEOT[NS] (*image 2.3.1*) or for the AW recording units (*image 2.4.1*), there is an increase in the multifaceted nature of the AN recording unit as the five-year periods progress from 1900 to 2009. When “read” from left to right, *graph 2.9.2* demonstrates this through the increasing number of differently coloured lines, each representing artists from a different nation. From the initial one country of Italy (dark-grey

[133] The fact that this thesis does indeed focus on this group of artists (ANRAG), within in the context of the use of their names within its text, is evidenced in *image 4.1.1*.

line) represented in the period 1905-1909, to artists from seven different nations being represented in the artwork-texts produced between 1925-1929,[134] to 13 between 1935-2939,[135] and 23 between 1980-1984.[136]

A third observation, examining the changing proportion of artwork-text dedicated to Artist Name (AN), is indicated via the dotted-red line on *graph 2.9.1*. This line illustrates the increase in the percentage of the text being used for the naming of artists, especially in the post-1934 period. From 1900 to 1934, the RAG-primary-source era, the average weighted percentage of the total proportion of artwork-text represented by AN, reaches a peak in 1919 of 3.11%. The average weighted percentage of recording unit AN, for the Years from 1902 to 1934, is .50%. This compares to an average of 3.12% for the Years from 1935 to 2009, and a peak of 7.30% for the artwork-texts of 1967.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[137]	*p*-value	Lower	Upper
AN	Year	.476	58	.000	.334	.600
GEOT	Year	.605	58	.000	.471	.709
AN	GEOT	.644	58	.000	.519	.746

Table 2.9.1: Bivariate correlation (Kendal's Tau) between the recording units AN and Year, GEOT and Year, and between AN and GEOT. (Per Year from 1902 to 2009.)[138]

An explanation for the second and third observations is provided in reference to "Section 2.3", *image 2.3.1*, and the second-level unit GEOT[NS]. *Image 2.3.1* demonstrates the increase in the proportion of different, geographical, nations included within the artwork-texts through the five-year periods from period 1900-1904 to period 2005-2009. The increasing ambition of exhibitions and catalogue contributors to position the artwork of the RAG globally, in part, explains, not only, the increase in the number of artists from different countries, but, through the accumulation of catalogue description and contextualization, also

[134] The seven nations are (average weighted percent per five-year period): Netherlands (.0075%); France (.08%); Germany (.0075%); Hungary (.0075%); Italy (.0075%); ANOTR (Greece) (.08%); RAG (.3225%).
[135] The 13 nations are (average weighted percent per five-year period): United Kingdom (.68%); Netherlands (.048%); France (.198%); Germany (.044%); Hungary (.04%); Italy (.032%); ANOTR (Mexico) (.038%); RAG (.114%); Romania (.02%); Russia (.05%); Spain (.076%); Switzerland (.074%); USA (.008%).
[136] The 23 nations are (average weighted percent per five-year period): Austria (.02%); Belgium (.042%); United Kingdom (.094%); Netherlands (.124%); France (.394%); Germany (.326%); Hungary (.112%); Ireland (.004%); Italy (.116%); ANOTR (Canada; Chile; Czech Republic; Finland; Mexico; Yugoslavia [former]; Other) (.054%); Poland (.056%); RAG (1.496%); Romania (.016%); Russia (.064%); Spain (.046%); Switzerland (.064%); USA (.038%).
[137] Cases (*N*) derive from 58 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)
[138] A complete list of results for correlation between AN[NS] (1902-1934) is produced in *App.2-[1902-1934]-16*.

explains the overall increase in the percentage of artwork-text being used to name such artists.

Table 2.9.1 supports this hypothesis: It confirms the significant, positive correlation between GEOT and Year. As the Years increase in numerical value from 1902 to 2009, so the value of GEOT's weighted percentage increase. Therefore, not only do the number of different, geographical nations cited within the artwork-text increase (*image 2.3.1*), but the proportion of the text used to cite them also increases. *Table 2.9.1*, also, confirms the observations of the dotted-red line from *Graph 2.9.1*: There is an increase within the artwork-texts through the five-year periods from 1900 to 2009 of text used for Artist Name (AN). This is supported by the significant, positive correlation between AN and Year, which indicates as the Years progress from 1902 to 2009 (increase in numerical value) the weighted percentage of AN also increases. In addition to the significant, positive correlations of both GEOT–Year and AN–Year, *table 2.9.1* also contains the significant, positive result of the correlation calculated between AN and GEOT. This further demonstrates the validity of the hypothesis that there is a relationship between the increasing global contextualization of the artwork-text, and the proportion of artwork-text used to name artists.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[139]	*p*-value	Lower	Upper
ANDUT	ANGER	.667	26	.001	.326	1.000
ANDUT	ANHUN	.394	26	.044	.090	1.000
ANDUT	**ANRAG**	**.349**	**26**	**.039**	**.095**	**.573**
ANDUT	ANUSA	.546	26	.019	.183	1.000
ANGER	ANHUN	.657	26	.001	.326	1.000
ANHUN	ANITA	.457	26	.012	.214	1.000
ANPOL	ANUSA	.657	26	.001	.398	1.000

Table 2.9.2: Significant bivariate correlations (Kendal's Tau) between AN[NS] recording units and AN[NS] recording units within the primary-source artwork-text of the RAG. (Per Year from 1902 to 1934.)[140]

Table 2.9.2 contains all of the significant correlations between artists' names of different nationality, within the primary-source artwork-text written by the RAG from 1902 to 1934. Although there is only one significant correlation that includes named RAG artists (**bold** emphasis), as already stated, there is an implied relationship between the RAG authors of the sources, and those artists named within them. What *table 2.9.2* allows for, is the viewing of which international artistic relationships the RAG thought of as significant.

[139] Cases (*N*) derive from 26 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

[140] A complete list of results for correlation between AN[NS] (1902-1934) is produced in *App.2-[1902-1934]-16*.

Examining the three strongest relationships present in *table 2.9.2* of ANDUT–ANGER, ANGER–ANHUN and ANPOL–ANUSA, within the RAG artwork-texts there are several examples of artists from these combinations of countries being discussed and named in relationship to each other. Dutch (ANDUT) and German (ANGER) artists are written of by, both, David Burliuk and Aleksandr Rodchenko. Burliuk, in "Cubism (Surface–Plane)" (1912), discusses the artists Rembrandt and Holbein whilst defining the historical basis of cubism:

> Like everything else, Cubism has its history. Briefly, we can indicate the sources of this remarkable event.
> I. If the Greeks and **Holbein** were, as it were, the first to whom *line* (in itself) was accessible.
> II. If Chiaroscuro (as colour), texture, surface appeared fleetingly to **Rembrandt**.
> III. Then Cézanne is the first who can be credited with the conjecture that Nature can be observed as a Plane, as a surface (surface construction).[141]

Whilst Burliuk draws from the past, Rodchenko, in his letter to Boris Kushner, begins in the same vein, before examining the photographic work of the contemporary German architect Erich Mendelsohn. Rodchenko begins by charting the four stages in the history of "visual discovery". Describing the first stage as "realism":

> The second stage is through the individual psychological perception of the world. Leonardo da Vinci, **Rubens** and so on in their paintings represent this type in different ways Leonardo da Vinci in the Mona Lisa, and **Rubens** in the portrayal of his own wife.
>
> The third stage is preciosity, painting for paintings' sake – for example, **Van Gogh**, Cezanne, Matisse. Picasso, Braque.[142]

The fourth stage in this development is "abstraction" described as almost "scientific-composition". This scientifically composed view, according to Rodchenko, is photography's arena, and this leads to his praise of Mendelsohn's photography for revealing the truth of

[141] Burliuk, 1912, p. 74 (Emphasis added by James Strugnell)
[142] Rodchenko, A., 1928[a], p. 56 (Emphasis added by James Strugnell)

what people "really" see. Contrasting Mendelsohn's "European" style of photography with the "American" style, Rodchenko writes:

> The other set of pictures of the same building were taken by the left-wing German architect **Mendelsohn**. He took an honest picture, the way an ordinary passer-by could see these buildings on the street.
>
> One shot is of the fire escape. It is a real view, one can see it like this from the window. But how impressive it is. It is possible that we often look at similar things without really seeing them.
>
> We do not always see what we look at.[143]

This letter by Rodchenko also provides evidence for the significant, positive relationship between the naming of German (ANGER) and Hungarian (ANHUN) artists within the artwork-texts of the RAG. Before concluding his letter, writing about the "left-wing" German architect Mendelsohn, Rodchenko discusses another "left-wing" artist in regard to the lack of writing on "visual thinking". Of, Hungarian, Moholy-Nagy he writes:

> I am not a writer. I have a visual mind. Nobody, however, writes about visual thinking. There are no articles on photography, nobody analyses its tasks and successes. Even left-wing photographers, such as **Moholy-Nagy**, write individual articles on 'My Working Method'. 'My Way in Photography' and so on.[144]

The third of the relationships, between Polish (ANPOL) and American (ANUSA) names is an anomaly. But it does raise worthwhile consideration regarding the use of citations within this thesis. The use of citations is of limited appeal in many respects. Bivariate correlation, for the most part, adds to the understanding of both inter-textual and textual-object relationships. It also reduces these relationships to a standardized digit that can be compared and contrasted with any of the other bivariate correlations (standardized digits) within this thesis. The results from the calculation of Kendall's Tau, allow for the determining of relationships within and between large quantities of data. Citations run contra to this by

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[143] Rodchenko, A., 1928[a], p. 66 (Emphasis added by James Strugnell)
[144] Rodchenko, A., 1928[a], p. 56 (Emphasis added by James Strugnell)

focusing on small quantities of data. They are, also, equally supportive of the results from bivariate correlation, based on all available data, as they are of assertions based, potentially, solely on the limited data of the citation. What the citations within this thesis are used for, primarily, and why they are important, is in demonstrating the validity of significant correlations. They are not used to support assertions, or as the foundations on which to build assertions. When, though, as is the case of the significant, positive relationship between the variables ANPOL and ANUSA, no supporting citation is found, and there is an apparent failure of the use of the statistical method as a diagnostic tool, the reason for such an anomalous result is usually discoverable.

The American artist that is being referenced in the significant, positive relationship, ANPOL–ANUSA, by the RAG artwork-text is the American poet Walt Whitman. In 1919, Rodchenko writes “Rodchenko’s System”, he includes several quotations from Whitman’s *Leaves of Grass*. The citations each promote the power of death as a creative force for renewal, which Rodchenko links to the killing of the old art in pursuit of a new art.[145] This writing by Rodchenko dates from the same year as Vavara Stepanova writes, in her diary, about an exhibition of Olga Rozanova’s artwork-objects, that she was visiting with the Polish avant-garde artist Władysław Strzeminsky.[146] It is because the sampling unit for the content analysis contains all of the artwork-texts produced in one particular Year, that such relationships can occur; where two unrelated artwork-texts can make it seem that there might be a significant relationship between two concepts that does not exist upon further exploration.

As is demonstrated above, two of the three pairs of variables identified as having a strong and significant, positive relationship within the artwork-text are able to be evidenced, as are the significant relationships throughout this thesis. One problematic feature specific to the results in *table 2.9.2*, written of already, is that the artwork-texts are written by the RAG artists themselves, and therefore the ANRAG recording unit might be underrepresented. There are two reasons for this: Firstly, due to the RAG, who wrote these articles, referring to themselves within them in the first person, rather than by their own names (third person). As it is these proper nouns that are used to form the AN recording units, reference to an RAG artist by themselves with the pronouns “I”/“myself”, or the possessive pronoun “my” would

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[145] Aleksandr Rodchenko, "Rodchenko's System", 1919, in Bowlt, J. E., (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991, pp. 149-151

[146] Stepanova, 1919[b], p. 337

not have been accounted for. Due to the amount of text involved in the content analysis it is not feasible to attribute each personal pronoun to its person/author. Especially in consideration with the second reason for the underrepresentation of the ANRAG recording unit. Even if the RAG writer did not replace their name with the appropriate personal pronoun, or there are no "their names" to replace within their artwork-text, by them being the author of the text there is an unenumerable implicit relationship between the ANRAG of them as author and the other AN[NS] units written by them within their artwork-text. In the case of the primary sources, written by the RAG, it is possible that for these reasons the results are skewed, and less accurate; underemphasizing the significance of some relationships between AN[NS] unit and ANRAG, and overemphasizing the significance of some relationships between AN[NS] units.

Artwork-text produced in the post-1934 period (1935-2009) is less effected by the problems associated with AN[NS] enumeration and correlation discussed in relation to the primary-source artwork-texts dating from 1902 to 1934. This is due to secondary sources dominating the artwork-texts of this latter period. None of the secondary sources are written by the RAG and, therefore, the secondary-source authors, theoretically, express all AN[NS] recording units, including ANRAG, equally; i.e. with the same relative use of proper nouns and pronouns, and no use of personal pronouns in relation to ANRAG.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)	*p*-value	Lower	Upper
ANAUS	Year (1902-2009)	.245	58	.021	.100	.375
ANBEL	Year (1902-2009)	.181	58	.090	.066	.301
ANBRI	Year (1902-2009)	.294	58	.004	.126	.453
ANDUT	Year (1902-2009)	.257	58	.010	.081	.417
ANFRA	Year (1902-2009)	.262	58	.006	.073	.439
ANGER	Year (1902-2009)	.302	58	.003	.129	.453
ANHUN	Year (1902-2009)	.291	58	.004	.110	.459
ANIRE	Year (1902-2009)	.155	58	.150	.035	.290
ANITA	Year (1902-2009)	.254	58	.011	.075	.431
ANOTR	Year (1902-2009)	.226	58	.029	.061	.377
ANPOL	Year (1902-2009)	.163	58	.119	.009	.315
ANRAG	Year (1902-2009)	.457	58	.000	.296	.598
ANROM	Year (1902-2009)	.172	58	.106	.049	.299
ANRUS	Year (1902-2009)	.558	58	.000	.420	.681
ANSPA	Year (1902-2009)	.238	58	.016	.051	.416
ANSWI	Year (1902-2009)	.290	58	.005	.127	.427
ANUSA	Year (1902-2009)	.245	58	.020	.086	.406

Table 2.9.3: Bivariate correlation (Kendal's Tau) between AN[NS] recording units and Year. (Per Year from 1902 to 2009.)[147]

[147] Cases (*N*) derive from 58 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

For, both, the artwork-texts from the period 1902 to 1934, and those from 1935 to 2009, when examined in isolation from each other, there are no significant relationships calculable between any of the second level AN recording units and Year.[148] There are no trends of, either, negative or positive correlation found between the weighted percentages of AN[NS] recording units and the advancement of time. If, though (*table 2.9.3*), the same calculations of Kendall's Tau are performed for the entire period from 1902 to 2009, many of the AN[NS] units exhibit significant, positive relationships with Year (1902-2009); as time progresses their average, yearly weighted percentage increases. This is true of all 17 AN[NS] recording units, with the exception of the names of artists from four countries, which do not exhibit significant relationships with Year (1902-2009): Belgium (ANBEL); Ireland (ANIRE); Poland (ANPOL); Romania (ANROM). These four AN[NS] recording units produce correlations with Year (1902 to 2009) with *p-values* greater than .05. These values have been underscored on *table 2.9.3*. The fact that, when studied in isolation, neither the period 1902-1934 nor 1935-2009 exhibit significant, positive relationships between AN[NS] and Year, suggests that there is a marked contrast and increase in the use of artists' names within the artwork-texts from these two periods.

The changes in the weighted percentages of the AN and AN[NS] recording units is shown in *graph 2.9.1* and *graph 2.9.2*. As discussed, *graph 2.9.1* charts, via the dotted-red line, the increase in the average weighted percentage of the AN recording unit between these two periods. Graph 2.9.1, via the purple line, also clearly shows the increase in the ANRAG recording unit post-1934. *Graph 2.9.2* illustrates the increase in the number of different nations being referred to through their artists' names. If a nation goes from a constant zero representation during the period 1902-1934, to being consistently represented in the period 1935-2009, although both periods in isolation might show no significant, positive/negative relationship between AN[NS] and Year, when conjoined in examination of the period 1902-2009, this zero to something will be calculated as a positive relationship. If the difference is great enough it will be calculated as a significant, positive relationship. This is demonstrated by examining the recording units ANAUS (Austrian Artist Name) and ANSWI (Swiss Artist Name). Neither, ANAUS (light-blue line) nor ANSWI (light-green line) appear on *graph 2.9.2* (or *graph 2.9.1*) until after 1934: ANAUS first appears in the period 1965-1969; ANSWI first appears in the period 1935-1939. Examining their correlations with Year for the periods 1902-1934 and 1935-2009: For the period 1902-1934 there is no data, and therefore no

[148] Complete lists of results for correlation between AN[NS]–Year (1902-1934) and AN[NS]–Year (1935-2009) are produced in *App.2-[1902-1934]-16* and *App.2-[1935-2009a]-10* respectively.

correlations calculable for either ANAUS or ANSWI;[149] For the period 1935-2009, neither AN[NS] recording unit has a significant relationship with Year.[150] Examination of *table 2.9.3* reveals that for the period from 1902 to 2009, both, ANAUS and ANSWI have significant relationships with Year (1902-2009).

Given the previous arguments and explanations regarding underrepresentation during the 1902-1934 period of the ANRAG recording unit, unsurprisingly, for the period 1902-2006 there is a significant, positive relationship between ANRAG and Year (*table 2.9.3*). This contrasts with two insignificant relationships for the periods 1902-1934 and 1935-2009.[151] The purple line (average weighted percentage of ANRAG per five-year period) of *graph 2.9.1*, also illustrates the contrast between these two periods that leads to two periods of insignificant correlations conjoining to form the significant, positive period of 1902-2009. It illustrates the increase in the average weighted percentage of the ANRAG recording unit advancing from an average of .27% from 1902 to 1934, to 2.06% from 1935 to 2009.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*[152])	*p*-value	Lower	Upper
ANRAG	ANBRI	-.408	32	.002	-.606	-.167
ANRAG	ANGER	-.271	32	.040	-.463	-.055
ANRAG	ANOTR	-.525	32	.000	-.696	-.327
ANRAG	ANROM	-.308	32	.031	-.493	-.105
ANRAG	ANSWI	-.412	32	.002	-.582	-.196

Table 2.9.4: Significant bivariate correlations (Kendal's Tau) between the recording units ANRAG and AN[NS] recording units. (Per Year from 1935 to 2009.)[153]

Table 2.9.4 contains all of the significant results from calculating the correlations between ANRAG and all of the other AN[NS] recording units for the exhibition-artwork-text period 1935-2009. All of the significant relationships are negative; an increase in the use of RAG-artist names (ANRAG) within the artwork-text of the catalogues relates to a decrease in the naming of artists from other nations, and *vice versa*. The greater the proportion of exhibition-catalogue artwork-texts focusing on RAG artists the lesser the proportion focusing on artists from other nations; the artwork-text becomes less inclusive. When the 1935-2009 artwork-texts of the 62-British-exhibition canon contain an increasing percentage of non-RAG-artist

[149] See *App.2-[1902-1934]-16*.
[150] ANAUS and Year (1935 to 2009): $T = -.052$, $N = 32$, $p > .05$ (.711), BCa 95% CI [-.341, .264]. ANSWI and Year (1935 to 2009): $T = -.198$, $N = 32$, $p > .05$ (.139), BCa 95% CI [-.459, .089].
[151] ANRAG and Year (1902 to 194): $T = .252$, $N = 26$, $p > .05$ (.082), BCa 95% CI [-.087, .562]. ANRAG and Year (1935 to 2009): $T = -.008$, $N = 32$, $p > .05$ (.948), BCa 95% CI [-.297, .286].
[152] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)
[153] A complete list of results for correlation between AN[NS] (1935-2009) is produced in *App.2-[1935-2009a]-10*.

names (AN[NS]), these AN[NS] units are demonstrated to be more inclusive of each other, with many significant, positive correlations in evidence. *Table 2.9.5* contains the correlations between those AN[NS] recording units that ANRAG has significant, negative relationships with.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[154]	*p*-value	Lower	Upper
ANBRI	ANGER	.187	32	.190	-.115	.478
ANBRI	ANOTR	.497	32	.001	.179	.735
ANBRI	ANROM	.113	32	.463	-.193	.450
ANBRI	ANSWI	.454	32	.002	.215	.675
ANGER	ANOTR	.340	32	.019	.053	.603
ANGER	ANROM	.370	32	.024	.047	.625
ANGER	ANSWI	.640	32	.000	.385	.830
ANOTR	ANROM	.400	32	.011	.076	.695
ANOTR	ANSWI	.519	32	.000	.232	.775
ANROM	ANSWI	.292	32	.057	-.010	.609

Table 2.9.5: Bivariate correlations (Kendal's Tau) between the AN[NS] recording units from *table 2.9.4* with which ANRAG had significant, negative relationships. (Per Year from 1935 to 2009.) [155]

Table 2.9.5 shows that in all but three (underscored) of the 10 case, the relationships between the AN[NS] units that have a significant, negative relationship with ANRAG are significantly positive. Whilst the recording unit ANRAG occurs in relation to the detriment of the discussion of artists from other nations, tending to occur with a simultaneous proportionally reduction in the discussion of artists from these nations in relation to its increasing proportional presence within the artwork-text, the other AN[NS] units have a greater chance of having a positive relationship with one another. A significant, positive relationship between non-ANRAG second level recording units is evident in 70% of the cases in *table 2.9.5*. Among all 128 possible combinations of AN[NS] relationships within the artwork-texts dating from 1935 to 2009 (*App.2-[1935-2009a]-10*), there is a 36.33% chance that the relationship will be a significant, positive one, and a 4.69% chance that it will be a significant, negative one. Among the possible relationships able to be formed between the ANRAG recording unit and the other AN[NS] recording units, there is a 31.25% chance that it will be a significant, negative relationship, and zero chance of it being a significant, positive one.

The AN recording unit is returned to, and further examined in "Section 3.1.5" in relationship to the numbers of RAG artwork-objects exhibited within the 62-British-exhibition canon.

[154] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)
[155] A complete list of results for correlation between AN[NS] (1935-2009) is produced in *App.2-[1935-2009a]-10*.

Although the relationships between the artwork-text and artwork-objects, calculable within the 62-British-exhibition canon, have been previously discussed, primarily, in relationship to artwork-object size in “Section 2.5”, and, briefly, in terms of numbers exhibited in “Section 2.6”, this relationship becomes the main focus of “Unit 3”. “Unit 3” examines the relationships between artwork-text and RAG artwork-objects within the 62-British-exhibition canon to discover how it defines/formulates the artwork of the RAG during the period from 1935 to 2009.

UNIT 3

3.0 – Bivariate Correlation between Artwork-Objects and Artwork-Texts: Introduction

As “Section 1.1” describes, this thesis is based on the premise that the "particles" of artwork-objects, displayed in the various exhibitions, are not measurable simultaneously against their associated "wave" of contextualizing artwork-text produced for each exhibition. They must be examined individually. Content analysis, examined in “Unit 2”, explores the changing textual element of art (historical) production. “Unit 3” examines, in parallel rather than simultaneously, this content analysis (artwork-text) and the numbers of various RAG artwork-objects displayed in the same Year: It examines the “shadow” of the artwork formed between the artwork-text and artwork-object. Firstly, by quantitatively measuring both factors separately, with no reference to each other. Secondly, by calculating the bivariate correlation between these two separate measurements for corresponding Years, allowing for the examination of trends between these two datasets.

The differentiation between the direct comparison of artwork-text and the artwork-object, and the examination of the relationship between the separately calculated content analysis of artwork-text and the exhibition-quantities of artwork-objects by different RAG artists is a subtle one. But as “Unit 2” demonstrates, and this section continues to demonstrates, the method of working presented in this thesis allows trends among, potentially, very large individual datasets to be identified through calculation and compared with one another. These comparisons (relationships/correlations), once the datasets are created, can be calculated quickly, on very large amounts of data (text, frequencies, etc.), to present facts in a standardized numerical form with the quality and ability of being cross-referenced and compared to other such units. In this thesis, these results (numbers) are divided into two groups: Those that are statistically significant, and those that are not (“Section 1.2.1”). In this section, the significant correlations, both positive and negative, are calculated between the two datasets of catalogue-content analysis (artwork-text) and RAG-artwork-object exhibition-quantity (artwork-object).[1] The correlations (Kendall's Tau) are calculated between each dataset's data-points as they correspond to the Years of exhibitions from 1935 to 2009: Significant correlations, in this section, evidence that as the exhibition-quantities of certain types of RAG artwork-objects change over the Years, there is correspondence to changes in

[1] Both of these datasets are presented on *Strugnell-ThesisCD*, *Excel* files: *Strugnell-A-02 (RAG artwork-objects in the 62 exhibitions)* and *Strugnell-A-T1 (Content analysis of artwork-text per Year)*.

particular words/content used in the accompanying artwork-text. If the quantity-of-exhibition of particular RAG artwork-objects is equated to the probability of particular artwork-objects "particle" being found at a certain place, then correlating words/concepts[2] from content analysis are evidence of the "path" used to reach this point.

[2] In the form of recording units: See "Unit 2".

3.1 – Bivariate Correlation between ANoRAG[M/F]/ANo[T23Artist] and Artwork-Texts

"Section 3.1" examines the total number of RAG artwork-objects (ANoRAG) exhibited in any particular Year within the 62-British-exhibition canon from 1935 to 2009, and whether there is significant correlation, positive or negative, to various content-analysis recording units (artwork-texts). The total number of RAG objects (ANoRAG) is divided into two further groups: Total number of male-RAG artwork-objects (ANoRAGM), and total number of female-RAG artwork-objects (ANoRAGF). The bivariate correlations between these artwork-object (ANoRAG[M/F]) datasets and the recording units within the content-analysis dataset are calculated. The content-analysis dataset and its recording units/concepts is the same dataset (1935-2009) as used in "Unit 2", and the unit of measurement is weighted percentage. The RAG-artwork-object-exhibition-quantity dataset consists of the number of RAG objects exhibited in the exhibitions for each individual Year from 1935 to 2009 for which there is data (i.e. an exhibition held).

"Section 3.1.5" differs, slightly, from the other sections within "Section 3.1" in that the variable ANoRAG[M/F] is replaced with ANo[T23Artist]. This allows for the calculation of relationships between artwork-object exhibition-quantities by specific, individual RAG artists, namely the T23Artist, and various content-analysis recording units.[3]

[3] The T23Artist being those RAG artists who have ≥ 30 artwork-objects exhibited within the exhibitions of the 62-British-exhibition canon from 1935 to 2009.

3.1.1 – Bivariate Correlation between ANoRAG[M/F] and First-Level Recording Units/Second-Level (and Third-Level) AN Recording Units

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[4]	*p*-value	Lower	Upper
ANoRAG	AW	-.261	32	.036	-.479	-.017
ANoRAG	CONN	.393	32	.002	.147	.624
ANoRAGF	AW	-.275	32	.031	-.474	-.057
ANoRAGM	CONN	.388	32	.003	.138	.605

Table 3.1.1.1: Significant bivariate correlations (Kendal's Tau) between ANoRAG[M/F] and first-level recording units. (Per Year from 1935 to 2009.)[5]

Table 3.1.1.1 contains all of the significant correlations calculated between ANoRAG[M/F] and the first-level-of-inclusion recording units (yellow boxes in *figure 2.0.1*). Of the 33 possible correlations, between the three, different RAG artwork-object quantity variables (ANoRAG[M/F]) and the 11 first-level recording units, there are only four that are significant.

Of the first-level units that produce no significant correlations with the numbers of RAG objects on display, perhaps, the most surprising is AN (Artist Name). Their might be expected, evidence of a significant, positive correlation between AN and ANoRAG[M/F]. Indicating that as the number of artwork-objects increase within an exhibition, the percentage of artwork-text being used to name artists also increases. *Table 3.1.1.2* contains the results for these three relationships, and demonstrates no significant, positive, nor negative, correlations between ANoRAG[M/F] and AN.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[6]	*p*-value	Lower	Upper
ANoRAG	AN	.032	32	.795	-.214	.271
ANoRAGM	AN	.000	32	1.000	-.238	.236
ANoRAGF	AN	.017	32	.895	-.227	.268

Table.3.1.1.2: Bivariate correlation (Kendal's Tau) between ANoRAG[M/F] and the recording unit AN. (Per Year from 1935 to 2009.)

Examining the AN recording unit's second and third levels of inclusion, focusing on the correlation between the naming of RAG artists within the catalogues (AN) and the numbers of their artwork-objects being displayed (ANoRAG[M/F]), there is an interesting contrast between the male-RAG and female-RAG. Defined in *figure 2.0.1*, the first-level unit AN is

[4] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

[5] A complete list of results for correlation between ANoRAG[M/F] and first-level recording units (1935-2009) is produced in *App.2-[1935-2009b]-01*.

[6] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

formed from 17 second-level recording units (AN[NS]) that divide AN into national units based on the artists' countries of origin, or define the artists as RAG (ANRAG). Where applicable, these second-level AN[NS] recording units are each sub-divided into two, third-level units of gender (AN[NS][M/F]). The recording unit of interest now, is the second-level ANRAG unit, and its third-level units of ANRAGM and ANRAGF. (Section 3.1.5 examines these units in even further detail: Studying the individual RAG artists' named within both the ANRAG[M/F] recording unit and ANoRAG[M/F].)

The correlation between second-level ANRAG and ANoRAG[M/F] echo the results previously discussed with regard to the first-level recording unit AN and ANoRAG[M/F]: There are no significant correlations.[7] The contrast occurs between the third-level units of ANRAGF and ANRAGM, and ANoRAG[M/F]. All of the correlations between these variables are listed in *table 3.1.1.3*.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[8]	*p*-value	Lower	Upper
ANoRAG	ANRAGM	.047	32	.709	-.263	.342
ANoRAGM	ANRAGM	.050	32	.685	-.265	.349
ANoRAGF	ANRAGM	-.082	32	.522	-.306	.155
ANoRAG	ANRAGF	.214	32	.093	-.051	.448
ANoRAGM	ANRAGF	.139	32	.274	-.103	.381
ANoRAGF	ANRAGF	.337	32	.010	.056	.570

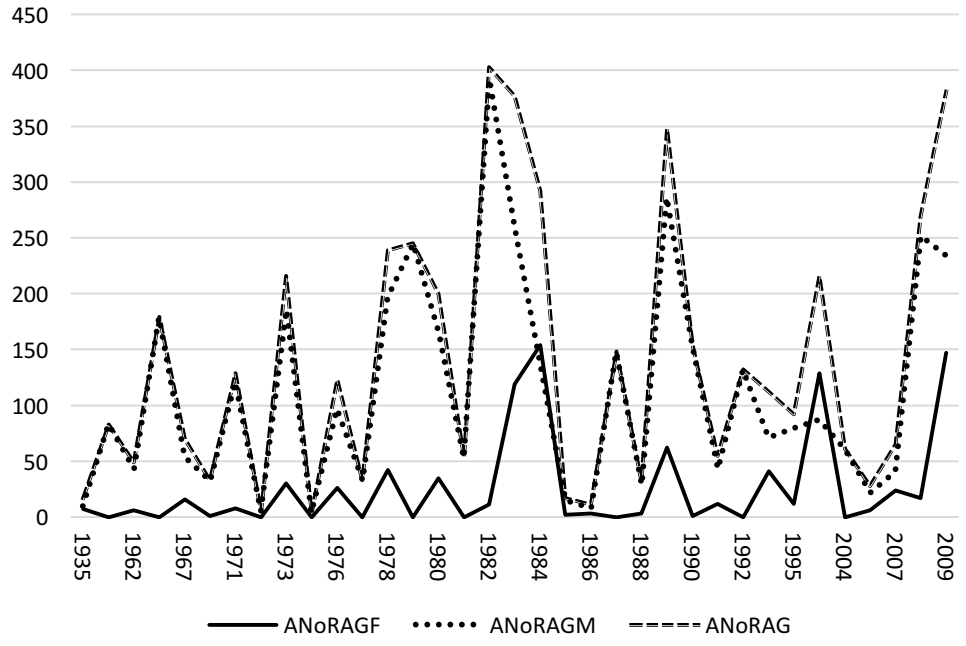
Table.3.1.1.3: Bivariate correlation (Kendal's Tau) between ANoRAG[M/F] and third-level AN recording units ANRAG[M/F]. (Per Year from 1935 to 2009.)

Table 3.1.1.3 shows that the only significant correlation is between the number of exhibited female-RAG artwork-objects (ANoRAGF) and the weighted percentage of female-RAG names within the artwork-texts (ANRAGF). This is a significant, positive correlation; as one variable increases or decreases in value the other variable does likewise. The fact that this is the only correlation of significance in *table 3.1.1.3*, demonstrates a unique interrelationship between the writing (artwork-text) about and displaying (artwork-object) of female-RAG artwork, within the 62-British-exhibition canon, that does not occur within male-RAG artworks.

[7] ANRAG and ANoRAG: $T = .083$, $N = 32$, $p > .05$ (.506), BCa 95% CI [-.205, .371]. ANRAG and ANoRAGM: $T = .063$, $N = 32$, $p > .05$ (.615), BCa 95% CI [-.241, .346]. ANRAG and ANoRAGF: $T = .011$, $N = 32$, $p > .05$ (.935), BCa 95% CI [-.234, .244].

[8] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

Graph 3.1.1.1 plots the number of RAG objects (ANoRAG [dashed line]), male-RAG objects (ANoRAGM [dotted line]), and female-RAG objects (ANoRAGF [solid line]) exhibited per Year[9], for the period 1935-2009 for which there are exhibitions from the 62-British-exhibition canon held. ANoRAG and ANoRAGM chart a similar course for this period, with nine "peaks" of ≥100 artwork-objects being displayed in the same Year, and a similar average for the number of artwork-objects displayed each Year for which there is an exhibition from 1935 to 2009: 139.17 and 113.06 respectively. In contrast the average number of female-RAG objects exhibited each Year from 1935 to 2009 is 26.11, and ANoRAGF demonstrates only three "peaks" in which the number of female-RAG artwork-objects exhibited is ≥100: 2009; 1999; 1984. ANoRAGF (*graph 3.1.1.1*) also goes beyond 100 in 1983, and there is a pronounced, but smaller, peak in 1989 of 62 (more than double the average).



Graph 3.1.1.1: Line graph allowing comparisons of the relationships between ANoRAG[M/F] and Year (1935-2009).

Why is there a significant, positive correlation between the number of female-RAG artwork-objects displayed and the weighted percentage of artwork-text dedicated to female-RAG artists' names, but no correlation for the respective male-RAG data? Why is it that, statistically, when an artwork-object by a female-RAG artist is displayed, female-RAG artists are also written about by name, but the same is not true for male-RAG artists?

[9] "Year" in this case refers to those years in which the 62 exhibitions of the 62-British-exhibition canon were held. For the period 1935-2009 there are 32 such Years.

Pursuing an explanation for the correlation between ANRAGF and ANoRAGF: Of the 62 exhibitions within this study, 42 do not name specific, individual RAG artists in their titles, and 20 do. If those that name individual RAG artists in their titles are termed “focused” RAG exhibitions and those that do not are termed “general” RAG exhibitions, comparison between the ANoRAG[M/F] “peaks” on *graph 3.1.1.1* and the Years in which "focused" exhibitions occur could provide an explanation, if the notion of a “focused” exhibition is gendered. This might give rise to a “gender-focused” RAG exhibition, if the exhibition’s title names either a male-RAG or female-RAG artist. The first hypothesis (H_1) would be: If the “peaks” of ANoRAGF, from *graph 3.1.1.1*, coincide to a greater percent with the Years of "gender-focused" exhibitions favouring the female gender, than the “peaks” of ANoRAGM coincide with male “gender-focused” exhibitions, this explains the significant correlation. *Table 3.1.1.4* contains: The Years in which "focused" exhibitions occur; the name of the exhibitions; the Years in which ANoRAGM and ANoRAGF “peak” at ≥100; the number of artwork-objects exhibited by either male-RAG or female-RAG artists in these “peak-years”.

"Focused" Exhibitions		≥100 Artwork-Objects Exhibited		Number/% (as % of total RAGM/F artwork-objects exhibited) of Artwork-Objects Exhibited	
Year	Title	ANoRAGM	ANoRAGF	ANoRAGM (Total RAGM artwork-objects: 3,957)	ANoRAGF (Total RAGF artwork-objects: 914)
1959	Kasimir Malevich 1878-1935				
1966	Naum Gabo: Constructions, Paintings, Drawings An Introduction to El Lissitzky Kandinsky and his Friends	X		179/4.52	
1973	Tatlin's Dream: Russian Suprematist and Constructivist Art 1910-1923	X		186/4.70	
1975	2 Stenberg 2: The "Laboratory" Period (1919-1921) of Russian Constructivism				
1976	Kasimir Malevich				
1977	The Suprematist Straight Line: Malevich; Suetin; Chasnik; Lissitzky				
1979	Alexander Rodchenko 1891-1956	X		245/6.19	
1982	Mayakovsky: Twenty Years of Work Collages and Reliefs 1910-1945 and Hiller Heliographs	X		392/9.91	
1987	Naum Gabo: Sixty Years of Constructivism	X		148/3.74	
1989	From Picasso to Abstraction Family Workshop: Rodchenko and Stepanova	X		286/7.23	
1990	Naum Gabo 1890-1977: Centenary Exhibition				
1999	New Art for a New Era: Malevich's Vision of the Russian Avant-Garde. Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova…		X		129/14.11
2004	Naum Gabo and Colour				
2008	Alexander Rodchenko: Revolution in Photography	X		252/6.37	
2009	Rodchenko and Popova: Defining Constructivism		X		147/16.08

Table 3.1.1.4: The Years (1935-2009) in which "focused" exhibitions occur; the name of the exhibitions; the Years in which ANoRAGM and ANoRAGF “peak” at ≥ 100 artwork-objects exhibited per Year; the number of artwork-objects exhibited by either male-RAG or female-RAG artists in these “peak-years”.

Seven of the nine “peaks” described by the dotted line of ANoRAGM on *graph 3.1.1.1* coincide with Years of "male-focused" exhibitions: 77.78%. Two of the three peaks described by the solid line of ANoRAGF coincide "female-focused" exhibitions: 66.67%. This evidence does not support the H_1 statement that if the “peaks” of ANoRAGF coincide more frequently with favourable "gender-focused" exhibitions than the peaks of ANoRAGM, then this offers a valid explanation for why there is greater correlation between the naming and displaying of female-RAG artists and female-RAG artwork-objects than male-RAG. This evidence supports the opposite being true, which it is not.

A second hypothesis (H_2), a slight variant on H_1: Rather than the frequency of coinciding *graph 3.1.1.1* “peaks” and "focused" exhibitions being the significant factor, it is the proportional average of artwork-object displayed within them that is the important factor as to why, when female-RAG artwork-objects are displayed in larger numbers, female-RAG artists’ names also represent a larger proportion of the artwork-texts. How proportionally significant are these peaks for the female-RAG and male-RAG artists? *Table 3.1.1.4* also contains the number of artwork-objects by both male-RAG and female-RAG artists that are exhibited in each of the “peak”-years coinciding with favourable "gender-focused" exhibitions. These quantities are expressed as a percentage of the, respective, total number of male and female objects that are exhibited in the exhibitions from 1935 to 2009. This percentage expresses what proportion of the artwork-objects these “peak”-years contain of all the objects available for viewing from 1935 to 2009 in the 62 exhibitions being examined.

Treating the period from 1935 to 2009 as a closed system, which, theoretically, it can now be, as all of the inputs and outputs of the 62-British-exhibition canon under consideration are known/defined: As a percentage, if all of the male-RAG and female-RAG artwork-objects that are displayed during this period are distributed evenly among the 32 Years/cases (*N*) being examined in this section, there is a chance to view 3.125% of all artwork-objects in each Year. This is not the case, the average proportional percentage of male-RAG objects on display in the seven "male-focused" exhibitions identified in *table 3.1.1.4* is 6.09%. Favourable "gender-focused" exhibitions relating to male-RAG objects and artists, contain proportionally more of the artwork-objects than the average 3.125% expected from an even distribution: Containing 1.95 times as many artwork-objects as is expected in an "average" Year. The average proportional percentage of female-RAG objects on display in the two "female-focused" exhibitions identified in *table 3.1.1.4*, though, is 15.1%. Favourable "gender-focused" exhibitions relating to female-RAG objects and artists, contain a much

greater proportion of female-RAG artwork-objects than would be expected from an even distribution: Containing 4.83 times as many artwork-objects as expected in an "average" Year. The "female-focused" exhibitions, due to their, comparatively, high concentration of the female-RAG artwork-object "stock", and the greater contrast to an "average" Year, are more unique/extraordinary events. Due to them containing a high concentration/large number of the finite number of female-RAG artwork-objects within this canon, leads to a smaller number of the artwork-objects being available for the other Years, and therefore smaller percentages of the total number of female-RAG objects able to be displayed in these subsequent Years. This "shortage" of female-RAG objects in most Years, increases the notion of rarity and novelty surrounding them, whilst limiting the opportunities to write about such objects in the artwork-text of an exhibition environment. Therefore, when female-RAG artwork-objects are displayed, they are written about and their female-RAG creators named. H_2 offers a valid explanation as to why the only significant and positive correlation between the number of RAG artwork-objects displayed and the RAG artists named within the artwork-text occurs between ANoRAGF and ANRAGF (as evidenced in *table 3.1.1.3*).

These female-RAG "events" are also illustrated in *graph 3.1.1.1*, where their ≥100-peaks, averaging 143.33 artwork-objects, evidenced by the solid line, representing ANoRAGF, stand in stark contrast to an average exhibition-quantity of just 26.11 objects per year. A contrast that is seen to a lesser extent among the ≥100-peaks of ANoRAGM which, although averaging 241.14, are half hidden by an average frequency of 113.06 objects per year.

The use of a first-level recording unit's constituent second-level and third-level recording units to better understand its relationship to the number of RAG artwork-objects exhibited is continued in the next two sections in reference to the variables of *table 3.1.1.1*. "Section 3.1.2" and "Section 3.1.3" return to *table 3.1.1.1* to examine those recording units, AW and CONN, for which significant correlations were calculated in relationship to the numbers of RAG artwork-objects being included within exhibitions from 1935 to 2009.

3.1.2 – Bivariate Correlation between ANoRAG[M/F] and Second-Level (and Third-Level) AW Recording Units

Returning to *table 3.1.1.1* and the significant correlations calculated between ANoRAG[M/F] and the first level of inclusion. The two, first-level concepts that produce significant correlations with ANoRAG[M/F] are those of AW (Artwork Words) and CONN (Contributor Names). “Section 3.1.2” and “Section 3.1.3” examine these concepts' second-levels of inclusion to gain a great understanding of their significant correlations with ANoRAG[M/F]. The investigation then returns to the significant correlations found between ANoRAG[M/F] and the second-level units, the first-level units for which no significant correlations are calculated. For, even though no significant correlations were calculated at the first-level of inclusion, as with AN, in some other cases there are significant correlation between their second-level units and ANoRAG[M/F].

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[10]	*p*-value	Lower	Upper
ANoRAG	AWMA	-.315	32	.012	-.516	-.101
ANoRAGM	AWMA	-.355	32	.005	-.554	-.131
ANoRAGF	AWSH	-.257	32	.045	-.463	-.021
ANoRAGF	AWST	-.309	32	.018	-.520	-.087
ANoRAG	AWTE	-.283	32	.023	-.490	-.055

Table 3.1.2.1: Significant bivariate correlations (Kendal’s Tau) between ANoRAG[M/F] and second-level AW recording units. (Per Year from 1935 to 2009.)[11]

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[12]	*p*-value	Lower	Upper
ANoRAG	AWPD3D	-.282	32	.024	-.475	-.089
ANoRAGM	AWPD3D	-.322	32	.010	-.510	-.128
ANoRAGF	AWPDTEX	.398	32	.003	.133	.623

Table 3.1.2.2: Significant bivariate correlations (Kendal’s Tau) between ANoRAG[M/F] and third-level AW recording units AWPD[AT]. (Per Year from 1935 to 2009.)[13]

As *table 3.1.1.1* demonstrates, there are significant, negative correlations between, both, ANoRAG and ANoRAGF, and the first-level recording unit AW. The first-level unit AW consists of nine second-level recording units. These are shown in *figure 2.0.1*, and described in “Section 2.0”. Notably, second-level recording unit AWPD (Artwork Word Artistic Product) is, in turn, constructed of five third-level units of Art Type ([AT]). Although

[10] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where “variable 1” and/or “variable 2” has no data. (As described in: “Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis”.)

[11] A complete list of results for correlation between ANoRAG[M/F] and second-level AW recording units (1935-2009) is produced in *App.2-[1935-2009b]-07*.

[12] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where “variable 1” and/or “variable 2” has no data. (As described in: “Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis”.)

[13] A complete list of results for correlation between ANoRAG[M/F] and third-level recording units AWPD[AT] (1935-2009) is produced in *App.2-[1935-2009b]-07*.

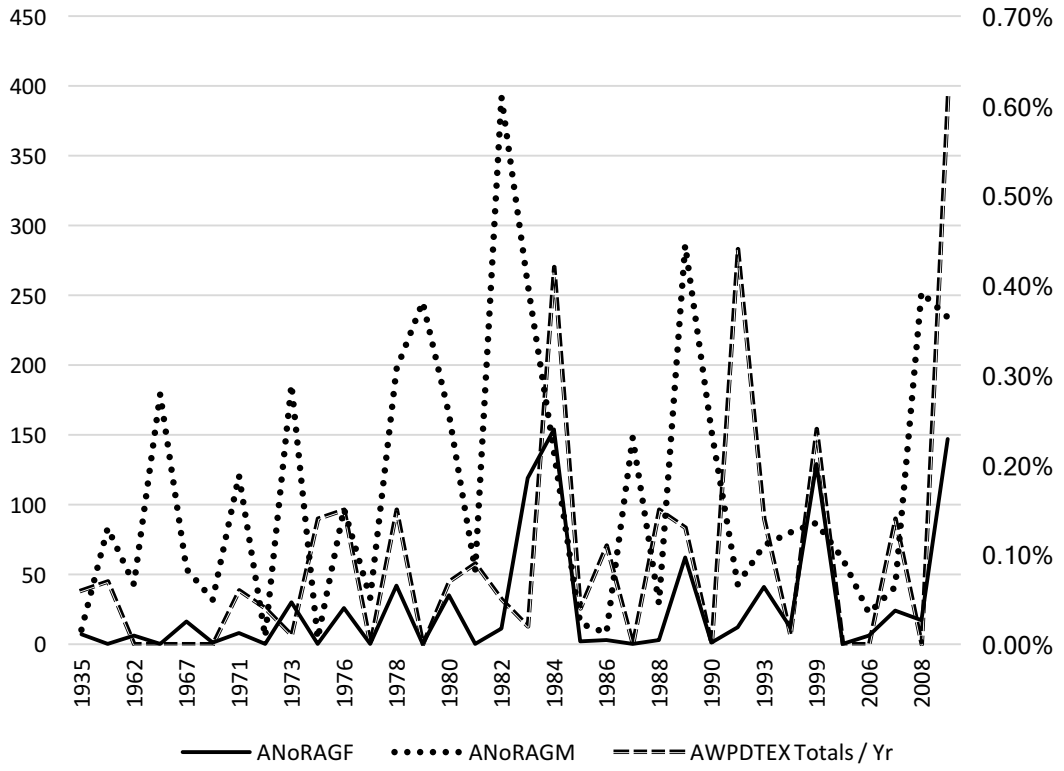
there are no significant correlations between AWPD and ANoRAG[M/F],[14] there are some significant relationships between its constituent parts (AWPD[AT]) and ANoRAG[M/F]. *Table 3.1.2.1* contains all of the significant correlations calculated between ANoRAG[M/F] and second-level AW units. Whilst *table 3.1.2.2* contains the significant relationships between ANoRAG[M/F] and AW's third-level units AWPD[AT].

Table 3.1.2.1 re-enforces *table 3.1.1.1*, emphasising the negative correlation between the number of RAG artwork-objects exhibited (in a given Year from 1935 to 2009), and the weighted percentage of the AW concept within the accompanying exhibition catalogues' artwork-texts: As the number of RAG objects displayed increases, the percentage of artwork-text used to describe their creation, the artistic processes, and their pictorial and physical qualities decreases. The inverse being also true, that as the number of artwork-objects exhibited decreases, the percentage of artwork-text describing their creation and physicality increases. The less RAG artwork-objects exhibited the greater the focus within the artwork-text upon them. Inversely, this suggests that as the number of RAG artwork-objects exhibited increases, a lesser percentage of the contemporaneous artwork-text is focused on the creation and physicality of the artwork-objects, and therefore must be focused on other factors, outside of the artwork-objects themselves.

Table 3.1.2.1 indicates that an increase in the number of RAG artwork-objects leads to the accompanying artwork-text becoming less focused on the objects' formal elements. This decrease in the artwork-texts' focus on the form and style of RAG artwork as the number of artwork-objects being displayed increases is particularly evident in four of the five pairs of variables within *table 3.1.2.1*: ANoRAG–AWMA; ANoRAGM–AWMA; ANoRAGF–AWSH; ANoRAGF–AWST. The second-level unit AWMA contains words describing the medium/materials used within the artworks-objects. Whilst AWSH describes the shapes and structural qualities within the artwork-objects, and AWST describes current state of the objects in terms of both its authenticity and legal ownership. Each of these pairs of variables produce significant, negative correlations and provide further information and meaning to the negative correlations calculated between ANoRAG–AW and ANoRAGF–AW in *table 3.1.1.1*. They expose another gender difference, with artwork-text describing the medium and materials of objects (AWMA) decreasing significantly as the number of objects by male-RAG

[14] ANoRAG and AWPD: $T = -.040$, $N = 32$, $p > .05$ (.746), BCa 95% CI [-.252, .166]. ANoRAGM and AWPD: $T = -.053$, $N = 32$, $p > .05$ (.673), BCa 95% CI [-.271, .174]. ANoRAGF and AWPD: $T = -.059$, $N = 32$, $p > .05$ (.646), BCa 95% CI [-.261, .152].

artists within exhibitions increases. But with no significant, negative correlation between a decrease in AWMA and the increased numbers of female-RAG exhibits. Whilst an inverse pattern is observable when artwork-text describe the shape and structural qualities of an artwork-object (AWSH). AWSH only has a significant, negative relationship with the exhibiting of objects made by female-RAG artists. As the number of these objects increases within exhibitions, less writing is focused on describing the shapes and structures of the art-objects.



Graph 3.1.2.1: Line graph allowing comparisons of the relationships between ANoRAG[M/F] (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and the relationship between recording unit AWPDTEX (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-1934).

In terms of Art Type (AT), *table 3.1.2.2* demonstrates the significant, negative relationship between the number of RAG artwork-objects exhibited and the percentage of the accompanying artwork-text including discussion on three-dimensional artwork. This negative correlation is more significant if the RAG artwork-objects are produced by male-RAG artists. *Table 3.1.2.2* also contains the only significant, positive correlation between RAG artwork-object numbers and AW recording units: ANoRAGF–AWPDTEX. As an increasing number of objects produced by female-RAG artists are exhibited, the percentage of the artwork-text discussing textiles (AWPDTEX) also increases. This is, partly, explained by *graph 3.1.1.1*.

The solid line of *graph 3.1.1.1* charts the number of female-RAG artwork-objects exhibited each Year. The highest "peak" terminates in 1984, with 154 female-RAG artwork-objects exhibited in this Year. 1984 is, also, the Year of the exhibition *Art into Production: Soviet Textiles, Fashion and Ceramics 1917-1935*, held at the Museum of Modern Art Oxford. This Year and 1999 are the only two Years from 1935 to 2009 that the number of female-RAG artwork-objects exhibited exceeds that of male-RAG artwork-objects.[15]

Graph 3.1.2.1 contains ANoRAGF (solid line) and ANoRAGM (dotted line) from *graph 3.1.1.1*, but plots them against the weighted percentage of AWPDTEX (dashed line). Each of the "peaks" of AWPDTEX at which it accounts for more than .40% of the artwork-text (1984, 1991, and 2009) coincides with upward trends in the number of female-RAG artwork-objects being exhibited (solid line) and downward trends in the number of male-RAG objects being exhibited (dotted line). Whereas three of the four highest "peaks" in the weighted percentage of AWPDTEX (1984, 1999, and 2009) coincide with the three Years in which the greatest numbers of female-RAG artwork-objects are exhibited. As well as illustrating the significant, positive correlation stated in *table 3.1.2.2*, *graph 3.1.2.1* reinforces the association between textiles and female-RAG artists: A positive association that is not made between any other Art Type and the exhibiting of artwork-objects by one particular gender.

Graph 3.1.2.1 can also be used to identify which exhibitions' artwork-text within these particular Years (1984, 1991, 1999, 2009) develop and maintain the significant, positive relationship of ANoRAGF–AWPDTEX. The Years 1984,1991, 1999, 2009, between them, host a total of seven of 62 exhibitions. Each of the Years contains two exhibitions, with the exception of 1991 in which there is only one: *Russian Constructivism and Suprematism 1914-1930*. The artwork-text that accompanies *Russian Constructivism and Suprematism 1914-1930* contains 11 references to the recording unit AWPDTEX, and the total number of female-RAG artwork-objects (ANoRAGF) exhibited account for 21.82% of the total number of RAG artwork-objects (ANoRAG) exhibited.[16] Three such references to **AWPDTEX** are in relation to Alexandra Exter's biography: "Turned to **textile** design while still maintaining her interest in stage design. 1923 Began work on her sets and **costumes** for the film 'Aelita' (produced 1924) […] Studied stage and **costume** design at the Modern Art Academy,

[15] In 1984, 138 male-RAG artwork-objects are exhibited. In 1999, 129 female-RAG artwork-objects are exhibited compared to 87 male-RAG artwork-objects.
[16] "References" is defined as the number of times one of the words that forms the AWPDTEX recording unit is used within the artwork-text. A list of the individual words forming AWPDTEX is produced in the "Coded Word Lists" (*App.1-[Content Analysis]-02*).

Paris."[17] The correlation of ANoRAGF–AWPDTEX is furthered by the inclusion of the gouache on paper, *Costume Design for the "Fille de Melios" from "Aelita"*, 1923/1924, by Exter as one of the exhibited artwork-objects at this exhibition.[18]

Of the remaining three pairs of exhibitions held in each of the Years 1984, 1999, 2009, one of each pair is demonstrable as the more influential in term of propagating the significant, positive ANoRAGF–AWPDTEX relationship. The two exhibitions held in the Year 1984 are *Art into Production: Soviet Textiles, Fashion and Ceramics 1917-1935* (Museum of Modern Art Oxford) and *Dada – Constructivism: The Janus Face of the Twenties* (Annely Juda Fine Art, London). Of the two it is *Art into Production: Soviet Textiles, Fashion and Ceramics 1917-1935* that is demonstrated to be influential in terms of the significant ANoRAGF–AWPDTEX relationship: Its accompanying artwork-text makes 161 references to AWPDTEX compared to the 17 references of *Dada – Constructivism*, and ANoRAGF accounts for 57.25% of ANoRAG exhibited compared to zero per cent at *Dada – Constructivism*.

The pairs of exhibitions in Years 1999 and 2009 are less definitive in terms of which of the pair is most supportive of the ANoRAGF–AWPDTEX relationship. But comparing each exhibitions' number of references to AWPDTEX and ANoRAGF percentage does indicate that for, both, 1999 and 2009 a more significant exhibition, in terms of supporting the ANoRAGF–AWPDTEX relationship, is determinable. The two exhibition of 1999 are *Amazons of the Avant-Garde*[19] (Royal Academy of Arts, London) and *New Art for a New Era*[20] (Barbican Art Gallery, London). Of the two it is *Amazons of the Avant-Garde* that is arguably the more influential and supportive of the significant, positive ANoRAGF–AWPDTEX relationship. Its accompanying artwork-text makes 178 references to AWPDTEX, compared to 14 references within the artwork-text accompanying *New Art for a New Era*. In addition, ANoRAGF accounts for 100% of the RAG artwork-objects exhibited at *Amazons of the Avant-Garde*, compared to 32.03% of those exhibited at *New Art for a New Era*. For the Year 2009, it is the *Rodchenko and Popova*[21] (Tate Modern, London) exhibition, rather than *The Great Experiment: Russian Art*[22] (Annely Juda Fine Art, London), which is more

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[17] Annely Juda and David Juda, *Russian Constructivism and Suprematism 1914-1930*, Annely Juda Fine Art: London, 1991, p. 16 (Emphasis by James Strugnell)
[18] Juda and Juda, 1991, p. 81 (Catalogue number 4)
[19] *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova*
[20] *New Art for a New Era: Malevich's Vision of the Russian Avant-Garde. From the collection of the State Russian Museum, St Petersburg*
[21] *Rodchenko and Popova: Defining Constructivism*
[22] *The Great Experiment: Russian Art - Homage to Camilla Gray*

significant to the relationship between ANoRAGF and AWPDTEX. The artwork-text accompanying *Rodchenko and Popova* makes 116 references to AWPDTEX, and ANoRAGF accounts for 40.53% of ANoRAG. This compares to figures of five references within the accompanying artwork-text, and ANoRAGF accounting for 23.26% of ANoRAG for the exhibition *The Great Experiment: Russian Art*.

In this example, bivariate correlation allows for the calculation of the significant, positive correlation between ANoRAGF and AWPDTEX from the analysis of the content of the 62 exhibition catalogues, dating from 1935 to 2009. In its diagnostic capacity, bivariate correlation allows for this relationship to be discovered between the artwork-text, via content analysis, and the artwork-objects, via the exhibition-quantities. By revealing this general relationship to be significant from 1935 to 2009, descriptive statistics are then use to pinpoint the exact exhibitions that have created this particular artwork via the conjoining of particular artwork-text to specific artwork-objects.

3.1.3 – Bivariate Correlation between ANoRAG[M/F] and Second-Level CONN Recording Units: Relationship between ANoRAG[M/F] and Gender Descriptions

Whilst "Section 3.1.2" expands upon the significant, negative correlations between, both, ANoRAG and ANoRAGF, and the first-level recording unit AW, *table 3.1.1.1* also includes two significant, positive correlations. These are calculated between the first-level recording unit CONN, and, both, ANoRAG and ANoRAGM. The first-level unit CONN refers to the number of references made within the artwork-texts from 1935 to 2009 to their authors; their authors being referred to as "contributors" (CONN) to the artwork-texts of the exhibition catalogues within the 62-British-exhibition canon. The recording unit CONN is the only first-level unit to have a significant, positive relationship to the number of artwork-objects being exhibited in a given Year.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[23]	*p*-value	Lower	Upper
ANoRAG	CONNF	.307	32	.024	.042	.522
ANoRAG	CONNM	.389	32	.003	.095	.666
ANoRAGM	CONNF	.345	32	.011	.084	.564
ANoRAGM	CONNM	.349	32	.008	.045	.633
ANoRAGF	CONNF	-.010	32	.943	-.290	.254
ANoRAGF	CONNM	.181	32	.181	-.152	.502

Table 3.1.3.1: Bivariate correlations (Kendal's Tau) between ANoRAG[M/F] and recording units CONN[M/F]. (Per Year from 1935 to 2009.)

The first-level CONN unit is formed from two second-level units dividing CONN into male contributors (CONNM) and female contributors (CONNF). *Table 3.1.3.1* contains all of the results of calculating Kendall's Tau between ANoRAG[M/F] and the second-level units of CONNM and CONNF.

Table 3.1.3.1 confirms the results of *table 3.1.1.1*. For ANoRAG and ANoRAGM, as the number of RAG and male-RAG artwork-objects exhibited in a given Year increases, the weighted percentage of the artwork-text used to reference, both, male and female contributors also increases; there are significant, positive correlations in all four pairings. Regarding the exhibiting of RAG and male-RAG artwork-objects, the greater the number of objects displayed in a given Year the greater the percent of contributor-references of, both, genders (CONNM and CONNF) within the artwork-text. There is no specific significant correlation between the gender of the contributor and the gender of the RAG artists

[23] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

producing the artwork-objects on display. This is confirmed by the results for the correlations between ANoRAGF and, both, CONNM and CONNF, neither of which are significant.

Although there is no relationship evident between the gender of the contributors to the artwork-texts, and the gender of the RAG artists who produce the artwork-objects, this in itself could be indicative of a gender neutering of an artworks authorship through much of the twentieth century. This process observes the initially artist-gendered artwork-object "particle" being carried by variously gendered artwork-textual "waves". There is evidence, though, that these textual "waves" do change, subtly, depending on the gender of the exhibited artwork-objects' RAG creators: Particularly in relation to a change in the number of objects produced by female-RAG artists exhibited in a particular Year.

There are two significant relationships between how gender is represented in the artwork-text of the catalogues and the number of female-RAG artwork-objects on display (ANoRAGF). As *table 3.1.3.2* and *table 3.1.3.3* show, the significant correlation is only calculated between ANoRAGF–GENM and ANoRAGF–SPWTG. There are no significant relationships between the total number of RAG artwork-objects or male-RAG artwork-objects exhibited and the recording units GENM or SPWTG.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[24]	*p*-value	Lower	Upper
ANoRAG	GENM	-.074	32	.558	-.084	.490
ANoRAGM	GENM	-.053	32	.673	-.309	.208
ANoRAGF	GENM	-.266	32	.040	-.456	-.066

Table 3.1.3.2: Bivariate correlations (Kendal's Tau) between ANoRAG[M/F] and recording unit GENM. (Per Year from 1935 to 2009.)

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[25]	*p*-value	Lower	Upper
ANoRAG	SPWTG	.280	32	.057	.094	.466
ANoRAGM	SPWTG	.190	32	.197	-.008	.378
ANoRAGF	SPWTG	.365	32	.016	.143	.574

Table 3.1.3.3: Bivariate correlations (Kendal's Tau) between ANoRAG[M/F] and recording unit SPWTG. (Per Year from 1935 to 2009.)

Table 3.1.3.2 contains a significant, negative correlation between the number of female-RAG artwork-objects exhibited (ANoRAGF) and the proportional use of Male Gender Words

[24] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)
[25] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

(GENM) in artwork-texts. As ANoRAGF increases the weighted percentage of GENM within the catalogue artwork-text of the corresponding Year decreases, and *vice versa*. This is not an unexpected result, but there is no corresponding positive correlation found between GENM and ANoRAGM. Nor, are there any significant relationships between GENF and ANoRAG[M/F].[26] It is only the exhibiting of increased numbers of RAG objects by female artists that coincides with a significant, negative correlation in relationship with the weighted percentage of Gender Words, namely Male Gender Words (GENM).

Continuing on from, and expanding upon "Section 2.6", the second significant gender relationship calculated between ANoRAGF and a second-level recording unit is presented in *table 3.1.3.3*: The significant, positive correlation between ANoRAGF and SPWTG. SPWTG is one of the nine, second-level recording units that form the first-level unit SPW, a concept containing socio-political words. Recording unit SPWTG contains Words Politicizing Gender such as: "Amazonian"; "androgyny"; "feminine"; "feminism"; "masculine"; "phallic".[27] As the number of female-RAG artwork-objects exhibited increase so do the weighted percentages of these words within the corresponding artwork-texts. But as *table 3.1.3.3* indicates, it is only the relationship between SPWTG and ANoRAGF that is significant, neither ANoRAG nor ANoRAGM have significant relationships with SPWTG. There is a textual politicization of gender that increases in relationship to an increase in the exhibition of female-RAG artwork-objects, that is not found with male-produced RAG objects.

This statement is supported if, rather, than calculating the correlation between ANoRAG[M/F] and SPWTG, ANoRAG[M/F] is examined in more detail through the 23 RAG artists who each have ≥ 30 artwork-objects exhibited between the 62 exhibitions from 1935 to 2009: Referred to as T23Artist. If the same correlations are calculated for the yearly distribution of artwork-objects by these artists and the second-level SPW recording units, the only significant, positive relationships recorded between the 23 individual RAG artist and the nine recording units, are between the number of artwork-objects exhibited by female-RAG artists and SPWTG.[28] Of the 23 RAG artists with ≥ 30 artwork-objects exhibited, six are female, and a third of these female-RAG artists' Artwork-Object Numbers (ANo)

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[26] ANoRAG and GENF: $T = .203$, $N = 32$, $p > .05$ (.119), BCa 95% CI [-.084, .4990]. ANoRAGM and GENF: $T = -.183$, $N = 32$, $p > .05$ (.158), BCa 95% CI [-.112, .477]. ANoRAGF and GENF: $T = .107$, $N = 32$, $p > .05$ (.420), BCa 95% CI [-.185, .376].

[27] A complete list of the SPWTG words is produced in the "Coded Word List" (*App.1-[Content Analysis]-02*).

[28] A complete list of results for correlation between ANo[T23Artist] and second-level SPW recording units (1935-2009) is produced in *App.2-[1935-2009b]-14*.

demonstrate significant, positive relationships with SPWTG. None of the 17 male-RAG artists' ANo demonstrate significant relationships. The two artists who demonstrate a significant, positive correlation with SPWTG are Alexandra Exter (ANoExtA) and Liubov Popova (ANoPopL).[29]

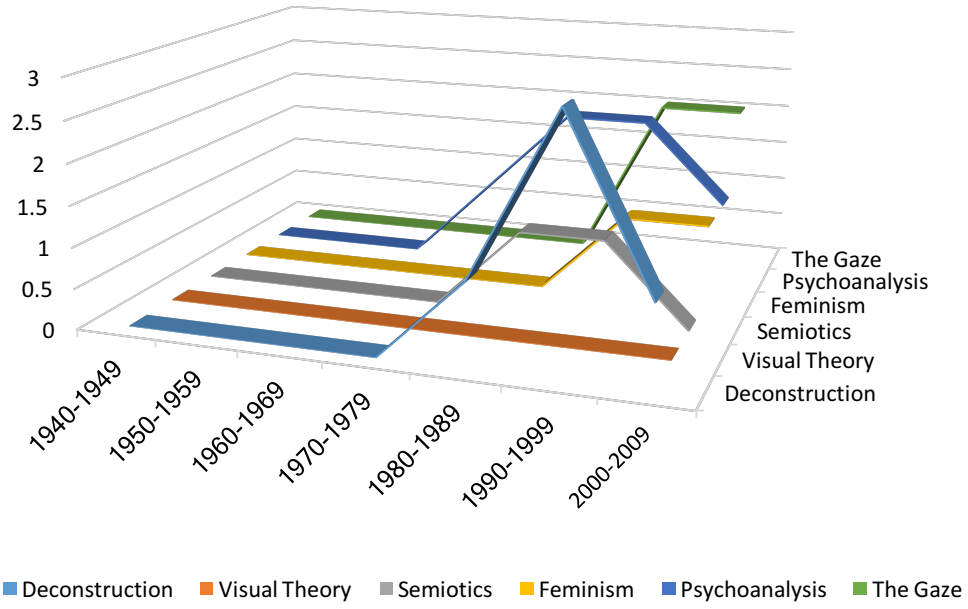
Owing to copyright restrictions, the electronic version of this thesis does not contain this image.

Graph 3.1.3.1: Elkins's "Theory in art history, 1940-2000, based on a keyword search of the *Bibliography of the History of Art*".[30]

In the "Series Preface" to *The Art Seminar* series of books James Elkins produces a chart "Theory in art history" (reproduced in *graph 3.1.3.1*). It shows, using the *Bibliography of the History of Art* as the source for its data, the number of art-historical essays produced in each of the decades that include certain key terms. These key terms are linked, by Elkins, to art "theory" and used to assert that since 1980 there has been an increase in theorizing in the visual arts, "and in three cases – the gaze, psychoanalysis, and feminism – the rise has been exponential".[31] The results of a similar study conducted on essays included within the exhibition catalogues (artwork-texts of the 62-British-exhibition canon) used within this thesis are presented in *graph 3.1.3.2*. *Graph 3.1.3.2* contains the results, per decade, of noting

[29] ANoExtA and SPWTG: $T = .425$, $N = 32$, $p < .05$ (.008), BCa 95% CI [.224, .645]. ANoPopL and SPWTG: $T = .385$, $N = 32$, $p < .05$ (.013), BCa 95% CI [.123, .612].
[30] James Elkins, "Series Preface", in Elkins, J., (ed.), *Photography Theory*, Routledge: New York, 2007[b], p. viii (and, also: James Elkins, "Canon and Globalization in Art History", in Brzyski, A., (ed.), *Partisan Canons*, Duke University Press, 2007[a], p. 71)
[31] Elkins, 2007[b], p. vii

how many essays (contributions by different authors) produced within the 62 exhibition catalogues contain the same words searched for by Elkins.

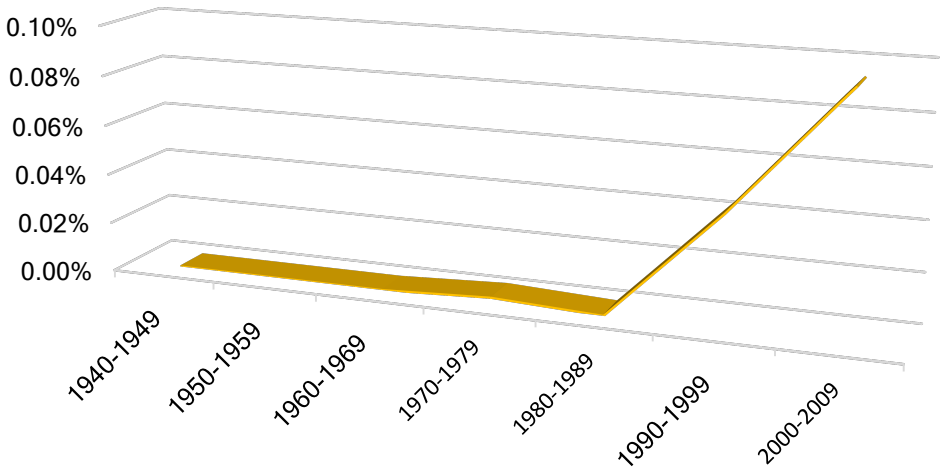


Graph 3.1.3.2: Strugnell's "Theory in art history, 1940-2009, based on the artwork-text of the exhibition catalogues that accompany the 62 British exhibitions examined within this thesis".

Graph 3.1.3.2 is slightly different *graph 3.1.3.1* in that its range along the x-axis extends from 1940 to 2009 rather than 1940 to 2000. This is to prevent the repetition of data that, potentially, occurs in Elkins's graph, where each ten-year period (or more precisely 11-year period) overlaps by one year: 1940-1950 is followed by 1950-1960, etc. So that *graph 3.1.3.2* includes the data up-to and including the Year 2000 it is necessary to include the final decade "2000-2009". *Graph 3.1.3.2*, with the exception of "Visual Theory", appears to confirm Elkins's findings that, post-1980, there is an increase in theorizing in the visual arts.

In, both, *graph 3.1.3.1* and *graph 3.1.3.2* the number of art-historical essays that use the word "feminism" increases sharply after 1980. Before the 1980s no contribution to any the exhibition catalogues used in this study features the word "feminism" (shown by the yellow line in *graph 3.1.3.2*). It is important to note that *graph 3.1.3.2* uses a much smaller sample than Elkins's graph, and this sample size, in terms of the number of separate essays, determines how this study is conducted. It contributes to the decisions to examine the content of artwork-texts at the scale of words, rather than essays, and this in turn has led to the use of weighted percentages rather than pure numbers: So as to allow for cross artwork-text comparisons. Examination at the scale of words also influences the decision to use

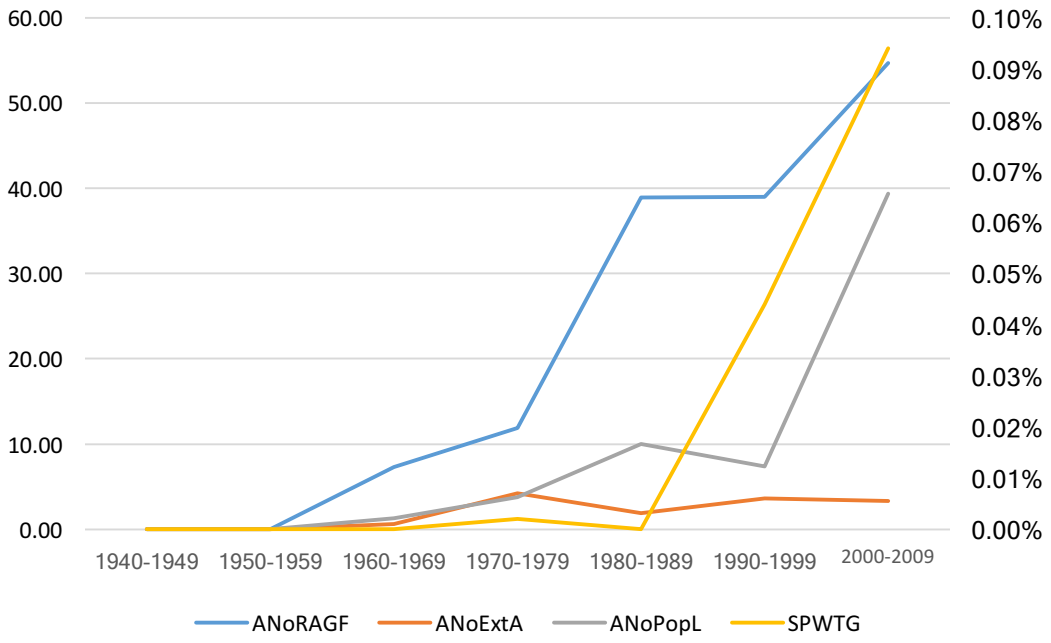
recording units and concepts, rather than individual words. Although every effort was made to check the context in which words are being used, incorporating the individual words into slightly broader conceptual meanings lessens the impact of any mis-contextualisation that might occur. Therefore, with regard to this study and what has been discussed above in relation to the recording unit SPWTG, which includes the word "feminism", it is sensible to examine the changes in its weighted percentage per ten-year period (*graph 3.1.3.3*). The recording unit SPWTG as represented in *graph 3.1.3.3*, is once more comparable and similar to the Elkins's findings in relation to "feminism" in *graph 3.1.3.1*. Elkins's "feminism", being his only "Theory in art history" that is overtly "gendered" is comparable to the concept of SPWTG used within this study to represent words politicizing gender within an art-historical content.



Graph 3.1.3.3: Line graph of the relationship between the average weighted percentage per ten-year period from 1940 to 2009 of recording unit SPWTG and Ten-Year periods (1940-1949 to 2000-2009).

Graph 3.1.3.3 actual mirrors Elkins's finds more accurately than *graph 3.1.3.2*. Unlike *graph 3.1.3.2*, *graph 3.1.3.3* demonstrates the slight increase in the use of SPWTG in artwork-texts the decade before its exponential growth from 1990 onward. Although both *graph 3.1.3.3* and *graph 3.1.3.1* show a post-1980 rapid increase in text(s) incorporating writing on the politicization of gender, *graph 3.1.3.3* indicates that this rapid increase occurs a decade later in relation to the 62-British-exhibition canon's artwork-texts than it occurs in *graph 3.1.3.1* in relation to the keywords noted in the *Bibliography of the History of Art*. *Graph 3.1.3.1* illustrates an initial increase in the use of feminist theory (or at least the word "feminism")

within art-historical writings listed in *Bibliography of the History of Art* occurring from the period 1960-1970, with the number of essays referencing it increasing from zero to c.150 in this period. There is then a steady increase from period 1970-1980, before a rapid increase from 1980 to 2000 ending in a peak of c.880 essays referencing "feminism" in the period 1990-2000. *Graph 3.1.3.3* demonstrates the ten-year lag between the journal-text based theory of Elkins's study, and its own exhibition-text based theory with an initial increase in SPWTG occurring within the exhibition-catalogue artwork-texts in the period 1970-1979, during which its average weighted percentage rises from the previous periods' zero to .002%. The average weighted percentage of SPWTG then increases rapidly in the period 1990-1999 to .044%, and again in the following period 2000-2009 to .094%.



Graph 3.1.3.4: Line graph allowing comparisons of the relationships between ANoRAGF (the yearly average number of artwork-objects exhibited over each Ten-Year period [left-hand side y-axis scale]) and Ten-Year periods (1940-1949 to 2000-2009), ANoExtA (the yearly average number of artwork-objects exhibited over each Ten-Year period [left-hand side y-axis scale]) and Ten-Year periods (1940-1949 to 2000-2009), ANoPopL (the yearly average number of artwork-objects exhibited over each Ten-Year period [left-hand side y-axis scale]) and Ten-Year periods (1940-1949 to 2000-2009), and the recording unit SPWTG (average yearly weighted percentage over each Ten-Year period [right-hand side y-axis scale]) and Ten-Year periods (1940-1949 to 2000-2009).

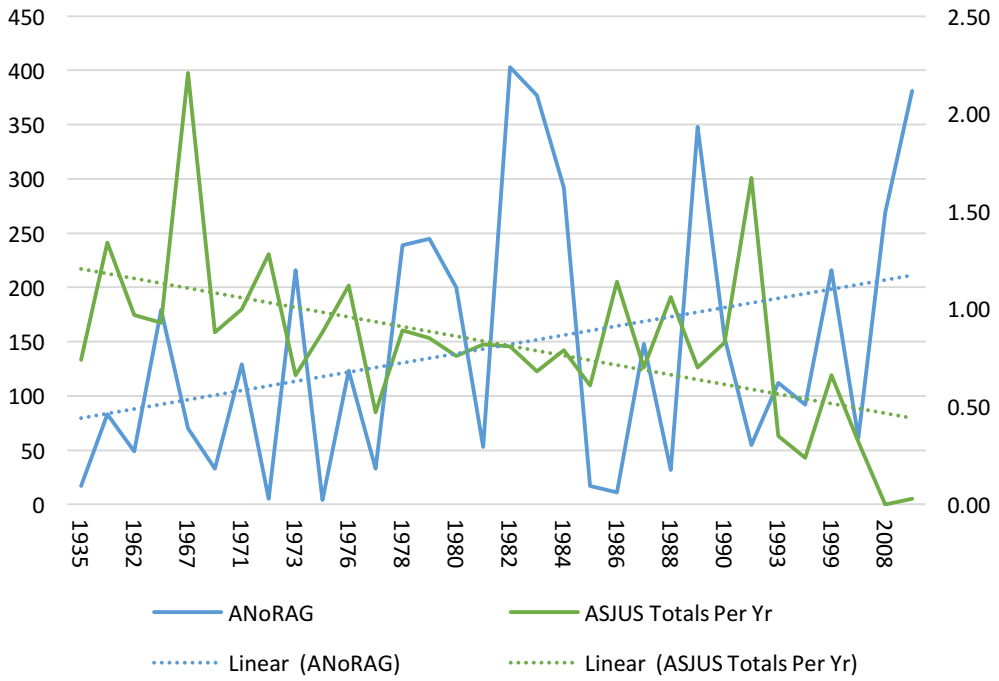
Despite this evidenced ten-year lag between certain theories/words entering various types art-historical text, Elkins's chart is useful comparison to both *graph 3.1.3.2* and *graph 3.1.3.3*. It provides a precedent which is confirmed by this thesis's independent enquiries. Whereas Elkins's graph presents art-historical texts in reference to each other, but removed from artwork-objects, this investigation examines artwork-texts' production in relationship with the exhibiting of particular artwork-objects. Indeed, it is these relationships of artwork-

object and artwork-text that defines the artwork(s) within this study. In doing so, this study can chart not only the introduction and changes in the theories used within artwork-text, but also which RAG artists' artwork-object enter into relationship with these theories. *Graph 3.1.3.4* illustrates, diagrammatically, some of these relationships: The yellow line is the same as that on *graph 3.1.3.3*, and charts SPWTG's changes in the yearly average weighted percentage over each ten-year period from 1940 to 2009; The blue line (ANoRAGF) represents the yearly average number of female-RAG artwork-objects exhibited over each ten-year period; The orange line (ANoExtA) charts the yearly average number of artwork-objects produced by Exter exhibited over each ten-year period; The grey line (ANoPopL) charts the yearly average number of artwork-objects produced by Exter exhibited over each ten-year period. It has already been established that ANoRAGF, ANoExtA, and ANoPopL have significant, positive correlations with SPWTG, and this is confirmed by the general echoing of each of the lines upward and downward trends in *graph 3.1.3.4*.

As with the significant, positive, "gender-focused" relationship between ANoRAGF and ANRAGF ("Section 3.1.1"), and that between ANoRAGF and AWPDTEX ("Section 3.1.2"), the significant, positive, "gender focused" relationships evidenced, only, between ANoRAGF and the recording units GENM and SPWTG, and not between these recording units and ANoRAGM or ANRAG, is of wider significance in the presentation of RAG artwork by the 63-British-exhibition canon. It demonstrates a defining of female-RAG artwork by the canon of the 62 British exhibitions within this thesis as different from that of the male-RAG artwork. Different, both, in terms of the Art Type that female-RAG artwork is referenced with (AWPDTEX), and the Socio-Political Words that it is aligned with (SPWTG). The fact that in all these cases ANoRAGF is in opposition to, not only, ANoRAGM, but, also, ANoRAG, has broader implications as to how the female-RAG artwork is perceived: Female-RAG artwork is not just different to male-RAG artwork, but also different to the encompassing category of RAG artwork. This creates a situation in which there is RAG artwork, and then there is female-RAG artwork.

3.1.4 – Bivariate Correlation between ANoRAG[M/F] and Second-Level AS Recording Units

"Section 2.7" examines the second-level recording units of Assertive Words (AS) within the context of content analysis. Justifications (ASJUS) are found to have a significant, negative relationship with Year: $T = -.447$, $N = 32$, $p < .05$ (.000), BCa 95% CI [-.669, -.206]. Meaning, that as the Years progress, the proportion of artwork-text formed by ASJUS words decreases. There is also a significant, negative correlation between ASJUS and ANoRAG: $T = -.262$, $N = 32$, $p < .05$ (.036), BCa 95% CI [-.458, -.066].[32] As the number of RAG artwork-objects exhibited in a particular Year increases the evident need for the artwork-text to justify decreases, and as the number of artwork-objects exhibited decreases, justification increases. This is demonstrated in *graph 3.1.4.1*.



Graph 3.1.4.1: Line graph with linear trend lines (dotted lines) allowing comparisons of the relationships between ANoRAG (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and between the recording unit ASJUS (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009).

Although there is no significant, positive correlation between ANoRAG and Year,[33] the linear trend line of ANoRAG (dotted-blue line of *graph 3.1.4.1*) does indicate an upward trend: as the Years advance from 1935 to 2009 there is a general increase in the number of RAG

[32] A complete list of results for correlations between second-level AS units and ANoRAG[M/F] is produced in *App.2-[1935-2009b]-05*.
[33] ANoRAG and Year: $T = .158$, $N = 32$, $p > .05$ (.182), BCa 95% CI [-.048, .110].

artwork-objects exhibited. The upward trend of ANoRAG on *graph 3.1.4.1* is in contrast to the downward trend of ASJUS (dotted-green line), indicating the significant, negative correlation, previously, calculated between ASJUS and Year.[34] The opposing relationships that ASJUS and ANoRAG have with Year, illustrated on *graph 3.1.4.1*, and their significant, negative correlation with one another, supports the hypothesis that earlier exhibitions of RAG artwork-objects within the 62-British-exhibition canon were accompanied by artwork-text dedicating a larger proportion of its words to justifying the exhibited RAG objects' art-historical value and also justifying the value for organizing such exhibitions.

Such uses of the ASJUS recording unit are examined in "Section 2.7" in respect to the 2008 exhibition of Aleksandr Rodchenko photography, but is also demonstrable within the artwork-text of the catalogue that accompanies the, 1966, *An Introduction to El Lissitzky* exhibition, Grosvenor Gallery, London. This artwork-text uses the same word as the 2008 exhibition from within the concept ASJUS, to, not only, justify El Lissitzky's importance within the history of Western artwork, but, also, to justify the exhibitions significance: "**Influence**". In justifying the importance of Lissitzky art-historical the artwork-text, firstly, cites Alexander Dorner: "Of all the Russian painters none had such **influence** on Western art as El Lissitzky […]."[35] This justification is reinforced by a second citation from the writings of Michael Seuphor: "No other Russian artist among those who were active in Central or Western Europe exercised such a radical **influence** on the course of art. This **influence** was felt, first of all, at the Bauhaus, through the teaching of Moholy-Nagy."[36]

Lissitzky's "**influence**" is used within the artwork-text to also justify the importance of this exhibition and of the artwork-objects displayed: "There are no works by this artist [Lissitzky] in any public collections in Britain; and only rare examples in private hands. His achievement and **influence** is difficult to display, both because of the diversity of his talents and the fact that most of his work remains in Russia."[37] The rarity, up to now, of being able to view Lissitzky's artwork-objects in the Britain, is commented on later in the exhibitions artwork-text with reference to the ANJUS-concept word "**First**":

> [Lissitzky's] ideas and personality are clearly reflected in this exhibition, in the group of paintings

[34] ASJUS and Year: $T = -.447$, $N = 32$, $p < .05$ (.000), BCa 95% CI [-.669, -.206].
[35] Grosvenor Gallery, *An Introduction to El Lissitzky*, Grosvenor Gallery: London, 1966, n.p. (Emphasis added by James Strugnell)
[36] Grosvenor Gallery, 1966, n.p. (Emphasis added by James Strugnell)
[37] Grosvenor Gallery, 1966, n.p. (Emphasis added by James Strugnell)

> called “Prouns” […], the drawings and lithographs, rare copies of his book designs and typography, and the remarkable series of photographs from the archives of the Tretyakov Museum, Moscow, seen in the West for the **first** time.[38]

As the twentieth/twenty-first century progresses the number of RAG artwork-objects being exhibited increases each Year, and a lesser percentage of the corresponding artwork-text is used to justify them. As the number of artwork-objects being exhibited follow an upward trend, and ASJUS a downward one, it is suggestive that justification for the artwork-object is required to a lesser extent once the exhibiting of artwork-objects establishes a critical/consistent mass.

In contrast to the significant, negative correlation between ANoRAG and ASJUS, is the significant, positive correlation between ANoRAG and second-level recording unit ASEXC (Exclusive Assertions): $T = .270$, $N = 32$, $p < .05$ (.032), BCa 95% CI [.028, .489]. A significant, positive relationship is also calculated between ANoRAGM and ASEXC, although there is no significant correlation between the number of female-RAG artwork-objects being exhibited (ANoRAGF) and ASEXC.[39] The male-RAG orientation of this correlation is further emphasized through examination of the exhibition numbers of those RAG artists who have ≥ 30 artwork-objects exhibited from 1935 to 2009 (T23Artist). Of these 23 artists the only one with a significant correlation to ASEXC is Aleksandr Rodchenko (ANoRodA). There is a significant, positive relationship between ANoRodA and ASEXC: $T = .342$, $N = 32$, $p < .05$ (.010), BCa 95% CI [.091, .569].[40] This means, that as there is an increase in the number of artwork-objects by Rodchenko being exhibited in a particular Year, there is a corresponding increase in the percentage of the artwork-text being used in an “exclusive” manner. This category of words is used to isolate the subject/object of the artwork-text from wider categories. *Graph 3.1.4.2* allows for the examination of the relationship between ANoRodA and ASEXC in more detail by plotting both ANoRodA and ASEXC against corresponding Years.

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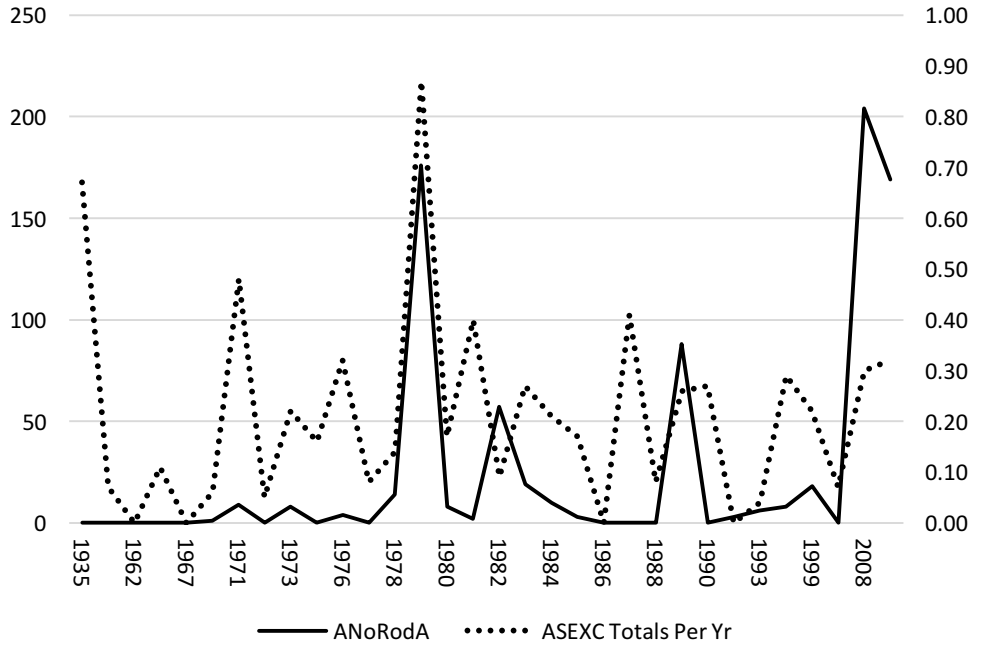
[38] Grosvenor Gallery, 1966, n.p. (Emphasis added by James Strugnell)
[39] ANoRAGM and ASEXC: $T = .282$, $N = 32$, $p < .05$ (.025), BCa 95% CI [.024, .498]. ANoRAGF and ASEXC: $T = .068$, $N = 32$, $p > .05$ (.599), BCa 95% CI [-.154, .293].
[40] A complete list of results for correlation between ANo[T23Artist] and second-level AS recording units (1935-2009) is produced in *App.2-[1935-2009b]-06*.

The correlation between ANoRodA and ASEXC is clearly demonstrated in *graph 3.1.4.2*, with the peaks and troughs of their representative lines frequently coinciding with one another throughout the period from 1935 to 2009.[41] Notable is 1979, the Year in which the first significant number of artwork-objects by Rodchenko are exhibited in Britain, which coincides with an equally significant proportion of the artwork-text being represented by ASEXC: 176 artwork-objects by Rodchenko exhibited in the same Year as ASEXC accounts for .85% of the artwork-text. In 1979 the *Alexander Rodchenko 1891-1956* exhibition is held at the Museum of Modern Art Oxford.



Graph 3.1.4.2: Line graph allowing comparisons of the relationships between ANoRodA (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and between the recording unit ASEXC (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009).

Alexander Rodchenko 1891-1956 is the first one-man show of Rodchenko's works held in Britain, and as such the artwork-text of the accompanying catalogue uses Exclusive Assertions (ASEXC) in a similar way as Justifications (ASJUS) are used in *An Introduction to El Lissitzky* (1966). The **Exclusive Assertions** are used to emphasize the uniqueness of Rodchenko's artwork-objects and thus justify their art-historical importance. Examples of the use of the ASEXC concept are read throughout the catalogue's artwork-text. David Elliott describes how Rodchenko's "desire to make a painting which was complete in itself without

[41] The coinciding peaks can be observed along the x-axis at: 1971; 1973; 1976; 1979. With ANoRodA coinciding with two, ASEXC, pre-climatic peaks at 1989 and 2008. The coinciding troughs are observable at: 1972; 1975; 1977; 1986; 2004.

any reference to **outside** influences had led him to distil subject matter to a single element - colour within the co-ordinates of the painted canvas."[42] Here the emphasis on excluding all "**outside** influences" also acts as justification of Rodchenko's artwork by implying uniqueness from all contemporaneous influences occurring, artistically and otherwise, around him. Later in the catalogue Andrei B. Nakov cites Rodchenko's *The Line* (1921) producing a similar effect:

> Non-objective painting has dedicated itself exclusively to its specific tasks ... it has cultivated colour for its own sake ... the final phase of this undertaking has been achieved with the attainment of a monochrome intensity within the limits of one single colour, a **unique** intensity (undiminished and un-intensified)[43]

As well as exemplifying the significant, positive correlation between ANoRAG and ASEXC, ANoRodA also exemplifies the significant, negative correlation found between ANoRAG and ASJUS. The significant, negative correlation between ANoRodA and ASJUS is: $T = -.312$, $N = 32$, $p < .05$ (.018), BCa 95% CI [-.540, -.079]. This is illustrated in *graph 3.1.4.3*, which also plots ASEXC for comparison. It is stated in this section that Exclusive Assertions are used in much the same way as Justifications, and as examples of Exclusive Assertions have been found within the catalogue for *Alexander Rodchenko 1891-1956* so too can Justifications. Gail Harrison's article "Alexander Rodchenko as a Book Designer: Graphic Commitment" from the *Alexander Rodchenko 1891-1956* catalogue, contains many Justifications alluding to the importance, rather than uniqueness, of Rodchenko's artwork: Words such as "innovative", used to describe the covers Rodchenko's designs for *LEF* and *Novyi LEF* magazines.[44] Harrison concludes with a sentence stating Rodchenko's "**revolutionary**" and "**significant**" contributions, using them to justify Rodchenko's standing as a founding figure of our present, Western, artistic "**heritage**":

> Even though he was denied proper credit for having achieved a **revolutionary** artform,

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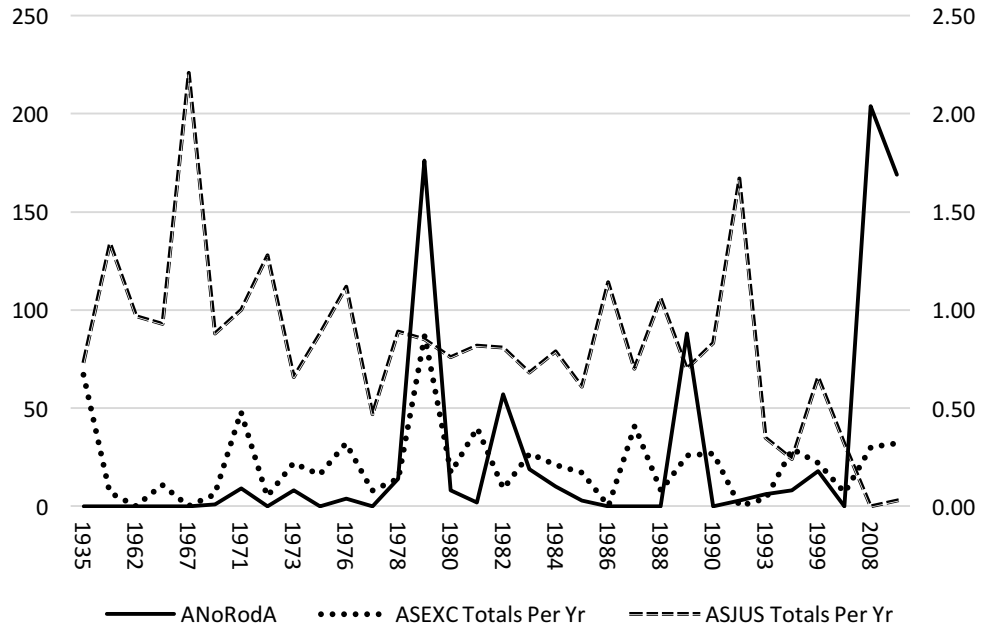
[42] David Elliott, "Introduction", in Elliott, D., (ed.), *Alexander Rodchenko 1891-1956*, Museum of Modern Art Oxford: Oxford, 1979, p. 6 (Emphasis added by James Strugnell)
[43] Andrei B. Nakov, "Stylistic Changes: Painting Without a Referent", in Elliott, D., (ed.), *Alexander Rodchenko 1891-1956*, Museum of Modern Art Oxford: Oxford, 1979, p. 57 (Emphasis added by James Strugnell)
[44] Gail Harrison, "Alexander Rodchenko as a Book Designer: Graphic Commitment", in Elliott, D., (ed.), *Alexander Rodchenko 1891-1956*, Museum of Modern Art Oxford: Oxford, 1979, p. 82 ["Rodchenko produced covers, title pages, illustrations and layouts for *LEF* and *Novyi LEF*, changed with enthusiasm for **innovative** art forms as a manifestation of the new social and artistic organization of social life."]

> Rodchenko's **contribution** to twentieth-century design remains **significant**, not only within the context of Soviet design, but as a progenitor of principles which have formed our own artistic **heritage** in the West today.[45]

The difference between ASJUS and ASEXC is that, whilst ASJUS declines as the number of artwork-objects being exhibited increases over time – evidently, losing its expedience – ASEXC increases as a proportion of artwork-text in relation to the increasing number of RAG artwork-objects being exhibited. The need to assert the RAG artwork-object's exclusivity is still required, whilst the need to justify its inclusion in exhibition is not.



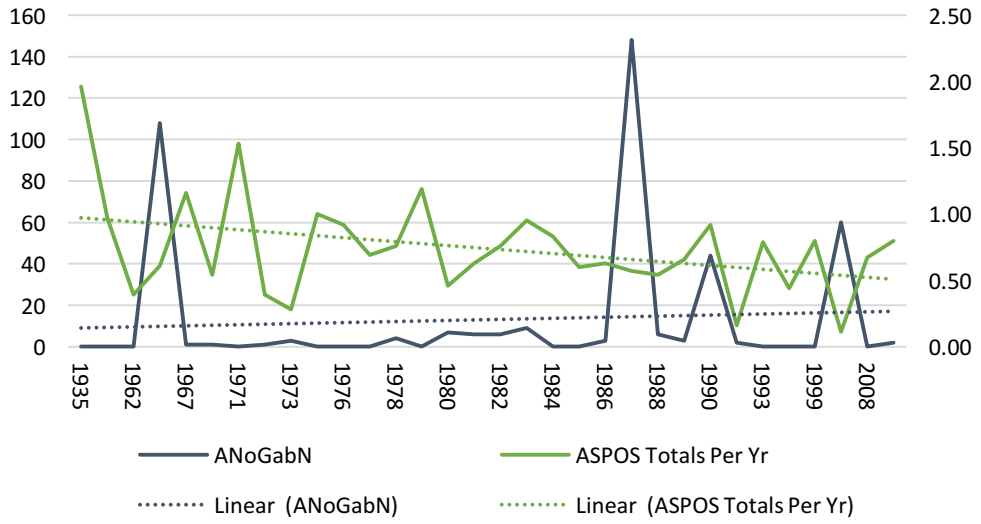
Graph 3.1.4.3: Line graph allowing comparisons of the relationships between ANoRodA (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), between the recording unit ASEXC (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009), and between the recording unit ASJUS (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009).

This is investigated through the examination of *graph 3.1.4.3* and the "peak" in Year 2008 of the solid line of ANoRodA, which represents the exhibition of 204 artwork-objects by Rodchenko. This "peak" coincides with a "near-peak" in ASEXC (dotted line) of a weighted percentage .30%, and a "trough" in ASJUS (dashed line) representative of zero per cent of the artwork-text. There are two major exhibitions held in London in 2008 that include RAG artwork-objects: *Alexander Rodchenko: Revolution in Photography* at the Hayward Gallery;

[45] Harrison, G., 1979, p. 88 (Emphasis added by James Strugnell)

From Russia: French and Russian Master Paintings 1870-1925 from Moscow and St Petersburg at the Royal Academy of Arts. Although discussion concentrates on the former of these two exhibitions, as it contained 203 artwork-objects by Rodchenko compared to the latter's one, the ASJUS value of zero includes both: Neither exhibition uses its artwork-text to justify its artwork-objects.

Examining the *Alexander Rodchenko: Revolution in Photography* catalogue, although there are no words to be found associated with the ASJUS recording unit, ASEXC words are still prevalent, and, as described, are used to similar effect. The same word, "**unique**", as cited by Nakov in the 1979 *Rodchenko* catalogue, is used to justify the importance of Rodchenko's artwork-object. In 2008, Alexander Lavrentiev describes Rodchenko's photography, whilst justifying the art-historical importance of the 203 Rodchenko exhibits: "His choice and his depiction of these subjects formed his **unique** style and photographic vocabulary."[46]



Graph 3.1.4.4: Line graph with linear trend lines (dotted lines) allowing comparisons of the relationships between ANoGabN (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and between the recording unit ASPOS (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009).

Between the broader categories of ANoRAG and ANoRAGM, and the second-level AS recording units, significant correlation is only calculated for the second-level units of ASJUS and ASEXC. When examining the more narrowly defined categories of the T23Artist in terms

[46] Lavrentiev, A., "Alexander Rodchenko: Beginnings of Photo Avant-Garde in Russia", in Lavrentiev, A., (ed.), *Alexander Rodchenko: Revolution in Photography*, Multimedia Complex of Actual Arts: Moscow, 2008[a], p. 204 (Emphasis added by James Strugnell)

of numbers of artwork-object exhibited, though, there is one other significant relationship calculable: That between the number of artwork-objects by Naum Gabo (ANoGabN) exhibited each Year and the weighted percentage of Positive Assertions (ASPOS) within the artwork-texts of the exhibition catalogues. As with the relationship between ANoRodA and ASJUS, the correlation between ANoGabN and ASPOS is a significant, negative one: $T = -.280$, $N = 32$, $p < .05$ (.036), BCa 95% CI [-.477, -.055]. This is demonstrated on *graph 3.1.4.4* by the frequent contradictory/opposing nature of the two solid lines representing ANoGabN (blue) and ASPOS (green). From 1966 to 1967 the number of Gabo artwork-objects exhibited decreases – from 108 in 1966 to one in 1967 – whilst the weighted percentage of ASPOS increases – from .61% in 1966 to 1.16% in 1967. In 2004 there is a "peak" in ANoGabN (60 artwork-objects) echoed by a "trough" in ASPOS (.11%). There is an inverse relationship between the two variables, with increases in one variable being reflected by decreases in the other.

As with the relationship between ANoRAG and ASJUS (*graph 3.1.4.1*) *graph 3.1.4.4* also includes the linear trend lines for, both, ANoGabN and ASPOS (see correspondingly-coloured-dotted lines). These trend lines suggest an overall average increase in the number of exhibited artwork-objects by Gabo each Year (upward slope of the dotted-blue line), and an overall average decrease each Year of the weighted percentage of Positive Assertions found within the artwork-texts (downward slope of the dotted-green line). Again, this demonstrates a mechanism whereby a lesser concentration of a particular Assertion (AS), in this instance ASPOS, is required within the artwork-text as the number of T23Atrist artwork-objects being exhibited each Year increases, in this instance the artwork-objects increasing in number are those created by Gabo (ANoGabN).

Examining artwork-text from the Years 1990 and 2004 provides a useful model for the whole. *Graph 3.1.4.4* shows, via ANoGabN, that in 1990, 44 artwork-objects by Gabo are exhibited, whilst in 2004, 60 artwork-objects are exhibited. These ANoGabN figures correspond to weighted percentages for ASPOS of .92% in 1990, and .11% in 2004. This demonstrates the significant, negative correlation between ANoGabN and ASPOS: As one (ANoGabN) increases the other (ASPOS) decreases. It also conforms to the trend that the average number of artwork-objects by Gabo being exhibited increases, whilst the weighted percentage of Positive Assertions within the corresponding artwork-texts decreases. The two Years, 1990 and 2004, also coincide with "focused" Gabo exhibitions held at Annely Juda

Fine Art gallery, London: *Naum Gabo 1890-1977: Centenary Exhibition* (1990); *Naum Gabo and Colour* (2004).[47]

The **ASPOS** recording unit is referenced on only six occasions in the artwork-text of the 2004 catalogue for *Naum Gabo and Colour* exhibition. Michael Harrison, in his contribution "Gabo and Colour", writes of Gabo's later arrival to art and the artist's lack of formal artistic training as, probably, being "the **ideal** prelude for the revolutionary art of Constructivism".[48] Whilst Annely and David Juda use their brief introduction to assert the positive "importance" of the artwork-objects presented in the exhibition: "We are proud to be able to make this exhibition which we hope will help people to see an **important** and different aspect of Naum Gabo's work."[49]

The six examples from the 2004 exhibition catalogue are in contrast to the diversity and quantity of "positive" words that collectively form the ASPOS recording unit of the 1990 catalogue *Naum Gabo 1890-1977: Centenary Exhibition*. As well as the words "important"[50] and "ideal"[51], words such as "inspired"[52], "visionary"[53], "remarkable"[54], and "great"[55] appear,

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[47] See "Section 3.1.1" for more information on "forced" and "general" exhibitions.
[48] Michael Harrison, "Gabo and Colour" (2003), in Juda, A., and Juda, D., *Naum Gabo and Colour*, Annely Juda Fine Art: London, 2004, n.p. ["Unlike his brother, Antoine Pevsner, Gabo had not been allowed to pursue his artistic ambitions from the outset and arrived as a sculptor only via the reluctant study of medicine, natural sciences and civil engineering. All three disciplines, coupled with an awareness of Cubism picked up in Paris where Antoine was painting and of Kandinsky's *Concerning The Spiritual in Art*, and added to the lack of an academic art training, were probably the **ideal** prelude for the revolutionary art of Constructivism."] (Emphasis added by James Strugnell)
[49] Annely Juda and David Juda, *Naum Gabo and Colour*, Annely Juda Fine Art: London, 2004, n.p. (Emphasis added by James Strugnell)
[50] Jörn Merkert, "Naum Gabo – International Figure of Constructivism", in Juda, A., and Juda, D., *Naum Gabo 1890-1977: Centenary Exhibition*, Annely Juda Fine Art: London, 1990, p. 11 ["[…] there is hardly a history of 20th Century sculpture or book about Gabo where the sculptures of these years are not reproduced. not as early masterpieces of constructivism but as **important** stages of a new concept of sculpture." (Emphasis added by Strugnell)]
[51] Michael Compton, "Gabo in European Art", in Juda, A., and Juda, D., *Naum Gabo 1890-1977: Centenary Exhibition*, Annely Juda Fine Art: London, 1990, pp. 22-23 [Compton is quoting Herbet Read's *The Meaning of Art* as Read's view upon Gabo's artwork: "The ultimate values of art transcend the individual and his time and circumstance. They express an **ideal** proportion or harmony which the artist can grasp only by virtue of his intuitive powers" (Emphasis added by Strugnell)]
[52] Merkert, 1990, p. 13 [In reference to Gabo: "The clear form and modern material, the regularity of strict geometry are the exact calculation of an **inspired** imagination. where the artistic materials with which the completely new aesthetic had been voiced." (Emphasis added by Strugnell)]
[53] Merkert, 1990, p. 12 ["Gabo experimented with the ideals he formulated in his Realist Manifesto of **visionary** ideas and possibilities in contemporary art in general, especially in the field of sculpture of room constructions of the 20s, and arrived at extra-ordinary solutions." (Emphasis added by Strugnell)]
[54] Patrick Heron, "Remembering Gabo", in Juda, A., and Juda, D., *Naum Gabo 1890-1977: Centenary Exhibition*, Annely Juda Fine Art: London, 1990, p. 26 [In reference to *Circle*: "And indeed it was a **remarkable** manifesto, jointly edited by Ben Nicholson, Naum Gabo, and Leslie Martin." (Emphasis added by Strugnell)]
[55] Annely Juda and David Juda, *Naum Gabo 1890-1977: Centenary Exhibition*, Annely Juda Fine Art: London, 1990, p. 5 ["We are very happy to start a new decade and a new gallery space with this outstanding exhibition of Naum Gabo, who is one of the **great** artists of the 20th century." (Emphasis added by Strugnell)] [Examples of

within the artwork-text, on a total of 35 occasions. These words are applied to all aspects of Gabo: His artwork-objects; his writing (artwork-texts); his person. They describe and inscribe upon the artwork-objects of the exhibition multiple facets of their existence. They describe the artworks as objects, and as products of a physical and theoretical creative process deriving from the artist. But ultimately, as with all the assertions discussed within this section, they derive from the contributors to catalogues accompanying the exhibitions within the 62-British-exhibition canon. It is, in part, this juxtaposition between the changing assertiveness of the contributors' artwork-text and the exhibiting of RAG artwork-objects that have helped to establish and continue to perpetuate the canon of RAG artwork.

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the word "great" being used a positive assertion to describe either Gabo or his work can, also, be found within the contributions to this catalogue by Merkert, Heron, and Compton.]

3.1.5 – Bivariate Correlation between ANo[T23Artist] and AN Recording Unit(s)

Whilst "Section 3.1.1" examines the relationships between the broader categories of Artist Name (AN and ANRAG[M/F]) and the numbers of RAG artwork-objects (ANoRAG[M/F]) exhibited from 1935 to 2009, "Section 3.1.5" investigates the correlations between Artist Name and the narrower categories of ANo, examining the number of artwork-objects exhibited by individual RAG artists. Namely, the T23Artist; those RAG artists for which a total of ≥ 30 artwork-objects are exhibited in the 62 exhibitions from 1935 to 2009. The significance of the relationships within three groups of variables is examined. The three groups being: ANo[T23Artist]–ANRAG[M/F]; ANo[T23Artist]–AN[RAGArtist]; ANo[T23Artist]–AN[NS]. The correlations within these groups explore, further, the attributional-assignation of artworks as defined in the space between the artwork-text and the artwork-object. It is an experimental exploration into the assigned "authorship" of an artist's artwork, and into the creation of that "author".

As stated in "Section 3.1.1" there are no correlations between ANoRAG[M/F] and ANRAG.[56] *Table 3.1.1.3* demonstrates that there are also no relationships calculable between ANoRAG[M/F] and ANRAGM. The only significant correlation exhibited between ANoRAG[M/F] and ANRAG[M/F] is that between ANoRAGF and ANRAGF (*table 3.1.1.3*). It is only change in the exhibited numbers of artwork-objects by female-RAG artists that is accompanied by a significant, positive correlation with the weighted percentage of text used for the naming of female-RAG artists within the artwork-text. It is only the exhibiting of female-RAG artwork-objects that is accompanied by a complementary naming and gendering within the artwork-text.

Examination of the relationship between ANo[T23Artist] and ANRAG[M/F] provides further evidence for there being more significance in the gendering of female-RAG artwork-objects as female-RAG artists' artwork than gendering male-RAG artwork-objects as male-RAG artists' artwork. In agreement with the findings of "Section 3.1.1", there are no significant correlations, positive or negative, between any of the ANo[T23Artist] and ANRAG.[57] There are also no significant correlations calculated between ANo[T23Artist] and ANRAGM.[58] This

[56] A complete list of results for correlation between ANoRAG[M/F] and ANRAG[M/F] units (1935-2009) is produced in *App.2-[1935-2009b]-03*.
[57] A complete list of results for correlation between ANo[T23Artist] and ANRAG units (1935-2009) is produced in *App.2-[1935-2009b]-04b*.
[58] A complete list of results for correlation between ANo[T23Artist] and ANRAGM units (1935-2009) is produced in *App.2-[1935-2009b]-04c*.

provides evidence that there is no significant active attempt, through correlation with the artwork-text, to gender the authorship of RAG artwork-objects produced either by male-RAG or female-RAG artists as "male artwork". There is evidence, though, for a significant relationship between the exhibiting of artwork-objects by female-RAG artists, and the naming of female-RAG artists within the artwork-texts; creating artworks with a particular gendered authorship. *Table 3.1.5.1* contains all of the significant correlations calculated between ANo[T23Artist] and ANRAGF.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[59]	*p*-value	Lower	Upper
ANoKlil [Kliun]	ANRAGF	.337	32	.014	.094	.555
ANoRodA [Rodchenko]	ANRAGF	.324	32	.015	.091	.546
ANoExtA [Exter]	ANRAGF	.412	32	.003	.113	.647
ANoPopL [Popova]	ANRAGF	.421	32	.002	.131	.657
ANoRozO [Rozanova]	ANRAGF	.339	32	.019	.070	.565
ANoSteV [Stepanova]	ANRAGF	.404	32	.005	.156	.601
ANoUdaN [Udaltsova]	ANRAGF	.333	32	.024	.113	.531

Table 3.1.5.1: Significant bivariate correlations (Kendal's Tau) between ANo[T23Artist] and recording unit ANRAGF. (Per Year from 1935 to 2009.)[60]

Six of the T23Artist are female and 17 are male. *Table 3.1.5.1* shows that of these six female-RAG artists, five (83.33%) have a significant and positive correlation with ANRAGF. This compares to only two (11.76%) of the 17 male-RAG artists. This, taken in conjunction with the fact that there are no significant correlations between T23Artist and ANRAG or ANRAGM, indicates that, in terms of the gendering of artwork-objects through their relationship with Artist Name contained within the artwork-text, there are certain relationships that are more likely to be enhanced through positively correlating than others. The evidence above suggests that "female artwork" is more likely to be overtly expressed as such (female), than "male artwork" is to be expressed as such (male). Remembering that "artwork" within the context of this thesis is that which forms in the space between the artwork-object and the artwork-text, what is being stated here is that "female artwork" is more likely to be thought of/labelled as "female" by the viewer than "male artwork" will be consciously labelled "male", or gendered at all. The justification for this is due to there being a significant, positive correlation between the artwork-object of female-RAG artists and the use of female-RAG artist names within the contemporaneous artwork-text. No such positive relationship/reinforcement/correlation is calculated between the exhibiting of male-RAG

[59] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

[60] A complete list of results for correlation between ANo[T23Artist] and ANRAGF units (1935-2009) is produced in *App.2-[1935-2009b]-04c*.

artwork-objects and the accompanying artwork-text. In relation to female-RAG artists their gender is expressed (in 83.33% of cases) significantly, by both their artwork-object and artist names appearing within the artwork-text. Whilst with regard to male-RAG artists, there is a higher percentage of cases (11.76%) where there is a contradictory expression of gender between the artwork-object and the artwork-text than where there is significant accord (zero per cent): No significant, negative correlation between male-ANo[T23Artist] and ANRAGF; no significant, positive correlation between male-ANo[T23Artist] and ANRAGM.

The idea that artwork-objects produced by female-RAG artists are more likely to be complementarily "labelled" as "female-RAG artworks" than male-RAG artwork-objects are to be "labelled" as "male-RAG artworks", is further evidenced through calculating the correlations between ANo[T23Artist], and the weighted percentage of the RAG artists' names that form the third-level AN recording units ANRAGF and ANRAGM. ANRAGF and ANRAGM are formed from the weighted percentages of 29 different RAG artists (AN[RAGArtist]) whose names appear at least twice in one or more of the artwork-texts according to the method for content analysis described in "Section 2.0".[61]

Of the 29 RAG-artists' names (AN[RAGArtist]) that have been used within the content analysis, six are female-RAG artists and 23 are male-RAG artists. *Table 3.1.5.2* contains the results of the bivariate correlations (Kendall's Tau) calculated between the six female-RAG artists' names used within the content analysis and the six female ANo[T23Artist]. Of the 36 pairs of variables 24 have a significant, positive correlation (there are no significant, negative correlations); 66.67% of the time there is a significant, positive relationship between the referencing of a female-RAG artist within the artwork-text (female-AN[RAGArtist]) and the number of female-T23Artist artwork-objects being exhibited (female-AN[T23Artist]). This reinforces the specific gendering-by-correlation that occurs in reference to "female-RAG artworks", but is not in evidence in the writing/exhibiting of "male-RAG artworks". Of the possible 391 combinations of variables for the 23 male-AN[RAGArtist] and 17 male-ANo[T23Artist], there is only significant, positive correlation between 42 (10.74%) of them.[62] There are also two significant, negative correlations: ANBurlD–ANoLisL and ANPevsA–ANoRodA.

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[61] A complete list of results for correlation between ANo[T23Artist] and AN[RAGArtist] units (1935-2009) is produced in *App.2-[1935-2009b]-16a – App.2-[1935-2009b]-16c*.
[62] A complete list of results for correlation between ANo[T23Artist] and AN[RAGArtist] units (1935-2009) is produced in *App.2-[1935-2009b]-16a – App.2-[1935-2009b]-16c*.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[63]	*p*-value	Lower	Upper
ANoExtA [Exter]	ANExteA [Exter]	.507	32	.001	.206	.775
ANoGonN [Goncharova]	**ANExteA [Exter]**	**.158**	**32**	**.288**	**-.150**	**.451**
ANoPopL [Popova]	ANExteA [Exter]	.497	32	.000	.216	.738
ANoRozO [Rozanova]	ANExteA [Exter]	.488	32	.002	.218	.709
ANoSteV [Stepanova]	ANExteA [Exter]	.302	32	.048	.016	.575
ANoUdaN [Udaltsova]	ANExteA [Exter]	.328	32	.036	.020	.594
ANoExtA [Exter]	ANGoncN [Goncharova]	.577	32	.000	.293	.825
ANoGonN [Goncharova]	ANGoncN [Goncharova]	.477	32	.002	.293	.825
ANoPopL [Popova]	ANGoncN [Goncharova]	.450	32	.002	.180	.683
ANoRozO [Rozanova]	ANGoncN [Goncharova]	.495	32	.002	.185	.779
ANoSteV [Stepanova]	ANGoncN [Goncharova]	.436	32	.005	.126	.721
ANoUdaN [Udaltsova]	ANGoncN [Goncharova]	.563	32	.000	.317	.786
ANoExtA [Exter]	ANPopoL [Popova]	.441	32	.005	.065	.724
ANoGonN [Goncharova]	**ANPopoL [Popova]**	**.233**	**32**	**.139**	**-.086**	**.560**
ANoPopL [Popova]	ANPopoL [Popova]	.481	32	.001	.178	.724
ANoRozO [Rozanova]	ANPopoL [Popova]	.458	32	.005	.057	.756
ANoSteV [Stepanova]	ANPopoL [Popova]	.448	32	.003	.174	.681
ANoUdaN [Udaltsova]	ANPopoL [Popova]	.306	32	.048	.041	.574
ANoExtA [Exter]	ANRozaO [Rozanova]	.394	32	.011	.045	.669
ANoGonN [Goncharova]	**ANRozaO [Rozanova]**	**.240**	**32**	**.124**	**-.125**	**.588**
ANoPopL [Popova]	ANRozaO [Rozanova]	.358	32	.017	.039	.623
ANoRozO [Rozanova]	ANRozaO [Rozanova]	.526	32	.001	.183	.809
ANoSteV [Stepanova]	**ANRozaO [Rozanova]**	**.182**	**32**	**.253**	**-.141**	**.504**
ANoUdaN [Udaltsova]	**ANRozaO [Rozanova]**	**.355**	**32**	**.030**	**-.038**	**.741**
ANoExtA [Exter]	**ANStepV [Stepanova]**	**.284**	**32**	**.061**	**-.026**	**.568**
ANoGonN [Goncharova]	**ANStepV [Stepanova]**	**.049**	**32**	**.746**	**-.281**	**.347**
ANoPopL [Popova]	ANStepV [Stepanova]	.329	32	.024	.063	.548
ANoRozO [Rozanova]	**ANStepV [Stepanova]**	**.250**	**32**	**.112**	**-.079**	**.537**
ANoSteV [Stepanova]	ANStepV [Stepanova]	.665	32	.000	.383	.881
ANoUdaN [Udaltsova]	ANStepV [Stepanova]	.444	32	.005	.053	.751
ANoExtA [Exter]	**ANUdalN [Udaltsova]**	**.273**	**32**	**.080**	**-.031**	**.556**
ANoGonN [Goncharova]	**ANUdalN [Udaltsova]**	**.186**	**32**	**.236**	**-.187**	**.536**
ANoPopL [Popova]	ANUdalN [Udaltsova]	.321	32	.033	.035	.559
ANoRozO [Rozanova]	**ANUdalN [Udaltsova]**	**.191**	**32**	**.227**	**-.123**	**.501**
ANoSteV [Stepanova]	ANUdalN [Udaltsova]	.419	32	.009	.055	.730
ANoUdaN [Udaltsova]	**ANUdalN [Udaltsova]**	**.431**	**32**	**.009**	**-.030**	**.836**

Table 3.1.5.2: Bivariate correlations (Kendal's Tau) between each female-ANo[T23Artist] and each of the corresponding AN[RAGArtist] recording units: ANExteA; ANGoncN; ANPopoL; ANRozaO; ANStepV; ANUdalN. (Per Year from 1935 to 2009.)

There is also not, proportionally, as much "self-referencing" within male-RAG artwork. The variables emphasized with a grey background on *table 3.1.5.2* indicate those "female-RAG artworks" in which there is a significant, positive correlation between the referencing of the artist within the artwork-text (AN[RAGArtist]) and the number of artwork-objects by that artist being exhibited (ANo[T23Artist]). In five of the six (83.33%) possible cases, a significant, positive relationship is demonstrated between a female-RAG-artist's name being cited within artwork-text (AN[RAGArtist**X**]) and the number of the same artist's artwork-objects being

[63] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

exhibited in a particular Year (ANo[T23Artist**X**]). Between the number of artwork-objects exhibited by the 17 male-T23Artist and their names' weighted percentages within the corresponding artwork-texts, significant, positive correlation is calculated for 11 of the 17 case: 64.71%. These significant correlations are listed in *table 3.1.5.3*, and the strength of the correlations between most pairing are similar to those of the significant female pairing shown in *table 3.1.5.2*.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[64]	*p*-value	Lower	Upper
ANoArcA [Archipenko]	ANArchA [Archipenko]	.566	32	.000	.164	.837
ANoChaM [Chagall]	ANChagM [Chagall]	.476	32	.003	.088	.801
ANoGabN [Gabo]	ANGaboN [Gabo]	.509	32	.000	.232	.746
ANoKanW [Kandinsky]	ANKandW [Kandinsky]	.335	32	.021	.059	.614
ANoKliI [Kliun]	ANKliuI [Kliun]	.374	32	.015	.074	.626
ANoLarM [Larionov]	ANLariM [Larionov]	.393	32	.009	.067	.667
ANoLisL [Lissitzky]	ANLissL [Lissitzky]	.477	32	.000	.291	.650
ANoMalK [Malevich]	ANMaleK [Malevich]	.418	32	.001	.143	.650
ANoPunI [Puni]	ANPuniI [Puni]	.621	32	.000	.312	.848
ANoRodA [Rodchenko]	ANRodcA [Rodchenko]	.597	32	.000	.340	.807
ANoSueN [Suetin]	ANSuetN [Suetin]	.538	32	.001	.198	.768

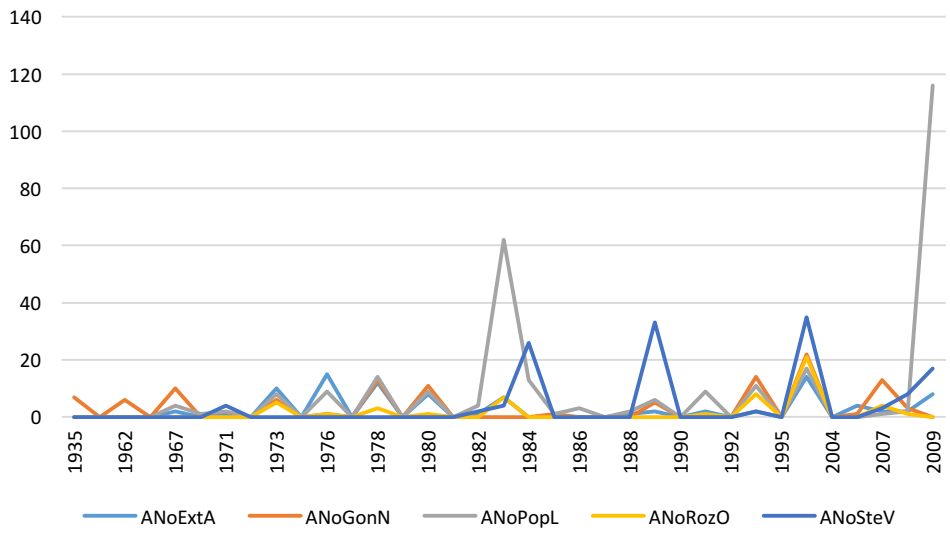
Table 3.1.5.3: Significant bivariate correlations (Kendal's Tau) between male-ANo[T23Artist] and the "self-referencing" AN[RAGArtist] recording unit. (Per Year from 1935 to 2009.)

"Section 3.1.5" calculates that there are no significant correlations calculated between ANo[T23Artist] and ANRAGM. Whilst *table 3.1.5.1* shows that four of the female-ANo[T23Artist] listed in *table 3.1.5.2* demonstrate significant, positive correlations with ANRAGF. Even though there are more significant, positive ANo[T23Artist**X**]-AN[RAGArtist**X**] pairings for the male-RAG (*table 3.1.5.3*), than ANo[T23Artist**X**]-AN[RAGArtist**X**] pairings for the female-RAG (*table 3.1.5.2*), female-ANo[T23Artist] are more likely to have a significant, positive correlation with the collective ANRAGF recording unit than male-ANo[T23Artist] are to have with the collective ANRAGM recording unit. This, evident, relationship between exhibiting particular female-RAG artwork-objects and them being associated with all female-RAG Artist Name (AN) within the artwork-text – this collectivization of female-RAG artwork – is at odds with the evidently more individualistic nature of male-RAG artwork. Reason for this difference is suggested through examination of *graphs 3.1.5.1* to *3.1.5.4*.

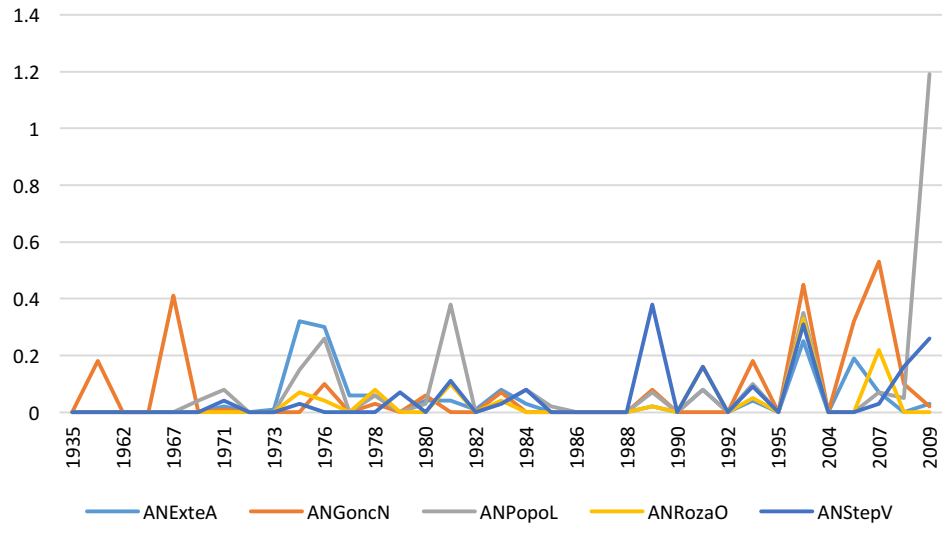
Graphs 3.1.5.1 and 3.1.5.2 chart each of the variables from *table 3.1.5.2* against Year for those pairs highlighted in grey. *Graph 3.1.5.1* charts the variable ANo[T23Artist], whilst *graph 3.1.5.2* charts the corresponding AN[RAGArtist] variable. *Graphs 3.1.5.3* and *3.1.5.4*

[64] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

chart the same variables but for the significant, positive “self-referencing” relationships calculated in *table 3.1.5.3* between male-ANo[T23Artist] and AN[RAGArtist].



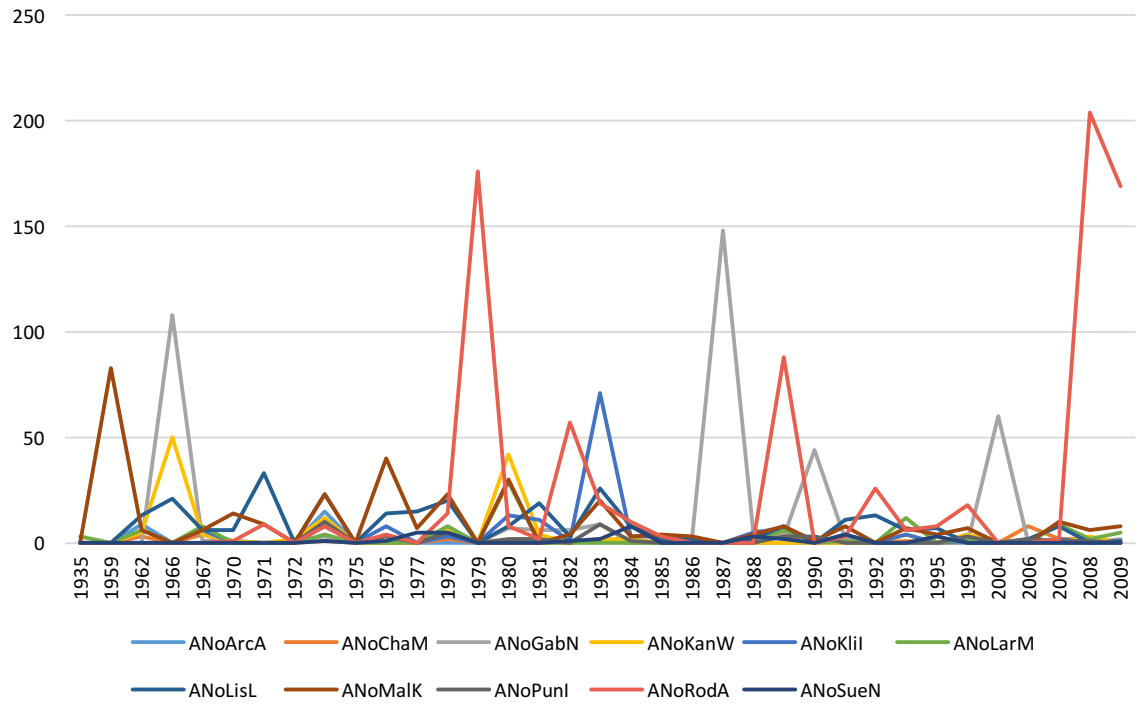
Graph 3.1.5.1: Line graph of the relationships between the female-ANo[T23Artist] from *table 3.1.5.2* and Year (1935-2009).



Graph 3.1.5.2: Line graph of the relationships between the recording units AN[RAGArtist] from *table 3.1.5.2* and Year (1935-2009).

Examination of *graphs 3.1.5.1 and 3.1.5.2* reveals that “peaks” and “troughs” for the lines representing the ANo[T23Artist] (*graph 3.1.5.1*) and AN[RAGArtist] (*graph 3.1.5.2*) for the female-RAG artists listed in *table 3.1.5.2* tend to rise and fall simultaneously. If there is a slight exception it is the orange lines representing ANoGonN and ANGoncN (Goncharova). These lines more frequently oppose the general trends being followed/set by the other lines. Note the unique “peaks” of ANoGonN 1959 and 1967 on *graph 3.1.5.2*, and of ANGoncN

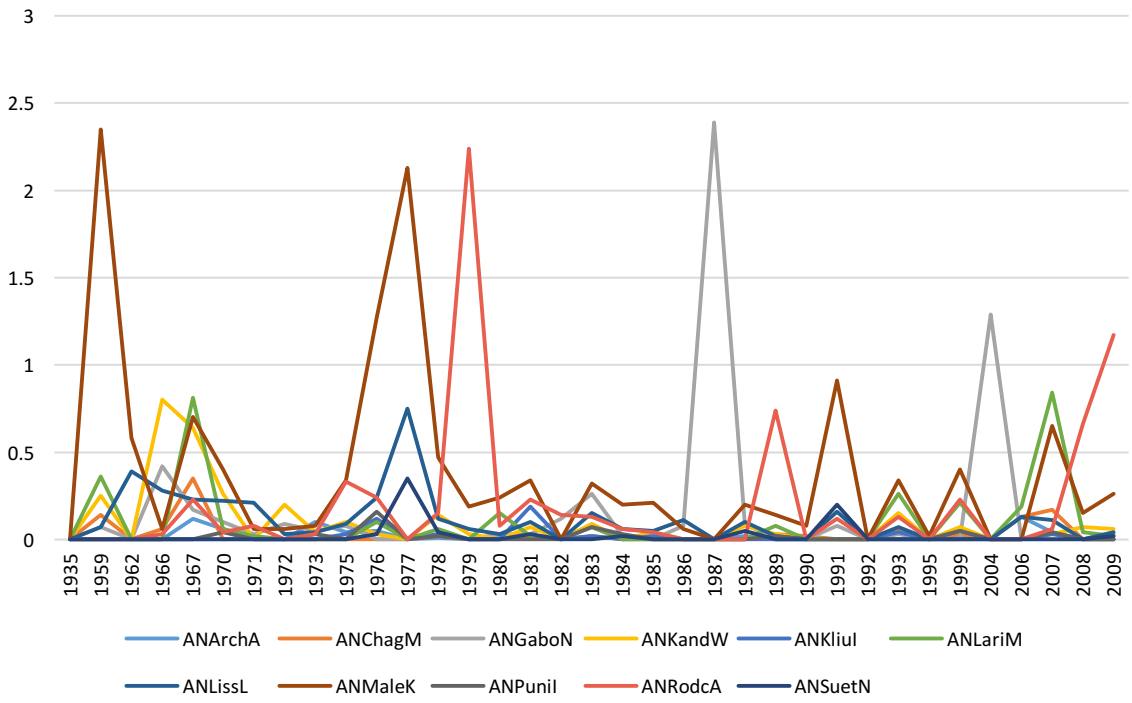
1935 and 1962 on *graph 3.1.5.1*. ANoGonN and ANGoncN are also the only lines to show a downward trend from 2008 to 2009, opposing the general upward trends exhibited by the lines in *graphs 3.1.5.1* and *3.1.5.2*. Unlike the other four female-RAG artists represented on these graphs, ANoGonN does not have a significant, positive relationship with ANRAGF (*table 3.1.5.1* and *App.2-[1935-2009b]-04c*). It is, therefore, not unexpected that ANGoncN and ANoGonN do not follow the similar trends of the other lines.



Graph 3.1.5.3: Line graph of the relationships between the male-ANo[T23Artist] from *table 3.1.5.3* and Year (1935-2009).

In contrast to *graphs 3.1.5.1 and 3.1.5.2*, the line *graphs 3.1.5.3 and 3.1.5.4*, representing the ANo[T23Artist] (*graph 3.1.5.3*) and AN[RAGArtist] (*graph 3.1.5.4*) for the male-RAG artists listed in *table 3.1.5.3*, exhibit much less coordination amongst their rises and falls; “peaks” and “troughs”. There is general synchronization between the rises and falls of the lines from each graph representing the same male-RAG artist: For example, the red lines ANoRodA (*graph 3.1.5.3*) and ANRodcA (*graph 3.1.5.*4), representing the number of artwork-object created by Rodchenko exhibited and the weighted percentage of “Rodchenko” within the artwork-texts, respectively, share the same significant “peaks” of 1979, 1989 and 2009. This is expected as *table 3.1.5.3* contains the significant, positive correlation between ANo[T23Artist] and AN[RAGArtist] for each of these male-RAG artists. The general lack of coordination between the lines of the different male-RAG artists is also not unexpected, and confirms a lack of collectiveness in the displaying and writing of the

male-RAG as a group, and, perhaps, their greater treatment as individuals when compared to the treatment and creation of female-RAG artwork. This is confirmed to some extent by there being no significant correlations calculated between ANo[T23Artist] and ANRAGM.



Graph 3.1.5.4: Line graph of the relationships between the recording units AN[RAGArtist] from *table 3.1.5.3* and Year (1935-2009).

The notion that *graphs 3.1.5.3* and *3.1.5.4* illustrate the more individualistic approach to the creation of male-RAG artwork through British exhibition from 1935 to 2009, is also supported by *table 3.1.1.4*. *Table 3.1.1.4* lists all of the "focused" exhibitions; exhibitions that named individual artists within their titles. Of the 20 "focused" exhibitions 19 name male-RAG artists in their titles, and three name female-RAG artists. Of the 19 that name male-RAG artists, 16 include the name of only one male-RAG artist. There are no exhibitions in which one female-RAG artist is named in isolation and not in conjunction with other male-RAG or female-RAG artists. This is represented on *graphs 3.1.5.1* to *3.1.5.4*, by the differing levels of synchronicity between lines. All three of the "focused" exhibitions that name just Malevich in the title are easily identified within *graph 3.1.5.4* by the dominating "peaks" of the brown-line ANMaleK in 1959, 1977 and 1999. These "peaks" represent the exhibitions: *Kasimir Malevich 1878-1935* (1959); *Kasimir Malevich* (1976); *New Art for a New Era: Malevich's Vision of the Russian Avant Garde* (1999). Similar "peaks" correlating to "focused" exhibitions, the titles of which name one male-RAG artist in insolation, are observable in the lines representing the artist Rodchenko (red line) and Gabo (grey line) on *graph 3.1.5.3 and*

graph 3.1.5.4. The red-line “peak” of 1979 coinciding with the exhibition *Alexander Rodchenko 1891-1956*, whilst grey-line “peaks” of 1987 and 2004 coincide, respectively, with the exhibitions *Naum Gabo: Sixty Years of Work* and *Naum Gabo and Colour*.

There are a couple of dominant “peaks” in *graph 3.1.5.2* for the female-RAG artists of Stepanova (dark-blue line) and Popova (grey line) that coincide with the “focused” exhibitions of *Family Workshop: Rodchenko and Stepanova* (1989) and *Rodchenko and Popova: Defining Constructivism* (2009). But, unlike 16 of the male-RAG “focused” exhibitions, the female-RAG share the billing. The other significant “peak” on, both, *graph 3.1.5.1* and *graph 3.1.5.2* is that of 1999. It is not significant due to one artist dominating, as in the rest of the “peaks” discussed, but because in *graph 3.1.5.1* it unites all lines, with the exception of ANoGonN, and in *graph 3.1.5.2* it unites all of the female-RAG lines. The “peak” represents the exhibition *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova*. This exhibition summarises the difference in the creation of male-RAG and female-RAG artworks as represented in *graphs 3.1.5.1* to *3.1.5.4*, and in the significant, positive correlations shown in *table 3.1.5.1* between the number of female-RAG artwork-objects exhibited and ANRAGF, in contrast to there being no significant correlations calculated between ANo[T23Artist] and ANRAGM. It demonstrates the collective quality imposed by, both, the exhibiting of artwork-objects and the artwork-text to form a coherent group of artwork describable as “female-RAG artwork”. There is no such collective quality in the artwork of the male-RAG, there is no correlation between the artwork-objects and a cohesive notion of a ANRAGM. Both the *graphs 3.1.5.3* and *3.1.5.4*, and the use of “focused” exhibitions listed in *table 3.1.1.4*, demonstrate that “male-RAG artwork” is formed on a history of individuals.

This collectivization of female-RAG artwork, in contrast to that of male-RAG artwork, which acts to present female-RAG artwork differently and as different to that of male-RAG artwork can be viewed as continuing the concluding comments of “Section 3.1.3”. “Section 3.1.3” states that female-RAG artwork is presented as a collective defined variously by specific alignment to particular Art Type (AWPDTEX) and social-political affiliation (SPWTG), placing it outside of the categories of male-RAG artwork and RAG artwork. The relationships between ANo[T23Artist] and AN[RAGArtist] are demonstrative of further collective segregation of female-RAG artwork from the dominant category of male-RAG artwork.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[65]	*p*-value	Lower	Upper
ANoSteV	ANRodcA	.411	32	.005	.154	.631
ANoRodA	ANStepV	.493	32	.001	.276	.670
ANoGonN	ANLariM	.424	32	.005	.118	.689
ANoLarM	ANGoncN	.477	32	.002	.192	.739
ANoRozO	ANKrucA	.449	32	.005	.109	.750
ANoKruA [No Data][66]	ANRozaO	-	-	-	-	-

Table 3.1.5.4: Bivariate correlations (Kendal's Tau) between ANo[T23Artist] and recording unit AN[RAGArtist] of familial couples. (Per Year from 1935 to 2009.)

If the artwork authorships are formed by correlations between ANo[T23Artist**X**] and AN[RAGArtist**X**], and between ANo[T23Artist**X**] and broader relationships such as to concepts of gender; then an artwork's authorship must also be created through any significant correlation with other artists named within the artwork-text (AN[RAGArtist**Y**]). Such relationships that form a collective authorship of an artwork could be professional or familial: This thesis examines the familial relationships. Collective authorship formed through professional relationship – i.e. relationships between RAG-artists working within the same artistic group – will not be examined due to the difficulty in assigning artists to particular groups, and these groups' memberships susceptibility to change or being disbanded. Returning to the six female-RAG artists identified above, three of them have partners who can also be described as belonging to the RAG: Vavara Stepanova's partner Aleksandr Rodchenko; Natalia Goncharova's partner Mikhail Larionov; Olga Rozanova's partner Aleksei Kruchenykh. *Table 3.1.5.4* contains the correlations calculated between AN[RAGArtist] and ANo[T23Artist] for each of these familial-couples.

With the exception of the relationship between ANoKruA and ANRozaO (for which there is not enough data to produce a result), in all the cases formed of familial-RAG-artist couples there are significant, positive relationships between the citing of one in the artwork-text and the number of artwork-objects on exhibit by the other. These relationships can be demonstrated diagrammatically. *Graph 3.1.5.5* and *graph 3.1.5.6* plot the variables of ANo[T23Artist**X**] and AN[RAGArtist**Y**] for partners Rodchenko and Stepanova (*graph 3.1.5.5*), and partners Goncharova and Larionov (*graph 3.1.5.6*). These graphs combine the lines pertaining to these artists from *graphs 3.1.5.1* to *3.1.5.4*.

[65] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

[66] There is no data for ANoKruA due to Kruchenykh not being in the T23Artist category. This is probably due to him being a RAG poet and not a visual artist.

Graph 3.1.5.5 illustrates, via the similarity of each lines' "peaks" and "troughs", the significant, positive correlations from *table 3.1.5.4* of ANoRodA–ANStepV and ANoSteV–ANRodcA. The graph also allows for key Years to be identified in the formation of this partnership between artwork-objects and artwork-text. From *graph 3.1.5.5*, Years 1971, 1989, 1999, 2008 and 2009 can be identified, via the coinciding "peaks"/high-points, as significant Years in the creation of artwork authorship for both Rodchenko and Stepanova. With the exception of 1971 (*Art in Revolution: Soviet Art and Design since 1917*), each of these Years host a "focused" exhibition naming both or either "Rodchenko" or "Stepanova" in its title.[67] Of particular note is the 1989 exhibition, *Family Workshop: Rodchenko and Stepanova*, represented on *graph 3.1.5.5* in that Year by a "peak" on all four lines. Not only does the exhibition contain artwork-objects by, both, Rodchenko (72 artwork-objects) and Stepanova (31 artwork-objects), but the artwork-text demonstrates the active creation/promotion of artworks of joint familial authorship and inspiration. Chris Carrell and Katya Young in their "Preface and Acknowledgements" chart a history of "togetherness" in relation to the artworks of Rodchenko and Stepanova:

> The works of Rodchenko and Stepanova were first shown together in the *Art in Revolution* exhibition, organised by the Arts Council of Great Britain at the Hayward Gallery in 1971, and more recently in the exhibition *Art in Production*, organised in 1984 by the Museum of Modern Art, Oxford.[68]

The influence of the *Art in Production* exhibition of 1984 is also observable on *graph 3.1.5.5*, but only forms a distinct "peak" in relation to Stepanova. Alexander Lavrentiev in his contribution to the artwork-text accompanying *Family Workshop*, demonstrates how the conjoined quality of Rodchenko's and Stepanova's artwork can be traced back to their own exhibiting of their artwork-objects: "From 1918 Rodchenko and Stepanova deliberately participated in exhibitions together, sometimes taking up whole galleries for their paintings and graphic works."[69]

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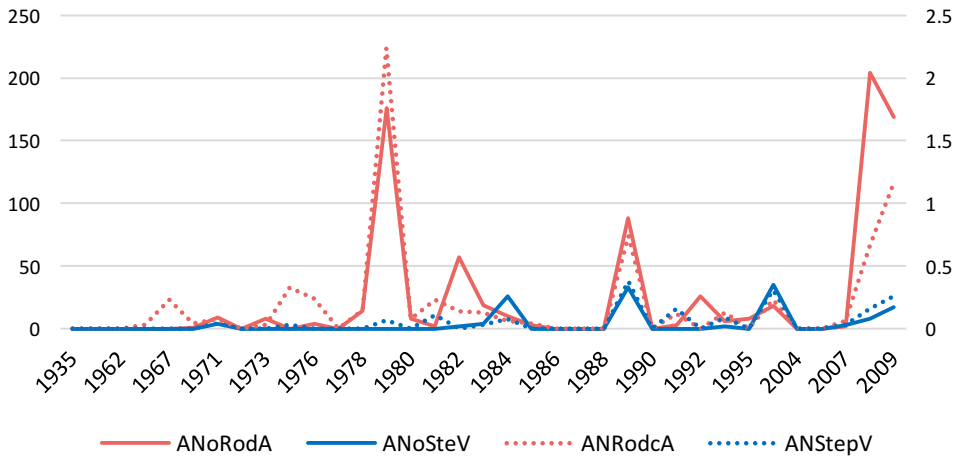
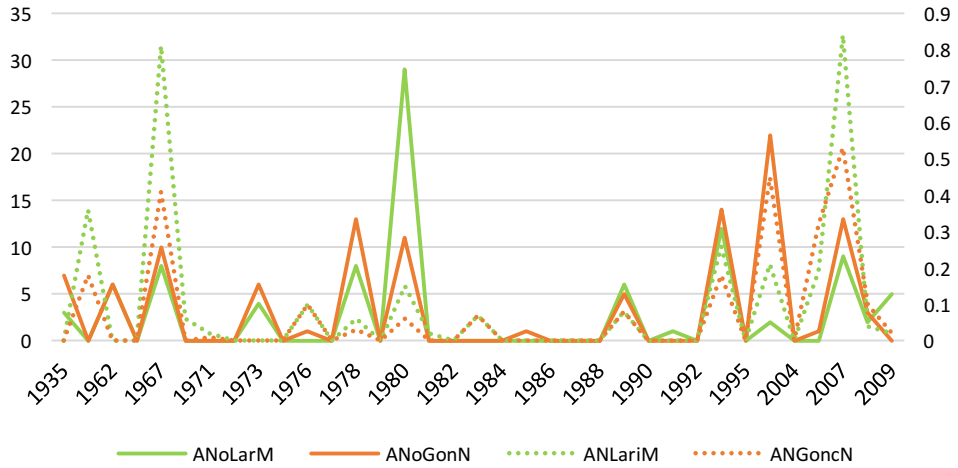
[67] The "focused" exhibitions are: *Family Workshop: Rodchenko and Stepanova* (1989); *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova* (1999); *Alexander Rodchenko: Revolution in Photography* (2008); *Rodchenko and Popova: Defining Constructivism* (2009)

[68] Chris Carrell and Katya Young, "Preface and Acknowledgements", in Carrell, C., Young, K., McArthur, E., and Lodder, C., (eds.), *The Rodchenko Family Workshop*, New Beginnings and Serpentine Gallery: Glasgow and London, 1989, p. 5

[69] Alexander Lavrentiev, "The Workshop of the Future", in Carrell, C., Young, K., McArthur, E., and Lodder, C., (eds.), *The Rodchenko Family Workshop*, New Beginnings and Serpentine Gallery: Glasgow and London, 1989, p. 12



Graph 3.1.5.5: Line graph allowing comparisons of the relationships between ANoRodA (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and the corresponding recording unit ANRodcA (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009), and between the its familial partnership of ANoSteV (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and the corresponding recording unit ANStepV (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009).



Graph 3.1.5.6: Line graph allowing comparisons of the relationships between ANoLarM (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and the corresponding recording unit ANLariM (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009), and between the its familial partnership of ANoGonN (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and the corresponding recording unit ANGoncN (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009).

As well as the history of exhibiting together, the correlation of artwork authorship is also aided within the Lavrentiev's artwork-text for the *Family Workshop* exhibition when, in respect to Stepanova's *The Figure* series of graphics and paintings (1919-1921), he writes: "The basic geometry can also be found in Rodchenko's compositions and in this narrow sense perhaps Stepanova could be called a pupil of Rodchenko."[70] This artwork-text can be

[70] Lavrentiev, 1989, p. 16

read in conjunction to the seven *Figure* artwork-objects by Stepanova exhibited in the exhibition, and blurs the creative authorship of the artwork from that of solely Stepanova to one of Stepanova–Rodchenko.[71]

Graph 3.1.5.6 allows for the identification of Years in which the authorship of artworks by, both, Goncharova and Larionov are expressed as joint enterprises, rather than the sole product of the artist credited with creating a particular artwork-object. These Years are evidenced from the *graph 3.1.5*.6 as being 1967, 1978, 1980, 1989, 1993, 1999 and 2007, and are indicated by simultaneous "peaks" in all four lines at these points. Examining three of these Years with reference to the artwork-text produced in conjunction with exhibitions held in which artwork-objects by, both, Larionov and Goncharova are exhibited, reveals examples of a project of joint authorship of Goncharova–Larionov artwork. This joint authorship of a Goncharova–Larionov artwork is created through the relationship between the artwork-text and the display of artwork-objects in each of these three case. The three Years that are used to exemplify this are 1989, 1993 and 2007. These Years correspond to three particular exhibitions: 1989, *100 years of Russian Art 1889-1989: From Private Collectors in the USSR* at the Barbican Art Gallery, London; 1993, *Russian Painting of the Avant Garde: 1906-1924* at the Scottish National Gallery of Modern Art, Edinburgh; 2007, *A Slap in the Face! Futurists in Russia* at the Hatton Gallery, Newcastle. All of these exhibitions contain artwork-objects by, both, Larionov and Goncharova, which, juxtaposed against the artwork-text of their accompanying catalogues, blur the distinct artwork authorship of the styles exhibited within each artist's artwork-objects.[72]

The expressing of the artwork of Goncharova and her partner Larionov as a joint enterprise, blurring authorial distinction, is demonstrated in two ways by the artwork-text of the three identified exhibitions: Firstly, in describing their artwork-objects stylistically. Valery Dudakov, in his contribution to the artwork-text that accompanies the, 1989, *100 years of Russian Art 1889-1989* exhibition writes, in conjunction with the four artwork-objects exhibited by Larionov and three by Goncharova: "Larionov and Goncharova began to work in a style

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[71] The seven *Figure* artwork-objects by Stepanova displayed in *Family Workshop*: *Child Figure*, 1921 (43.4x30.5cm); *Female Figure*, 1920 (90.5x60cm); *Male Figure*, 1921 (43.4x30.5cm); *Male Figure*, 1921 (43.4x30.5cm); *Three Figures*, 1920 (39.7x35.2cm); *Three Figures on a Black Background (A Circus)*, 1920 (70.8x53.7cm); *Two Figures*, 1921 (80x60cm).

[72] 1989, *100 years of Russian Art 1889-1989* contains four artwork-objects by Larionov and three by Goncharova. 1993, *Russian Painting of the Avant Garde* contains nine artwork-objects by Larionov and 11 by Goncharova. 2007, *A Slap in the Face! Futurists in Russia* contains nine artwork-objects by Larionov and 13 by Goncharova

which was based on folk traditions."[73] This professional conjoining of Larionov–Goncharova style continues through to 2007 in the artwork-text of the *A Slap in the Face!* Exhibition, which juxtaposes nine artwork-objects by Larionov and 13 by Goncharova. John Milner writes: "Goncharova and Larionov's work could not adequately be explained in terms of Italian futurism."[74]

The second way, demonstrated by the artwork-texts, in which the authorship of the artwork of Goncharova and Larionov is presented as a joint enterprise is in describing the developments that Goncharova and Larionov brought to art in general. As with the stylistic descriptions of their artwork-objects, little distinction is made between the two artists' various, individual developments within their artwork-objects, rather they are presented in partnership. Christina Lodder writes in the artwork-text of the catalogue, which accompanies the *Russian Painting of the Avant Garde: 1906-1924* exhibition and the displaying of nine artwork-objects by Larionov and 11 by Goncharova: "For Larionov and Goncharova, seeking a path of development beyond Neoprimitivism, the creation of Rayism represented a distinct and original response to these new stimuli […]"[75] Again, John Milner continues, in his 2007 artwork-text, this joint Larionov–Goncharova artwork through comment on their development of Rayism. Milner writes of their influence on Malevich:

> The effect of powerful coordinated beams of light in unfamiliar colour combinations from several directions was a new spectacle, and a new medium for Malevich that he could use to develop the recent rayist innovations of Larionov and Goncharova.[76]

Two incidental points: Firstly, as well as familial correlation between partners it is also exhibited between siblings. In the case of the exhibiting of artwork-objects by Naum Gabo and the citing of his brother's name, Antoine Pevsner, within the contemporaneous artwork-text the significant, positive correlation is almost as strong as that between the exhibition of Gabo's artwork-objects and the references to his own name within the artwork-text.[77]

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[73] Valery Dudakov, "An Introduction to the Exhibition", in Elliott, D., and Dudakov, V., (eds.), *100 years of Russian Art 1889-1989: From Private Collectors in the USSR*, Lund Humphries: London, 1989, p. 31
[74] John Milner, *A Slap in the Face! Futurists in Russia*, Philip Wilson: London, 2007, p. 12
[75] Christina Lodder, *Russian Painting of the Avant Garde: 1906-1924*, Trustees of the National Galleries of Scotland: Edinburgh, 1993, p. 15
[76] Milner, 2007, p. 28
[77] ANoGabN and ANPevsA: $T = .501$, $N = 34$, $p < .05$ (.000), BCa 95% CI [.251, .729]. ANoGabN and ANGaboN: $T = .537$, $N = 34$, $p < .05$ (.000), BCa 95% CI [.266, .754].

Secondly, these authorships need not be defined in terms of inter-person or inter-gender correlation: They can also be examined, defined, and demonstrated on broader geographical/national terms.

Returning to *figure 2.0.1* and AN's second-level recording units where the artists have been divided into groups corresponding to their country of origin, or their being RAG. Examination of the correlations calculated between ANo[T23Artist] and AN[NS] reveals that of the 16, second-level AN[NS] recording units, excluding ANRAG, only one demonstrates a significant, positive correlation with more than one ANo[T23Artist]: ANGER (Germany). *Table 3.1.5.5* contains the significant results of the relationships between named artists from Germany (ANGER) that appear within the artwork-texts and the number of artwork-objects exhibited by RAG artists.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[78]	*p*-value	Lower	Upper
ANGER	ANoLisL [Lissitzky]	.306	32	.026	.033	.572
ANGER	ANoKanW [Kandinsky]	.289	32	.046	.007	.559
ANGER	ANoKluG [Klucis]	.341	32	.021	.072	.608

Table 3.1.5.5: Significant bivariate correlations (Kendal's Tau) between ANo[T23Artist] and the recording unit ANGER. (Per Year from 1935 to 2009.)[79]

The results from *table 3.1.5.5* are also displayed in *graph 3.1.5.7*. The general synchronisation of all four lines on *graph 3.1.5.7* is indicative of the significant, positive correlation calculated between ANGER and the numbers of artwork-object displayed from 1935 to 2009 by the three RAG artists in *table 3.1.5.5*. *Graph 3.1.5.7* also shows that these significant, positive relationships are reducing ones, in terms of the impact they have within exhibitions, and in defining RAG artwork. The proportion of the artwork-text represented by ANGER (yellow line), ANoLisL (dotted-blue line) and ANoKanW (dotted-orange line) are all shown to reduce from 1935 to 2009; they each present a downward trend against Year for the period. The exception is the line representing ANoKluG (dotted-grey line), this line demonstrates a slight positive trend for the period 1935-2009. These trends are supported, by the correlations between each variable and Year, which although not significant and lacking confidence, do not contradict the observations of *graph 3.1.5.7*.[80]

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[78] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

[79] A complete list of results for correlation between ANo[T23Artist] and AN[NS] units (1935-2009) is produced in *App.2-[1935-2009b]-04a* and *App.2-[1935-2009b]-04b*.

[80] ANGER and Year: $T = -.114$, $N = 32$, $p > .05$ (.386), BCa 95% CI [-.416, .214]. ANoLisL and Year: $T = -.209$, $N = 32$, $p > .05$ (.106), BCa 95% CI [-.444, .041]. ANoKanW and Year: $T = -.183$, $N = 32$, $p > .05$ (.183), BCa 95% CI [-.431, .078]. ANoKluG and Year: $T = .107$, $N = 32$, $p > .05$ (.442), BCa 95% CI [-.128, .340].

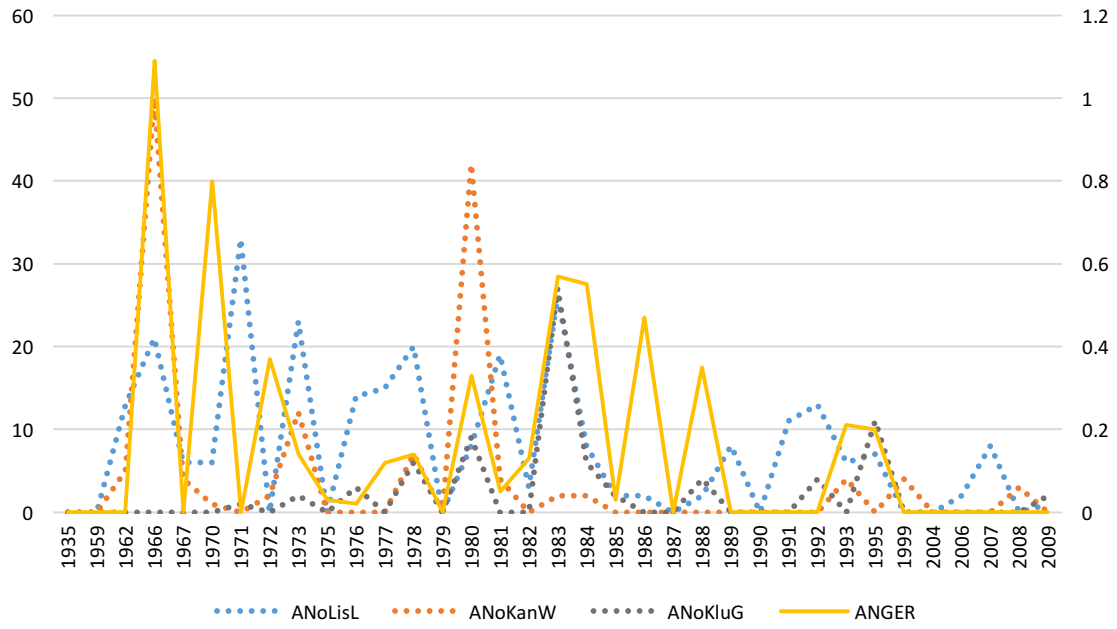

Table 3.1.5.7: Line graph allowing comparisons of the relationships between ANoLisL (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), ANoKanW (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), ANoKluG (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and ANGER (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009).

The initial higher proportion of ANGER within the artwork-texts and its significant, positive correlation to ANoLisL and ANoKanW is demonstrated in the artwork-text of two exhibition catalogues from 1966, and observable by the "peaks" on *graph 3.1.5.7* at Year 1966. The two exhibitions: *An Introduction to El Lissitzky*, Grosvenor Gallery, London, at which 21 artwork-objects by Lazar Lissitzky are exhibited; *Kandinsky and his Friends: Centenary Exhibition*, Marlborough Fine Art Limited, London, at which 50 artwork-objects by Wassily Kandinsky are exhibited. The artwork-texts of, both, catalogues, produced to accompany the exhibitions, cite the names of a number of German artists in relation to both Lissitzky's and Kandinsky's name (AN) within the artwork-text, but also in juxtaposition to the exhibition's exhibited artwork-objects by these artists. *An Introduction to El Lissitzky* cites the following names in the accompanying biographical details for Lissitzky, 1921:

> Sent to Berlin to establish cultural contacts with the West. Met Schwitters, Hausmann, Grosz, Heartfield, Van Doesburg, Arp, Eggling, Hans Richter, Moholy-Nagy and the architects Hilbersaimer, Mies Van der Rohe and Van Eesteren. Addressed conference of Dadaists at

> Weimar and a Constructivist congress at Dusseldorf.[81]

Whilst Will Grohmann, in his contribution to the artwork-text for *Kandinsky and his Friends*, writes:

> Kandinsky and Marc were busy with the preparation for the Blaue Reiter which was opened at *Thannhauser's* gallery at the same time as the third exhibition of the Neue *Künstlervereinigung* on December 18th, 1911. The battle had been won, Delaunay, Macke, Münter and Kubin were in Kandinsky's camp, Jawlensky and Werefkin left the *Künstlervereinigung* only in 1912, and the group ceased to exist.[82]

In each extract the Artist Name, and by association their artwork-objects are being incorporated into a wider lexicon. Consisting, in these cases, of a significant number of German artists, the names of which, for 1966, account for 1.09% of the artwork-text produced. The significant point here, is not that such a relationship is found, but that, as demonstrated in *graph 3.1.5.7*, these relationships are not constant; how the artworks are defined changes with Years. *Graph 3.1.5.7* shows that in relation to the number of artwork-objects exhibited by Lissitzky the relationship demonstrated for 1966 no longer exists in 2007. For whilst eight artwork-objects by Lissitzky are exhibited, ANGER accounts for zero per cent of the artwork-text.

As demonstrated throughout this unit the RAG artwork is an evolving relationship. It is the "shadow" cast by the artwork-object's particle as it is passed by the wave of artwork-text. In this understanding, the RAG artwork is never static and can never be permanently defined. To insist upon permanence is to remove the element of time from the examination of the 62-British-exhibition canon; it is to reduce every graph presented within this unit to a point. This in return would raise the question: Which point best represents the whole? The answer being asserted within this study is none, and that there is no need to choose a point when the relationship over time is equally quantifiable through bivariate correlation and able to be represented visually via graphs plotting the relationships between artwork-text and artwork-object in relation to Years. So far in this thesis the textual element has referred to the words

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[81] Grosvenor Gallery, 1966, n.p.
[82] Will Grohmann, *Kandinsky and his Friends: Centenary Exhibition*, Marlborough Fine Art Limited: London, 1966, p. 5

contained within and creative of the artwork-text, in the final section of “Unit 3” (“Section 3.2”) a second “textual” element is examined: Reproductions of RAG artwork-objects.

3.2 – Reproductions: Introduction

As previously stated, this thesis examines the shadow-like formation of artwork between object (artwork-object) and text (artwork-text). The objects and texts used for the majority of this study derive from exhibitions and exhibition catalogues of the 62-British-exhibition canon, but what is being studied is their ineffable collaborations. This has been an ambition of some museums and galleries that can be traced back over a century. William Stanley Jevons in his *Method of Social Reform and Other Papers*, published in 1883, writes that the true purpose of museums is "to enable students to see the things and realise sensually the qualities described in lessons or lectures: in short, to learn what cannot be learnt in words".[83] He views this as the "true meaning and beauty of the object" and that to achieve this "the spectator must possess a previous knowledge of its [the artwork-object's] historical bearings and a rare power of imagination, enabling him to restore it ideally to its place".[84] Jevons's fellow Victorian John Forbes Watson also believes that the artwork-object or, as he terms it, the "actual article" could not function alone within the museum setting.[85] In his paper "On the measures required for the efficient working of the Indian Museum and Library", published in 1874, he writes that these objects "must be supplemented by literary and statistical information, as also by pictorial or graphic illustrations".[86]

Content analysis allows for the examination of the catalogue texts and their relationship with the exhibited objects in the formation of artwork. But, as described by Watson, there are other inputs into the category of "text" that might not be covered by/included in content analysis: "pictorial or graphic illustrations". In relation to the 62 exhibitions examined in this thesis, such inputs include those exhibits that come under the category of reconstruction, reproduction, reprint, or realization. Of the 4,871 RAG artwork-objects exhibited in the 62 British exhibitions (1935-2009) included in this study, 183 are classified as "RAG" reproductions: Equating to 3.76% of RAG exhibited artwork-objects. Of the 183 "RAG" reproductions, 117 are exhibited during the 1970s, with 1971 being the first Year to witness the exhibition/use of "RAG" reproductions. For the 1970s, "RAG" reproductions account for 11.39% of the RAG exhibited artwork-objects.[87] *Table 3.2.1* shows how, from the 1970s,

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[83] Willian Stanley Jevons, *Method of Social Reform and Other Papers*, Macmillan: London, 1883, p. 60
[84] Jevons, 1883, p. 58
[85] John Forbes Watson, "On the measures required for the efficient working of the Indian Museum and Library", 1874, in Siegel, J. (ed.), *The Emergence of the Modern Museum: An Anthology of Nineteenth-Century Sources*, Oxford University Press: Oxford, 2008, p. 325
[86] Watson, J. F., 1874, p. 325
[87] 117 of the 1,027 RAG artwork-objects. For complete list of RAG artwork-objects exhibited in each exhibition see *Strugnell-ThesisCD* and *Excel* file: *Strugnell-A-O2 (RAG artwork-objects in the 62 exhibitions)*.

there is a decline in, both, the number of "RAG" reproductions exhibited, and the percentage that these reproductions account for in relation to the total number of exhibited RAG artwork-objects. That is until the latter half of the first decade of the twenty-first century when there is an increase in the use of "RAG" reproductions within exhibitions. These reproductions are divided into various groups: Architectural and theatre-set models; reprints from original negatives; reprints from original woodblocks; sculptures; textiles. They are, usually, produced contemporaneously to an exhibition, and are not made by the artist credited with making or designing the "original"/period version.

Five-Year Period	1955-1959	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009
Total No. "RAG" Reproductions	0	0	0	40	77	25	16	1	1	0	23
% "RAG" Repro's of Total RAG exhibited	0	0	0	10.44	11.96	1.89	2.88	.22	.32	0	3.1

Table 3.2.1: Total number of "RAG" reproductions, expressed both as a number and as a percentage of the total number of RAG artwork-objects exhibited per Five-Year period from 1955 to 2009.

The 1973 exhibition *Russian Constructivism Revisited*, held at the Hatton Gallery University of Newcastle, curated by John Milner, contains 17 reconstructions, or as the catalogue frequently terms them, "realizations".[88] They are all dated 1973, the same year as the exhibition, and include, among others, newly produced realizations of: Gustav Klucis's, 1922, *Kiosk with a Screen*, by Ron Anderson; Aleksandr Rodchenko's, 1920, *Construction in Space* (from the *Equal Piece Series*), by Lance Armstrong; Aleksandr Rodchenko's, 1920, *The Oval within an Oval* (from the *Surfaces Reflecting Light Series*), by Stephen Taylor and John Milner. In addition, John Milner is credited with four other reconstructions exhibited at *Russian Constructivism Revisited*, and in 1979 he is credited with a further nine Rodchenko remakes for the *Alexander Rodchenko 1891-1956* exhibition held at the Museum of Modern Art Oxford.[89] In his exhibition catalogue for *Russian Constructivism Revisited* Milner echoes Watson's belief, written one-hundred years prior, of the supplementary necessity of illustration to accompany an exhibition's artwork-objects ("actual articles"). Whilst Watson's list of "**illustrations**" includes "pictorial and graphic", Milner adds "**reconstructions**":

> Like diagrams that accompany theorems they have no right way up, and as far as their constructional principles are concerned, no scale or material. It is this aspect especially of the

[88] John Milner, *Russian Constructivism Revisited*, University of Newcastle: Newcastle, 1973, pp. 6 and 18 ("Realization" used with respect to catalogue number: 15, 86, 89, and 90.)
[89] For complete list of RAG artwork-objects exhibited in each exhibition see *Strugnell-ThesisCD* and *Excel* file: *Strugnell-A-O2 (RAG artwork-objects in the 62 exhibitions)*.

> constructions that we have tried to **illustrate** in our own **reconstructions** in the present exhibition.[90]

For the purpose of this thesis, reconstructions are viewed as belonging to and contributing to the textual element of an artwork; they are artwork-texts not artwork-objects. They are categorized as an addition to Watson's supplementary-list along with literature, statistics, and illustrations. As such, this section examines the correlation between the "RAG" reconstructions and the number of RAG artwork-objects (ANo) exhibited each Year. But first, after introducing the "RAG" reproductions that will be used within the investigation ("Section 3.2.1"), the relationships between the number of "RAG" reconstructions exhibited and the other concepts (recording units) of content analysis is examined, to discover whether and, if so, how these relationships differ to those relationships between RAG artwork-object numbers and these recording units.

[90] Milner, 1973, p. 2 (Emphasis added by James Strugnell)

3.2.1 – Introducing "RAG" reproductions: ANoRepRAG[M/F]; ANoRep[T23Artist]; ANoRep[T3MKR]

Unlike the RAG artwork-objects and the RAG artists, the "RAG" reproductions are not made by the Russian avant garde, but are reproductions of their objects created by the non-RAG. This leads to potential difficulties in the categorization/coding of these objects: Should they be categorized with reference to the RAG artists who create the artwork-objects on which they are based? Or, should they be categorized with reference to their actual makers? Both ways of categorizing the reproductions are used in this thesis.

With regard to categorizing the "RAG" reproductions with reference to the RAG artists on who's artwork-objects they are based, the reproductions are categorized into three broad categories, and nine more narrowly defined ones. The three broad categories contain the total number "RAG" reproductions exhibited each Year (ANoRepRAG), and, also divides this large group into the number of "male-RAG" and "female-RAG" reproductions exhibited each Year (ANoRepRAGM and ANoRepRAGF).[91] The nine narrower categories contain reproductions based on the artwork-objects of the T23Artist. Of the 23 RAG artists with ≥ 30 artwork-objects exhibited from 1935 to 2009, nine also have reproductions of their objects made for one or more of the 62 exhibitions in this same period. These nine categories are: ANoRepExtA (number of reproductions of Alexandra Exter's artwork-objects exhibited in a particular Year from 1935 to 2009); ANoRepGabN (Naum Gabo); ANoRepKluG (Gustav Klucis); ANoRepLisL (Lazar Lissitzky); ANoRepMalK (Kazimir Malevich); ANoRepPopL (Liubov Popova); ANoRepRodA (Aleksandr Rodchenko); ANoRepSteV (Vavara Stepanova); ANoRepTatV (Vladimir Tatlin). These nine categories account for 161 of the total 183 reproductions within ANoRepRAG.

There are 30 potential categories of "RAG" reproductions that could be created from their actual makers. There are 29 different, named, individuals responsible for producing reproductions of RAG objects for the 62 exhibitions within this study, and they account for 161 of the 183 reproductions. The remaining 22 reproductions account for the 30th category, formed from "RAG" reproductions that are not attributed to a named creator, but only to a RAG artist. There are two individuals and one organization that dominate the production of these "RAG" reconstructions within the 62-British-exhibition canon, accounting for 95 of the

[91] ANoRepRAG accounts for 183 reproduction exhibits from 1935 to 2009. Of which, ANoRepRAGM accounts for 167, and ANoRepRAGF accounts for 16.

183 reproductions, and these three makers (T3MKR) are examined during this section and in "Section 3.2.2". The two individuals are Martyn Chalk and John Milner, and the organization is the Rodchenko Archive, Moscow (alternatively known as the A. Rodchenko and V. Stepanova Archive, Moscow).[92] The, respective, codings for the number of "RAG" reproductions made by each of these three makers per Year are: ANoRepMCha (Martyn Chalk); ANoRepJMil (John Milner); ANoRepRArc (Rodchenko Archive).

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[93]	*p*-value	Lower	Upper
ANoRepRAGM	ANoRepMCha	.579	32	.000	.336	.772
ANoRepRAGM	ANoRepJMil	.397	32	.013	.273	.631
ANoRepRAGM	ANoRepRArc	.312	32	.050	.018	.546
ANoRepTatV	ANoRepMCha	.936	32	.000	.821	1.000
ANoRepRodA	ANoRepJMil	.525	32	.002	.322	.796
ANoRepRodA	ANoRepRArc	.618	32	.000	.336	.900

Table 3.2.1.1: Significant bivariate correlations (Kendal's Tau) between ANoRepRAG[M/F] and ANoRep[T3MKR], and between ANoRepRAG[T23Artist] and ANoRep[T3MKR]. (Per Year from 1935 to 2009.) [94]

Each of these three makers (T3MKR) of "RAG" reproductions "specializes" in (re-)producing the artwork-objects of a particular RAG artist. All 11 of the different "RAG" reproductions produced by Martyn Chalk – exhibited a total of 26 times – are recreations of *Reliefs* originally produced by Vladimir Tatlin.[95] Whilst of the 17 "realizations" produced by John Milner 16 are recreations of artwork-objects originally made by Aleksandr Rodchenko, and of the 52 reprinted photographs by the Rodchenko Archive 51 were originally taken by Rodchenko. These specializations, and the three makers' dominant position in terms of production quantities of "RAG" reproductions, are confirmed through examination of the correlations calculated between the two sets of variables ANoRepRAG[M/F]–ANoRep[T3MKR] and ANoRepRAG[T23Artist]–ANoRep[T3MKR]. As well as there being significant, positive correlations between all the ANoRep[T3MKR] and ANoRepRAGM, there

[92] The individual of "John Milner", also, includes collaborations between Milner and other makers. Of the 17 reproductions made by "John Milner": Eight are credited to John Milner; four are credited to Milner and Lance Armstrong; two are credited to Milner and Stephen Taylor; one to Milner and Charles Cooper; one to Milner and Peter Moore; one to Milner and Sara Selwood. (See *Strugnell-ThesisCD* and *Excel* file: *Strugnell-A-O2 (RAG artwork-objects in the 62 exhibitions*.)

[93] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

[94] A complete list of results for correlation between ANoRepRAG[M/F] and ANoRep[T3MKR], and ANoRepRAG[T23Artist] and ANoRep[T3MKR] (1935-2009) is produced in *App.2-[1935-2009c]-09*.

[95] In fact, there are more of Chalk's *Tatlin Reliefs* exhibited in the 62 exhibitions from 1935 to 2009 than there are Tatlin *Reliefs* exhibited. There are two *Reliefs* by Tatlin exhibited, one in 1967 (*Aspects of Russian Experimental Art 1900-1925*, Grosvenor Gallery, London) and one in 1973 (*The Non-Objective World: 1914-1955*, Annely Juda Fine Art, London).

are also significant, positive relationships between each and the reproduction numbers of the specific RAG artist that each specializes in: These results are shown in *table 3.2.1.1*.

Notable in *table 3.2.1.1* is the extremely strong, significant, positive correlation between ANoRepMCha and ANoRepTatV. Whilst there are several different makers of "Rodchenko" reproductions, this extremely strong positive relationship between the number of "Tatlin" reproductions being exhibited and the number of reproductions by Chalk being exhibited is indicative of the near monopoly by Chalk in the production of "Tatlin" reproductions exhibited within the 62 exhibitions. This is confirmed by examining the data within the original dataset listing all of the exhibits: Of the 14 "Tatlin" reconstructions created for the exhibitions, 11 are made by Chalk (78.57%).[96] In terms of the number of exhibits within the 62 exhibitions, these 14 "Tatlin" reproductions equate to 29 exhibits, 26 of which are the 11 produced by Chalk (89.66%).

[96] For complete list of RAG artwork-objects exhibited in each exhibition see *Strugnell-ThesisCD* and *Excel* file: *Strugnell-A-O2 (RAG artwork-objects in the 62 exhibitions)*.

3.2.2 – Bivariate Correlation between ANoRepRAG[M/F]/ANoRep[T23Artist] and Artwork-Texts

For each ANoRepRAG[M/F]/ANoRep[T23Artist] variable there is an equivalent ANoRAG[M/F]/ANo[T23Artist] variable. Although, there are more ANoRAG[M/F]/ANo[T23Artist] variables than ANoRepRAG[M/F]/ANoRep[T23Artist] variables. This means that for each number-of-"RAG"-reproductions exhibited of a specific T23Artist (ANoRep[T23Artist]) or group of RAG artists (ANoRepRAG[M/F]) in a particular Year from 1935 to 2009, there is an equivalent variable of the number-of-RAG-artwork-objects exhibited by that T23Artist (ANoRAG[T23Artist]) or group of artists (ANoRAG[M/F]). But as not all of the T23Artist have reproductions of their work exhibited in Britain during this period (1935-2009) there are more ANoRAG[M/F]/ANo[T23Artist] variables than ANoRepRAG[M/F]/ANoRep[T23Artist] variables. Regarding their relationship with the concepts (recording units) of content analysis, in most cases, the resulting relationships between ANoRepRAG[M/F]/ANoRep[T23Artist] and the recording units from the content analysis of the artwork-text, either, agree with those significant results calculated between the equivalent ANoRAG[M/F]/ANo[T23Artist] and the same recording units, or do not produce a significant result but retain the "direction" of correlation. In some cases, significant correlation is calculated between an ANoRepRAG[M/F]/ANoRep[T23Artist] variable and a recording unit, that is not found between its equivalent ANoRAG[M/F]/ANo[T23Artist] variable and the same recording unit. It is these differences that are investigated in this section, as this offers insight into the functional difference between the exhibiting of "RAG" reproductions compared to RAG artwork-objects.[97]

The first relationship to be examined, between the catalogue artwork-text and the number of RAG artwork-objects[98]/"RAG" reproductions[99] being exhibited, is that between them and the third-level recording unit ASHISF. From *figure 2.0.1*, ASHISF is shown to be one of the three recording units that combine to form the second-level AS unit ASHIS. ASHIS is a concept containing words that act to place the subject/object of the artwork-text historically or temporally, either in the Past (ASHISP), Present/Now (ASHISN) or Future (ASHISF). ASHISF is the recording unit containing those words denoting a future context. There are no

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[97] Complete lists of results for correlation between ANoRAG[M/F]/ANo[T23Artist] and Content Analysis recording units (1935-2009) are produced in *App.2-[1935-2009b]-01 – App.2-[1935-2009b]-20*. Complete lists of results for correlation between ANoRepRAG[M/F]/ANoRep[T23Artist] and content analysis recording units (1935-2009) are produced in *App.2-[1935-2009c]-01 – App.2-[1935-2009c]-20*.
[98] ANoRAG[M/F]/ANo[T23Artist]
[99] ANoRepRAG[M/F]/ANoRep[T23Artist]

significant correlations, positive or negative, present between the "non-reproduction" variables ANoRAG[M/F] or ANo[T23Artist] and the recording unit ASHISF.[100] In fact, there are no significant relationships between the number of RAG artwork-objects displayed and any of the third-level temporal-locating AS recording units. This is contrasted by the significant, positive relationships calculated between ASHISF and, both, the reproduction variables of ANoRepRAG and ANoRepRAGM, as well as between ASHISF and ANoRepGabN (Naum Gabo). *Table 3.2.2.1* contains the results for these correlations, and the results for the **corresponding/equivalent ANoRAG[M/F]/ANo[T23Artist] relationships**.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[101]	*p*-value	Lower	Upper
ANoRepRAG	ASHISF	.406	32	.006	.091	.678
ANoRAG	**ASHISF**	.252	32	.067	-.066	.514
ANoRepRAGM	ASHISF	.415	32	.005	.103	.684
ANoRAGM	**ASHISF**	.278	32	.042	-.033	.516
ANoRepGabN	ASHISF	.340	32	.039	.138	.606
ANoGabN	**ASHISF**	.028	32	.851	-.246	.300

Table 3.2.2.1: Significant bivariate correlations (Kendal's Tau) between ANoRepRAG[M/F]/ANoRep[T23Artist] and recording unit ASHISF, and between the **corresponding/equivalent ANoRAG[M/F]/ANo[T23Artist] relationships**. (Per Year from 1935 to 2009.) [102]

This data supports the hypothesis that as the number of "RAG" reproductions exhibited increases, there is a greater proportion of artwork-text used to position the subject/objects of the text within the context of the future. *Table 3.2.2.1*, in conjunction with the results of *App.2-[1935-2009b]-05* and *App.2-[1935-2009b]-06*, also demonstrates that this is a relationship exclusive to the exhibiting of "RAG" reproductions: No such significant correlations are calculated between the temporal-assertions and RAG artwork-objects.

The results within *table 3.2.2.1* show this contrast as particularly acute between ANoRepGabN and ASHISF, and ANoGabN and ASHISF. The relationship between the number of reproductions of "Gabo" artwork-objects (ANoRepGabN) and recording unit ASHISF is a significant, positive one. Whilst the relationship between artwork-objects by Gabo (ANoGabN) and ASHISF has no significance, and has a BCa 95% CI that crosses zero. These results are not unexpected: As argued, "RAG" reproductions should be viewed

[100] Complete lists of results for correlation between ANoRAG[M/F]/ANo[T23Artist] and AS recording units (1935-2009), including ASHIS[P/N/F], are produced in *App.2-[1935-2009b]-05* and *App.2-[1935-2009b]-06*.
[101] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)
[102] A complete list of results for correlation between ANoRepRAG[M/F]/ANoRep[T23Artist] and AS recording units (1935-2009) is produced in *App.2-[1935-2009c]-14*.

as artwork-texts, rather than artwork-objects. Therefore, the results of the correlations between ANoRepGabN and the temporal assertions – ASHISP, ASHISN, ASHISF (ASHIS[P/N/F]) – should be comparable to those relationships between the recording unit representing the use of Gabo's name within the artwork-text (ANGaboN) and the same temporal recording units (ASHIS[P/N/F]). *Table 3.2.2.2* contains the results of these two sets of relationships: ANoRepGabN–ASHIS[P/N/F]; ANGaboN–ASHIS[P/N/F].

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[103]	*p*-value	Lower	Upper
ANoRepGabN	ASHISF	.340	32	.039	.138	.606
ANoRepGabN	ASHISN	.042	32	.785	-.109	.211
ANoRepGabN	ASHISP	-.148	32	.343	-.333	.045
ANGaboN	ASHISF	-.037	32	.796	-.317	.231
ANGaboN	ASHISN	-.284	32	.034	-.522	-.018
ANGaboN	ASHISP	-.392	32	.004	-.632	-.112

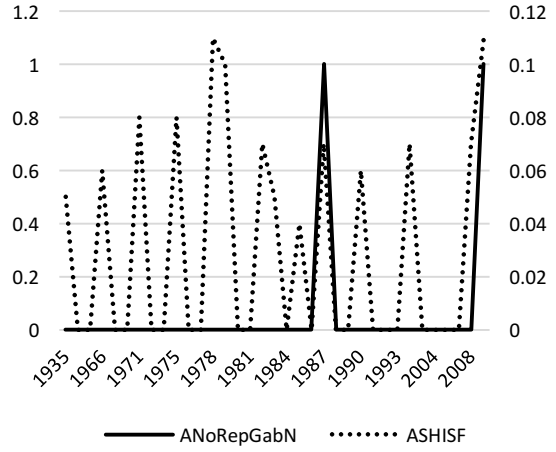
Table 3.2.2.2: Bivariate correlations (Kendal's Tau) between ANoRepGabN and the recording units ASHIS[P/N/F], and between recording unit ANGaboN and recording units ASHIS[P/N/F]. (Per Year from 1935 to 2009.)

Comparison of the results in *table 3.2.2.2*, in terms of significance, demonstrates an opposing relationship between the two sets of correlation. In relation to the three temporal units, the ANoRepGabN-set of results has one significant relationship, between ANoRepGabN and ASHISF. Whilst there are significant relationships demonstrated between ANGaboN and, both, ASHISN and ASHISP. But the significant correlation between ANoRepGabN and ASHISF is positive, whilst the significant relationships within the ANGaboN-set are, both, negative. Due to this the two sets of correlations demonstrate a more complementary than oppositional nature: As the number of "Gabo" reproductions in a particular Year increases, the percentage of the artwork-text being used to set subjects/objects of the text within the context of the future increases; as the weighted percentage of Gabo's name within the artwork-text increases, the percentage of the text being used to set subjects/objects of the text within the context of the past decreases.

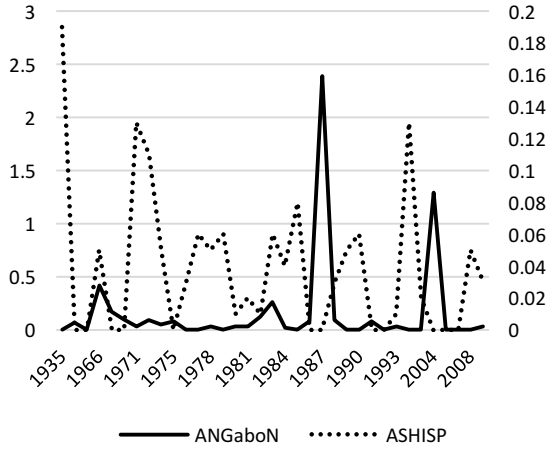
The significant, negative correlation between the recording units of ANGaboN and ANHISP is clearly demonstrated in *graph 3.2.2.2*, by the repeated juxtaposition between Years in which artwork-text, either, contains a proportion of ANGaboN or ASHISP, but never both simultaneously. Years in which the artwork-text demonstrates the inclusion of ANGaboN, but not ANHISP are: 1959; 1967; 1970; 1975; 1978; 1986; 1987; 1991; 2004. The inverse is true

[103] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

for the Years: 1935; 1976; 1977; 1979; 1985; 1989; 1990; 1995; 1999; 2008. For 19 of the 35 Years for which there is data from 1935 to 2009, there is an extreme negative correlation demonstrated between ANGaboN and ASHISP. This relationship is demonstrable through the calculation of the correlation (*table 3.2.2.2*) and through observation of *graph 3.2.2.2*, but is not citable from the artwork-texts. This is because at its most significantly negative the relationship ANGaboN–ASHISP relies upon the omission, entirely, from the artwork-text of one of its variables.



Graph 3.2.2.1: Line graph allowing comparisons of the relationships between ANoRepGabN (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and ASHISF (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009).



Graph 3.2.2.2: Line graph allowing comparisons of the relationships between ANoRepGabN (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and ASHISF (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009).

The significant, positive correlation between ANoRepGabN–ASHISF is demonstrated in *graph 3.2.2.1* at Years 1987 and 2009, and is demonstrable within the artwork-text. In both of these Years the exhibiting of a "Gabo" reproduction coincides with an increase in the proportional use of the ASHISF recording unit within the contemporaneous artwork-text. In 1987 the "Gabo" reconstruction, by an uncredited maker, *Kinetic Construction (Standing Wave)*, 1919-20/reconstructed 1985 (height: 61.5cm), is exhibited at *Naum Gabo: Sixty Years of Constructivism*, The Tate Gallery, London, and in 2009 a reassembled *Model for Constructed Head No.3 (Head in a Corner Niche)*, 1917/1996 (61x48.5x34.5cm) is exhibited at *The Great Experiment: Russian Art – Homage to Camilla Gray*, Annely Juda Fine Art, London. In Michael Compton's contribution to the artwork-text of the 1987 Tate exhibition, inclusion of the mechanical reconstruction, *Kinetic Construction*, is complimented through juxtaposition with the **ASHISF** unit being applied to Gabo's original intention for such artwork-objects: "Gabo was an artist for whom the purpose of art was to state a vision for his

time and for the **future**. In several of these works we see him associating that vision with the aesthetic of the machine, an idea he was quickly to transcend."[104]

A second relationship between the catalogue artwork-text of the 62-British-exhibition canon, and the number of RAG artwork-objects and "RAG" reproductions being exhibited that conforms to what is observed between ANoRepRAG[M/F]/ANoRep[T23Artist] and ASHISF, and between ANoRAG[M/F]/ANo[T23Artist] and ASHISF, is their relationship with the second-level SPW recording unit SPWTG. *Table 3.2.2.3* contains the significant correlations calculated between ANoRepRAG[M/F]/ANoRep[T23Artist] and SPWTG, and between ANoRAG[M/F]/ANo[T23Artist] and SPWTG, as well as any equivalent/corresponding correlations, even if they are not significant. The results within *table 3.2.2.3* clearly demonstrate that the relationship between the number of "RAG" reproductions exhibited and Words Politicizing Gender within the artwork-texts (SPWTG) is very different to the relationships between the number of RAG artwork-objects and SPWTG. Not only are there more significant, positive relationships calculated between the RAG artwork-objects and SPWTG than between their equivalent "RAG" reproductions, but also there is no agreement between the set of results relating to the "RAG" reproductions and that relating to the RAG artwork-objects. In no circumstance is significant correlation found for both ANoRepRAG[M/F]/ANoRep[T23Artist] and its equivalent ANoRAG[M/F]/ANo[T23Artist]. This, again, indicates that "RAG" reproductions, although visually similar, are functionally differentiated from actual RAG artwork-objects in relationship with the artwork-text.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[105]	*p*-value	Lower	Upper
ANoRepRAGF	SPWTG	.195	32	.261	-.139	.731
ANoRepExtA	SPWTG	-.057	32	.748	-.082	-.057
ANoRepKluG	SPWTG	.511	32	.004	.248	1.000
ANoRepPopL	SPWTG	.268	32	.126	-.118	.821
ANoRAGF	SPWTG	.365	32	.016	.169	.539
ANoExtA	SPWTG	.425	32	.008	.224	.645
ANoKluG	SPWTG	.119	32	.469	-.169	.438
ANoPopL	SPWTG	.385	32	.013	.123	.612

Table 3.2.2.3: Significant bivariate correlations (Kendal's Tau) between ANoRepRAG[M/F]/ANoRep[T23 Artist] and recording unit SPWTG, and between ANoRAG[M/F]/ANo[T23Artist] and recording unit SPWTG. (Per Year from 1935 to 2009.) [106]

[104] Michael Compton, "Rediscovered Sculptures", in Tate Gallery, *Naum Gabo: Sixty Years of Constructivism*, Tate Gallery Publications: London,1987, p. 10

[105] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

[106] A complete list of results for correlation between ANoRepRAG[M/F]/ANoRep[T23Artist] and SPWTG (1935-2009) is produced in *App.2-[1935-2009c]-16*. Complete lists of results for correlation between ANoRAG[M/F]/ANo[T23Artist] and SPWTG (1935-2009) are produced in *App.2-[1935-2009b]-13* and *App.2-[1935-2009b]-14*.

Whilst no agreement is found between the significant results that, either, ANoRepRAG[M/F]/ANoRep[T23Artist] or ANoRAG[M/F]/ANo[T23Artist] have in relation to the recording unit SPWTG, once again comparison of relationships between ANoRepRAG[M/F]/ANoRep[T23Artist] and SPWTG with those between AN and SPWTG proves more fruitful. *App.2-[1935-2009c]-16* and *App.2-[1935-2009d]-03* respectively, contain the results of the correlations between ANoRepRAG[M/F]/ANoRep[T23Artist] and SPWTG, and between AN[RAG[M/F]/Artist] and SPWTG. For the 11 ANoRepRAG[M/F]/ANoRep[T23Artist] that have equivalent AN[RAG[M/F]/Artist] there are no contradictory relationships with recording unit SPWTG. Unlike the results within *table 3.2.2.3* showing the oppositional relationships of ANoRepRAG[M/F]/ANoRep[T23Artist] and ANoRAG[M/F]/ANo[T23Artist] with SPWTG, there is no opposition between the equivalent results of *App.2-[1935-2009c]-16* and *App.2-[1935-2009d]-03*. This, further, supports "RAG" reproductions within British exhibitions being considered in the same vein as artwork-text rather than as comparable to functioning as additional artwork-objects.

A second, second-level SPW recording unit relationship warranting further examination is SPWTR. SPWTR, as a concept, includes Religious Thought and Theory Words. In relation to AN[RAG[M/F]/Artist] recording units it has a significant, positive correlation with the names of two RAG artists: Marc Chagall (ANChagM) and Wassily Kandinsky (ANKandW).[107] It also has a significant, negative relationship with the names of three RAG artists: Alexandra Exter (ANExteA); Nikolai Suetin (ANSuetN); Aleksandr Vesnin (ANVesnA).[108] No significant correlations are calculated between SPWTR and the number of RAG artwork-objects exhibited. This is in contrast with the number of "RAG" reproductions exhibited with which there are three significant, negative relationships. These three, significant relationships are between: SPWTR and ANoRepRAG; SPWTR and ANoRepRAGM; SPWTR and ANoRepTatV.[109] Unlike the previous two cases – correlations between "RAG" reproductions and ASHISF/SPWTG – there are no comparisons to be made regarding the similarities between the relationships of ANoRepRAG[M/F]/ANoRep[T23Artist] with SPWTR, and

[107] ANChagM and SPWTR: $T = .352$, $N = 32$, $p < .05$ (.015), BCa 95% CI [.071, .579]. ANKandW and SPWTR: $T = .344$, $N = 32$, $p < .05$ (.011), BCa 95% CI [.076, .606].
[108] ANExteA and SPWTR: $T = -.281$, $N = 32$, $p < .05$ (.042), BCa 95% CI [-.496, -.052]. ANSuetN and SPWTR: $T = -.287$, $N = 32$, $p < .05$ (.049), BCa 95% CI [-.481, -.047]. ANVesnA and SPWTR: $T = -.294$, $N = 32$, $p < .05$ (.038), BCa 95% CI [-.498, -.062].
[109] ANoRepRAG and SPWTR: $T = -.321$, $N = 32$, $p < .05$ (.019), BCa 95% CI [-.554, -.059]. ANoRepRAGM and SPWTR: $T = -.328$, $N = 32$, $p < .05$ (.017), BCa 95% CI [-.558, -.068]. ANoRepTatV and SPWTR: $T = -.353$, $N = 32$, $p < .05$ (.015), BCa 95% CI [-.573, -.060].

AN[RAG[M/F]/Artist] with SPWTR. It is the fact that the relationship between SPWTR and the number of "RAG" reproductions differs so greatly to the relationship between SPWTR and the number of RAG artwork-objects that creates the need for further investigation.

Although there are no significant relationships between SPWTR and the number of RAG artwork-objects exhibited (*App.2-[1935-2009b]-13* and *App.2-[1935-2009b]-14*), of the five RAG artists whose names (AN[RAGArtist]) have a significant relationship with SPWTR there is ANo[T23Artist] data for four of them: Chagall (ANoChaM); Kandinsky (ANoKanW); Exter (ANoExtA); Suetin (ANoSueN). *Table 3.2.2.4* lists the correlations calculated between the number of artwork-objects by each of these artists exhibited in a given Year and the weighted percentage of their names within the respective artwork-texts.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[110]	*p*-value	Lower	Upper
ANChagM	ANoChaM	.476	32	.003	.088	.801
ANExteA	ANoExtA	.507	32	.001	.206	.775
ANKandW	ANoKanW	.335	32	.021	.059	.614
ANSuetN	ANoSueN	.538	32	.001	.198	.768

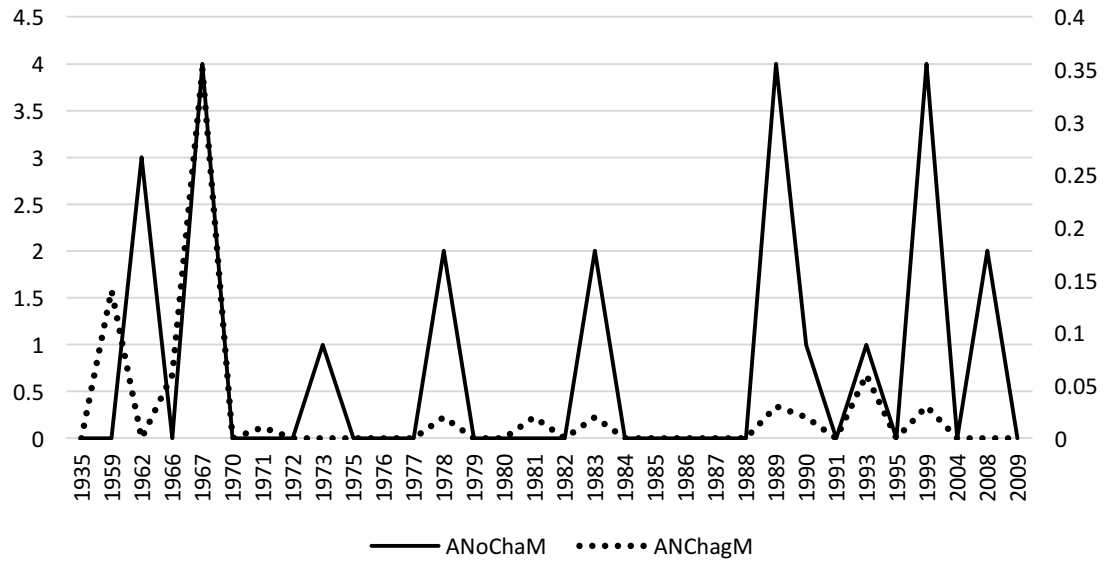
Table 3.2.2.4: Bivariate correlations (Kendal's Tau) between ANo[T23Artist] and the corresponding AN[RAGArtist] recording units for the four of the five RAG artists whose names (AN[RAGArtist]) have a significant relationship with SPWTR. (Per Year from 1935 to 2009.)

The results of *table 3.2.2.4* indicate that each of the pairs of variables produces a significant, positive correlation between the AN and ANo of the four RAG artists. Meaning, that if each artist's pair of variables were plotted on a line chart against Year, each lines "peaks" and "troughs" would, in the majority of cases, coincide. This is observable on *graph 3.2.2.3*, which plots ANoChaM with ANChagM against Years.

Extending this investigation of the significant, negative relationship between the number of "RAG" reproductions on display and the recording unit SPWTR, both are plotted against Year on *graph 3.2.2.4*. *Graph 3.2.2.4* allows for the identification of those Years in which the discord between these two variables occurs. Such oppositional relationships between artwork-text and "RAG" reproductions can only be studied through contrast with how the artwork-text would operate within a significant, positive relationship with an artwork-object. But, as identified, there are no significant, positive relationships between the variables of ANoRAG[M/F]/ANo[T23Artist] and SPWTR. There are, though, five significant relationships

[110] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

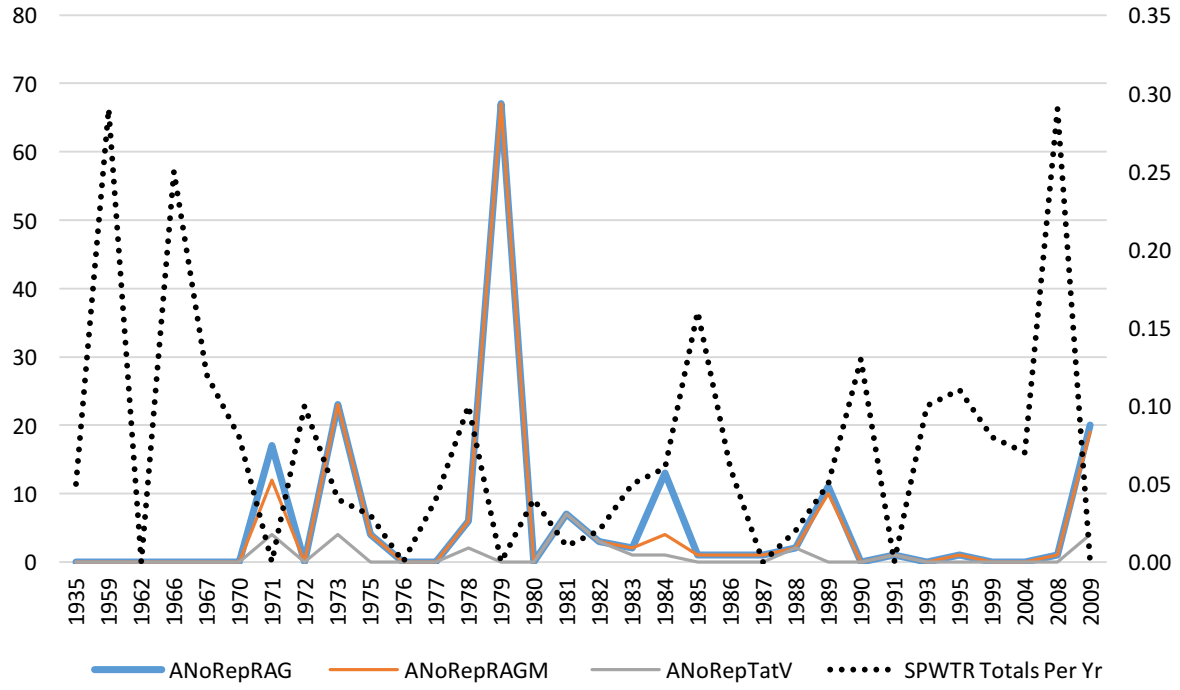
between AN[RAGArtist] and SPWTR, two of which are positive: ANChagM–SPWTR and ANKandW–SPWTR. It is demonstrated in *table 3.2.2.4* that both ANChagM and ANKandW have significant, positive relationships with their equivalent ANo[T23Atrist] variables: ANoChaM and ANoKanW. This means that when plotted against Year the lines for these pairs of equivalent variables are highly similar, as demonstrated in *graph 3.2.2.3* for "Chagall": The lines ANoChaM and ANChagM echo one another. The significant, positive correlation between AN[Artist] and SPWTR, and between AN[Artist] and ANo[T23Artist], in the cases of "Chagall" and "Kandinsky", mean that, even though, for "Chagall" and "Kandinsky", there are no significant, positive correlations between ANo[T23Artist] and SPWTR, when ANoChaM and ANoKanW are plotted on a graph with SPWTR against Year these lines follow a similar "path" to ANChagM and ANKandW. ANoChaM and ANoKanW are used on *graph 3.2.2.5* for the identification of those Years in which the contrasting complimentary relationship between artwork-text and RAG artwork-object occurs. These relationships will be contrasted with the discordant artwork-text and "RAG" reproduced-object ones, allowing each to shed light onto the other.



Graph 3.2.2.3: Line graph allowing comparisons of the relationships between ANoChaM (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and ANChagM (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009).

The Years of maximum discord, identifiable from *graph 3.2.2.4*, that account for the significant, negative correlation between SPWTR and the number of "RAG" reproductions exhibited occur in the Years: 1959; 1966; 1971; 1972; 1979; 1985; 1990; 2008; 2009. Each of these Years represents a point at which, either, SPWTR equals zero whilst the number "RAG" reproductions exhibited reaches a "peak" (1959, 1966, 1972, 1985, 1990, and 2008),

or the number "RAG" reproductions exhibited equals zero whilst SPWTR is at a "peak" (1971, 1979, and 2009). In contrast to *graph 3.2.2.4*, *graph 3.2.2.5* allows for the identification of those Years supportive of a contrasting, positive correlation between SPWTR and the number of RAG artwork-object included in exhibition from 1935 to 2009 by Kandinsky and Chagall.[111] These Years are illustrated by the coinciding of the respective lines' "peaks".[112] Accord between SPWTR and ANoKanW occurs in 1966, 1978, 1980, and 2008. Whilst the same coinciding of "peaks" is seen to occur between ANoChaM and SPWTR in 1978 and 2008.



Graph 3.2.2.4: Line graph allowing comparisons of the relationships between ANoRepRAG (number of "artwork-objects" exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), ANoRepRAGM (number of "artwork-objects" exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), ANoRepTatV (number of "artwork-objects" exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and SPWTR (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009).

Examining the artwork-text from the Years of greatest accordance, illustrated in *graph 3.2.2.5*, it is not surprising to find words that form the concept SPWTR being used in reference to Kandinsky and Chagall. In the introductory piece of text for the 1966, *Kandinsky*

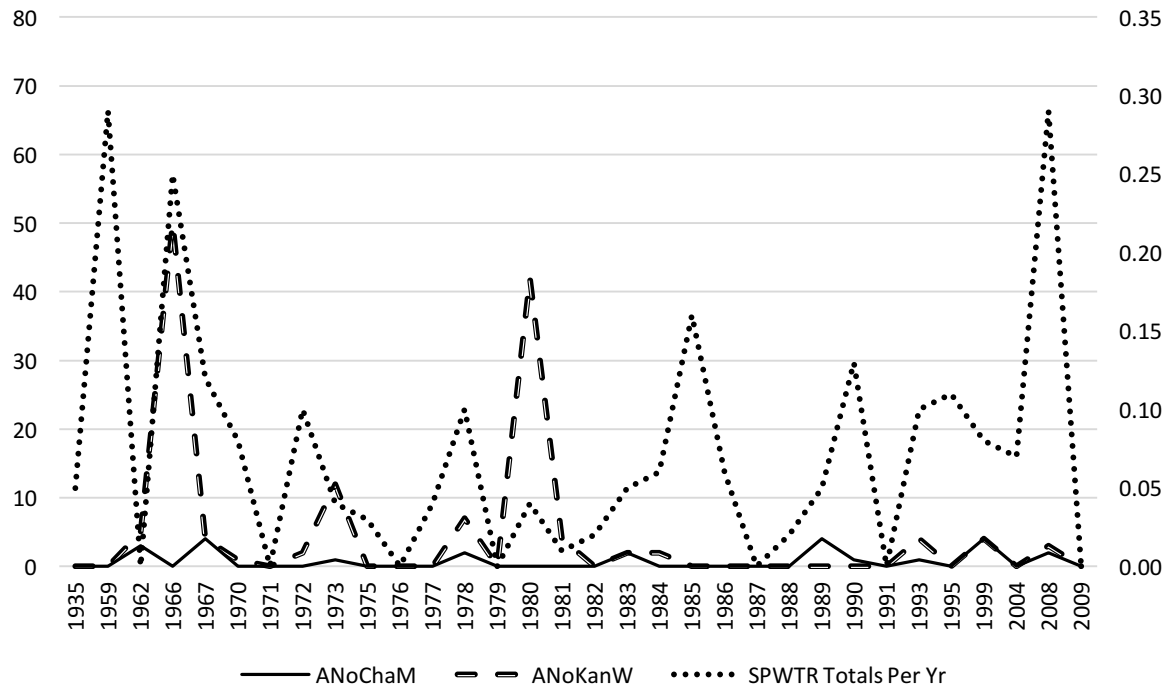
[111] Even though not "significant" the correlations between the variables SPWTR–ANoKanW, and SPWTR–ANoChaM are still demonstrably positive: SPWTR and ANoKanW: $T = .216$, $N = 32$, $p > .05$ (.124), BCa 95% CI [-.065, .497]; SPWTR and ANoChaM: $T = .221$, $N = 32$, $p > .05$ (.128), BCa 95% CI [-.044, .458].

[112] It is worth noting that the positive correlation between SPWTR and the number of exhibits by Chagall and Kandinsky is, also, reliant on the coinciding of "troughs". But, as this, at its most notable, would occur at a meeting of zero points, it would be quite hard to comment upon qualitatively with reference to the exhibition catalogues. As there would be zero data to look at.

and his Friends: Centenary Exhibition, at Marlborough Fine Art Ltd, London, Will Grohmann writes:

> The **spirit** developed during the years 1909 to 1914 can be traced in *'Concerning the Spiritual in Art'*, and the essays in the Almanac. In contrast to the group *Die Brücke* it is a new beginning which was based not only in the new pictorial media but on a new **spiritual** approach to art.[113]

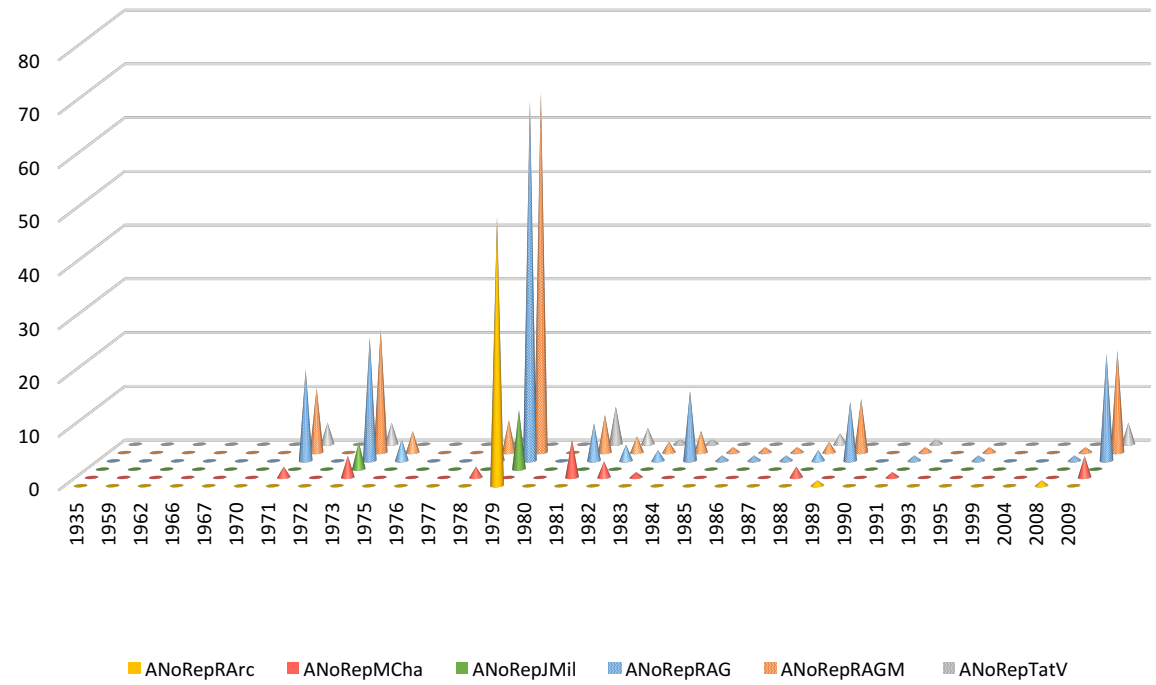
Differing to the discussion of the "**spiritual**" in relation to Kandinsky, the use of SPWTR in relation to Chagall tends to focus on Chagall's own Jewish religion. This is demonstrated in the artwork-text from the *From Russia: French and Russian Master Paintings 1870-1925 From Moscow and St Petersburg* exhibition catalogue that accompanies the coinciding 2008 "peaks". In their "Curators' Preface" Ann Dumas and Sir Norman Rosenthal write: "Marc Chagall adapted elements of French Cubism to his highly individual and poetic distillation of Russian-**Jewish** folklore."[114]



Graph 3.2.2.5: Line graph allowing comparisons of the relationships between ANoChaM (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), ANoKanW (number of artwork-objects exhibited per Year [left-hand side y-axis scale]) and Year (1935-2009), and SPWTR (average weighted percentage per Year [right-hand side y-axis scale]) and Year (1935-2009).

[113] Grohmann, 1966, p. 5 (Emphasis added by James Strugnell)
[114] Ann Dumas and Sir Norman Rosenthal, "Curators' Preface", in Tokareva, I., and Maximenko, G., (eds.) *From Russia: French and Russian Master Paintings 1870-1925 From Moscow and St Petersburg*, Palace Editions Europe and Royal Academy of Arts, London: London, 2008, p. 28 (Emphasis added by James Strugnell)

As alluded to, more problematic to explain is the significant, negative correlation between SPWTR and the number of “RAG” reproductions being exhibited in a particular Year. This is due to the fact that at the points of maximum discord on *graph 3.2.2.4*, one of the variables, either, of SPWTR or ANoRep[RAG[M]/TatV], has a value of zero. This zero value means that the two variables will not be referenced together in the same artwork-texts in contrast to the examples between ANoKanW and SPWTR or ANoChaM and SPWTR. Returning to the principle that “RAG” reproductions are equivalent to artwork-text rather than artwork-objects, *graph 3.2.2.6* plots the number of “RAG” reproductions produced by the “top”-three/most-prolific-three makers [T3MKR] of reproductions against Year. The T3MKR are the Rodchenko Archive, Martyn Chalk and John Milner. Also, shown on this graph by the dotted cones are the “RAG”-reproduction results from *graph 3.2.2.4*.



Graph 3.2.2.6: Three-dimensional column chart allowing comparisons of the relationships between ANoRepRArc and Year (1935-2009), ANoRepMCha and Year (1935-2009), ANoRepJMil and Year (1935-2009), ANoRepRAG and Year (1935-2009), ANoRepRAGM and Year (1935-2009), and ANoRepTatV and Year (1935-2009).

Graph 3.2.2.6 demonstrates a strong positive correlation between these three makers of “RAG” reproductions and the categories of “RAG” reproductions that have significant, negative relationships with SPWTR. 1979 and 1981 demonstrate particularly strong, positive correlation between the conical “peaks” in the exhibiting of T3MKR reproductions and the

number of “male-RAG”/“Tatlin” reproductions being exhibited. In fact, in 1979, of the total number of 67 “RAG” reproductions represented by the ANoRepRAG cone (blue),[115] 61 of them are accounted for by the T3MKR pyramids of the Rodchenko Archive (50) and John Milner (11). Whilst in 1981, the total number of “Tatlin” reproductions exhibited is seven, which is also the total number of “RAG” reproductions exhibited in this Year. The seven “Tatlin” reproductions are accounted for by the seven reproductions made and exhibited in that Year by Martyn Chalk. The significance of the relationships between these three makers and the types of “RAG” reproductions with significant, negative correlations with SPWTR, is also confirm by calculation of their correlation with one another. *Table 3.2.2.5* contains all of the results from the nine bivariate correlations between these six variables:

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
		Tau (*T*)	Cases (*N*)[116]	*p*-value	Lower	Upper
ANoRepRArc	ANoRepRAG	.301	32	.058	.015	.530
ANoRepMCha	ANoRepRAG	.565	32	.000	.322	.765
ANoRepJMil	ANoRepRAG	.396	32	.013	.272	.630
ANoRepRArc	ANoRepRAGM	.312	32	.050	.018	.546
ANoRepMCha	ANoRepRAGM	.579	32	.000	.336	.772
ANoRepJMil	ANoRepRAGM	.397	32	.013	.273	.631
ANoRepRArc	ANoRepTatV	-.198	32	.238	-.325	-.098
ANoRepMCha	ANoRepTatV	.936	32	.000	.821	1.000
ANoRepJMil	ANoRepTatV	.128	32	.448	-.204	.550

Table 3.2.2.5: Bivariate correlations (Kendal’s Tau) between the six variables charted on *graph 3.2.2.6*: ANoRepRArc; ANoRepMCha; ANoRepJMil; ANoRepRAG; ANoRepRAGM; ANoRepTatV. (Per Year from 1935 to 2009.)

“Section 3.2.1” notes that, of the 29 “Tatlin” recreations exhibited from 1935 to 2009, 26 of them are produced by Martyn Chalk. This explains the significant, and near perfect, positive correlation between the variables ANoRepMCha and ANoRepTatV (*table 3.2.2.5*). It also explains why the other two T3MKR variables produce negative/non-significant relationships with the variable ANoRepTatV, as neither of these maker produces “Tatlin” reproductions. The rest of the relationships within *table 3.2.2.5* are positive, and all except one, only marginally not, are significantly so.

Both, the Rodchenko Archive, through its curator, and John Milner, personally, contribute on multiple occasions to the artwork-text of the exhibition catalogues. The curator of the

[115] The ANoRepRAGM cone (orange) also contains 67 reproductions. Therefore, all of the “RAG” reproductions exhibited in 1979 were of male-RAG artists’ artwork-objects.
[116] Cases (*N*) derive from 32 sampling units of yearly averages excluding pairwise for cases where “variable 1” and/or “variable 2” has no data. (As described in: “Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis”.)

Rodchenko and Stepanova Archive is Alexander Lavrentiev.[117] *Table 4.1.1* contains the Years in which Milner and Lavrentiev contribute to the artwork-text of the exhibition catalogues: Milner contributes in **1973**, 1978, **1979** and 2007; Lavrentiev contributes in **1979**, **1989**, 1999 and **2008**. Milner exhibits reproductions in both **1973** and **1979**, whilst Lavrentiev (Rodchenko Archive) exhibits reproductions in **1979**, **1989** and **2008**. In all of the Years that, both, Milner and Lavrentiev exhibit reproductions they, also, contribute to the artwork-text of the accompanying catalogues. Although, it is of note that they are not the sole contributors in any of the Years in which they also exhibit. "Section 4.1" conducts content analysis on those contributors whose writings appear three or more times in the exhibition catalogues containing RAG artwork-objects, and includes analysis of both Milner's and Lavrentiev's contributions. The recording unit SPWTR accounts for only .03% of all of Milner's artwork-text, and zero per cent of artwork-text written by Lavrentiev. This compares to .32% of the artwork-text written by Christina Lodder. Martyn Chalk also contributes to an exhibition's artwork-text, but on only one occasion, hence he is not included in the "Section 4.1" study. But his artwork-text does accompany the seven reconstructions he exhibits in 1981. He contributes to the catalogue of the Annely Juda Fine Art, 1981 exhibition, *Configuration 1910-1940 and Seven Tatlin Reconstructions*, and, as with Milner's artwork-text, SPWTR accounts for .03%.

The same person being responsible for, both, the authorship of the artwork-text and simultaneous production of "RAG" reproductions is what distinguishes the reproductions from the RAG artwork-objects on display in the same exhibitions within the 62-British-exhibition canon. It is argued that such "RAG" reproductions should be aligned with the qualities and function of artwork-text rather that of the RAG artwork-objects. The way that their relationship with the recording units of ASHISF and SPWTG contradict these recording unit's relationships with RAG artwork-object supports this. As do their significant, positive correlations with their creators' own authorship of artwork-text in relationship to the SPWTR recording unit. Martyn Chalk's writing in the artwork-text that accompanies his seven reconstructions of lost Tatlin artwork-objects in the, 1981, *Configuration* exhibition, both, supports and is supported by the evidence within this section. He, too, draws parallels between reconstruction and academic text rather than with artwork-objects:

[117] The Pushkin State Museum of Fine Art, *At Home with Rodchenko and Stepanova*, The Pushkin State Museum of Fine Art: Moscow, 2014 (Internet Source: http://www.arts-museum.ru/events/archive/2014/rodchenko_ stepanova/?lang=en [accessed: 31-08-2016])

> Reconstruction serves a valuable purpose because it produces actual three-dimensional objects where none existed before. It takes over where more restrained 'academic' history stops, but reinforces the work of that discipline by contributing to the understanding of existing original material and by making available some impression of the 'presence' of the originals in a way which no photograph ever can.[118]

[118] Martyn Chalk, "Missing, Presumed Destroyed: Seven Reconstructions", in Juda, A., *Configuration 1910-1940 and Seven Tatlin Reconstructions*, Annely Juda Fine Art: London, 1981, n.p.

4.0 – Conclusion

This thesis presents and demonstrates a valid method for the efficient analyzing of large amounts of data. It applies a statistical methodology to the artwork-objects and artwork-text of 62 British exhibitions that exhibit RAG artwork-objects from 1935 to 2009 and form the 62-British-exhibition canon. In doing so, it examines aspects of this canon's contribution to the development of RAG artwork. But such methodologies as used within this thesis could be applied to any field of art history, over any time period, and incorporate much larger amounts of data. It is also believed that this thesis, whilst making a valuable contribution in its own right, points the way to future, fruitful research in the field of "big data".

This thesis utilizes various software packages, without which this investigation would have been impossible: *Abode Acrobat Pro DC (Version 215.020.2042)* is used for its Optical Character Recognition (OCR) capabilities, which allows scanned documents (exhibition catalogues) to be "read" by the computer and the elements of content analysis to be conducted; *IBM SPSS Statistics (Version 23)* is used for the calculation of the bivariate correlation and bootstrapped confidence intervals; *NVivo for Mac (Version 10.2.2)* is used in conjunction with the OCR-processed artwork-text to calculate word frequencies and weighted percentages for use within content analysis; *Microsoft Excel for Mac (Version 15.27)* is used to create/organize the datasets before they are uploaded to *IBM SPSS Statistics* and is also used to create the charts and graphs.

These software packages work in this thesis, but it is still quite a labour-intensive process in terms of the time required to scan original documents onto the computer and create the initial *Excel* datasets. There is so much more data, both structured (numbers) and unstructured (text) that is associated with the 62-British-exhibition canon, and that it would have been interesting to have incorporated into this project. There are structured-data element such as exhibition visitor attendance figures; exhibition financial reports. Whilst unstructured-data elements include newspaper articles and reviews on the 62 exhibitions; government and corporate correspondence in relation to the exhibitions; social media commentary; contemporaneously published artwork-text by the exhibition-catalogue contributors; contemporaneously published artwork-text on the RAG. There is a lot of data being continuously generated, and it all has a potential bearing upon artwork perception and

creation. IBM estimated in 2012 "that 90 percent of the data in the world today did not exist before 2010".[1]

The term used for this massive increase in, primarily, digital data, is "big data", and extracting information from it is being pursued in numerous research fields: science; medicine; commerce; national security; ecology; geology.[2] There is no reason why the field of art history should be insulated from this twenty-first-century data-explosion, and it is the belief of this thesis that the requirement to explore the impact of big data upon art history is becoming increasing relevant. As such, this thesis views itself as a stepping stone to further incorporation into the field of art history of methods used to explore big data. Of particular interest for future research is "data mining", which "typically operates on very large data sets with many variables".[3] In relation to scientific data, Ben Raymond (et al.) describe data mining as: "[T]he discovering of previously unknown information from a large collections of individual data sources […]."[4] As with the use of bivariate correlation used within this research, Raymond (et al.) view data mining as a diagnostic tool, stating:

> While the formulation of scientific hypotheses has conventionally followed the observation of physical phenomena, the observation of numerical properties of previously collected data can also provide this stimulus […] Data mining therefore has a role in the strategic planning of scientific research.[5]

As with the calculation of bivariate correlation and bootstrapped confidence intervals within this research, data mining is a computer-intensive diagnostic technique performed via specifically designed software. One such software package is *IBM SPSS Modeler*, which is capable of discovering patterns and trends in structured (numbers) and unstructured (text)

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[1] Thomas K. Grose, "Delivering Big Data", in *ASEE Prism*, Vol. 2, No. 4 (December 2012), pp. 26-31, The American society of Engineering Education [http://www.jstor.org/stable/43530811 (accessed: 06-11-2016)] p. 28
[2] Grose, 2012, p. 28 (science, medicine, commerce, national security). Stephanie E. Hampton, Carly A. Strasser, Joshua J. Tewksbury, Wendy K. Gram, Amber E. Budden, Archer L. Batcheller, Clifford S. Duke and John H. Porter, "Big Data the Future of Ecology", in *Frontiers in Ecology and the Environment*, Vol. 11, No. 3 (November 2013), Wiley, 2013, pp. 156-162 [http://www.jstor.org/stable/23470551 (accessed: 06-11-2016)] (ecology). Erin Gleeson and Gregory B. Greenwood, "Big Data are all the Rage – For Mountains Too", in *Mountain Research and Development*, Vol. 35, No. 1 (February 2015), International Mountain Society, 2015, pp. 87-89 [http://www.jstor.org/stable/mounresedeve.35.1.87 (accessed: 06-11-2016)] (geology).
[3] Ben Raymond, David J. Watts, Harry Burton and Jeremy Bonnice, "Data Mining and Scientific Data", in *Arctic, Antarctic, and Alpine Research*, Vol. 37, No. 3 (August 2005), INSTAAR, University of Colorado, 2005, pp. 348-357 [http://www.jstor.org/stable/4095896 (accessed: 05-11-2016)] p. 348.
[4] Raymond (et al.), 2005, p. 348
[5] Raymond (et al.), 2005, p. 348

data. As stated, it would have been interesting to apply such software to expanded datasets within this thesis, but the additional time required to create the expanded datasets and conduct analysis of them, as well as the cost of acquiring such computer programs, made such an endeavor prohibitive.[6]

Within the "Introduction: Data" ("Section 1.0") it is stated that the focus of this thesis is the quantitative defining of relationships, as opposed to the causal effects for such relationships. It would have been possible to produce a thesis containing standardizing bivariate correlations, indicating the probable likelihood of such relationships occurring. In the writing of this thesis, though, it became evident that the use of these standardized, quantitative relationships were as diagnostic tools. They allow the large datasets to be compared and analyzed for significant relationships between: The weighted percentage of content-analysis recording units in the artwork-text; the exhibition-quantities of the artwork-objects; artwork-text recording units and artwork-objects exhibition-quantities. The last of these correlations being viewed, "Section 1.1", as formative of the RAG artwork. Upon running such diagnostics upon the datasets, and such diagnostics effectively extracting those relationships for which there is statistical evidence of significance, attention is focused upon these significant relationships, and qualitative evidence sought for them within the artwork-text.

Finding examples, or not, within the 1,661,620 words of artwork-text is facilitated by the use of *NVivo*. As well as being used to calculate the weighted percentages of recording units, *NVivo* is used to organize and contain the scanned artwork-text. The artwork-text is uploaded to it and categorized by Year and author. The texts can be search individually, by Year groups/periods, or by author groups for the occurrences within them of the words forming the concepts within the content analysis. Searching in this way allows for examples supportive of the significant relationships, expressed by *SPSS* to be found efficiently and accurately within the artwork-text. The significant relationships expressed by *SPSS* are supported qualitatively, whilst such qualitative relationships are evidenced, defined and comparable quantitatively.

During the course of this investigation certain key, distinguishing features in the significant relationships within the 62-British-exhibition canon have been discovered and quantified.

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[6] The current cost of *IBM SPSS Modeler Professional*, which includes the data mining software is £5,332.00 per user per year. [https://www.ibm.com/marketplace/cloud/spss-modeler/purchase/uk/en-uk (accessed 05/11/16)]

Firstly, gender, as a distinguishing feature of inter-artwork-text relationships, inter-artwork-object relationships, and in the formation of RAG artwork – i.e. the relationship between artwork-text and artwork-object – is evidenced repeatedly. The gender division is initially evidenced within the relationships between recording units within the artwork-texts. “Section 2.7” demonstrates this in its examination of the exclusive, significant, positive relationship between recording units SPWTG (Words Politicizing Gender) and GENF (Female Gender Words), which initiates discussion of SPWTG as a gender biased concept that is examined further in “Unit 3” in relationship to its use in conjunction with the exhibition of artwork-objects.

“Section 3.1.3”, making reference to “Section 3.1.1” and “Section 3.1.2”, examines significant gender division within RAG artwork as presented within the 62-British-exhibition canon. It studies the relationships between the number of artwork-objects exhibited and, both, AWPD[AT] (Art Type) and SPW (Socio-Political Words), including the recording unit SPWTG. The section evidences the segregating of the female-RAG artwork through unique association with certain recording units – AWPDTEX (Textile Artwork) and SPWTG – that places female-RAG artwork outside of, not only, the male-RAG artwork category but, also, the broader category of RAG artwork as presented within the 62-British-exhibition canon.

“Section 3.1.5”, meanwhile, continues discussion of the differential quality of female-RAG artwork in terms of artwork authorship. It examines the relationship between the AN (Artist Name) within the artwork-text and the numbers of artwork-objects exhibited by T23Artists, and produces evidence supportive of much greater female-collective authorship within the female-RAG artwork than is demonstrable within male-RAG artwork. Male-RAG artwork among the T23Artist being more individualistic in its authorship.

Other elements of the datasets are demonstrated to be features that change significantly over the course of the 62-British-exhibition canon from 1935 to 2009 in relation to Years. Such elements include the changing trends in the uses of the recording unit AS (Assertive Words) within the artwork-text as examined in “Section 2.7” and “Section 2.8”, and, also the changing uses of such recording units in relation to the number of artwork-objects exhibited as evidenced in “Section 3.1.4”.

“Section 2.7” demonstrates the changing assertive qualities of the artwork-texts in relation to first-level AS recording unit’s constituent second-level recording units. It also, with reference

to the second-level recording unit ASJUS (Justification), examines the changes within the structure of the concepts at the level of "word", and in relation to the units ASNEG (Negative Assertion) and ASPOS (Positive Assertion), examines, the declining trends in AS usage in the relationships between, both, the artwork-text of the 62-British-exhibition canon and the preceding RAG primary-source artwork-texts, and between these artwork-texts and Years. "Section 2.8" explores the varying relationships between the temporally assertive, third-level recording unit ASHIS[TEMP]. Demonstrating the shifting temporal emphasis from the primary-source RAG artwork-text, which correlate the present (ASHISN) with the future (ASHISF), to that of the artwork-text from the 62-British-exhibition canon with its correlation between the present (ASHISN) and the past (ASHISP).

"Section 3.1.4" continues the examination of the second-level AS recording units, but in relation to the number of RAG artwork-objects exhibited per Year within the 62 exhibitions. It relates the declining trends in relation to progressing Years of recording unit ASJUS and ASPOS, examined in "Section 2.7", to the exhibiting of increasing numbers of RAG artwork-objects and Naum Gabo artwork-objects, respectively, from 1935 to 2009.

The use of *fingerprints* throughout "Unit 2" also demonstrates the increasingly multifaceted nature of the artwork-text in relation to the advancement of Years. "Section 2.3" demonstrates this occurrence in relation to GEOT[NS] (Geographical Locales: Areas Smaller Than Nations [proper nouns]) recording units, both, within the 62-British-exhibition canon and between this canon's artwork-text and that of the primary-source artwork-text of the RAG. The *fingerprints* of "Section 2.3", in reference to the actual artwork-texts, demonstrate the increasing global-inclusivity of the artwork-text accompanying the artwork-objects of the RAG: From the limited relationships forged between the primary-source RAG artwork-text from 1900 to 1934 with an average of 2.78 different countries per five-year period (excluding recording unit GEOTOTR), to the average of 9.25 countries per five-year period cited within the artwork-text accompanying the exhibition of RAG artwork-objects from 1970 to 2009, including the trans-Atlantic connection to the USA.

"Section 2.4" demonstrates a similar increasingly-multifaceted occurrence in relation to second-level AW (Artwork Words) recording units, whilst also examining the changing relationships between the second-level AW recoding units. From initial inspection of the *fingerprints*, "Section 2.4" demonstrates a shift from the primary-source-artwork-texts' focus upon describing the artwork in terms of colour (AWCO [Colour/Descriptions of Artistic

Qualities]) and form (AWSH [Shapes/Descriptions of Structural Qualities]), to the secondary-source-catalogue contributions' increasing focus on the qualities of the artwork-objects' creators: Profession (AWPE) and artistic associations (AWTE [Institutions of Teaching/Artist Associations]). This increasing focus on AWPE and AWTE coincides with significant, negative correlation between, both, AWCO and Year (1902-2009), and between AWSH and Year (1902-2009).[7]

Each of these distinguishing relationships demonstrates the transitory nature of the artwork-text. In doing so, and by defining artwork as the "shadow" cast by the particle of the artwork-object by the moving wave of artwork-text, this thesis evidences and quantifies the changing nature of the artwork itself. It also demonstrates that to write of an artwork-object is to affect the artwork. Although this thesis has been positioned outside of the 62-British-exhibition canon that it studies, how its "shadow" might compare to those created by the contributors to this canon is examined in the final section: "Postscript".

[7] AWCO and Year: $T = -.425$, $N = 58$, $p < .05$ (.000), BCa 95% CI [-.559, -.275]. AWSH and Year: $T = -.256$, $N = 58$, $p < .05$ (.005), BCa 95% CI [-.448, -.058]

4.1 – Postscript

This final section explores the previous section's concluding comment further, through examination of the artwork-text of some of the "recidivist" contributors. It has been titled "Postscript" as, in addition to applying content-analysis methodology from "Unit 2" to each of the selected contributors' artwork-texts, it applies the content-analysis methodology to this thesis. The methodology from "Unit 2" has been used on all of the text contained in "Unit 1", "Unit 2", "Unit 3", and "Section 4.0" of "Unit 4" of this thesis. Only this section, "Section 4.1", is omitted from examination, hence its title of "Postscript".

This thesis is not contained within the same canon of artwork as has been defined in "Section 1.0" for the texts of the selected contributors. It is a study of the canon to which they contribute and, therefore, it is of interest as to whether it is reflective of the canon's content: A reflectivity, already, demonstrated not to be shared between the RAG's primary-source based artwork-text and the contributors' canon of the 62-British-exhibitions from 1935 to 2009 containing RAG artwork-objects.

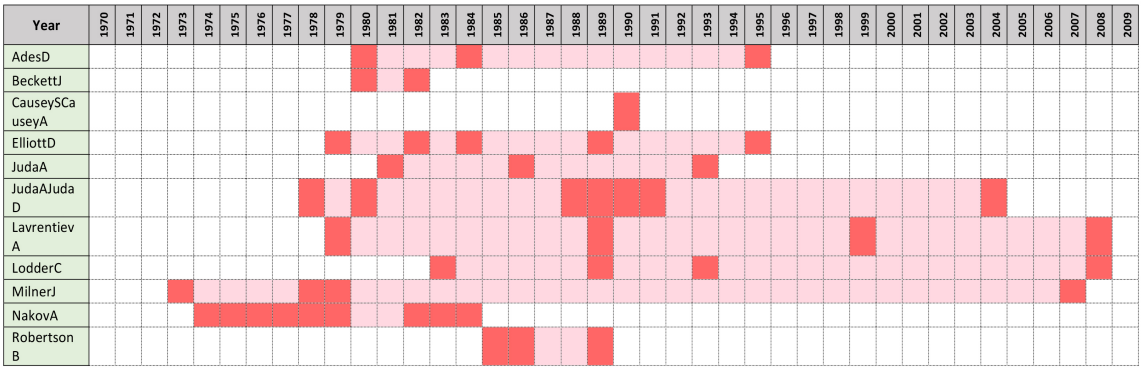


Table 4.1.1: Writers who have contributed three or more pieces of artwork-text to the 62-British-exhibition canon, and in which Years these contributions are made.

Table 4.1.1 contains those writers who have contributed three or more pieces of artwork-text to the catalogues that accompany the 62 British exhibitions from 1935 to 2009. The darker squares within the table indicate the Years in which their writing was published. Whilst the lighter squares allow reference to the span of time for which the different individuals are actively contributing. There are twelve contributors to the catalogues, who contribute three or more times. These twelve appear as eleven entries within *table 4.1.1*, due to some artwork-text contributions being attributed to more than one author: Susan and Andrew Causey; Annely and David Juda.

There are differences within the approach and aims of the contributors' writing. Some – Bryan Robertson, and Annely and David Juda – write as the directors or owners of galleries. Others, Jane Beckett and Dawn Ades, contribute with more academic-style texts, aimed at informing, but with less focus, solely, on the RAG, focusing more broadly on other twentieth-century art movements. Dawn Ades contributes three times from 1980 to 1995, with two articles focussing on Dada, and a third examining monumental artwork in both the Americas and Europe (including Russia).[8] The final "group" of contributors appearing in *table 4.1.1* produce artwork-text with a focus on RAG subjects. This group includes: David Elliott, from the Museum of Modern Art Oxford; Alexander Lavrentiev, grandson of Aleksandr Rodchenko and Vavara Stepanova; Christina Lodder, university lecturer; John Milner, university lecturer and curator of many RAG exhibitions at the University of Newcastle's Hatton Gallery; Andrei Nakov, art historian. This section uses exactly the same method of content analysis as introduced in "Unit 2", and exactly the same recording units, but, rather than examining the artwork-text produced in particular Years, "Section 4.1" examines the artwork-text produced by particular contributors/authors.

The differences in the focus, in relation to the RAG, in the artwork-texts of Beckett and Ades, whom it is asserted write more broadly of twentieth-century art, and the final group including Elliott, Lavrentiev, Lodder, Milner and Nakov, whom write with a greater focus upon the RAG, are demonstrated through examination of the *fingerprints* produced from content analysis of the artwork-text attributable to each author. *Image 4.1.1* contains the *Fingerprints* of the average proportional representation of second-level AN (Artist Name) recording units within the first-level recording unit AN for each of the writers within *table 4.1.1* and James Strugnell (2016). The dark-green segment of each *fingerprint* represents the proportion of the AN recording unit accounted for by the second-level recording unit ANRAG (proportion of text used to name RAG artists [proper noun]). Comparing the *fingerprints* derived from the Ades's and Beckett's content-analysis data with those of Elliott, Lavrentiev, Lodder, Milner and Nakov, the contrast is striking. The average proportion of AN accounted for by ANRAG within the artwork-text of Ades and Beckett is 12.65%, compared to an average for the latter group of 80.67%. The proportion of AN accounted for by ANRAG in this thesis, with its focus

[8] Dawn Ades three contributions are: "Dada and Abstract Art in Zurich 1915-20", 1980, in Tate Gallery, *Abstraction: Towards a New Art. Painting 1910-20*, Tate Gallery Publications: London, 1980; "Dada – Constructivism", 1984, in Juda, A., and Juda, D., *Dada – Constructivism: The Janus Face of the Twenties*, Annely Juda Fine Art: London, 1984; "Art as Monument", 1995, in Britt, D., (ed.), *Art and Power: Europe under the dictators 1930–45*, Hayward Gallery: London, 1995.

on the application of bivariate correlation and descriptive statistics to the artwork of the RAG, should be expected to be closer to the 80.67% than the 12.65%, and is 96.00%.

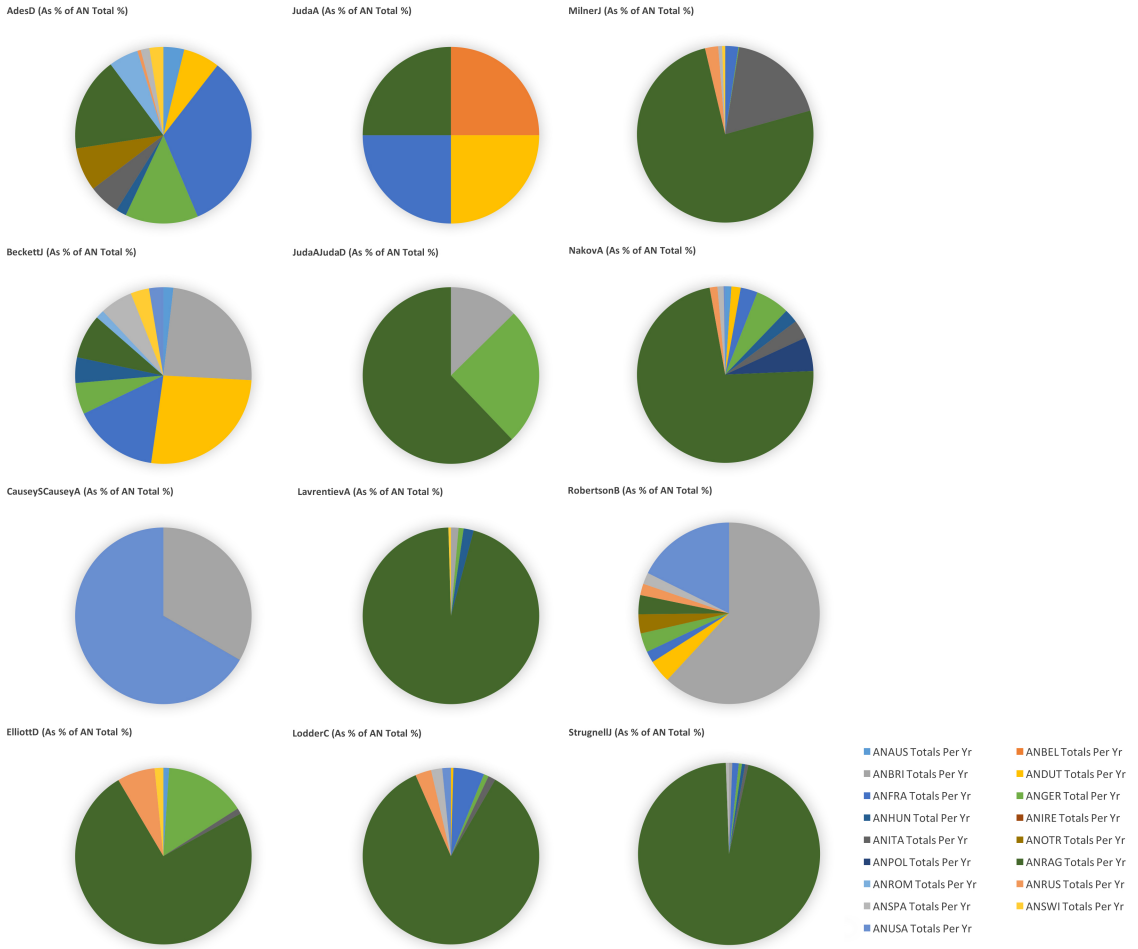


Image 4.1.1: *Fingerprints* of the average proportional representation of second-level AN recording units within the first-level recording unit AN for each of the writers within *table 4.1.1* and Strugnell (2016).[9]

This section examines, via content analysis, the text of the contributors listed in *table 4.1.1*, and not the text of a particular Year. But comparison of bivariate correlations (Kendall's Tau), descriptive statistics, charts and graphs for particular Years are still of use to indicate differences between these contributors' artwork-text, the production of which spans a period from 1972 to 2008, and that of this thesis, which, when incorporated, increases the period's span to 2016. In the calculation of bivariate correlations for these two periods – 1972-2008 and 1972-2016 – it is the content analysis data from the Years in which the authors of *table 4.1.1* have contributed that have been used. This data is the same as that used within the rest of this thesis, but only the Years shown on *table 4.1.1*, as containing contributions, are included. The data for each selected Year includes all the artwork-text from that Year, and

[9] Complete lists of the percentages represented within this *image* are produced in *App.3–[Contributors 1972-2016]-01*.

not, necessarily, just that of the contributors. The exception being the Year 2016, which only contains data from Strugnell's text – i.e. this thesis – but this is not included on *table 4.1.1*. The results of calculating bivariate correlation using this more general "per-Year" data is still of use in identifying differences between the two periods – 1972-2008 and 1972-2016 – and through further examination, between the content of artwork-text produced for the 62-British-exhibition canon and that within this thesis.[10]

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
Recording Unit	Year	Tau (*T*)	Cases (*N*)[11]	*p*-value	Lower	Upper
ANHUN	Year (1972-2008)	-.508	23	.001	-.698	-.294
ANHUN	Year (1972-2016)	-.481	24	.002	-.668	-.267
ANITA	Year (1972-2008)	-.330	23	.032	-.575	-.059
ANITA	Year (1972-2016)	-.343	24	.022	-.589	-.071
ANM	Year (1972-2008)	-.360	23	.016	-.602	-.100
ANM	Year (1972-2016)	-.406	24	.005	-.620	-.164
ANHUNM	Year (1972-2008)	-.506	23	.001	-.702	-.292
ANHUNM	Year (1972-2016)	-.479	24	.002	-.671	-.260
ANITAM	Year (1972-2008)	-.314	23	.042	-.565	-.047
ANITAM	Year (1972-2016)	-.328	24	.029	-.579	-.055
AWSH	Year (1972-2008)	-.329	23	.028	-.636	-.008
AWSH	Year (1972-2016)	-.349	24	.017	-.659	-.011
ECON	Year (1972-2008)	.340	23	.024	.055	.557
ECON	Year (1972-2016)	.306	24	.039	.015	.561
SPWTA	Year (1972-2008)	-.341	23	.023	-.628	-.004
SPWTA	Year (1972-2016)	-.381	24	.009	-.665	-.069

Table 4.1.2: Significant bivariate correlations (Kendal's Tau) between content-analysis recording units and Year. Table shows those correlations that are significant for **both** 1972-2008 **and** 1972-2016 periods.[12]

Table 4.1.2 contains all the significant correlations between the variables of content-analysis recording units and Year that are significant for both the contributor-period from 1972 to 2008 and the extended period from 1972 to 2016, which includes the content-analysis results for this thesis. All of the results that are significant for both periods are also significant in the same "direction" for each of these periods; i.e. corresponding pairs of variables are either, both, significantly negative, or, both, significantly positive. The results within *table 4.1.2* suggest that, for these eight recording units, this thesis follows the same trends regarding decreasing or increasing weighted-percentage representation in relationship to Years (1972-2016) that have been formed by the previous Years (1972-2008) to which the writers of *table 4.1.1* contributed to: It, at the least, does not go significantly enough against

[10] Ideally the correlation would be calculated using only content-analysis data from the contributors in *table 4.1.1* and that derived from this thesis. But, due to how the content analysis has been conducted within the rest of this thesis – grouping all the texts from one Year together – separating out the "*table 4.1.1* texts" for each Year and running a separate content analysis upon them is not achievable in the current timeframe.

[11] For variable "Year (1972-2008)": Cases (*N*) derive from 23 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. For variable "Year (1972-2016)": Cases (*N*) derive from 24 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

[12] Complete lists of results for correlation between Recording Units and Years for 1972-2008 and 1972-2016 periods are produced in *App.2-[1972-2008]-01* and *App.2-[1972-2016]-01*.

the established trend to alter the significance of the resulting correlation. These instances are shown in *table 4.1.3*.

Variable 1	Variable 2	Kendall's Tau			Bootstrap BCa 95% CI	
Recording Unit	Year	Tau (*T*)	Cases (*N*)[13]	*p*-value	Lower	Upper
ANDUT	**Year (1972-2008)**	**-.302**	**23**	**.051**	**-.541**	**-.026**
ANDUT	Year (1972-2016)	-.344	24	.023	-.570	-.062
ANRUS	Year (1972-2008)	.430	23	.005	.139	.658
ANRUS	**Year (1972-2016)**	**.321**	**24**	**.032**	**-.016**	**.632**
ANDUTM	**Year (1972-2008)**	**-.294**	**23**	**.058**	**-.536**	**-.013**
ANDUTM	Year (1972-2016)	-.336	24	.027	-.566	-.057
ANRUSM	Year (1972-2008)	.420	23	.006	.133	.651
ANRUSM	**Year (1972-2016)**	**.312**	**24**	**.036**	**-.035**	**.630**
ASJUS	Year (1972-2008)	-.356	23	.017	-.639	-.042
ASJUS	**Year (1972-2016)**	**-.305**	**24**	**.037**	**-.618**	**.031**
ASNEG	Year (1972-2008)	-.381	23	.013	-.657	-.093
ASNEG	**Year (1972-2016)**	**-.262**	**24**	**.080**	**-.594**	**.090**
AWST	**Year (1972-2008)**	**-.283**	**23**	**.063**	**-.593**	**.081**
AWST	Year (1972-2016)	-.338	24	.023	-.610	-.043
GEN	**Year (1972-2008)**	**.267**	**23**	**.076**	**-.079**	**.563**
GEN	Year (1972-2016)	.321	24	.029	.008	.591

Table 4.1.3: Bivariate correlations (Kendal's Tau) between content-analysis recording units and Year. Table shows those correlations that are significant (and have a BCa 95% CI that does not cross zero) for **only** 1972-2008 **or** 1972-2016 period, and the **corresponding "non-significant" correlation**.[14]

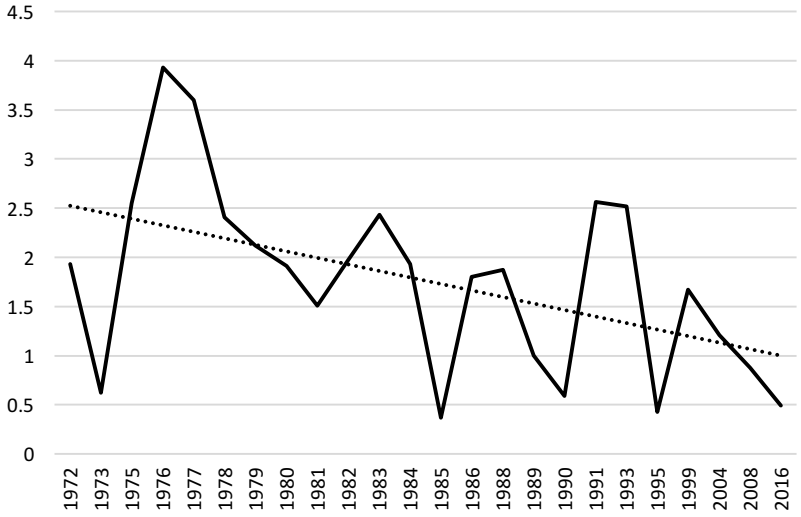
Table 4.1.3 contains all the significant correlations between the variables of content-analysis recording units and Year that are significant for either the contributor-period from 1972 to 2008 or the extended period from 1972 to 2016. The corresponding "non-significant" correlations are included for comparison. The only difference between the two periods of 1972-2008 and 1972-2016 examined within this section, in terms of the results used to calculate their correlations, is the inclusion of the content-analysis results for this thesis and its corresponding Year (2016) within the 1972-2016 period. Therefore, any significant difference between these two periods' resulting correlations between recording units and Year must derive from this addition, and indicate it as the cause of divergence from the previous existent trend.

Graph 4.1.1 charts the significant, negative correlation between the recording unit SPWTA (Art Thought and Theory Words) and Year (1972-2016). The relationship between SPWTA and Year is a significant, negative one for both periods 1972-2008 and 1972-2016, and is included in *table 4.1.2*. *Graph 4.1.1* illustrates and confirms the previous assertion that corresponding-correlation results for the same variable between periods demonstrates that

[13] For variable "Year (1972-2008)": Cases (*N*) derive from 23 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. For variable "Year (1972-2016)": Cases (*N*) derive from 24 sampling units of yearly averages excluding pairwise for cases where "variable 1" and/or "variable 2" has no data. (As described in: "Section 1.2: A Note on the Expression of Cases (*N*) in this Thesis".)

[14] Complete lists of results for correlation between Recording Units and Years for 1972-2008 and 1972-2016 periods are produced in *App.2-[1972-2008]-01* and *App.2-[1972-2016]-01*.

this thesis continues to follow the trend being charted over the Years by the artwork-text of the 62 exhibition catalogues. In this case there is a pronounced downward trend (shown by the dotted, linear trend line) in the proportion of text used for Art Thought and Theory Words (SPWTA), which this thesis contributes to with its own SPWTA weighted percentage of .49% being the terminating point of the graph's final sharp decline from the high in 1999 of 1.67%.



Graph 4.1.1: Line graph with linear trend line (dotted line) of the relationship between recording unit SPWTA and Year (1972-2016).

A downward trend of SPWTA should mean that those writers, from *table 4.1.1*, who began contributing text to the catalogues earlier, closer to 1972, have a higher proportion of SPWTA within their artwork-texts. The "earliest" contributor in *table 4.1.1* is Milner making his first contribution in 1972, followed by Nakov in 1973. Those latest in making their first contributions are Robertson in 1985 and Susan and Andrew Causey in 1990. The average weighted percentage for SPWTA for the 11 entries (writers/pairs of writers) of *table 4.1.1* is 2.09%. The earlier contributors of Milner and Nakov have average SPWTA weighted percentages of 2.42% and 2.37% respectively, both above the average. Whilst the later contributors of Robertson and the Causeys have weighted percentages of .14% and .96% respectively, both well below the average.

There seems to be a far greater contrast between the average SPWTA value of the later contributors than of the earlier. There is a difference of 1.95% between the weighted percentage of SPWTA within later contributor Robertson's artwork-texts (.14%) and the average of 2.09%. This compares to a difference of only .33% for the earlier contributor Milner. A reason for this might be the longevity, in terms of contributing activity, of many of the earlier contributors. Five of the 12 writers named in *table 4.1.1*, contribute text to the

exhibition catalogues within this study for periods of > 20 years, two of them over periods of ≥ 30 or more years.[15] Of the remaining seven, three contribute for periods spanning ≥ 10 or more years, and four contribute over periods of five or fewer years.[16] This suggest that those making contributions over a long period of time such as Milner – 35-year period from 1972 to 2007 – might adapt their artwork-text content over this period so that whilst earlier artwork-texts might be proportionally higher in SPWTA later artwork-text is lower, therefore, bringing their personal average in line with that of the whole period (1972-2008), which in Milner's case is the same time span, from 1972-2008. Examining an early contributor who does not contribute artwork-text over a long period of time, it should be expected that the average weighted percentage of SPWTA within their artwork-text be higher. Beckett only contributes for a brief period from 1980 to 1982, relatively early within the timeframe of 1972-2008, and the average weighted percentage of his artwork-text accounted for by SPWTA is 3.56%, which would support this hypothesis.

Image 4.1.2, which contains the *fingerprints* for the average proportional representation of second-level SPW (Socio-Political Words) recording units within the first-level recording unit SPW for each writer within *table 4.1.1* and Strugnell (2016), also confirms that, not only, is there a reduction in the overall weighted percentage of SPWTA being used by later contributors, but that SPWTA as proportion of the total SPW recording unit, also, reduced dramatically in the later contributors' artwork text. Milner's and Nakov's *fingerprints* show the proportion of SPW attributable to SPWTA (orange segment) as 48.99% and 43.01% respectively. Whilst in the *fingerprints* corresponding to Robertson and the Causeys the SPWTA segment accounts for 3.84% and 8.50% respectively. In the Strugnell's *fingerprint*, the one for this thesis, SPWTA accounts for a slightly higher than expected, given its lateness, 20.00%.

Graph 4.1.2 illustrates the significant, positive correlation between the recording unit GEN (Gender Words) and Year (1972-2016). The relationship between GEN and Year is only significantly positive for period 1972-2016, and is included in *table 4.1.3*. *Table 4.1.3* also contains the correlation for GEN and Year (1972-2008), which, although demonstrably still

[15] The five are: John Milner, contribution from 1972 to 2007; Alexander Lavrentiev, contributions from 1979 to 2008; Annely Juda and David Juda, contributions from 1978 to 2004; Christina Lodder, contributions from 1983 to 2008.
[16] The four are: David Elliott, contributing from 1979 to 1995; Dawn Ades, contributing from 1980 to 1995; Andrei Nakov, contributing from 1974 to 1984. The three are: Jane Beckett, contributing from 1980 to 1982; Bryan Robertson, contributing from 1985 to 1989; Susan and Andrew Causey, contributed in 1990.

positive, is not significant and lacks confidence, with BCa 95% CI limits that cross zero. As stated, the only additional data included within the 1972-2016 period and not in the 1972-2008 period is that deriving from this thesis. The GEN recording unit within this thesis is different enough from those for the Years 1972-2008 to affect the resulting correlation significantly. *Graph 4.1.2* indicates that there is not much movement within the GEN recording unit for the period from 1972 to 1995; it suggests that it is the post-1995 period (1999-2016) that is responsible for the significant, positive correlation between GEN and Year (1972-2016). These assertions are confirmed through comparison of the linear trend lines (dotted lines) of *graph 4.1.2* and *graph 4.1.3*.

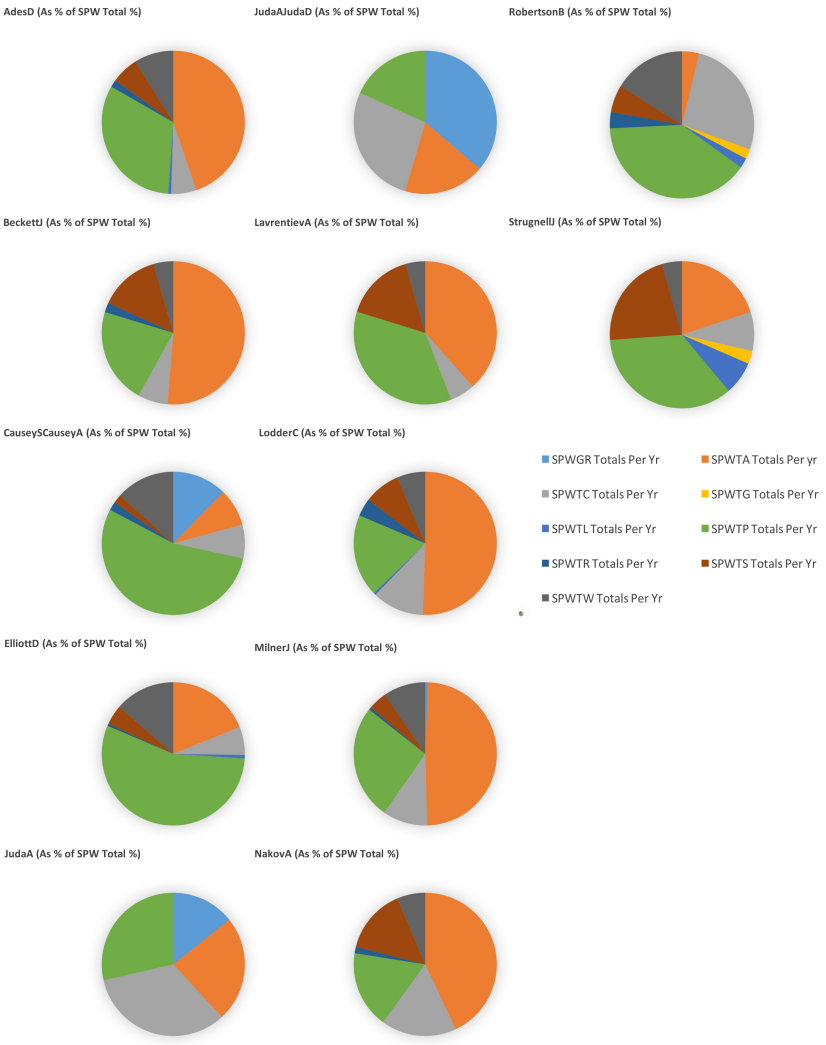
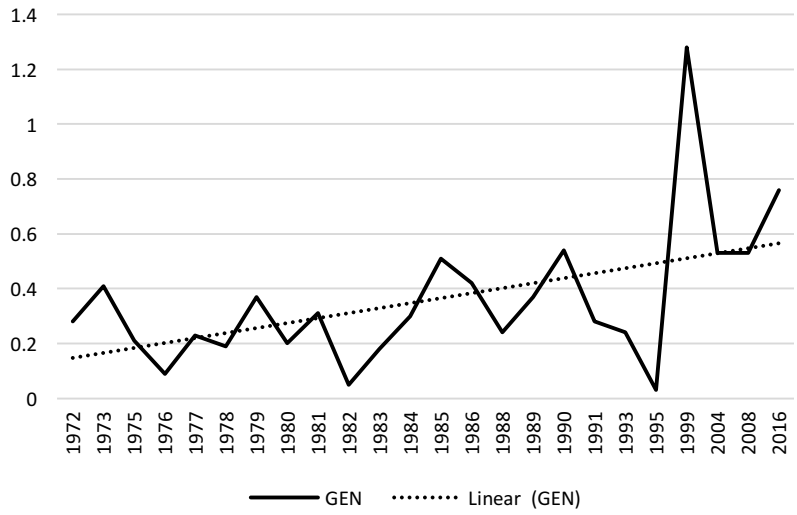


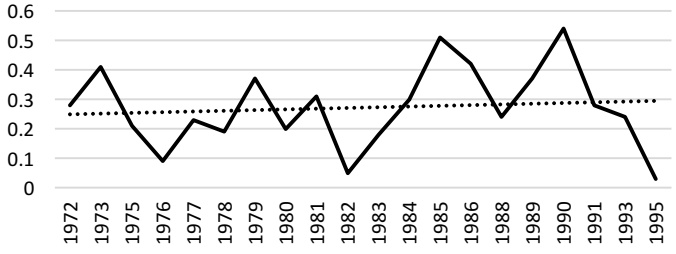
Image 4.1.2: *Fingerprints* of the average proportional representation of second-level SPW recording units within the first-level recording unit SPW for each of the writers within *table 4.1.1* and Strugnell (2016).[17]

[17] Complete lists of the percentages represented within this *image* are produced in *App.3–[Contributors 1972-2016]-02*.

Graph 4.1.3 charts the same data as *graph 4.1.2*, but only for the period 1972-1995. The trend line is almost horizontal, indicative of no significant, negative or positive correlation between GEN and Year (1972-1995), which is confirmed through calculation: $T = .068$, $N = 20$, $p > .05$ (.673), BCa 95% CI [-.265, .400]. Compared to the trend line of *graph 4.1.3*, that of *graph 4.1.2* shows a marked left-to-right incline demonstrative of the significant, positive correlation stated in *table 4.1.3*. *Graph 4.1.2* also indicates the Year responsible for the dramatic change in gradient as 1999 (1.28%), which is then followed by a period of GEN returning to levels more similar to the 1972-1995 period (.53%), before 2016 shows another "spike" in the weighted percentage of GEN within the artwork-text (.76%). There were two exhibitions in 1999, *New art for a New Era* (Barbican Art Gallery, London)[18]and *Amazons of the Avant-Garde* (Royal Academy of Arts, London) [19].



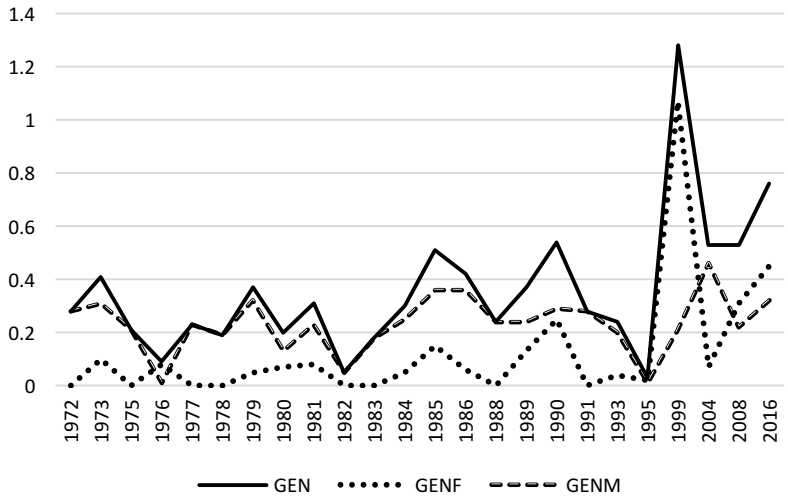
Graph 4.1.2: Line graph with linear trend line (dotted line) of the relationship between recording unit GEN and Year (1972-2016).



Graph 4.1.3: Line graph with linear trend line (dotted line) of the relationship between recording unit GEN and Year (1972-1995).

[18] *New Art for a New Era: Malevich's Vision of the Russian Avant-Garde. From the collection of the State Russian Museum, St Petersburg*
[19] *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova*

Graph 4.1.4 shows the line representing the relationship between GEN and Year (1972-2016) from *Graph 4.1.2*, and lines corresponding to the second-level recording units that combine to form GEN: GENF (dotted line: Female Gender Words) and GENM (dashed line: Male Gender Words). Although neither the relationship between GENF and Year (1972-2016), or between GENM and Year (1972-2016) are significant and both have confidence intervals that cross zero, *Graph 4.1.4* clearly demonstrates that it is the relationship between GENF and Year that is responsible for the significant, positive correlation between GEN and Year.[20] The dotted line representing the GENF–Year (1972-2016) relationship mirrors that of the solid line of the GEN–Year (1972-2016) relationship from the Year 1999 onward. This suggests that it is the *Amazons of the Avant-Garde* exhibition, and its focus of female-RAG artists, rather than *New Art for a New Era*, which is based around the male-RAG artist Malevich, that is responsible for the 1999 high of both recording units GEN and GENF.



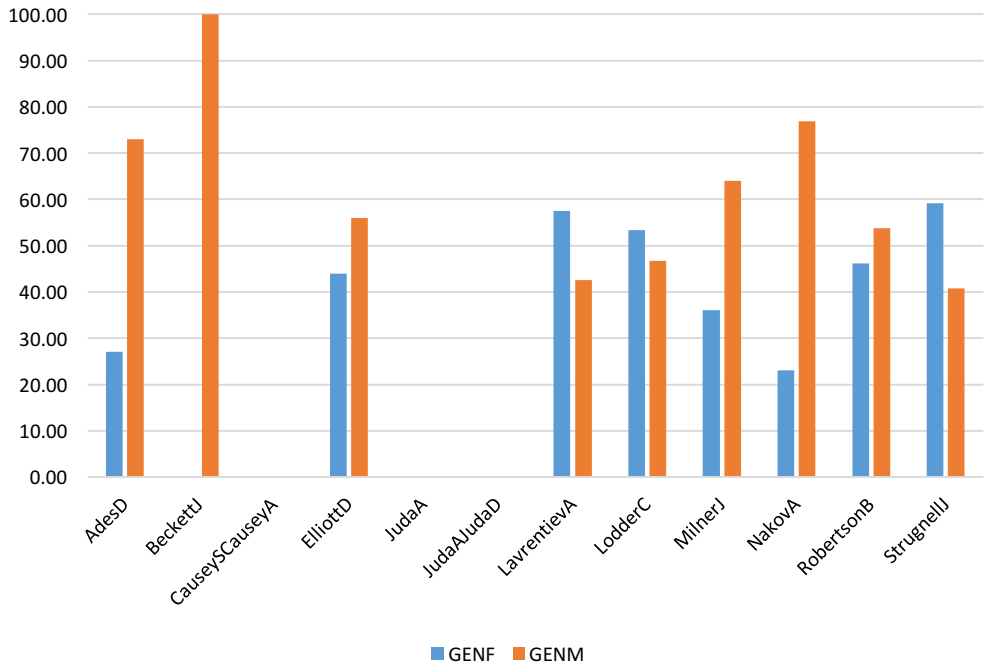
Graph 4.1.4: Line graph allowing comparisons of the relationships between GEN and Year (1972-2016), GENF and Year (1972-2016), and GENM and Year (1972-2016).

Examination of *table 4.1.1* reveals that only one of the individual writers being examined contributed artwork-text in 1999: Alexander Lavrentiev. Lavrentiev contributed the essay "Vavara Stepanova" to the catalogue accompanying the exhibition *Amazons of the Avant-Garde*.[21] *Graph 4.1.5* charts the proportion of the GEN recording unit formed of each of its two second-level units – GENF and GENM – for each of the writers listed in *table 4.1.1* and

[20] GENF–Year (1972-2016): $T = .335$, $N = 24$, $p < .05$ (.027), BCa 95% CI [-.012, .632]. GENM–Year (1972-2016): $T = .121$, $N = 24$, $p > .05$ (.412), BCa 95% CI [-.152, .397].

[21] Alexander Lavrentiev, "Vavara Stepanova", 1999, in Bowlt, J. E., and Drutt, M., (eds.), *Amazons of the Avant-Garde: Alexandra Exter, Natalia Goncharova, Liubov Popova, Olga Rozanova, Varvara Stepanova, and Nadezhda Udaltsova*, Royal Academy of Arts: London, 1999, pp. 241-247

for Strugnell (2016). In only three of the 12 cases shown on *graph 4.1.5* does the proportion of GENF exceed that of GENM within the recording unit GEN. The three writers that exhibit this trait are: Alexander Lavrentiev; Christina Lodder; James Strugnell. Examination of *table 4.1.1* shows the Years in which Lodder and Lavrentiev contribute to be: 1979; 1983; 1989; 1993; 1999; 2008. Including the Year 2016 for Strugnell's contribution, which is not included in *table 4.1.1*, examination of *graph 4.1.4* shows that for each of these Year, with the only exception being 1983, the overall weighted percentage of GENF increases from that of the previous data point (Year on y-axis). There is evidenced in *graph 4.1.2* through to *graph 4.1.5* of: The connection between a rise in the proportion Female Gender Words (GENF) included within the artwork-text and the advancement of Years from 1972 to 2008; those writers from *table 4.1.1* that are responsible for such change; the significance of this trend to exist, as stated in "Section 4.0", and, also, to be inadvertently enhanced in significance by the text of this thesis.



Graph 4.1.5: Cluster column chart showing the percentage of the GEN recording unit formed of its two second-level units, GENF and GENM, for each of the writers listed in *table 4.1.1* and for Strugnell (2016).

The examples of ANRAG, SPWTA and GENF demonstrate some of the reflections and relationships between artwork-texts contributing to the same art-historical canon, and, also between such text and the by-product of studying them: This thesis (more text). This began as an examination of a particular art-historical canon – the exhibition of the Russian avant garde (RAG) in British galleries from 1935 to 2009 – and the relationships between the

artwork-objects and artwork-texts of this canon. Mikhail Larionov writes in “Rayonist Painting”, 1913:

> Now, if we wish to depict an object exactly as we see it, then we must depict also these reflex rays belonging to other objects – and then we will depict literally what we see. I painted my first works of a purely realistic kind in this way. In other words, this is the most complete reality of an object – not as we know it, but as we see it.[22]

The aim of this thesis’s use of bivariate correlation – in conjunction with descriptive statistics, charts and graphs – is to depict the artwork of the RAG, using bivariate correlation to conjoin artwork-text, artwork-objects, and time. The *ANoRAG-and-ANRAG* line, written in the “Section 1.0”, is an attempt to depict the most complete reality of the artwork expressed within the canon investigated within this thesis:

ANoRAG and ANRAG: $T = .083$, $N = 32$, $p > .05$ (.506), BCa 95% CI [-.205, .371]

It is artwork not as we know it, but as we see it, bringing with us our unique set of artwork-texts to bear upon the artwork-object before us.

[22] Mikhail Larionov, “Rayonist Painting”, 1913, in Bowlt, J. E., (ed.), *Russian Art of the Avant Garde: Theory and Criticism 1902–1934. Revised and Enlarged Edition*, Thames and Hudson: London, 1991, p. 98

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[1] Although this section is titled “The 62 Exhibition Catalogues” it contains 58 references. The discrepancy between the number of catalogues and number of exhibitions is due to four of the exhibitions’ catalogues being contained within the same publication: Causey, S., (ed.), *Tradition and Revolution in Russian Art*, Manchester Free Press: Manchester, 1990 [This contains the catalogues for four of exhibitions included in this study: *Russian Faces, Soviet Lives*; *The Russian Lubok: Two Hundred Years of Popular Prints*; *Bolshevik Posters*; *Street Art of the Revolution: Petrograd 1918*.]

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