Secondary transfer effects of intergroup contact via social identity complexity

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Abstract

Secondary transfer effects of intergroup contact refer to the generalization of contact effects from a primary encountered outgroup to attitudes towards secondary outgroups (Pettigrew, 2009). Using two large, cross-sectional datasets from Germany ($N = 1381$) and Northern Ireland ($N = 1948$), this paper examined the extent to which secondary transfer effects of intergroup contact on attitudes towards a range of secondary outgroups occur via a previously unexplored psychological construct, social identity complexity (operationalized as similarity complexity and overlap complexity). Study 1 found primary outgroup contact to be associated with greater similarity complexity, but no indirect effects on secondary outgroup attitudes via complexity emerged. Study 2, however, revealed indirect positive relationships between primary outgroup contact and secondary outgroup attitudes via increased similarity complexity and overlap complexity. These relationships were obtained while controlling for two previously tested mediating mechanisms, attitude generalization and deprovincialization. We discuss the theoretical implications of these findings and the contribution of social identity complexity to understanding processes underlying secondary transfer effects of contact.

Keywords: intergroup contact; secondary transfer effects; social identity complexity; attitude generalization; deprovincialization.

A recent development in intergroup contact research (see Brown & Hewstone, 2005, for a review) pertains to so-called *secondary transfer effects* (STEs; Pettigrew, 2009). STEs refer to the generalization of contact effects from a primary outgroup target to other, secondary outgroups (Pettigrew, 1997; 2009; see also Lolliot, Schmid, Hewstone, Al Ramiah, Tausch, & Swart, 2013; Pettigrew & Tropp, 2011). Although still in its early stages, research has already made important contributions to demonstrating this phenomenon (e.g., Pettigrew, 1997) and, importantly, to explaining the psychological mechanisms that help clarify how such STEs come about (see, e.g., Tausch et al., 2010).

This paper contributes to this growing body of research by examining a previously unexplored mediator of STEs: social identity complexity (Roccas & Brewer, 2002). We test whether intergroup contact with primary outgroups leads individuals to perceive greater complexity surrounding their multiple ingroups, and the consequences of this for secondary outgroup attitudes. Using data from two general population samples, we examined STEs of contact on attitudes towards a range of secondary outgroups, and the extent to which such effects occur via increased social identity complexity operationalized as similarity complexity (Studies 1 and 2) and overlap complexity (Study 2), while controlling for two previously explored mediating processes, attitude generalization (via primary outgroup attitude) and deprovincialization (via ingroup attitude and ingroup identification).

Secondary transfer effects of intergroup contact

STEs pertain to the generalization of contact effects from encountered, primary outgroups to other, secondary outgroups, that may or may not have been previously encountered. This phenomenon was first observed in a study examining the effects of intergroup contact between Black and White US soldiers stationed in Germany, revealing that Black respondents' contact experiences with White US soldiers were not only predictive of their attitudes towards White US soldiers, but also towards Germans, even when direct

contact with Germans was controlled for (Weigert, 1976). Similar results were witnessed among White, non-Jewish Americans' attitudes towards Jewish, Latino and Asian Americans, following positive contact experiences with Black Americans (Wilson, 1996). In his analysis of over 3800 majority group respondents in France, Germany, Great Britain and the Netherlands, Pettigrew (1997) observed that contact with minorities present in each country was associated with reduced prejudice towards secondary outgroups not present in the country (see also Pettigrew, 2009). And a longitudinal investigation of approximately 2000 White, African American, Asian American and Latino students showed that contact with roommates who belonged to one outgroup predicted not only attitudes towards this primary outgroup, but also towards secondary ethnic groups, even when contact with, and pre-existing attitudes towards, the secondary outgroups were controlled for (Van Laar, Levin, Sinclair, & Sidanius, 2005; see also Eller & Abrams, 2004; Sidanius, Levin, Van Laar & Sears, 2008). The most comprehensive test of STEs carried out to date, however, comprises a series of three cross-sectional studies and one longitudinal study in different contexts (Cyprus, Northern Ireland and the US), providing consistent support for STEs, even when controlling for contact with the secondary outgroups (Studies 2-4), and socially desirable responding (Study 3; Tausch et al., 2010). This research was also the first to systematically study two mediators of STEs, attitude generalization and deprovincialization.

Processes underlying secondary transfer effects

Attitude generalization. Attitudes towards particular objects can generalize to other, related objects (e.g., Fazio, Eiser, & Shook, 2004; Walther, 2002). In the theoretical realm of STEs, attitude generalization takes the form of attitudes towards a primary outgroup generalizing to other (secondary) outgroups, which may explain the indirect effects of primary outgroup contact on secondary outgroups. In other words, for STEs to occur via attitude generalization, the primary outgroup attitude mediates the effects of primary outgroup

contact on secondary outgroup attitudes. Indeed, Tausch et al. (2010) found that the relationship between primary outgroup contact and secondary outgroup attitudes was consistently mediated by primary outgroup attitudes (see also Pettigrew, 2009).

Deprovincialization. Pettigrew (1997) argued that intergroup contact may lead individuals to 'de-provincialize', i.e., to re-appraise their ingroup's norms, customs and lifestyles, which may explain the occurrence of STEs. Research to date has primarily operationalized deprovincialization in terms of lowered ingroup affect or identification, with mixed results. Pettigrew (1997), for example, reported that positive contact experiences with foreigners were associated with lower national pride (see also Pettigrew, 2009; Verkuyten, Thijs, & Bekhuis, 2010), which mediated STEs. Research by Tausch et al. (2010), however, did not yield strong support for deprovincialization (operationalized as private collective self-esteem, i.e. a measure of identification, Studies 1 and 4, and ingroup attitude ratings, Studies 2-4) (see also Eller & Abrams, 2004).

It is, however, not surprising that operationalizing deprovincialization in terms of lowered ingroup affect or identification has so far yielded only mixed results. The idea that ingroup and outgroup evaluation are functionally interdependent has long been called into question (see, e.g., Brewer, 1999), since ingroup attitudes and identification tend to be inconsistently related to outgroup attitudes (e.g., Brewer & Campbell, 1976; Hinkle & Brown, 1990; Levin & Sidanius, 1999). Moreover, the theoretical underpinnings of deprovincialization neither necessitate nor even imply a *reduction* in positive ingroup affect or identification as a consequence of contact, but reflect rather the idea that intergroup contact may prompt individuals to 'broaden their horizon' and re-conceptualize their ingroup perceptions more generally. In this paper we thus draw on Brewer's (2008) reasoning that conceptualizations of deprovincialization may be extended and conceived of in even broader terms, to the extent that intergroup contact with a primary outgroup may lead individuals to think in more differentiated terms about the *multiple* ingroups they belong to. Intergroup

contact may thus lead to a change in the cognitive representation of one's multiple ingroups, i.e., in greater *social identity complexity* (Roccas & Brewer, 2002; see also Brewer, 2008).

Social identity complexity

Theoretically rooted in the multiple categorization literature (see Crisp & Hewstone, 2007, for a detailed review), social identity complexity defines the extent to which individuals subjectively perceive their multiple ingroups in complex, differentiated and inclusive terms, ranging on a continuum from low to high (see Schmid & Hewstone, 2011, for a review). Conceptually, social identity complexity includes two distinct, but related sub-components: similarity complexity and overlap complexity. Similarity complexity refers to the perceived defining, prototypical or evaluative properties of categories (i.e., the perceived similarities in meaning associated with multiple ingroups), while overlap complexity relates to the perceived quantifiable boundaries between categories (i.e., the subjective perception of actual overlap in numbers or proportions between different categories). To illustrate, a British Christian might perceive high similarity between the categories 'British' and 'Christian' (e.g., he or she thinks that the typical British person is very similar to the typical Christian person), as well as high overlap (e.g., he or she thinks that most British people are Christians). Individuals may thus, at one extreme, perceive their multiple ingroups as highly similar and overlapping so that only individuals who fulfil ingroup membership on the sum of these categories are considered fellow ingroup members (low complexity), or, at the other extreme, they may perceive lower similarity and overlap between their multiple ingroups (high complexity). Most interesting, perhaps, is that social identity complexity tends to positively co-vary with general outgroup attitudes, for example, with greater tolerance and reduced intergroup bias (Brewer & Pierce, 2005; Schmid et al., 2009), as well as greater support for affirmative action and multiculturalism (Brewer & Pierce, 2005; Roccas & Brewer, 2002).

But why might social identity complexity act as a mediator of STEs? Previous research has shown intergroup contact to positively co-vary with social identity complexity (Schmid et al., 2009), and social identity complexity to co-vary positively with attitudes towards a range of outgroups (see, e.g., Brewer & Pierce, 2005). It has also confirmed that social identity complexity mediates the relationship between contact and outgroup attitudes (Schmid et al., 2009). We argue that intergroup contact thus highlights – via direct experience with diverse others who may be ingroup members on some categories (e.g., gender, profession), but outgroup members on others (e.g., religion, ethnicity) – the complex and non-overlapping nature of social categories. This should then prompt individuals to engage in increased cognitive differentiation processes, i.e., to positively influence complexity, which in turn is associated with more positive attitudes towards a range of outgroups (see Brewer, 2008; Brewer & Pierce, 2005).

The present research

The research reported here considered the relative contribution of social identity complexity as a previously unexplored process explaining the occurrence of STEs by testing its effects alongside an established process known to underlie secondary transfer effects, attitude generalization via primary outgroup attitude, as well as two conventional operationalizations of deprovincialization, less positive ingroup attitude and lower ingroup identification. Moreover, we examined STEs of contact using both conceptualizations of social identity complexity, similarity complexity (Studies 1 and 2) and overlap complexity (Study 2).

We examined these relationships in two contexts of intergroup relations, Germany (Study 1) and Northern Ireland (Study 2). Study 1 considered the relationship between primary outgroup contact with Turks and secondary outgroup attitudes towards West-Europeans and Russians. Study 2 considered the relationship between primary outgroup

contact with ethno-religious outgroup members and secondary outgroup attitudes toward

racial minorities, homosexuals and people from the Travelling community[1].

STUDY 1

Our first study examined social identity complexity, operationalized as similarity

complexity in this study, as a psychological process underlying STEs, i.e., testing the extent

to which STEs come about by contact prompting more inclusive and complex multiple

ingroup perceptions. We tested the relative contribution of similarity complexity as a process

underlying STEs alongside previously tested psychological processes, attitude generalization

and deprovincialization. Using a large sample of the German adult population, Study 1

investigated intergroup relations between the German majority population and three minority

groups, taking into consideration the mediating role of similarity complexity, primary

outgroup attitude, ingroup attitude, and identification, respectively. Study 1 considered

Germans' contact experiences with, and attitudes towards the three most prevalent minority

outgroups: Turks, West-Europeans, and Russians. We use the term 'Turks' to refer to Turkish

foreign nationals, or German nationals of Turkish descent, while we use 'West-Europeans' to

refer to EU foreign nationals other than Germans. When speaking of 'Russians' we refer to

Russian foreign nationals of ethnically German descent, or Germans from Russia, so-called

'*Russlanddeutsche*'. Although this latter group 'Russians' is ethnically German, it is typically

considered a relevant immigrant outgroup in Germany. We chose Turks as the primary

outgroup since they are the largest of the three outgroups present in the country (Rühl, 2009).

We hypothesized that primary outgroup contact with Turks would be indirectly associated

with more positive attitudes towards West-Europeans and Russians, via higher similarity

complexity, as well as via more positive primary outgroup attitudes towards Turks. Given the

mixed prior evidence base surrounding deprovincialization in STEs, we did not derive a

hypothesis for ingroup attitude and identification, but merely probed for possible indirect effects.

Method

Participants and Procedure.

The data for this study were collected as part of a larger survey concerning intergroup relations in Germany, from which we used a subset of items. Some of the items used in the current paper (i.e., similarity complexity and attitudes towards Turks, Russians and Germans) were also used in another paper (Schmid, Hewstone, & Al Ramiah, 2013; Study 1). The earlier paper did not, however, examine STEs of intergroup contact, but the relationship between diversity, social identity complexity and ingroup bias. Moreover, the earlier paper used multilevel analyses involving the estimation of random intercepts (i.e., focusing on context-level relationships between constructs), whereas here we focus on individual-level relationships only.

Data were collected between May and July 2010, with respondents purposefully sampled from neighbourhoods varying in their proportional share of foreigners, in sixteen different cities and towns in Germany, including eight medium-sized towns (50,000–99,999 residents), six big cities (100,000–499,999 residents) and two metropolitan cities (500,000+ residents). Respondents were interviewed by trained social survey interviewers, using computer assisted telephone-interviewing techniques.

The total achieved sample comprised 2500 adults, of whom, in this paper, we only selected respondents who self-categorized as both of German nationality (without migration background) and of Christian religion, yielding a final sample of 1381 German adults ($M_{age} =$ 56; 555 males, 826 females).

Measures.

Primary and secondary outgroup contact were measured using one item per group. For the primary outgroup (Turks) respondents were asked: 'How often do you talk with people who are themselves, or whose parents are, from Turkey?'. For the secondary outgroup West-Europeans, respondents were asked: 'How often do you talk with people who are themselves, or whose parents are, from other West-European countries?'. For the secondary outgroup Russians, respondents were asked: 'How often do you talk with people who are themselves, or whose parents are, *Russlanddeutsche*'?. Responses were made on the following scale: *1=never, 2=less than once a month, 3=at least once a month, 4=at least once a week, 5=every day*.

Similarity complexity was measured with two items adapted from Roccas and Brewer (2002). We first asked respondents to self-categorize in terms of their national and religious identity to make salient these two ingroups, and then presented individuals who had self-categorized as German and Christian with the following two items: 'Being German means the same as being Christian', and 'The typical German person is similar to the typical Christian person' (*1=strongly disagree*, *5=strongly agree*). Both items were reversed, so that higher scores reflect greater similarity complexity. The items were reliably correlated ($r = .47$, $p < .001$), and averaged to form an index.

Primary and secondary outgroup attitudes and *ingroup attitude* were measured using four feeling thermometers adapted from Converse and Presser (1986). Respondents were initially instructed as follows: 'Please imagine a thermometer and tell me how warm or cold your feelings are towards the following groups. 0 means very cold and 100 means very warm'. For the primary outgroup (Turks), respondents were then asked: 'How do you feel about Turks living in Germany?'. For the two secondary outgroups, respondents were asked: 'How do you feel about other West-Europeans living in Germany?' and 'How do you feel about *Russlanddeutsche* living in Germany?'. For attitudes towards the ingroup, respondents were asked: 'How do you feel about Germans?'. Respondents then answered with a number

on a continuous scale ranging from 0 to 100, with higher scores reflecting more positive attitudes.

Ingroup identification was measured using a single item: 'How strongly do you identify with Germans?' (*1=not at all*, *5=very much*).

Results and Discussion

We estimated parameters for all models reported in this paper using *Mplus* version 6 (Muthén & Muthén, 1998-2010), using fully integrated maximum likelihood estimation. As our sampling technique could potentially have given rise to non-independence of responses within sampling units (since respondents were nested in neighbourhoods), we initially computed intraclass correlations (ICCs) and design effects for all variables in our sample. Non-ignorable nestedness of responses is usually indicated by a design effect > 2, which is a function of both the ICCs and the average cluster size (see e.g., Muthen & Satorra, 1995). ICCs of all variables were generally low (highest ICC = .02), yielding no design effect above 2 (largest design effect = .73; average cluster size = 27).

To examine the structural relationships between constructs, we estimated a path model (involving a single model estimation), including primary outgroup contact with Turks as independent variable, similarity complexity, primary outgroup attitude with Turks, ingroup attitude and identification as mediators, and the two secondary outgroup attitudes towards West-Europeans and Russians as dependent variables. We further estimated direct paths between contact with and attitudes towards the two secondary outgroups, respectively, while controlling for age, gender, and education[2]. Table 1 shows means and standard deviations. For reasons of space we only present statistically significant, unstandardized effects in the main text, but report all coefficients pertaining to direct and indirect relationships in Tables 2 and 3, respectively.

Direct relationships between primary outgroup contact, similarity complexity, primary

outgroup attitude, ingroup attitude, identification and secondary outgroup attitudes

The estimated model yielded acceptable fit, $\chi^2(22) = 206.92$, $p < .001$, CFI = .91,

RMSEA = .07, SRMR = .04 (see e.g., Hu & Bentler, 1999 for an overview of fit indexes).

Primary outgroup contact was significantly associated with higher similarity complexity ($b =$

.10, $SE = .02$, $p < .001$), such that more frequent contact was associated with more complex

multiple ingroup perceptions. More primary outgroup contact was also directly associated

with more positive attitudes towards the primary outgroup ($b = 3.98$, $SE = .43$, $p < .001$), as

well as with lower ingroup attitude ($b = -.78$, $SE = .38$, $p = .04$) and lower identification ($b =$

$-.11$, $SE = .02$, $p < .001$). More primary outgroup contact was also directly associated with

more positive secondary outgroup attitudes towards West-Europeans ($b = 1.17$, $SE = .42$, $p =$

.01).

Primary outgroup attitudes were significantly associated with more positive secondary

outgroup attitudes towards West-Europeans ($b = .44$, $SE = .03$, $p < .001$), and towards

Russians ($b = .59$, $SE = .04$, $p < .001$). Similarly, more positive ingroup attitudes were

associated with more positive attitudes towards West-Europeans ($b = .13$, $SE = .04$, $p < .001$),

and Russians ($b = .09$, $SE = .04$, $p = .03$). Finally, more frequent contact with West-Europeans

was associated with more positive attitudes towards West-Europeans ($b = 3.38$, $SE = .40$, $p <$

.001), while contact with Russians was associated with more positive attitudes towards

Russians ($b = 4.12$, $SE = .43$, $p < .001$). The model explained 34.90% of the variance in

secondary outgroup attitudes towards West-Europeans, and 41.50% of the variance in

secondary outgroup attitudes towards Russians.

Indirect relationships between primary outgroup contact and secondary outgroup attitudes

In order to test for indirect effects of primary outgroup contact on secondary outgroup

attitudes via the mediators we employed bootstrapping procedures using 5000 resamples and

bias-corrected confidence intervals. Significant indirect effects are present when the confidence intervals exclude zero (Preacher & Hayes, 2008). We only obtained significant indirect relationships between primary outgroup contact and secondary outgroup attitudes towards West-Europeans ($b = 1.76$, $CI_{95\%} = 1.33$, 2.24) and attitudes towards Russians ($b = 2.34$, $CI_{95\%} = 1.89$, 2.96) via primary outgroup attitudes.

Reverse secondary transfer models

The logic underlying STEs is that contact with one outgroup exerts positive effects on attitudes not only towards encountered outgroups, but also towards secondary outgroups. Since Turks constitute the largest minority outgroup in Germany our original model explicitly tested primary outgroup contact with Turks as an independent predictor of secondary attitudes towards West-Europeans and Russians, respectively. However, it is equally plausible to consider a reverse STE model, whereby contact with West-Europeans and Russians exerts secondary transfer effects on attitudes towards Turks. We estimated such a reverse model, including contact with West-Europeans and Russians as independent predictors, similarity complexity, attitudes towards West-Europeans, attitudes towards Russians, ingroup attitude and identification as mediators, and attitudes towards Turks as the outcome variable.

Given the wealth of estimated parameters, and due to space limitations, we merely focus on the significant indirect effects. Results for the reverse models revealed that although contact with both West-Europeans and Russians was associated with greater similarity complexity, no indirect STEs via this construct emerged. Statistically significant indirect STEs on attitudes towards Turks again emerged only via attitude generalization, such that contact with West-Europeans exerted indirect effects on attitudes towards Turks via attitudes towards West-Europeans ($b = 1.48$, $CI_{95\%} = 1.07$, 1.99), while contact with Russians was indirectly associated with attitudes towards Turks via attitudes towards Russians ($b = 1.59$, $CI_{95\%} = 1.18$, 2.04).

Summary

Although we observed our predicted effects of primary outgroup contact on social identity complexity (operationalized as similarity complexity), the effect of complexity on secondary attitudes failed to reach significance; we thus failed to obtain the predicted STEs via identity complexity. Only primary outgroup attitude as well as ingroup attitude were positively associated with secondary outgroup attitudes towards West-Europeans and Russians, yet indirect STEs only occurred via attitude generalization.

STUDY 2

One of the potential limitations of Study 1 is that all three outgroups constituted ethno-national minority outgroups in Germany, i.e. the primary and secondary outgroups were related and 'West-Europeans' may also have been conceived of as a common ingroup, which may explain why only attitude generalization accounted for indirect STEs and why ingroup attitude, but not social identity complexity, were directly associated with secondary outgroup attitudes. In Study 2, we thus considered additional secondary outgroups, unrelated to each other. Furthermore, we tested the involvement of both operationalizations of social identity complexity, similarity and overlap complexity. We tested our predictions in a different context of intergroup relations, Northern Ireland, which has a long history of conflict between those who want Northern Ireland to remain part of the United Kingdom and those who want it to be reunited with the Republic of Ireland (see, e.g., Cairns & Darby, 1998). The present study examined the relationship between contact with the primary rival ethno-religious outgroup (Catholics or Protestants) and attitudes towards secondary outgroups, via similarity complexity, overlap complexity, primary outgroup attitude, ingroup attitude and ingroup identification.

Study 2 uses a small subset of items from a large data set based on a cross-sectional adult sample, which was used in two previously published papers that did not consider social identity complexity as a mediator of STEs. One of these papers considered the relationship between intergroup contact, social identity complexity and outgroup attitudes (Schmid et al., 2009, Study 2), while the other considered secondary transfer effects of intergroup contact (Tausch et al., 2010, Study 2). The latter paper explicitly considered the relationship between primary outgroup contact with ethno-religious outgroup members and secondary outgroup attitudes towards racial minorities, via two mediators, attitude generalization via primary outgroup attitudes and deprovincialization via ingroup attitude. Our aim here was to extend the analyses presented in Schmid et al. (2009), which did *not* consider STEs, and Tausch et al. (2010), which did, but did *not* consider social identity complexity as an additional mediator in their test of STEs. We further extend the previous analyses by Tausch et al. (2010) by considering ingroup identification as a second operationalization of deprovincialization, alongside ingroup attitude.

This research thus attempted to gauge the relative contribution of social identity complexity as an additional psychological process underlying STEs, over and above the previously confirmed process underlying STEs, attitude generalization, as well as two operationalizations of deprovincialization, ingroup attitude and ingroup identification. To that end, Study 2 sought to examine the extent to which STEs of contact with ethno-religious outgroup members on secondary outgroup attitudes can be explained by similarity and overlap complexity, while controlling for three other mediators, primary outgroup attitude, ingroup attitude, and identification. Moreover, while the Tausch et al. paper only considered secondary outgroup attitudes towards racial minorities, we included in the present paper two additional secondary outgroups not previously considered in any analyses of these data, homosexuals, and people from the Travelling community.

We hypothesized that primary outgroup contact with the ethno-religious outgroup would be related to more positive secondary outgroup attitudes towards racial minorities, homosexuals and Travellers, via greater similarity and overlap complexity. Since previous research has found similarity and overlap complexity to exert comparable effects (e.g., Roccas & Brewer, 2002; Schmid et al., 2009), we did not derive differential hypotheses for each subcomponent. In line with prior analyses using these data, we also expected to obtain significant indirect effects of primary outgroup contact on secondary outgroup attitudes via more positive attitudes towards the ethno-religious outgroup, but not via ingroup attitude or identification.

Method

Participants and Procedure.

Our original sample consisted of 2000 adults, reduced to 1,948 after removing 52 respondents not originally from Northern Ireland or who had not completed relevant subsections of the survey. The final sample (M_{age} = 45) comprised 970 (49.8%) Catholics (353 males, 617 females) and 978 (50.2%) Protestants (391 males, 587 females). Data were collected between March and October 2007 by a professional survey organization. Respondents were interviewed face-to-face in their own home by trained social survey interviewers, using computer aided personal interviewing.

Measures.

Primary outgroup contact was measured using four items: 'How often do you chat to people who are <OUTGROUP>?', 'How often do you do something social together with your <OUTGROUP> neighbours (e.g. by way of sport, going out and so on)?', 'How often do you visit your <OUTGROUP> neighbours in their home?' and 'In general, how often would you say you have contact with your <OUTGROUP> neighbours?' (*1=never, 2=rarely,*

3=occasionally, 4=often, 5=very often). The four items formed a reliable scale ($\alpha = .87$) and were treated as a combined index.

Secondary outgroup contact was measured using three single items for each secondary outgroup: 'In the area where you live, how often do you have contact with people who are from racial minority backgrounds (e.g. Asian or Black people)?', 'In the area where you live, how often do you have contact with people who belong to the gay community?', and 'In the area where you live, how often do you have contact with people who belong to the travelling community?' (*1=never*, *7=very often*).

Similarity complexity was measured using two items. We first asked respondents to self-categorize in terms of their religious (Catholic/Protestant) and national (British/Irish) identities, and then asked them to respond to the following two items: 'Being a <INGROUP$_{\text{RELIGION}}$> in Northern Ireland means the same as being <INGROUP$_{\text{NATIONALITY}}$>', and 'A typical <INGROUP$_{\text{RELIGION}}$> is very similar to the typical < INGROUP$_{\text{NATIONALITY}}$> person in Northern Ireland' (*1=strongly disagree, 5=strongly agree; r = .67, p < .001*). Items were reversed and combined, with higher scores reflecting higher similarity complexity.

Overlap complexity was measured using two items, adapted from Roccas and Brewer (2002): 'How many <INGROUP$_{\text{RELIGION}}$> in Northern Ireland do you think consider themselves to be <INGROUP$_{\text{NATIONALITY}}$>?' and 'How many <INGROUP$_{\text{RELIGION}}$> in Northern Ireland do you think consider themselves to be <OUTGROUP$_{\text{NATIONALITY?}}$>' (*0=none*, *100=all*). The former item was reversed, and the two items combined, so that higher scores reflect higher overlap complexity ($r = .41, p < .001$).

Ingroup identification was measured using four items: 'Being <INGROUP> is an important part of who I am', 'I identify with other <INGROUP>', 'Overall, being <INGROUP> has a lot to do with how I feel about myself' and 'I see myself as <INGROUP>' (*1=strongly disagree, 5=strongly agree*; $\alpha = .91$).

Primary outgroup attitude, secondary outgroup attitudes and *ingroup attitude* were measured using similar measures as in Study 1. Respondents were instructed as follows: 'How do you feel about <GROUP>? Please rate <GROUP> on a thermometer that runs from zero to a hundred degrees. The higher the number, the warmer or more favourable you feel towards <GROUP>. The lower the number, the colder or less favourable you feel. If you feel neither warm nor cold towards members from <GROUP>, rate them at 50'. For the primary outgroup, respondents were asked about the ethno-religious outgroup, while for the secondary outgroups respondents were asked about people from racial minority backgrounds (e.g. Asian or Black people), people from the gay community, and people from the Travelling community, respectively. For ingroup attitude, respondents were asked about their ethno-religious ingroup. Responses were made on a continuous scale ranging from *0=extremely unfavourable* to *100=extremely favourable*.

Results and Discussion

We entered primary outgroup contact as the independent variable, similarity complexity, overlap complexity, primary outgroup attitude, ingroup attitude and identification as mediators, and the three secondary outgroup attitudes as dependent variables (in a single path model estimation). We also estimated the relationships between the three secondary outgroup contact items and attitudes towards the three secondary outgroups, respectively, while further controlling for age, gender, and education. Table 4 shows descriptive statistics, and Tables 5 and 6 the estimated direct and indirect coefficients, respectively[3].

Direct relationships between primary outgroup contact, similarity complexity, overlap complexity, primary outgroup attitude, ingroup attitude, identification and secondary outgroup attitudes

The estimated path model yielded good fit, $\chi^2(21) = 122.66$, $p < .001$, CFI = .97, RMSEA = .05, SRMR = .02. Primary outgroup contact was associated with greater similarity complexity ($b = .14$, $SE = .02$, $p < .001$), greater overlap complexity ($b = 3.31$, $SE = .33$, $p < .001$), and more positive primary outgroup attitude ($b = 4.86$, $SE = .40$, $p < .001$).

Similarity complexity was positively associated with secondary outgroup attitudes towards racial minorities ($b = 1.13$, $SE = .51$, $p = .02$), and towards homosexuals ($b = 1.29$, $SE = .61$, $p = .03$), while greater overlap complexity was positively associated with attitudes towards Travellers ($b = .09$, $SE = .04$, $p = .03$). In line with the attitude generalization hypothesis, more positive primary outgroup attitude was associated with more positive attitudes towards racial minorities ($b = .44$, $SE = .03$, $p < .001$), homosexuals ($b = .43$, $SE = .04$, $p < .001$), and Travellers ($b = .36$, $SE = .03$, $p < .001$). Ingroup attitude was also associated with more positive attitudes towards racial minorities ($b = .14$, $SE = .03$, $p < .001$), homosexuals ($b = .13$, $SE = .04$, $p < .001$), and Travellers ($b = .08$, $SE = .04$, $p = .04$). Conversely, greater ingroup identification was associated with lower attitudes towards racial minorities ($b = -1.78$, $SE = .58$, $p < .01$), and homosexuals ($b = -1.90$, $SE = .68$, $p < .01$).

Finally, the secondary outgroup contact items were significantly associated with each of the respective secondary outgroup attitude measures (racial minority contact–racial minority attitudes: $b = 3.62$, $SE = .26$, $p < .001$; homosexual contact–homosexual attitudes: $b = 4.74$, $SE = .29$, $p < .001$; Travellers contact–Travellers attitudes: $b = 3.40$, $SE = .33$, $p < .001$). The model explained 24.70% of the variance in secondary outgroup attitudes towards racial minorities, 26.30% of the variance in attitudes towards homosexuals, and 14.40% of the variance in attitudes towards Travellers.

Indirect relationships between primary outgroup contact and secondary outgroup attitudes

Considering STEs for racial minority attitudes first, results revealed significant indirect effects via similarity complexity ($b = .15$, $CI_{95\%} = .02, .32$) and via primary outgroup

attitude ($b = 2.16$, $CI_{95\%} = 1.71$, 2.65). Since both similarity complexity and primary outgroup attitude yielded significant indirect effects, we also compared the multiple mediation effects by contrasting the indirect effect via similarity complexity with that obtained via primary outgroup attitude. This revealed that the effect via primary outgroup attitudes was stronger ($b = 2.00$, $SE = .26$, $p < .001$). Similarly, the indirect effect of primary outgroup contact on attitudes towards homosexuals via similarity complexity was significant ($b = .17$, $CI_{95\%} = .02$, .37), as was the indirect effect via primary outgroup attitude ($b = 2.11$, $CI_{95\%} = 1.67$, 2.65). Again, the effect via primary outgroup attitude was stronger ($b = 1.94$, $SE = .26$, $p < .001$). Finally, the indirect effects on attitudes towards Travellers via overlap complexity ($b = .28$, $CI_{95\%} = .02$, .54) and primary outgroup attitudes ($b = 1.73$, $CI_{95\%} = 1.33$, 2.19) were also significant, with the latter stronger than the former ($b = 1.44$, $SE = .26$, $p < .001$).

Reverse secondary transfer models

As in Study 1, we estimated a reverse STE model, entering contact with racial minorities, homosexuals and Travellers as independent predictors, similarity and overlap complexity, attitudes towards racial minorities, homosexuals and Travellers, ingroup attitude and identification as mediators, and ethno-religious outgroup attitude as the outcome variable, while controlling for ethno-religious outgroup contact, and the demographic variables. Again, we report the effects for significant indirect effects only. Results of this reverse model showed that contact with racial minorities, homosexuals and Travellers was only significantly associated with attitudes towards the respective target outgroups, but not with any other mediators. Testing for indirect STEs was thus only warranted via the primary outgroup attitude measures, which revealed significant indirect effects of contact with racial minorities ($b = .65$, $CI_{95\%} = .45$, .85), contact with homosexuals ($b = .45$, $CI_{95\%} = .26$, .65), and contact with Travellers ($b = .20$, $CI_{95\%} = .09$, .33) on ethno-religious outgroup attitudes.

Summary

Study 2 by and large confirmed our predictions, showing social identity complexity (operationalized using similarity and overlap complexity measures), to be a process that can help explain, in part, the occurrence of STEs. Our results thus showed that primary outgroup contact was indirectly associated with more positive attitudes towards racial minorities and homosexuals, via greater similarity complexity, and with more positive attitudes towards Travellers, via overlap complexity. Importantly, these results were obtained over and above key processes of attitude generalization underlying STEs, previously confirmed for attitudes towards racial minorities (Tausch et al., 2010, Study 2) and now confirmed also for two secondary outgroups not considered previously, homosexuals and Travellers. Noteworthy also is that social identity complexity helped explain STEs of primary outgroup contact while the conventional operationalization of deprovincialization via ingroup attitude and identification did not. However, it should be noted that social identity complexity emerged as a mediator only when considering contact with the ethno-religious outgroup as the independent predictor; for the reverse models no significant effects were obtained.

General Discussion

This paper adds to a growing body of research on secondary transfer effects (STEs) of intergroup contact (see e.g., Lolliot et al., 2013), and extends prior research considering a previously unexplored construct that helps explain the occurrence of STEs, *social identity complexity*. We discuss the findings of our research, first, with regard to STEs of contact more generally, second, with regard to the role of social identity complexity as a potential process underlying STEs, and third, by addressing limitations and future research directions.

Secondary transfer effects of intergroup contact

This research further substantiates the recently advanced notion of STEs (Pettigrew, 1997, 2009), whereby engaging in positive contact with one outgroup exerts not only positive effects on primary outgroup orientations, but also positively affects secondary outgroup attitudes. These relationships emerged both directly (in Study 1 for attitudes towards West-Europeans) and indirectly (in Studies 1 and 2 for attitudes towards all secondary outgroups considered), even when controlling for direct contact with secondary outgroups. Evidence for STEs is further confirmed by our tests of reverse STEs, which followed a similar pattern, albeit only for the previously confirmed process, attitude generalization.

In line with prior research, our findings underline, again, the centrality of attitude generalization as a process underlying STEs. While Study 1 adds to the growing body of research on STEs via attitude generalization (e.g., Pettigrew, 2009; Schmid et al., 2012), Study 2 adds to an earlier analysis of part of this data by confirming STEs for two additional secondary outgroups – homosexuals and Travellers – in addition to racial minorities (Tausch et al., 2010). Additionally, our research adds to the mixed body of prior research concerning the role of deprovincialization in explaining STEs. Since both studies included two different operationalizations of deprovincialization, ingroup attitude and identification, our analyses constituted relatively strong tests of the deprovincialization hypothesis. However, in neither of our studies did indirect STEs emerge via deprovincialization, highlighting, yet again, that STEs may not readily occur via deprovincialization, at least not when operationalized in terms of changes in ingroup affect or identification. Interestingly, however, is that the direct effects of ingroup attitude, but not identification, were unexpectedly positively associated with secondary outgroup attitudes in both studies (we return to this point later).

Secondary transfer effects via social identity complexity

Confirming our predictions (see also Brewer, 2008), our results showed that primary outgroup contact was associated with greater similarity complexity (Studies 1 and 2) and

overlap complexity (Study 2). In study 2, which used more reliable measures of contact and identification, and two related measures of social identity complexity, we then also obtained indirect STEs of primary outgroup contact with the ethno-religious outgroup on attitudes toward racial minorities and homosexuals via higher similarity complexity, and on attitudes toward Travellers via higher overlap complexity. These findings thus empirically substantiate the theoretical prediction made by Brewer (2008), highlighting that contact is associated with more differentiated perceptions of one's multiple *in*groups, which in turn may lead individuals to perceive multiple *out*groups in more favourable terms.

In Study 1, however, no indirect effects via social identity complexity emerged for either outgroup. As already mentioned, respondents may have considered West-Europeans (and perhaps also Russians, since they pertained to ethnic Germans from Russia in this context) to be part of a common ingroup, which may explain why ingroup attitude, but not complexity (which concerns more differentiated ingroup perceptions) yielded positive effects. The effects of ingroup attitude and of primary outgroup attitude may thus have overridden those of similarity complexity due to the nature of the groups considered in this study, all of which fall into the same category boundary (nationality), and which one may expect to be related with each other (at least in the context of this study, which narrowly concerned intergroup relations between Germans and the three outgroups).

It should also be noted that for the different secondary outgroups considered in Study 2, different subcomponents of social identity complexity accounted for indirect effects, something we had not expected. While it was similarity complexity that was related with more positive attitudes towards racial minorities and homosexuals, it was overlap complexity that uniquely predicted attitudes toward Travellers. These differential effects may have emerged due to the fact that the two subcomponents of social identity complexity were positively correlated ($r = .25$, $p < .001$), such that only one subcomponent yielded effects for each secondary outgroup attitude. Alternatively, the different outgroups considered in this

context may reflect different types of groups (see also Goffman, 1963), which may thus have given rise to different normative considerations and associations. Since preliminary research has found similarity and overlap complexity to be differentially related to different values (Roccas & Brewer, 2002), the two subcomponents may thus have exerted differential effects. For example, Roocas & Brewer (2002) found that overlap complexity correlates more strongly than similarity complexity with universalism, a value reflecting aspects such as unity with nature and broadmindedness (Schwartz, 1992) and that may apply particularly to the Traveller outgroup, given its traditionally nomadic lifestyle and cultural values. However, this is conjecture and it remains for future research to examine systematically the differential effects of both subcomponents of social identity complexity on attitudes towards different groups.

Moreover, while social identity complexity emerged as a significant mediator in our original STE model in Study 2, the reverse models failed to confirm STEs via this construct. This, we suspect, is due to the nature of the ingroup categories implicated in the measures of identity complexity, which were functionally related to the primary outgroup only. The fact that contact with the secondary outgroups failed to predict social identity complexity could thus suggest that outgroup contact may be primarily effective in increasing complexity for categories directly implicated in the intergroup experience. Whether this is the case remains an important avenue for future research. Yet interestingly, however, the social identity complexity measures nonetheless predicted the three secondary outgroup attitudes in our original model, which suggests that once identity complexity is enhanced, it may bring about positive effects even with regard to outgroups not implicated in the measure of social identity complexity (see also Brewer & Pierce, 2005).

Conceiving of increased social identity complexity as a process that explains, in part, how intergroup contact may also be beneficial for intergroup attitudes, theoretically advances current thinking on the STE. Prior research examining the mechanisms that may explain STEs

has, to date, mainly considered attitude generalization (for which there now exists strong

support) and deprovincialization operationalized using various measures of ingroup affect or

identification (for which there exists only mixed support). This research has shown that

having contact with one outgroup can also lead to more complex perceptions of one's

multiple ingroups, accounting, in part, for STEs.

Limitations and future research directions

Before closing, three potential limitations should be noted. First, our research relied on

cross-sectional data, preventing us from drawing causal inferences on the nature of the

relationships. We thus draw heavily on the theoretical and substantive plausibility of the

tested relationships, based on previous research. For example, previous research has shown

that contact with the primary outgroup is longitudinally related with attitudes to secondary

outgroups (Tausch et al., 2010, Study 4), making us more confident that the direction of

relationships between contact and attitudes as tested in our research is in line with the STE

hypothesis. Nonetheless, we strongly recommend the use of experimental methods and further

longitudinal data, to reach more confident conclusions about causality.

Second, our measures of social identity complexity relied on a limited number of

categories and items. Although the small number of items is, to some extent, offset by the

large number of respondents drawn from representative population samples (adding to the

external validity of the research), future research should nonetheless use more comprehensive

measures. It is notable that Study 2, with more reliable measures of contact, detected

significant indirect effects of contact on attitudes via social identity complexity. Future

research may also seek to compare the relative contribution of social identity complexity

measures that consider, on the one hand, ingroup categories that are of functional relevance to

the intergroup dynamics under focus, and, on the other hand, ingroup categories that are

unrelated to the primary and secondary outgroups considered. Since our measures of social

identity complexity did not capture additional categories that may become salient during contact with secondary outgroups (e.g., ethnicity or sexual orientation) we were unable to compare such effects.

Third, our attitude measures, for primary and secondary outgroups, involved similar measurement instruments. Using such similar measures of attitudes to both outgroups, where the former is the putative mediator of the latter, hold the risk of shared method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), that is, the possibility that relationships between variables are inflated due to the use of common methods and response characteristics. Although prior research has demonstrated the occurrence of STEs using different attitude measures (e.g., Schmid et al., 2012), the research reported here risks inflated relationships between primary and secondary outgroup attitudes, and indeed ingroup attitude. This may explain, for example, why we witnessed positive effects of ingroup attitude (but not identification) on secondary outgroup attitudes. This may also explain, in part, why the indirect STEs via attitude generalization consistently yielded stronger effects than those via social identity complexity. In order to ascertain the relative strength of both mediators, future research should consider using clearly distinct primary and secondary outgroup attitude measures.

To conclude, we have again shown evidence of reliable STEs, and for the first time shown that they may not only occur via attitude generalization but also via increased social identity complexity. Our research thereby opens up interesting avenues for future research, highlighting the need to reconsider and expand current theorizing on STEs, and also to develop innovative operationalizations of deprovincialization, which should include some component of social identity complexity.

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Notes.

1. The Travelling community, also commonly referred to as 'Irish Travellers' or 'Travellers', are a community of ethnically Irish origin that traditionally opted for a nomadic lifestyle.

2. Since the control variables are not of theoretical interest in this paper and for reasons of space we do not attend to these further. The interested reader can obtain results for the control variables, as well as the zero-order correlations between all variables from the first author. The German-language items for Study 1 can also be obtained from the first author.

3. Relationships were by and large comparable for Catholics and Protestants, except for minor variations in the magnitude of regression coefficients.