

# **‘If Something Doesn’t Look Right, Go Find Out Why’: How Intuitive Decision Making is Accomplished in Police First-Response**

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## **Abstract**

Intuition is an important mechanism by which organizational actors make significant decisions; however, precisely how intuitive decisions are taken is not well understood and hence is worthy of closer scrutiny. First-response decisions, because of the conditions under which they are executed, offer researchers an interesting and relevant context for the study of intuitive decision making in organizations. We used qualitative methods to explore how ‘peak performing’ police officers used intuition in first-response decisions. Our findings show that intuition’s role in first-response occurs in two differing but complementary ways: ‘recognition-based intuition’ and ‘intuition-based inquiry’. This finding builds on previous intuition research and informs current debates in behavioural sciences regarding ‘default-intervention’ versus ‘parallel-competitive’ variants of dual-process theory; it also reveals how a complex and situated mix of intuition and analysis can guide effective decision making and support peak performance in uncertain, dynamic and complex environments that typify many organizational decision processes. Our findings contribute to intuition research by extending the current theory of ‘intuition-as-expertise’ in going beyond a simple ‘recognize-and-respond’ model. We propose a ‘Perceiving-Knowing-Enacting-Closing’ framework which captures the complex role that intuition in combination with analysis plays in police first-response decisions, and discuss implications for decision-making policies and practices in organizations.

Keywords: decision making, dual-process, intuition, police first-response

## **Introduction**

Most organizational decisions tend not to be the exclusive products of deliberative rational analyses as portrayed in classical decision theory (e.g. Janis & Mann, 1977), instead they are also likely to involve intuitive judgements (Dane & Pratt, 2007; Sinclair & Ashkanasy, 2005). Intuition as an organizational phenomenon is without doubt important (Simon, 1987). There has been significant work that has theorized intuition's role in organizational decision making (see Burke & Miller, 1999; Dane & Pratt, 2007; Miller & Ireland, 2005; Sadler-Smith, 2016a, 2016b; Sadler-Smith & Shefy, 2004; Sinclair, 2010). However, intuition is comparatively under-researched in workplace settings (Akinci & Sadler-Smith, 2012) and there is a dearth of studies using qualitative approaches (e.g. Akinci & Sadler-Smith, 2018; Calabretta, Gemser, & Wijnberg, 2016; Fenton O-Creevy, Soane, Nicholson, & Willman, 2011; Willman, O'Creevy, Nicholson, & Soane, 2001).

The motivation and rationale of our research was to add to this body of empirical work by studying the role intuition plays in consequential decisions carried out in real-world contexts under conditions of time pressure, dynamism and uncertainty and delve more deeply into the micro-processes of intuitive decision making. Our research context was first-response decision making in front-line police work. The fact that many of the decisions undertaken by first-responders (such as police officers, firefighters and paramedics) are taken under conditions of time pressure, dynamism and uncertainty suggests that these decisions are often, and of necessity, accomplished intuitively. This context provides intuition researchers with a promising setting for studying the micro-processes of intuitive decision making. We aimed to contribute to theories of intuitive decision making by using qualitative methods to explore 'peak performing' police officers' perceptions of how they have used their intuition in first-response decision making. Our findings reveal two substantively different modes in which intuition was used in first-response: 'recognition-based intuition' and 'intuition-based

inquiry'. The latter finding extends current knowledge of 'intuition-as-expertise' (Sadler-Smith & Shefy, 2004) beyond simple 'recognize-and-respond' type models (e.g. RPD, Klein, 1998) revealing more complex interactions between intuition and analysis than previously thought. Our research offers an enhanced understanding of the micro-processes of how intuition is used in organizational settings and sheds light on the dynamic relationship between intuition and analysis. Our findings inform current debates in the behavioural sciences regarding dual-process theorizations of decision making, and how System 1 and System 2 processes interact (Evans, 2003, 2007; Evans & Stanovich, 2013), and in particular the debate about the veracity of 'default-intervention' versus 'parallel-competitive' formulations of dual-process theory (Hodgkinson & Sadler-Smith, 2018).

### **Theoretical Background**

On the bases that intuition in organizational settings will be only partially-understood if researchers overlook analysis (Hodgkinson & Sadler-Smith, 2018) and that intuition in decision making is one of the more 'opaque areas' of organizational behaviour (Ashkanasy, 2009, p. 17), this research sought to address the following question: What are 'peak performing' police officers' perceptions of how they use intuition in first-response decisions, and what does this tell us about the micro-processes of intuitive decision making and the relationship between intuition and analysis? In establishing the background to our study, we review sequentially three relevant aspects of intuition research, namely: intuition and dual-process theory; relationship between intuition and expertise; and the role of intuition in police work.

#### ***Intuition and dual-process theory***

Recent research has focused on intuition as an important decision making tool in organizations but it should be seen in relation to what is the dominant decision making paradigm, that of rationality (or analysis as it is sometimes referred to, see Allinson, Chell, &

Hayes, 2001). Indeed, Highhouse (2008) has cautioned against giving an undue emphasis to and an excessive reliance on intuition. Relatedly, in a meta-analysis of the existing research base ( $k = 80$ ;  $N = 27,501$ ), Highhouse and colleagues (Wang et al., 2017) found strong support for the view of intuitive and analytical processing as independent constructs which may be underlain by dual cognitive systems. This underlines the need to examine the relationship between intuition and analysis in decision making behaviour.

Intuition researchers in management and organization studies have drawn on dual-process theories from psychology in order to distinguish between intuitive (associative, automatic, faster; System 1) and analytical (rule-based, controlled, slower; System 2) information processing (Stanovich & West, 2000). This dual-process/dual-system theorization, ‘posits two minds [intuitive and analytical] in one brain’ (Evans, 2007, p. 454). Within dual-process theory, two competing accounts of the interplay between intuition and analysis have been proposed by researchers such as Evans (2003, 2007) based on the precept that the two systems conflict: (1) default-interventionism: System 1 generates intuitive (i.e. Type 1) default responses on which subsequent Type 2 processing may or may not intervene; (2) parallel-competitivism: Type 1 and Type 2 processes proceed in parallel and each has its say and conflict is resolved where necessary (Evans & Stanovich, 2013). However, over-and-above these theoretical assertions, how System 1 (intuition, Type 1 processing) and System 2 (analysis, Type 2 processing) interact and are interrelated in intuitive decision making needs to be much better-understood (Calabretta et al., 2016; Cokely, Hodgkinson, & Sadler-Smith, 2018; Parpart & Schooler, 2009).

Evans and Stanovich (2013) incline towards default-interventionism rather than parallel-competitivism for several reasons. Parallel-competitive assumptions are problematical in relation to matters of speed of processing and cognitive resources, for example, if both types of processing are to have their say the ‘fast horse’ (i.e. intuition) has to wait for the ‘slow

horse' (i.e. analysis) to arrive before any potential conflict between them can be resolved. There is also the contention that most behaviour is controlled by Type 1 processes running constantly in the background, and default-interventionism is more consistent with the view of humans as 'cognitive misers' (Evans & Stanovich, 2013, p. 237). The veracity of these various models and their theoretical claims is debated hotly (Macchi et al., 2012) and the related empirical question of *if* and *how* intuition and analysis conflict, compete, or collaborate in expert decision making in occupational settings is unresolved (Hodgkinson & Sadler-Smith, 2018).

### ***Relationship between intuition and expertise***

Proficiency in intuitive decision making is a product of explicit and implicit learning and the acquisition of extensive, domain-relevant experience (Ericsson, Prietula, & Cokely, 2007; Hogarth, 2001). Defined as 'analyses frozen into habit' (Simon, 1987, p. 63), intuition affords skilled decision makers the capability to deploy automated expertise spontaneously and accurately to scope-out situations, foresee events, and take decisive action (Dane & Pratt, 2007; Dreyfus & Dreyfus, 2006; Klein, 1998, 2003; Miller & Ireland, 2005; Salas, Rosen, & DiazGranados, 2010; Sinclair, 2010).

The roots of this highly-influential program of intuition research are traceable to Klein and colleagues' studies of the decisions taken by experienced US Army fire-ground commanders (in expertise parlance they were 'peak performers', see: Ericsson & Pool, 2016) under conditions of time pressure, uncertainty and dynamism (see: Klein, Calderwood, & Clinton-Cirocco, 1988). Klein and colleagues came up with the 'recognition-primed decision' (RPD) model in which experts mobilize an action script in response to a recognized pattern of cues (Klein, 2003). In RPD most decision points can be handled based on pattern matching of cues to mental models without deliberation by the application of an 'if *x* then *y* strategy' (Klein, Calderwood, & Clinton-Cirocco, 2010, p. 201). Experienced decision makers identify

an option immediately, intuitively and with minimal deliberation and judge it to be the one that will work (Klein et al., 1988, 2010).

In a further significant development, Dane and Pratt (2007) highlighted the significance of affect in the process of intuiting when they declared that ‘intuitions are *affectively charged* judgements that arise through rapid, non-conscious and holistic associations’ (p. 40, emphases added). Dane and Pratt’s conceptualization is noteworthy in the light of the fact that the intuitive expertise literature from its inception in Simon’s work on perception in chess (Chase & Simon, 1973) through to Klein’s RPD studies (Klein, 1998, 2003; Klein et al., 1988, 2010) and beyond offers little in the way of detailed exposition of the now taken-for-granted role that intuitive affect (‘gut feelings’, ‘hunches’ or ‘vibes’, see: Epstein, Pacini, Denes-Raj, & Heier, 1996) plays in intuitive decision making. By way of illustration, in the original explanation of the RPD model (Klein et al., 1988, 2010) feeling is exteriorized in a single reference to the ‘spongy feel’ of the roof of a burning building. Indeed, Sinclair and Ashkanasy (2005) noted that the ‘proponents of experience-based [expert] intuition focus *solely* on the cognitive elements of the construct’ (p. 358, emphasis added).

Even though gut feeling is a widely-used colloquialism, too little consideration is given in management intuition research to the role of emotions and intuitive affect (Slovic et al., 2004), intuition as an interoceptive state (Dunn et al., 2010) or how unmediated intuitive knowing (Chia, 1997) communicates to the focal decision maker and impacts on decision making in occupational settings (Sadler-Smith, 2016b). This view is supported by recent research that suggests that cognitive information-processing and emotion information-processing work in tandem to create decision outcomes (Dionne, Gooty, Yammarino, & Sayama, 2018). In keeping with this line of argument, we share Sayegh, Anthony and Perrewé’s (2004) conviction that intuitive affect is likely to be highly salient for decision making in organizational settings because it helps to give structure and meaning to

experiences, especially when the decision maker must make sense quickly of a multi-dimensional, fast-moving and uncertain situation and cannot therefore be ignored (Dionne et al., 2018).

### ***Intuition in police work***

First-responders such as police officers and firefighters save lives and protect the public and property. They often have vital duties to attend to under conditions of urgency, dynamism, uncertainty and ambiguity (Bakken & Haerem, 2011). First-response is an essential, but sometimes contentious, aspect of the conduct, organization, and culture of law enforcement in which police officers may be called-on to undertake a wide variety of interventions ranging from life-saving acts whilst waiting for other emergency staff to arrive at an incident (Elmqvist, Brunt, Fridlund, & Ekebergh, 2010) to vehicle stops (Williams & Stahl, 2008) to distinguishing between truth and lies (Mann, Vrij, & Bull, 2004). It is one of the most difficult and demanding aspects of a police officer's role (Hails & Borum, 2003) and has significant consequences for personal and public safety, reputation, trust, community well-being, and society's attitudes to policing (Correll et al., 2007).

Surprisingly, despite public interest in and the undoubted importance of this topic there are few studies of police officers' intuitive decision making in general or in first-response in particular (see Taslitz, 2010 for a literature review). For example, Leach, Talwar, Lee, Bala and Lindsay's (2004) study of police officers' intuitive lie detection and Mitchell and Flin's (2007) study of intuition in authorized firearms officers' (AFOs) shoot/no shoot decisions both used experimental designs, while a handful of studies of detecting deception have relied on undergraduate participants in laboratory settings (e.g. Albrechtsen, Meissner, & Susa, 2009). Mann et al.'s (2004) study using video-taped interviews of suspects found that police officers who were poor at lie-detecting did not report using intuition, whereas good lie-detectors put significantly greater reliance on their intuition. Garcia-Retamero and Dhami

(2009) found that experienced police officers employ intuitive heuristics based on pattern matching, and argued that the dynamism and uncertainty inherent in police work elicits intuitive processing.

There are even fewer studies of this phenomenon outside the confines of the laboratory. For example, Allen's (2011) and Schafer, Carter, Katz-Bannister and Wells' (2006) studies of traffic officers' vehicle-stop decisions, and Quinton, Bland and Miller's (2000) UK government report on police stop-and-search practices. Police officers themselves often insist that their intuitive 'sixth sense' is an invaluable tool in the field (Quinton et al., 2005, p. 205) and plays an important role in how they carry out decision making 'on the street' (Ellis, 2010). Intuitive affect (manifesting as hunches, gut feelings or vibes) helps give structure and meaning to police officers' experiences in the multi-dimensional and uncertain situation of front-line police work. Intuitions are not necessarily contrary to or obstacles to analytical (Type 2) processing in police work, rather they are indispensable heuristics that allow police officers to process diffuse and complex information (Ellis, 2010; Sayegh et al., 2004).

### ***Summary***

It is important to recognize that dual-process theories have been criticized (Larue & Juvina, 2016) and it has been suggested that dual theories be expanded into a tripartite system (System 0, 1 and 2) (Dreyfus, 2014) or abandoned in favour of a single-system model (Keren & Schul, 2009). For now, we are content to work within the dual-system paradigm and are convinced that by clarifying the types of processes, both analytical *and* intuitive, involved in police decision making it will be possible to improve the more general explanatory powers of dual-process theories for management and organizational researchers. Furthermore, developing theories of intuitive judgement that accommodate *both* intuitive *and* analytical cognitions is also of likely practical significance since knowing when or when not to mobilize deliberative (Type 2) processing and/or give credence to gut feelings, hunches and vibes (the

outcomes of Type 1 processes) is highly significant for how organizational actors make optimal choices at crucial junctures (Dunn et al., 2010). On this basis we sought to address the following research question: What are ‘peak performing’ police officers’ perceptions of how they use intuition in first-response decisions, and what does this tell us about the micro-processes of intuitive decision making and the relationship between intuition and analysis?

### **Research Design and Method**

We achieved a methodological fit to our research question by sampling purposively, using qualitative in-depth inquiry based on semi-structured interviews, and analyzing our empirical material through thematic content analysis with the goal of identifying emergent patterns. This approach was appropriate to the inductive method in general, i.e. an open-ended inquiry about our phenomenon of interest (Edmondson & McManus, 2007) and aligned with the predominant methodology and assumptions used in such studies (Isabella, 1990). Moreover, notwithstanding the acknowledged limitations (see below) we chose to use this method for revealing participants’ perceptions of how intuition works in first-response because, per Dane and Pratt (2009), retrospective reports are ‘strong’ compared to the traditional priming studies conducted in laboratories (which all-too-often rely on non-work based samples) in that they allow knowledgeable agents ‘the opportunity to indicate their perceptions about how they actually made their decisions in field settings’ (p. 20).

### ***Sampling***

The organizational unit we sampled was the ‘response command’ division of a police force accountable for law enforcement across a single county in England. From within response command we elicited a sample of police officers’ accounts of operational decisions taken in first-response situations. As noted in the review of literature, the police first-response context is valid for intuition research because police first-responders must make sense quickly of ‘multi-dimensional and uncertain situations’ in which intuitive affect can give structure and

meaning to their experiences (Sayegh et al., 2004, p. 194). Moreover, the fact that we gained an impressive level of access to a hard-to-reach population with little prior empirical work to draw on, meant that we were fortunate to have the opportunity to examine our phenomenon of interest in a unique setting with an enhanced probability of novel findings (Langley & Abdallah, 2011).

We followed a purposeful sampling approach in choosing informants who would be most able to enlighten us regarding our research question (Lincoln & Guba, 1985). We sought admittance to the organization from senior stakeholders and we were given access to informants who had relevant experience of first-response and were judged to have the highest levels of first-response expertise on two criteria: senior managers' informal subjective judgement and formal performance appraisal assessment. The sample was identified on the basis of these two criteria and in so doing we sampled 'peak performers', defined by Ericsson and Pool (2016) as people who are amongst 'the very best at what they do' (p. xxi). In police parlance, our informants were the top-performing 'thief takers' in response command whilst in research parlance they were highly-skilled, knowledgeable agents who knew what they were trying to achieve, spoke convincingly about their experiences (Morse, 2011) and were well-able to 'explain their thoughts, actions and intentions' (Gioia, Corley, & Hamilton, 2013, p. 17) relating to how intuition works for them in first-response decisions. By sampling purposively the organization's peak performers, i.e. experts (see Dreyfus & Dreyfus, 2006), we sought the best examples of intuition in first-response so that interesting findings might emerge more quickly and cleanly, and not be 'obscured with other noise in the data' (Morse, 2011, p. 234). Informants comprised 27 operational officers and staff involved in first-response, 16 males and 11 females with an average of 10.5 years of experience in policing, ranging from two-and-a-half years to 31 years. After 27 interviews, we detected diminishing

original insights and returns from additional data collection, and saturation was deemed to have been reached (Ashforth, Kreiner, Clark, & Fugate, 2007).

### ***Data collection and analysis***

We used semi-structured interviews to gather informants' self-reported retrospective accounts of specific first-response incidents in which they used intuition. Self-reports are a widely used method of data collection in the social and behavioral sciences for the study of subjective experiences and inner states, and as a means to access informants' perceptions of how intuitive decision making worked for them in specific incidents (real-time data capture was infeasible – see discussion in the 'Limitations' section below) (Schwarz, 2007). Retrospective self-reports are 'valid sources of evidence' for the schemas that decision makers use to conceptualize and make sense of their experiences and actions (Lipshitz & Strauss, 1997, p. 158) and can be used to assess actual incidents of decision making, provide insights into the dynamic character of decisions, and for the identification of the role of a range of contextual and other factors (Morrell & Arnold, 2007).

The interview protocol (see Appendix) which consisted of questions focusing mainly on events gave informants the opportunity to begin by talking generally about intuition in first-response (we did not ask them to define intuition but asked them whether they had experienced intuition ('gut feel') in first-response) and then to describe and discuss detailed aspects of it pertaining to specific incidents (Akinci, 2014; Druskat & Wheeler, 2003; Flanagan, 1954; Isabella, 1990). We sampled differences between 'polar types' (Langley & Abdallah, 2011, p. 208) in terms of outcomes, namely informants' perceptions of intuitive decision making successes ('intuitive hits') and failures ('intuitive misses') using a variant of Flanagan's CIT procedure (Akinci, 2014). Informants were notified of this expectation in advance of the interview. Sampling events in this way has potential to offer variation within and between informants and maximizes 'chances of credible novelty' and the emergence of

richer findings (Langley & Abdallah, 2011, p. 207). Suitable probing questions were used to scrutinize relevant incidents more closely and thereby capture the unfolding of the narrative ‘on the fly’ (Gioia et al., 2013, p. 20). As co-researchers, we worked together closely in the field and our concurrent and in-depth checking for consistency of approach (guided by the protocol) and co-reflections on informants’ accounts helped to shape our joint approach and interpretations, and guided our decision about when to terminate data collection. With the agreement of informants, each interview was audio-recorded for subsequent transcription. Informant anonymity was guaranteed.

As a precursor to the formal process of identifying relevant elements of the text that spoke to us in potentially informative ways, we began by reading meticulously and re-reading our data set with the aim of deep ‘immersion’ (Suddaby, 2006. p. 639). The analysis then progressed through an iterative process of coding at several levels (Corbin & Strauss, 2008; Miles & Huberman, 1994). We identified and labelled two hierarchical levels in our data: ‘first-order concepts’ (lower) and ‘second-order themes’ (higher) (Gioia et al., 2013; Nag, Corley, & Gioia, 2007).

To derive our first-order concepts we broke the transcripts down into ‘thought units’ (Gioia & Sims, 1986), i.e. informants’ statements ranging from a phrase, through to a complete sentence, to several sentences which were germane to our phenomenon of interest (i.e. intuition) (Butterfield, Trevino, & Ball, 1996, p. 1483). An example of a thought unit is: ‘If ever I have an intuition, I would always still act within the law’ (Informant 22), this was coded as ‘following procedures’. By constant comparisons between thought units we drew on shared textual properties identified within and between them to derive our classifications by iteratively cross-cutting and inter-relating ‘blocks of raw data’ (Corbin & Strauss, 2008, p. 195). This afforded us a representation of intuition-based first-response in terms of 14 first-

order concepts (for example, 'behavioural cues', 'feeling', 'risk-taking', etc.) adequate at the level of meaning of informants (Langley & Abdallah, 2011).

In moving 'up' from 'participant-based [first-order] concepts' to researcher-based (second-order) themes (Langley & Abdallah, 2011, p. 214), and following the method of Corley and Gioia (2004), once first-order concepts had been generated, we then looked for linkages which allowed for their grouping into second-order themes; for example 'feeling' and 'sensing' suggested a grasping of the situation through an 'intuitive knowing' and were grouped and labelled accordingly as 'knowing'. Through a process of aggregation, we moved from more concrete to more abstract interpretations and were thus able to classify the 14 first-order concepts in terms of six second-order themes that expressed the deeper and more general structure within the data.

To probe the trustworthiness of our empirical material we engaged several informed third parties (four senior officers and business managers in the same police organization, and two qualitative research colleagues) on several occasions to discuss the patterns that had emerged inductively from the data (Lincoln & Guba, 1985). These individuals served as 'sounding boards' for the evolving ideas, offered expert perspectives and commentaries on the emerging interpretation, and provided critical questions which challenged our thinking in the analysis of the data (Corley & Gioia, 2004). We also probed the reliability of our analysis by having our two independent raters classify a random sample of ten per cent of the thought units in the full data set ( $N = 740$ ). The computed value of Cohen's kappa ( $\kappa$ ) (Cohen, 1960) was 0.73 (SE = 0.07) thereby indicating a 'substantial' strength of inter-rater agreement (Landis & Koch, 1977, p. 165). Having formed a static interpretation of intuition in first-response (in the form of the data structure) we then sought additional insights into how intuition is accomplished in first-response by focusing on the course of events in our informants' accounts. By further readings and re-readings of the data we were able to discern two main categories of first-

response in which intuition played a role: ‘recognition-based intuition’ and ‘intuition-based inquiry’.

We report our findings as follows: first, we describe the overall data structure (see Figure 1), illustrated by relevant ‘power quotes’ in the text and tabulated ‘proof quotes’ (Pratt, 2008); second, we discuss the two categories of intuitive first response (recognition-based intuition and intuition-based inquiry), illustrated with representative vignettes.

### **Results: How is intuitive decision making accomplished in police first-response?**

Our research question was designed to identify the processes and sub-processes implicated in intuitive first-response decisions. In keeping with the tenets of the so-called ‘Gioia method’ in which higher-order themes are superordinate to lower-order concepts (Gioia et al., 2013), our analysis yielded an overall data structure of 14 first-order concepts and six second-order themes. The data structure is summarized in Figure 1.

[FIGURE 1 HERE]

*Perceiving*, captured two distinct sets of cues, behavioural and contextual, defined as ‘observable attributes of a situation which attracted informants’ attention and triggered an intuitive response’, i.e. noticing behavioural cues and noticing contextual cues.

‘Well, to be honest it’s normally, it’s usually intuition to first of all look at them, and then once you’re looking at them then you can make a judgement call on them. It is normally body language or avoidance; you know, the old head down, looking away, or they glance back. There is something about them, shoulders down, head down, hood up, glance away; just negative body language you can normally tell with a person.’ (Informant 14, *Noticing behavioural cues*)

‘You would make interventions in terms of stopping, speaking to people, because you just felt that the circumstances that surrounded them, the environment and so on didn’t fit.’ (Informant 12, *Noticing contextual cues*)

*Knowing* occurs involuntarily in response to these cues. Informants’ narratives captured a distinction between two types of intuitive knowing: ‘feeling’ of change in the internal bodily state ‘viscerally’ located as in ‘a feeling in your stomach’; and ‘sensing’ which captured a cognitive awareness of ‘something saying to me, hang on a minute; this doesn’t make sense’.

‘It isn’t a voice, it’s a feeling; no, because I didn’t want to make it sound like I’m crazy or something, it’s a feeling in my stomach, I can’t explain it. It’s like... it’s not like butterflies, you know, when you’re sort of... I don’t know, it’s just this... bizarre, I’ve never even thought about trying to describe it before because it’s just something I’m used to. I know it’s there, it happens, I act on it because I’m normally right. It’s just like a little rumble in my tummy, I suppose, and this sort of breathing; I don’t know how to describe it, sorry.’ (Informant 21, *Feeling*)

‘I can’t hear it; I haven’t got voices in my head or anything, but you just almost physically go, ‘hmmm’, if you see what I mean.’ (Informant 17, *Sensing*)

*Predicting* denoted informants’ strategies for the real-time evaluation of the viability of a potential course of action and envisioning the consequences of actions taken by themselves or others based on ‘relying on past experiences’ and ‘foreseeing’ outcomes.

‘Experience, just having done it over-and-over again.’ (Informant 10); ‘It’s difficult [to explain]. These things are based on experience a little bit, aren’t they? You, sort of, learn by your experiences in the past, I guess that was part of it.’ (Informant 19, *Relying on experience*)

‘I put myself in his position, what would I do if I was them? Which I said earlier on about the car, breaking into a car. And I find I tend to get results by trying to put myself in their place, but then doing, it sounds stupid, I know it does.’ (Informant 9, *Foreseeing*)

*Expediting* refers to behaviours executed rapidly in response to high risk, time pressure or dynamism in the triggering situation, used to speed-up the resolution of the situation; this involved ‘instinctive reaction’, sometimes risky actions, and ‘improvising’, i.e. thinking on their feet.

‘...someone standing there with a gun pointing at you and you know shots have been fired, what you going to do? You’re going to pull the trigger or not. You’ve got one of two choices and you’ve got a fraction of a second to do it.’ (Informant 6, *Reacting instinctively*)

‘There were procedures in place that said if we’d done things by the book we should have withdrawn, kept containment on and waited for support. We took a split-second look at each other and went through the door and took them on and got away with it and all three were arrested, thanks very much.’ (Informant 20, *Improvising*)

*Pursuing* occurred where informants experienced a clear and compelling need to respond to their intuition in some way but exactly how to do so was not clear immediately. To move the

situation forward informants ‘persisted’, ‘checked’ and ‘probed’, thereby seeking to reduce uncertainty and diminish ambiguity in order to be able to respond and resolve the situation.

‘If I didn’t follow it up I will spend the next week driving around in my van going, why didn’t I search that? I’d no reason to search it, but my gut feeling said search it and if I don’t search it, it will really bother me.’ (Informant 20, *Persisting*)

‘And there was nothing there. But when I got back to the station on our computers, and was linking all the people that was in the cars together as being friends. It came up on our intelligence screen that three of them out of four are known to go there and do drugs, and I didn’t know that.’ (Informant 17, *Checking*)

‘I think it’s probably just like a, you know, if you had a flag, you’re going through your daily work and this little red flag goes up and you go... you carry on with what you’re doing and subconsciously you probably think about things and sometimes that flag goes down and you think, no, and on you move. Well, it didn’t go down and so that made me think, right I do still want to take that one further.’ (Informant 9, *Probing*)

*Resolving* captured actions that were followed in closing-down a situation, resolving uncertainties by ‘evidencing’, avoiding the compromising of organizational processes by ‘following procedures’, and ‘reflecting-on-action’ and learning from intuitive first-responses.

‘So, if I’ve got a hunch, an intuition, a gut feeling, why have I got that? Have I got any evidence to support my gut feeling? And I’m going to try and find it. If I can’t find it, then I’ve got to try and convince, articulate that to my boss or whoever I’m chatting with to convince them, to back it up.’ (Informant 13, *Evidencing*)

‘If ever I have an intuition, I would always still act within the law.’ (Informant 22, *Following procedures*)

‘On the bigger jobs, when we have a debrief, or a structured debrief, we get the good and the bad points and if there’s a learning outcome from it, that gets fed back into the system. It might affect training; it might affect policy and procedure in what we do.’ (Informant 6, *Reflecting-on-action*)

To arrive at a more detailed understanding of how intuition is accomplished in terms of the relationships between various processes and sub-processes identified above, we examined the flow of events in our informants’ accounts. On this basis we identified two substantively different modes in which intuition was used in first-response: (1) ‘recognition-based intuition’; and (2) ‘intuition-based inquiry’. In analyzing intuitive ‘misses’ as well as intuitive

‘hits’ we also identified several factors that mitigated against success in the accomplishing of intuitive first-response. Furthermore, we uncovered some of the tensions that can occur when intuition and analysis are oppositional forces in first-response decisions.

### ***Recognition-based intuition mode***

In recognition-based intuition informants recognized a familiar situation and applied previous learnings consistent with recognition-primed decision model: an action script was mobilized automatically in response to a recognized pattern. In the following river rescue example the decision was taken under conditions of high time-pressure, low ambiguity and high dynamism, the problem was transparent, obvious, and time-constrained; the required outcome was clear—to protect life (first-order concepts in [square brackets]):

‘He’s screaming for help, he needs to be saved, so, you know, there’s no intuition at this stage, there’s common sense – that bloke needs saving – what is available to me [Noticing contextual cues]? So, I call up on the radio: how long for the lifeguards, how long for the fire brigade with their boats [Checking]. Both of them were 30 minutes plus, okay? Common sense says, that guy’s not going to hang on for 30 minutes. Right. Is there any other access to him [Foreseeing]? No. I’m at the closest point on the riverbank. So, then I’m stuck - I’ve got two decisions, haven’t I? I try and get him or I watch him die – that’s what it comes down to [Foreseeing]. I’m going in the River {redacted} at two o’clock in the morning in the pitch black in a wooden boat with one oar to save someone who’s on the edge of a weir [Improvising]. The risk factor is huge. So, whether it’s intuition or whether it’s common sense, it’s a stupid thing to do [Reacting instinctively].’ (Informant 20, ‘River Rescue’ vignette)

In this incident, the decision maker had to make a critical life-or-death decision within a very short time span and did so as follows: ‘perception of contextual cues’ enabled an emergency response to be ‘expedited’ by ‘reacting instinctively’ and ‘improvising’ which led, in this case, to a satisfactory resolution (i.e. rescuing the potential victim). A further example is in the following vehicle stop which, as it turned out, involved the driver being caught in possession of illegal substances:

‘This ain’t right, for one thing he hasn’t got his seatbelt on, so eventually we pull him up and he’s also messing around his groin area [Noticing behavioural cues]. He’s been very keen to get out of the car, which I didn’t have a problem with, because normally that’s... now I’m going through, well hang on, you’re very keen

to speak to me [*Sensing*]. Yes, too keen. If they get out of the car too quickly, they're either trying to restrict you from looking in the car, or, what's the matter, they've got something. Normally if you go to a vehicle they normally, they haven't got a clue why you're stopping them [*Relying on experience*]. And so, we stop him, and he wants me to give him a ticket. I says, look, you weren't wearing your seatbelt, 'yes, give [me] the ticket', and this was raising my suspicions [*Sensing*]. Now as soon as they start making gestures, hand gestures, eye gestures or the way they speak to me, even if it changes, I'm thinking, this is different to how you would normally address me [*Relying on experience*]. Like, who would be keen to accept a £30 ticket? £30 if you're unemployed is a lot of money, now why would you want to gesture up that? [*Foreseeing*] I'm inviting you back for a strip search, you know? I'm going to... The next thing, he's pulled out, you know the 'Persil packet'; you know the bags? Well he's pulled out one of those from his groin area, it's got a load of drugs in there [*Following procedures*].' (Informant 1, 'Drugs Bust Vehicle Stop' vignette)

In recognition-based intuition informants encountered critical contextual and behavioural cues (e.g. 'he's also messing around his groin area') which evoked subjective experiences in the form of gut feelings or hunches (e.g. 'hang on you're very keen to speak to me'). Informants were able to predict events through relying on experience (e.g. 'Like, who would be keen to accept a £30 ticket?'), foresee consequences (e.g. 'I'm inviting you back for a strip search, you know? I'm going to... The next thing...') and follow necessary procedures to resolve the situation (in this case with an arrest for possession of illegal substances).

In the recognition-based mode the decision maker intuitively recognizes *both* the relevant cues *and* what needs to be done to protect life and property or obviate criminal activity. This mode of intuitive first-response, which has much in common with Klein and colleagues' recognition-primed decision model (Klein et al., 2010), contrasted with a second, and less well-understood, category of intuitive first-response where officers felt or sensed intuitively from the available cues that something was not 'right' but were perplexed, at least initially, as to what to do which prompted a different mode of response.

### ***Intuition-based inquiry mode***

In this mode, the perception of behavioural and contextual cues aroused an unformulated but nonetheless compelling suspicion that 'something just didn't seem right'. Circumstances were

less time-constrained and dynamic than in recognition-based first-response, but were prone both to high ambiguity (reasons for having the intuition tended to be unclear) and uncertainty (potential outcomes in terms of what to do or how to interpret the situation were unclear initially). Intuition mobilized curiosity and compelled informants to act on their intuition not by automatically executing a prototypical response (since, unlike recognition-based intuition, no obvious action script was available immediately) but by persisting and probing, as illustrated in this incident of what turned out to be a sexual assault allegation:

‘It [the complaint seemingly] was [about] somebody banging on somebody’s door and they’d left before we got there, and really there wasn’t much for me to do [*Noticing contextual cues*]. But something just didn’t seem right about the situation, and it just felt as though something was... there was more going on than they’d said [*Sensing*]. If it wasn’t for the fact that I’d had that feeling that something wasn’t right, I wouldn’t have... there would have been no necessity for me to ask extra questions [*Probing*]. Everything I needed to do was done, so I could have just gone on my way. But just something didn’t quite seem right [*Sensing*]. I asked a few more questions as to why this is happening, and it seemed a little bit odd to me. I’m going to have to find out what it is [*Probing*]. But there was nothing from the information I’d been given... and we act on information... that would lead me to think something else had occurred. It was just something wasn’t right, and that’s all I could think of [*Sensing*]. They weren’t saying anything to me that would make me think, oh, there’s more to this, or there’s something else that’s gone on. They were quite calm about it [*Noticing behavioural cues*]. They just said, we don’t want to do anything else. We know who it is. We’re not worried about it. And that was it really. But it just didn’t seem right to me. There was something that was... the back of my head going, there’s something else here, and I don’t know what it is yet [*Sensing*]. It’s kind of just that I couldn’t move on from the fact that there was something else. It was just a case of this needs to be... I need to do something more with this [*Persisting*].’ (Informant 21, ‘Alleged Sexual Assault’ vignette)

In this and similar instances recounted to us, informants reported intuitively grasping the most salient features of an ambiguous situation and executing an intuition-based inquiry by probing and persisting to make sense of significant cues which had given rise to a perplexity for which they felt compelled to find a resolution, as further illustrated by this vehicle stop:

‘There was no signs of any drugs, because we're not allowed to look in the car, because we don't have the right to unless there's a reason why we should look [*Noticing contextual cues*]. So, whilst I was just walking round the car chatting to people, you sort of look inside, you don't search, you just look, and I was looking for ... anything to do with drugs, anything they might have threw in the car window when they see me coming [*Probing*]. And there was nothing there. But when I got

back to the station on our computers, and was linking all the people that was in the cars together as being friends [*Checking*]. It came up on our intelligence screen that three of them out of four are known to go there and do drugs, and I didn't know that [*Reflecting on action*]. I just thought it's in there, it has to be in there, in my head I just knew [*Sensing*].' (Informant 17, 'Vehicle Stop' vignette)

Disquiet at things not being quite right involved a process of making meaning out of something strongly 'sensed' or 'felt' but not fully understood at the time. Intuitions communicated a sense of unease or frustration — as in 'you sense that something's not right' — kick-started an episode of 'checking', 'probing' and 'persisting'.

Cues which violated expectations or raised suspicions also prompted 'checking' using informational resources (for example by extracting information from police computer databases) to 'figure-out' the meaning of their 'hunch', explore the situation further, build a better 'intel' (i.e. intelligence) picture, or help them 'join the dots' to arrive at an insight which afforded them a credible or viable interpretation. We heard repeated variations of the idea that "if something doesn't look right, go find out why" (Informant 6) – hence the title of our paper – and which resulted in informants probing situations penetratingly and persistently to seek resolution:

'...you think well, this isn't quite right, and then you might pick up a little, a couple of little things, and then you tend to sort of say, oh, I think I'll just check on this, just check on that, and just in case there's some more to this than meets the eye.' (Informant 15, *Probing*)

'I'll say, no, that's not right; I don't think that's right, there's more to it than this. Or there's something else going on here, let's dig a bit... you know, and, sure enough, most of the time I am right, something else has happened.' (Informant 21, *Probing*)

Relatedly, informants persevered tenaciously in their probing, as captured in these quotes:

'It stays with me. It stays with me, but I had to... I couldn't park it because I had to do something with it.' (Informant 13, *Persisting*)

'It was, now this just isn't right, you know, and it becomes, no, I don't want to lose here; I don't want to go, well I could have jumped in the car and gone, and it would have been done.' (Informant 12, *Persisting*)

Informants felt compelled to pursue their intuition—even if this deferred an immediate response—on the basis that if they ‘dug deeper’ for long and hard enough their disquiet, unease, or suspicions might be resolved.

‘If you try and ignore it, I don’t think it’s possible, it just keeps coming back.’  
(Informant 10, *Persisting*)

‘If you see something that doesn’t look right, go and find out why it doesn’t look right, because nine out of ten times, there’ll be something wrong.’ (Informant 4, *Probing*)

Our informants accepted that intuitions could be disconfirmed subsequently (and hence implicated risk, judgement and oppositional tensions) but were committed to resolving the matter as part of their professional responsibility and duty. Incidents which appeared peculiarly puzzling or perplexing communicated something not-yet-understood and prompted skilled first-responders to slow things down and initiate an episode of more deliberative and reflective inquiry.

### ***What happens when intuitions miss or conflict with analysis***

Whilst our principal concern was with those intuitive decisions in first-response that yielded a positive outcome, so-called ‘intuitive hits’ (e.g. successful arrest, saving life, protecting property, etc.), we also explored incidents that were deemed to be unsuccessful (so-called ‘intuitive misses’). We discerned four factors which mitigated against successful intuitive first-response, see Table 1.

[TABLE 1 HERE]

Success appeared to be mitigated when decision makers ignored or lacked attentiveness (Dane, 2011) to intuitive signals, failed to follow relevant procedures, or where decisions were based on inadequate experience. Consistent with the notion that intuitions are ‘affectively-charged *judgements*’ (Dane & Pratt, 2007, p. 40, emphasis added), informants also recognized that there was no guarantee that intuition would yield a successful outcome.

Finally, we also witnessed tensions between intuition and analysis as illustrated by the following extracts from an incident in which intuition was treated as a ‘miss’ (i.e. ignored) but turned out to be correct (i.e. it was in fact a ‘hit’). It concerned an officer (Informant 14) who, based on available evidence and the requirement to follow procedures, was compelled to arrest a suspect for an alleged assault with an offensive weapon. However, the officer’s intuition gave rise immediately to significant doubts about the suspect’s involvement.

‘We do ignore our gut feeling sometimes, because you have to act on the facts that you’ve been given [*Following procedures*]. You have to arrest them as a suspect because they’re in the right place, they’ve matched the description, they’re doing the right things that indicate that they were the person responsible [*Evidencing*].’

In this specific incident:

‘I yell at him ‘put the [weapon] down!’. He does, and then I’m able to handcuff him and arrest him [*Following procedures*]. And within the first two or three minutes of talking to him, even just when I’m cautioning him and telling him why he’s being arrested, everything is screaming at me, ‘he’s not the one, he’s not the one’ [*Feeling*].’

Despite circumstantial evidence, the officer’s intuitive response was in opposition to a logical analysis of the situation:

‘All my nerve endings were going, ‘no, he’s not the guy, he’s not the guy’ [*Feeling*]. And the journey in, he’s asking me questions, what’s going to happen? And I’m more... I’m getting more and more positive that he’s not the guy involved [*Probing*].’

The tensions between intuition and analysis were palpable:

‘Part of me is thinking I shouldn’t have arrested him, I know he’s not the guy [*Reflecting-on-action*]. But then, the logical side of me is saying, you have to act on the facts you’ve got [*Following procedures*].’

The suspect was released the next day without charge, and the officer summarized the dilemma s/he was in:

‘My intuition told me don’t arrest him, he’s not the guy [*Feeling*]. But on this occasion, I didn’t follow my intuition. I had to ignore my intuition really. Although, it did come into play when I wrote my notes about the incident, because we write notes about everything we do, I do include [intuition] in my notes [*Following procedures*]. You have to keep it factual but I will write it in a way that reflects how

it was [*Evidencing*]. So, I think for the main part I had to ignore it, and just do what I had to do [*Following procedures*].’

We interpret this vignette in two ways. First, in dual-process theoretic terms the decision maker experienced a conflict between intuition (Type 1 processing) and analysis (Type 2 processing) (Evans, 2007); the latter took precedent as far as operational matters were concerned; procedures were followed in keeping with available evidence, the suspect was arrested and detained, albeit temporarily. However, intuition afforded the decision maker strong negatively-valenced signal that the person arrested could in fact be innocent. The officer was in a state of conflict until the matter was resolved by further inquiry, reporting of the incident and the release of the suspect. Second, in paradox-theoretic terms there was a ‘splitting’ between the two poles of the paradox which gave rise temporarily to a ‘vicious cycle’ (Lewis & Smith, 2014) whereby oppositional tensions between intuition and analysis were not immediately resolvable. The cycle was later broken when facts came to light which established the suspect’s innocence.

Overall, the second of our findings is both novel and important for conceptual and theoretical reasons because it highlights the fact that intuitive (Type 1) processing, as well as giving rise to automatic, rapidly executable, heuristic responses as in the category of recognition-based first-response, is also catalytic of and complicit with fully-fledged analytical (Type 2) processing. Our research thereby offers new insights into the relationship between intuition and analysis in the accomplishment of decision making in police first-response and sheds important light on current debates within dual-process theory with particular reference to default-interventionism and parallel-competitivism (Evans, 2007; Evans & Stanovich, 2013; Hodgkinson & Sadler-Smith, 2018).

## **Discussion**

Based on these findings we propose a ‘Perceiving-Knowing-Enacting-Closing’ framework (Table 2) which captures the role that intuition plays in police first-response decisions and

reflects the finding that it occurs in two different ways: (1) *recognition-based intuition mode*: defined as ‘identifying and implementing a predictable, viable sequence of action through the mobilization of expertise based on pattern recognition’; and (2) *intuition-based inquiry mode*: defined as ‘seeking to reduce uncertainty and diminish ambiguity by deliberate inquiry that seeks to resolve the situation in response to an intuition’. In the recognition-based intuition mode the processes of ‘predicting’ and ‘expediting’ were to the fore in decisions executed under conditions of time pressure and dynamism; whereas in the intuition-based inquiry mode ‘knowing’ and ‘pursuing’ prevailed under conditions of uncertainty and ambiguity. This latter mode extends current knowledge of ‘intuition-as-expertise’ beyond RPD-type ‘recognize-and-respond’ models.

[TABLE 2 HERE]

One pressing theoretical issue we sought to address in this research is the default-intervention versus parallel-competitive debate in dual-process theory (Evans, 2003; Evans & Stanovich, 2013; Hodgkinson & Sadler-Smith, 2018), and in this and related matters we offer four theoretical contributions. We begin with the argument that recognition-based intuition as default-interventionism offers an incomplete and partial account of how intuitive decision making is accomplished in police first-response. We devote the bulk of our discussion to the three ways in which our findings relating to intuition-based inquiry extend previous research and theorizing, namely: significance of interoceptive awareness in intuitive decision making (much overlooked in intuitive expertise literatures); intuition-based inquiry and the default-intervention versus parallel-competitive debate; intuition-based inquiry as the resolution of the paradox of intuition and analysis. We also discuss the practical implications of our findings.

### ***1. Recognition-based intuition as default-interventionism is an incomplete account***

Accomplishing intuitive first-response through ‘recognizing’ comes closest to widely-accepted recognition-primed decision (RPD) models of intuitive expertise. Contextual and behavioural cues mobilize RPD processes, i.e. the recognition of patterns, deployment of action scripts (Klein, 1998, 2003), and the execution of an appropriate response (i.e. judged as likely-to-be-effective, see: Kahneman & Klein, 2009). In dual-processing terms, this inclines towards a default-interventionist position whereby, as noted above, ‘most behaviour is controlled by Type 1 processes running in the background’ (Evans & Stanovich, 2013, p. 237) with minimal analytic intervention (Evans, 2007; Klein et al., 1988). Experienced decision makers do not, it has been argued in RPD research, usually ‘compare *any* options’ but instead come up [intuitively] with a ‘single course of action’ which they duly enact unless, on rare occasions, mental simulation suggests that an alternative should be sought (Klein, 2003, p. 15, original emphasis). It seems to us that this is too narrow a conceptualization of how intuitive decision making is accomplished in police first-response. The nub of our argument is that there is a different (but complementary) manifestation of intuitive expertise—the category of intuition-based inquiry—used by peak performers under particular types of first-response circumstances which is much more than seeking an alternative action script. Moreover, it seems to us that the intuitions in intuition-based inquiry communicate knowledge to the decision maker before s/he fully understands them or their implications. This finding addresses current shortcomings by highlighting that a more complex relationship exists between intuition and analysis than a strict default-interventionism would suggest.

### ***2. The significance of interoceptive awareness in intuitive decision making***

As noted earlier, expertise researchers (whose theoretical bent inclines both explicitly and implicitly towards default-interventionism) have been criticized by intuition scholars such as Sinclair and Ashkanasy (2005) for concentrating on the cognitive elements of the construct at the expense of the affective ones. We agree. It seems to us that being ‘in touch’ (Shotter &

Tsoukas, 2014a, p. 377) with ‘gut feelings’, ‘hunches’ and ‘vibes’ (Epstein et al., 1996)—that is, the decision maker’s ‘interoceptive awareness’ (Craig, 2002)—affords first-responders an important signalling mechanism that guides behaviour and, moreover, that this is overlooked in models of intuitive expertise (perhaps traceable to a false dichotomy of ‘intuition-as-expertise’ and ‘intuition-as-feeling’ propounded by Sadler-Smith & Shefy, 2004, p. 76).

We speculate that intuitive knowing (Chia, 1997) accessed via interoception (Craig, 2002) is vital in expert performance. Support is growing for this view; for example, research into London stock market trading found that traders’ interoceptive awareness predicted not only their relative profitability but also how long they survived in the financial markets (Kandasamy et al., 2016). These results support the idea that signals from the body in the form of gut feelings or hunches, which may not be immediately interpretable, are implicated significantly in peak performance in complex decision making tasks. Moreover, it seems plausible to us that intuitive affect itself can vary in terms of valence (positive and negative), intensity (from high to low), and locus (bodily or cognitive) (Clare, 1992; Dunn et al., 2010; Sadler-Smith, 2016b). These variabilities represent a promising area for further inquiry into the micro-dynamics and phenomenology of intuition (Petitmengin, 2014; Petitmengin-Peugeot, 1999) and its relationship to peak performance (Ericsson & Pool, 2016).

In police work (and likely in related occupations such as border control) intuition-based inquiry is likely to inform—irrespective of whether they are correct or not—social judgements such as ‘is this person lying to me?’ or ‘what is this person’s motive or intention?’ (Lieberman, 2000). In exercising peak performance in such job roles, intuitive judgements are pursued in tandem with analytical processing (emanating from System 2), hence reflexive intuition catalyzes reflective analysis (cf. Lieberman’s [2007] X- and C- systems). In seeking a ‘new orientation to their puzzling surroundings’ the judgement that is enacted in intuition-based inquiry ‘emerges’ (Shotter & Tsoukas, 2014b, p. 377) from a symbolically unmediated

(i.e. embodied) intuitive knowing (Bergson, 1913; Chia, 1997) signalled by intuitive affect in its various forms (Sadler-Smith, 2016b), as in the words of our informants: ‘feeling in my stomach’; ‘something at the back of my head’. A positively or negatively-valenced holistic judgement is arrived at rapidly and non-consciously, and a compelling conviction arises that a response is required but in the absence of any specific course of action springing immediately to mind. Decision makers knew they needed to do something but they were initially perplexed as to what action to take. Ambiguity was resolved via the interplay between analysis and intuition.

### ***3. Intuition-based inquiry and the default-intervention versus parallel-competitive debate***

In theorizing our findings, our interest was stirred most by what happens under conditions of intuitive expertise if, as we found, a triggering event ‘x’ occurs, intuitive affect ‘y’ is evoked, but no strategy ‘z’ suggests itself. Instead the decision maker is left ‘hanging’, dogged by feelings of disquiet and unease, and puzzled and perplexed as to how to proceed. We were intrigued by those situations where intuition was—inevitably because System 1 is fast—first to arrive on the scene (as default-interventionism suggests, see Evans & Stanovich, 2013) but no straightforward heuristic response or action script suggested itself.

Instead, the accomplishment of an effective response required effortful cognition to arrive at a plausible interpretation of the observed behavioural and contextual cues which promoted the intuition in the first place (Sonenshein, 2007; Weick, 1995). Intuitions were evoked pre-consciously, rapidly and automatically (Type 1 processing) based on perceptions of behavioural and contextual cues. This resulted in the first-responder being, initially at least, confounded. Thus, s/he sought to rectify this situation by means of conscious, deliberative, effortful and persistent probing to make sense of their intuition (i.e. by means of Type 2 processing). The effective execution of the intuition-based inquiry mode required cognitive resources and time, as well as motivation and tenacity. In this situation, analysis and intuition

operate *co-actively* even though fast intuitive processing must ‘wait’ initially for slower analytic processing to ‘arrive’ before the next steps can be taken. One point of difference between the recognition-based intuition and intuition-based inquiry modes may be as a result of the amount of information that is available consciously and subconsciously. The former can be matched directly and explicitly to existing schemas while the latter registers inconsistencies (things not ‘stacking up’ or ‘feeling right’) that have to be constructed into a convincing narrative and the missing information is sought and analyzed using deliberative processes (Glöckner & Ebert, 2011).

We noted in the review that dual-process theorists such as Evans (2003, 2007) assume that intuitive (Type 1) and analytical (Type 2) processing are ‘conflictual and competing’, and that a behavioural response must be ‘controlled *either* heuristically [intuitively] *or* analytically’ (Evans, 2007, p. 322, emphases added) (citing the argument that humans are cognitive misers, reliant on ‘rules-of-thumb’, most decision making will accord with defaults, hence they prefer default-interventionism over parallel processing accounts). But why should it be necessary to force ‘data to fit with a *competing systems* account’ (Bonner & Newell, 2010, p. 195, original emphases)? We are in accord with Bonner and Newell (2010) and also with De Neys and Glumicic’s (2008) contention that ‘postulating a purely parallel [parallel-competitive] or serial [default-intervention] reasoning architecture does not work for dual-process theories’ (p. 30) in field settings (whether this argument applies to other single or tripartite models [e.g. Dreyfus, 2014] is an open question). The concept of intuition-based inquiry is commensurable with the idea that attentiveness (Dane, 2011) to intuitive arousals (feeling or sensing) can also raise questions (as in the intuition-based inquiry mode) as well as pre-formed solutions (as in the recognition-based category) and redirect peak performers’ attention towards ‘deeper [Type 2] processing’ (De Neys & Glumicic, 2008, p. 2). In our proposals, there is no ‘forcing’ or requirement that analysis and intuition conflict and compete

(it is a both/and not an either/or relationship, cf. paradox theory below), or that default-interventionism and parallel-competitivism themselves are mutually exclusive. There is room for both. Whichever prevails depends upon the focal decision.

#### ***4. Intuition-based inquiry as resolution of the intuition-analysis paradox***

It is only very recently that researchers have explicitly acknowledged and attempted to understand the paradoxical relationship between intuition and analysis (Calabretta et al., 2016). Our research offers insights to this line of inquiry. From the perspective of paradox theory (Lewis, 2000) the relationship between intuition and analysis meets the criteria for a ‘focal paradox’ (Smith & Lewis, 2011), namely contradictory yet inter-related elements that exist simultaneously, persist over time, and have oppositional tendencies. Intuition and analysis may polarize via the processes of ‘splitting’, exacerbating tensions, and giving rise to ‘vicious cycles’ (Lewis & Smith, 2014) resulting in cognitive inertia/narrowing and reliance on habituated patterns of thinking which actors may feel comfortable in controlling but which may be maladaptive for the task at hand (e.g. eschewing intuition when creative thinking is required) (Sadler-Smith & Sparrow, 2007).

From the perspective of paradox theory, in the case of intuition-based inquiry we witness a dynamic interplay whereby one element of the paradox (intuition) catalyzes the other (analysis). In so doing a ‘virtuous cycle’ is created which attenuates and reconciles tensions between the poles of the paradox (through, in our research, the processes of persisting, probing, etc.) and contributes to peak performance and a successful outcome (Lewis & Smith, 2014). We also witnessed the situation where intuition and analysis were oppositional forces in tension, but where the latter was heeded for reasons of logic and procedure, even though intuitive conviction offered contrary voice. A paradox interpretation is consistent with the notion that even if it was possible to be wholly rational or intuitive (for example by playing to the strengths of one’s preferred cognitive style) this ‘would not be desirable’ because some of

the advantages of the opposing pole or of the synergies between the poles would be lost (Epstein & Pacini, 1999, p. 477). Hence the intuition-analysis paradox has the potential to become ultimately an effective one (Cameron, 1986) in which intuition and analysis do not conflict, but rather they ‘complement’ (i.e. operate co-actively and constructively) and even ‘complete’ (i.e. become a unified whole) each other. In intuition-based inquiry as practised by peak performers we seem to witness the ‘ideal state’ (e.g. ‘switching cognitive gears’, Louis & Sutton, 1991) of ‘*both intuition and analysis*’: intuition catalyzes analysis, and intuition and analysis are co-complicit in effective decision making and in supporting exceptional performance (Cameron, 1986; Lewis, 2000).

### **Implications, Limitations and Further Research**

Our research has practical implications for individual first-responders, organizations, and policy makers. It offers an evidential basis for a ‘Perceiving-Knowing-Enacting-Closing’ framework which is appropriate for a wide range of first-response situations, can be applied by individuals or teams, and offers a rationale for what decisions were taken and why in specific circumstances. It is less complicated than the current models such as the seven-dimensional CIAPOAR (Code of ethics-Information-Assessment-Powers and policy-Options-Action and Review) National Decision Model of the UK’s National College of Policing. Moreover, the framework could also be used as a tool to review and interpret individual decision making episodes and facilitate individual and organizational learning (Crossan, Lane, & White, 1999).

Taking the issue of learning a stage further, it is important that law enforcement officers have knowledge of the outcomes of their intuitive decisions. Knowing about outcomes allied to reflection, de-briefing and coaching supports individual and organizational learning and the development of intuitive expertise collectively (Akinci & Sadler-Smith, 2018; Crossan et al., 1999; Dreyfus & Dreyfus, 2006; Kahneman & Klein, 2009; Salas et al., 2010). Shallow

reflections-on-action and lack of knowledge of outcomes will likely create a breeding ground for the development of biased, prejudiced, and inaccurate intuitions (cf. 'kind' versus 'wicked' learning structures, see: Hogarth, 2001). As far as police work is concerned, the latter is a potentially perilous state of affairs not only for individual first-responders and other actors, it also presents a potential hazard for civil society.

Our research also highlights the potential tensions between the use of first-response intuition, organizational procedures, and legal requirements. Law enforcement organizations need to develop policies and procedures, and the training programs to support these which acknowledge and accommodate the fact that first-response intuitions are: (1) inevitable and inescapable; (2) relied on frequently and appear to be trusted by law enforcement officers; (3) pursued in two ways (a recognition-based intuition mode and an intuition-based inquiry mode) contingent on the attributes of the triggering situation. There are parallels with the use of intuition by lawyers; it is notable that intuition is an integral and inevitable part of legal judgement hence it is important that decision makers such as lawyers and judges (and police officers) should not, indeed cannot, be forbidden to use intuitions 'but they should be informed about the mechanisms, as well as the advantages and downsides of intuition' (Glöckner & Ebert, 2011, p. 165). So doing may help decision makers resolve the tensions inherent in the intuition-analysis paradox.

Our research could contribute to first-response training since many of the first-order concepts in our analysis are readily translatable into behavioural statements (e.g. 'improvising', 'probing', 'evidencing' etc.) and be a basis for the specification of learning outcomes and job competencies for police first-response work. It could also be helpful in highlighting the potential problems associated with intuitive decision making suggested in this study, namely ignoring intuitions, not following relevant procedures, or not having requisite levels of experience.

All empirical studies have limitations and ours is no exception. We employed the widely used and versatile technique of informants' retrospective self-reports (Metts et al., 1991); the limitations of this data collection method are long-recognized and continue to be debated (Miller, Cardinal, & Glick, 1997). Amongst the limitations of retrospective self-reports for un-covering 'real' cognitive processes as they happen in action include potential biases such as *post-hoc* rationalization and internal attribution. If our aim had been to reveal cognition *in vivo* we would have adopted a somewhat different approach (e.g. ethnographic, think aloud protocols, etc.), however in the context of police first-response (which is *ad hoc* and unpredictable) and in recognition of these issues we were primarily interested in participants' perceptions of how intuitive processing worked for them in their decision making as a 'critical' and 'private' event that is not amenable to direct observation (Metts et al., 1991, p. 163). The use of retrospective self-reports was expedient given its suitability for exploring the complex and multi-dimensional nature of events, such as police first-repose decision making, that occur on an ad hoc, incidental and unpredictable basis (Metts et al., 1991; Schwarz, 2007). We endeavoured to eliminate potential biases related to general beliefs by focusing on participants' recollections of how they used their intuition in specific incidents (cf. Flanagan, 1954) by asking informants to recall the situation, how they knew they had an intuition etc. (see Appendix) and in keeping with other applications of this method in intuition research (Akinci, 2014).

Moreover, our assumption was that our informants, as peak performers (Ericsson & Pool, 2016), were intelligent, skilful, knowledgeable agents who knew what they were trying to achieve and could explain their thoughts, actions and intentions (Gioia et al., 2013) bolstered our confidence that we were accessing participants' perceptions of how intuition worked in decision making for them in specific clear-cut incidents (rather than vague general observations about intuition in police work). We have no evidence which counters our

‘intelligent, skilful, knowledgeable agent’ assumption and we are as confident as we can be that our findings are based on informants’ authentic interpretations of, and rationales for, recollected events. Our research strategy sought to reveal the subjective world of the actor’s experience. In keeping with this approach we do not claim that our findings are representative of the situation of *all* police officers engaged in first-response. Our findings are, however, demonstrative of the complexities of the process of intuitive decision making in first-response (see Korac, 2003; Payne & Williams, 2005). Moreover, our sample is consistent with the guidelines for median sample size when selecting interview participants for specific occupational groups in single organization studies (Saunders & Townsend, 2016).

We propose further directions for future research. The fact that our informants reported intuition manifesting variously as ‘feeling’ and ‘sensing’ raises the possibility of individual differences in the subjective (interoceptive) experience of intuition (Clore, 1992; Dunn et al., 2010), its locus, peak performers’ sensitivities and mindfulness towards it (Dane, 2011), and modalities, images and micro-dynamics by which intuition presents (Petitmengin, 2014). The role of metaphor (Lakoff & Johnson, 1999; Tsoukas, 1991) as a means by which the intuitive system ‘encodes reality’ (Epstein, 2011, p. 39) and in the way actors interpret and make sense retrospectively of their intuitive ‘knowings’ is another direction (Bergson, 1913; Chia, 1997; Crossan et al., 1999). Intuition researchers also need to learn more about the micro-properties of critical environmental cues, and why these and not others evoke various types of responses in terms of the two modes we identified. We would be surprised if our study has not generated concepts and principles that have relevance to other domains, and therefore research which applies these various approaches in other occupational and institutional contexts would be welcome.

## **Conclusion**

Our findings present a challenge to any claims that experts' intuitive decisions in field settings are exclusively 'analyses frozen into habit' (Simon, 1987, p. 63), reducible to fast-and-frugal 'one-reason' decisions (Gigerenzer & Goldstein, 1996, p. 650), simple 'defaults' based on heuristics with minimal analytic intervention (Evans, 2007; Evans & Stanovich, 2013), or action scripts mobilized intuitively in response to the recognition of a previously-encountered pattern (Klein, 2003). Our distinction between recognition-based intuition and intuition-based inquiry shows why. In the intuition-based inquiry mode we encounter a surprising anomaly which goes beyond 'recognize-and-respond' models of intuition-as-expertise (Sadler-Smith & Shefy, 2004). As such, our study affords intuition researchers a platform for further theorizing which extends the current body of intuition research (focused largely on recognition-based intuitions) and offers promising links to relevant aspects of organizational theory, such as paradox, process, and mindfulness and beyond. Through the use of peak performers' narrative accounts in a societally important domain (front-line police work) that is highly germane to our phenomenon of interest (intuitive decision making), we have endeavoured to extend current conceptualizations of intuition at a level of detail which we hope will magnify current understandings and reveal how being in touch with a complex and situated mix of intuition and analysis can guide effective decision making and support peak performance.

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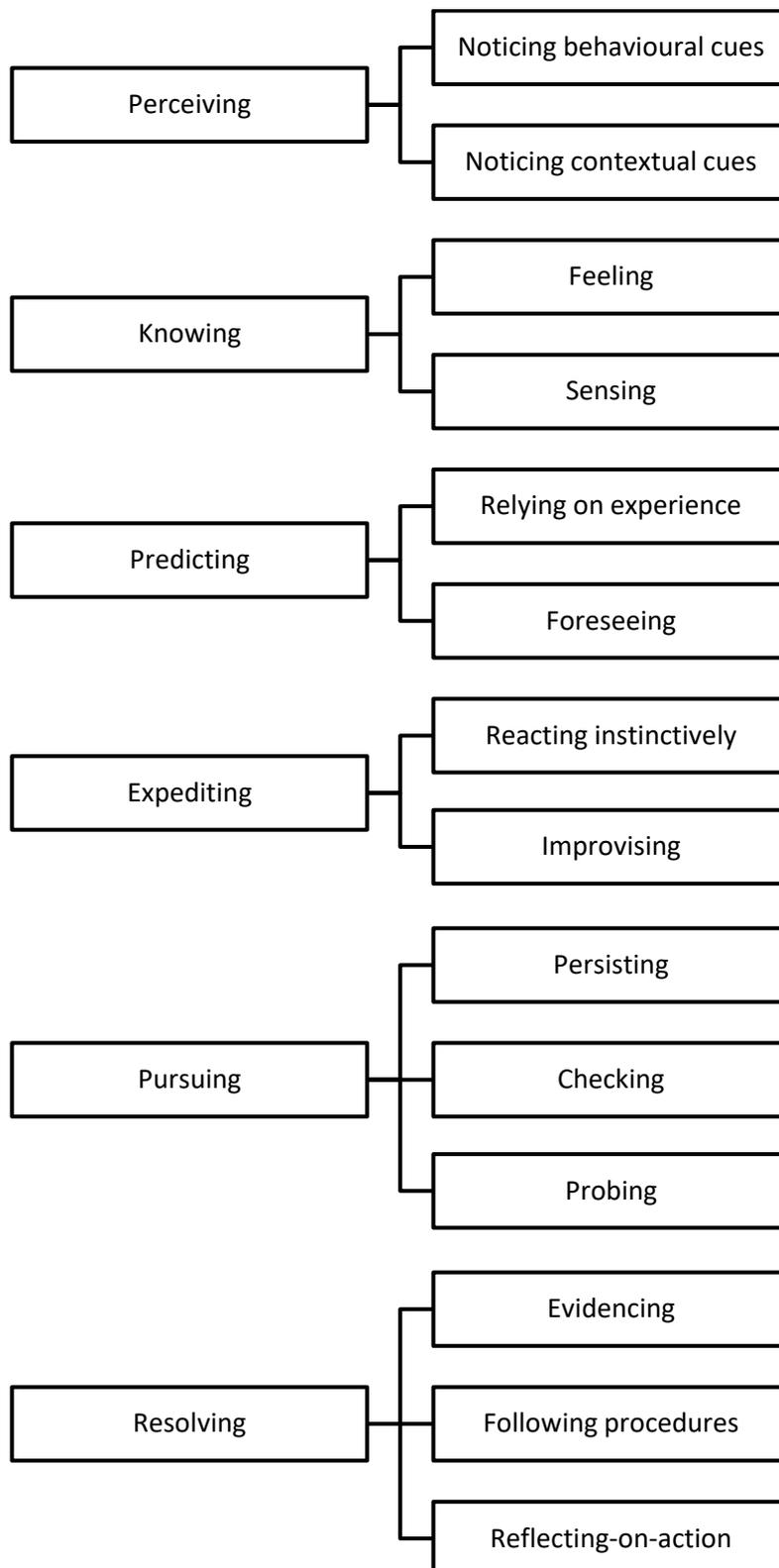
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**Figure 1.** Data structure of themes (second-order) and concepts (first-order)



**Table 1.** Mitigating factors associated with intuitive misses

<b>Factor</b>	<b>Example</b>
<i>Not listening to intuitive signals</i>	‘And then, s**t, I found it. He was suspect for various other jobs and so forth and to cut a long story short I was going to stick something on the box anyway but, again, I felt, hang on, gut instinct, gut instinct, gut instinct, I should have reacted on it, but I had no evidence to link.’ [Informant 1]
<i>Not following procedures</i>	‘And I did some checks on him and he had warnings on him for attempted murder. I thought, hmm, okay, that’s strange, but yes, he’s not going to cause me any problems today. And then just as I’m leaving with him, escorting him off the premises, he then starts to cause me problems, and I did not see it coming. So, potentially that could have gone very wrong indeed, because I was comfortable enough with him that I let him get close to me, you know, I was walking side-by-side with him. I was in a small room on my own with him. Didn’t request any backup.’ [Informant 4]
<i>Not having requisite experience to draw on</i>	‘I was just driving down the road and obviously, he’s in the passenger seat. We drove passed a park and there were three lads sat in the park. I didn’t notice it, I carry on driving. He said: stop, turn around, we’re going to go and speak to those lads. I didn’t even notice the lads in the park. He’d obviously already spotted them and his intuition was that they were up to something. Went in the park and all three of them had cannabis on them, so they were all given cannabis warnings. But obviously still young in service I wasn’t aware of what to be looking out for; he obviously was.’ [Informant 26]

**Table 2.** ‘Perceiving-Knowing-Enacting-Closing’ Framework

<b>Stage</b>	<b>Components</b>		
<i>Perceiving relevant environmental cues</i>	<p><i>Contextual cues:</i> Perceiving and attending to relevant situational or informational attributes of the triggering situation through rapid, non-voluntary, associative, pre-conscious perceptual processes.</p> <p><i>Behavioural cues:</i> Perceiving and attending to relevant verbal or non-verbal behaviours of individuals associated with the triggering situation through rapid, non-voluntary, associative, pre-conscious perceptual processes.</p>		
<i>Knowing the subjective experience</i>	<p><i>Feeling:</i> Somatic-affective feeling state evoked in response to contextual and behavioural cues in the triggering situation.</p> <p><i>Sensing:</i> Cognitive-affective feeling state evoked in response to contextual and behavioural cues in the triggering situation.</p>		
<i>Enacting the intuition</i>	<table border="0"> <tr> <td style="vertical-align: top;"> <p><i>Recognition-based intuition:</i> Identifying and implementing a predictable, viable sequence of action through the mobilization of expertise based on pattern recognition (by predicting and expediting).</p> <p>Higher time pressure and dynamism; Lower uncertainty and ambiguity.</p> </td> <td style="vertical-align: top;"> <p><i>Intuition-based inquiry:</i> Reducing uncertainty and diminishing ambiguity by deliberate inquiry in response to affective signals generated intuitively (by knowing and pursuing).</p> <p>Higher uncertainty and ambiguity; Lower time pressure and dynamism.</p> </td> </tr> </table>	<p><i>Recognition-based intuition:</i> Identifying and implementing a predictable, viable sequence of action through the mobilization of expertise based on pattern recognition (by predicting and expediting).</p> <p>Higher time pressure and dynamism; Lower uncertainty and ambiguity.</p>	<p><i>Intuition-based inquiry:</i> Reducing uncertainty and diminishing ambiguity by deliberate inquiry in response to affective signals generated intuitively (by knowing and pursuing).</p> <p>Higher uncertainty and ambiguity; Lower time pressure and dynamism.</p>
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<i>Mitigating factors</i>	Not listening to intuition; not following procedures; not having requisite experience to draw on.		
<i>Closing the situation</i>	<i>Resolving:</i> Closing-down a first-response incident through evidencing, following procedures and reflections on actions.		