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Original Article

The influence of police officers' decision-making style and anger control on responses to work scenarios

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ABSTRACT

Decision-making within police work is a global concern. Our research attempts to contribute to the literature regarding how police officers make decisions. We examined the interactive effects of decision-making style and anger control on decision-making using a sample of 120 police officers. Police officers were presented with a realistic decision-making scenario, and asked to choose their intended action. Results suggest that analytical and intuitive cognitive processes have an interactive effect on decision-making. Results are discussed regarding the implications on officer decision-making training.

1. Introduction

During 2014, at least three incidences of public protests were reported in the media which occurred as a result of what appeared to many people as being poor police decision-making. In Ferguson, Missouri, for example, residents demonstrated their dissatisfaction with the shooting of Michael Brown with active protest activities for at least four months. Similar recent incidences in the media have been observed in Europe and Middle-Eastern countries as well as other regions of the world. The issue of how police officers make decisions is a very important topic and has far-reaching implications on the public. The recent cases of which the public has been highly critical regarding police officers' decisions, highlights a need for attention to this topic, both by practitioners and researchers. The judgment and decision-making literature has made notable progress toward understanding how decisions are made in high risk or crisis situations such as those faced by police officers. Therefore, we attempt to explore this domain further by focusing on the specific context of police work.

Within the judgment and decision-making literature, the dual process model has been frequently utilized to explain the nature of the decision-making process. Specifically, this dichotomy in reasoning has been labeled System 1 and System 2. System 1 refers to thinking characterized by automatic, principally unconscious, and effortless processing, while System 2 denotes controlled, largely conscious and effortful processing (Stanovich & West, 2000). While this dual-system approach has received significant attention among decision-making researchers, some have been critical of its propositions. For example, Systems 1 and 2 are believed to be inseparable – especially in complex decision-making contexts (Keren & Schul, 2009). In fact, some have proposed a unified framework with the suggestion that both Systems 1 and 2 involve similar rule-based judgments (Kruglanski & Gigerenzer, 2011). Yet, the approach does seem to provide a useful classification and has significant research support (Evans, 2008; Kruglanski & Orehek, 2007). For example, the dual-process theory has been applied to probability judgment to demonstrate that biases, often linked to System 1 processes may be ameliorated by System 2 thinking (Kahneman & Frederick, 2005).

Considering the value of the dual-process model to decision-making, we apply this framework to understand the specific decision-making experience of police officers. Explicitly, our primary concern relates to the management of anger and its effects on decision-making. Police officers report that anger, as well as the control of anger, is a key emotional experience within police work (Daus & Brown, 2012). Thus, we seek to examine how police officers' inclination toward engaging in intuitive and rational decision-making and their tendency to control their anger are related to the decisions that they typically make. Hence, rather than restricting our attention to cognitive processes alone, we also explore the effect of emotion, which is often linked to System 1 processes (Epstein, 1994).

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Therefore, the following research seeks, first, to understand better the extent to which the tendency of controlling the expression of anger influences decisions to act within the context of police work. Additionally, we hope to demonstrate that anger control can act as a buffer in situations of impulsive decision-making when an anger-inducing incident is presented. Second, we explore System 1 thinking, which involves intuitive and emotional processes, and provides a fitting representation of police work. Given that police officers often rely on intuitive reasoning in crisis situations (Patton, 2003), our study will help to clarify how such reasoning occurs while providing a better understanding of the role of emotions in police officers' decision-making. Third, our research provides some implications for action avoidance. Within the context of police work – a high stress profession (Finn & Tomz, 1996) – a tendency toward avoidance may represent a coping strategy (Anshel, 2000). Therefore, exploring the processes leading to such decisions (i.e., the decision not to use force, for example) may provide some insight into how decision-making processes may aid the demands of police work.

In the following sections we provide a review of the literature and support for our hypotheses. First, we discuss the role of emotions in the decision-making process with a specific focus on anger. Next, we introduce the decision-making styles and provide an overview of the intuitive and rational styles. In this discussion, we propose a mapping of these two decision-making styles onto the dual-process framework with intuitive decision-making style being more typical of System 1 processes, and rational decision-making being more typical of System 2 processes. Additionally, in our study, we examined the effects of decision-making style and anger control on reported decisions to either discharge a weapon or issue a speeding ticket (details to follow); we refer to decisions in favor of these options as action.

1.1. Emotions in decision-making

Attention to the consideration of the role of emotions in the dual process account of decision-making has been called for by researchers (e.g., Evans, 2008). Emotions are linked to System 1, or experiential processes, with reasoning being categorical, unreflective and action-oriented. Further, thinking is believed to be more self-evidently valid when individuals are highly emotional (Epstein, 1994). That is, when emotions are strongly felt, individuals are more likely to engage in actions based on broad generalizations and have greater trust in the legitimacy of these actions. Therefore, emotions may play an important role in judgment and decision-making processes. While emotions are more closely tied to the experiential system, they are not considered to be the *foundation* of the system's decision-making processes. Rather, emotions function to support the acquisition of information to aid decision-making (Epstein, 1994). In novel situations, emotions are relied on significantly for their informational role, and as behavior becomes more proceduralized and thus automatic, emotions are less required (Smith, 1984). This distinction is relevant to police decision-making given the situations within which police officers make decisions. While the need to decide to use some form of force is commonplace, the actual deployment of force is quite rare. For example, the use of a gun as a weapon across six different jurisdictions has a frequency of only 0.1% during arrest situations (Garner & Maxwell, 1999). This implies that decision-making in such high risk circumstances may not have the opportunity of becoming proceduralized for police officers, which may suggest greater reliance on the informational support of emotions in these decision-making processes.

This influence on the decision-making process reflects the idea that in many cases, decisions are guided by factors that depart from the traditional 'rational path' expected of the decision-making process (Kahneman & Tversky, 1982). In fact, others propose that the departure from classical rationality, such as the use of fast-and-frugal algorithms, is superior to previously held rational norms (Gigerenzer & Goldstein, 1996). Emotions may play a similar role as these alternatives to controlled and calculated thinking (Epstein, 1994; Evans, 2008). We believe that the emotion of anger will have an effect on the decision-making process as police officers make an active effort to *control* this emotion.

1.2. Anger and decision-making

Affect (i.e., emotions and mood), impacts decision-making by guiding *what* decision-makers think (i.e., the content), as well as *how* they think (i.e., the process; Forgas & George, 2001). In this study, we focused on the emotion of anger – specifically, its regulation or control. This provides implications regarding the experience of anger – absence of regulation – and the suppression of anger – result of successful regulation. That is, on one hand, we believe that when expressed, anger may affect police decisions by means of the information the emotion contributes to the evaluation of alternatives. On the other hand, when anger is being controlled, this functions against the automatic response inherent in System 1 thinking. Given that both the expression and suppression of anger occur frequently in police work (Daus & Brown, 2012), it is valuable to consider how this emotion impacts decision-making.

Anger, a negative affective experience, has unique effects on cognitive processes such as judgment when compared to positive or other negative affective states. Anger may trigger intuitive processes and, relatedly, increase the desire to reach a decision (Sinclair & Ashkanasy, 2005). Often, harmful situations elicit anger and require quick and adaptive responses (Bodenhausen, Sheppard, & Kramer 1994) which occur by means of System 1 or more intuitive processes. This suggests that the experience of anger should strengthen the effect of intuitive thinking on decision-making, while the control of anger should act as a conflicting force.

1.3. Anger control

The control of anger, a form of emotional coping, requires the reappraisal of an otherwise stressful emotional event to reduce experienced distress (Lazarus, 1993). Anger control is also a form of emotion regulation that involves the modification of the experience and expression of an emotional response (Gross & John, 2003). Emotion regulation has been conceptualized within a dual-process framework. Specifically, it has been proposed that emotion regulation can be conceived either as deliberate, response-focused regulation (explicit regulation; Gyurak, Gross, & Etkin, 2011; for example, see Bonanno, Papa, Lalande, Westphal, & Coifman 2004) or automatic, largely unconscious regulatory processes (implicit regulation; Gyurak et al., 2011; for example, see Gollwitzer, 1999). Particularly, the control of anger has been suggested to involve some automatic control (Mauss, Cook, & Gross, 2007); however, evidence also suggests that the control of anger involves some conscious regulation (Martin & Dahlen, 2005), signifying that rational processes are involved in its execution. Since a part of the control of anger is a rational process, this leads us to expect that there will be a positive relationship between anger-control and the rational decision-making style (Hypothesis 1a) and a negative relationship between anger-control and the intuitive decision-making style (Hypothesis 1b). Further, it could be expected that when the anger control tendency is high, police officers will exercise more cognitive control and be less likely to make an impulsive decision toward acting. Therefore, we hypothesize that anger control will be negatively related with action such that the more likely one is to control one's anger, the less likely one would be to report that s/he would issue a ticket or shoot (Hypothesis 2).

1.4. Decision-making styles

Besides the effect of emotional factors on decision-making, individual differences can also have an effect. Previous research has examined decision-making from a situational perspective – specific contexts of the decision – but often without much consideration of potential individual differences in decision styles and their influence in the process (e.g. Payne, Bettman, & Johnson, 1993). Attention has been directed toward the influence of decision-making styles which are defined as "learned, habitual response patterns exhibited by an individual when confronted with a decision-making situation" (Scott & Bruce, 1995, p. 820).

Five decision-making styles have been empirically identified including: rational (thorough search and logical evaluation); intuitive (reliance on hunches); dependent (seeking advice); avoidant (tendency to delay); and spontaneous (immediacy) (Gambetti, Fabbri, Bensi, & Tonetti, 2008; Scott & Bruce, 1995). An individual's penchant for each style varies from high to low and decision-making may be guided by multiple styles; yet, for each person, one style tends to be predominant. The present research focuses on the rational and intuitive styles as these are most relevant to our hypotheses, and are primarily implicated in the risky and spontaneous decisions of police officers, as roughly representing 'opposite ends of the spectrum' in terms of approach to the problem. As such, we anticipate that the intuitive and rational decision-making styles will be negatively correlated, as observed in previous research ($r = -.19$ to $-.25$; Scott & Bruce, 1995). Therefore, we expect that there will be a negative relationship between the intuitive and rational decision-making styles (Hypothesis 3).

1.5. Intuitive decision-making

Intuitive decision-making refers to the process of deciding with a reliance on the use of feelings, hunches, and correlates with a spontaneous approach to decision-making ($r = .32$–$.53$; Scott & Bruce, 1995). This approach to making decisions may develop over time. That is, intuitive reasoning develops through instinctive response, general experience and focused learning (Patton, 2003). Practically, this is useful for the nature of police work and especially so in crisis situations demanding immediate response. Given the impulsive nature of acting on hunches, we expect that police officers will be more likely to decide to act when they have a tendency toward using an intuitive decision-making style. Therefore, we expect a positive relationship between intuitive decision-making style and action such that the higher one scores on intuitive decision-making style, the more likely one would be to issue a ticket or shoot (Hypothesis 4a).

The above, however, raises some questions regarding the experience of those with a propensity toward intuitive thinking, and especially in the midst of an anger-inducing event. Given that those with a high intuitive style should be more likely to make spontaneous decisions, when faced with a situation requiring an immediate response such as discharging a weapon in a threatening situation or having to make a decision about issuing a speeding ticket, it is expected that the default response will be the more impulsive response of immediate action. However, when anger control propensity is high, officers may demonstrate a different response to the opposing forces of impulsivity versus control. That is, police officers may be largely inclined to rely on System 1 processes (i.e., experiential or automatic) given their experience and training (Patton, 2003); however, given the System 2 (i.e., controlled or conscious) demands of anger control (Martin & Dahlen, 2005), officers may respond using more controlled decision-making – represented as less of a likelihood to issue a ticket or use deadly force. As such, we expect that anger control will moderate the effect of intuitive decision-making style on action such that there will be a negative relationship between intuitive decision style and action for participants high on anger control and a positive relationship for those low on anger control (Hypothesis 5a).

1.6. Rational decision-making

Rational decision-making refers to the process of making logical evaluations of alternatives, engaging in thorough search strategies, and is negatively correlated with a spontaneous approach to decision-making ($r = -.29$ to $-.41$; Scott & Bruce, 1995). In other words, rational decision-making style is an analytical and slower-evolving process in comparison to intuitive decision-making style. As a note, we understand that the term 'rational' can be perceived contrarily. In this paper, our reference to a "rational decision-making style" refers to the decision process and *not* the decision outcome. To illustrate,[1] imagine two groups of 1000 officers each. The 1000 officers of the first group rely on their hunches and are fast thinking. The other 1000 officers carefully weigh the various alternatives and are slower thinking – representatives of System 1 and System 2. Now, imagine all 2000 operate in a highly risky environment. After 10 years, 10 of the first group (intuitive), but 30 of the second group (rational) have been killed in their job. Thinking of rationality as an outcome would imply that those in the first group are more rational as they show higher survival probabilities. However, in classifying rational decision-making style, we merely aim to be consistent with the label used by other decision-making authors (e.g., Scott & Bruce, 1995) who allude to the rational styles being an analytical approach to making decisions, and not the resultant outcomes of those decisions.

That said, we suggest that the rational decision-making style will have the opposite effect on decisions in comparison to the intuitive style. Specifically, rather than responding impulsively by acting, officers will be more likely to avoid issuing a ticket or discharging their weapon when high on rational decision-making style. Specifically, we hypothesize that rational decision-making style will be negatively related to action such that the higher one scores on rational decision-making style, the less likely one would be to issue a ticket or shoot (Hypothesis 4b). Further, rational decision-making style which involves some System 2 processes, should demonstrate an interaction with anger-control which has also been suggested to involve some analytical processes (Martin & Dahlen, 2005). Specifically, anger control will moderate the effect of rational decision-making style on action such that there will be a negative relationship between rational decision style and action for participants high on anger control, and a positive relationship for those low on anger control (Hypothesis 5b). See Fig. 1 for a summary of the study hypotheses.

2. Method

2.1. Participants

Participants ($N = 120$) were law enforcement officers from Jamaica and Midwestern U.S. Of the U.S. sample, 27 officers were employed at three police departments within suburban communities, and 44 officers worked in police departments operating in more inner-city settings in the Midwest. The remaining 49 officers were employed by a police department located in an urban area in Jamaica. Table 1 provides a summary of the sample demographics. Officers were recruited by initiation of their respective chief (through both email and face-to-face meeting such as shift

[1] We thank Ulrich Hoffrage for this example.

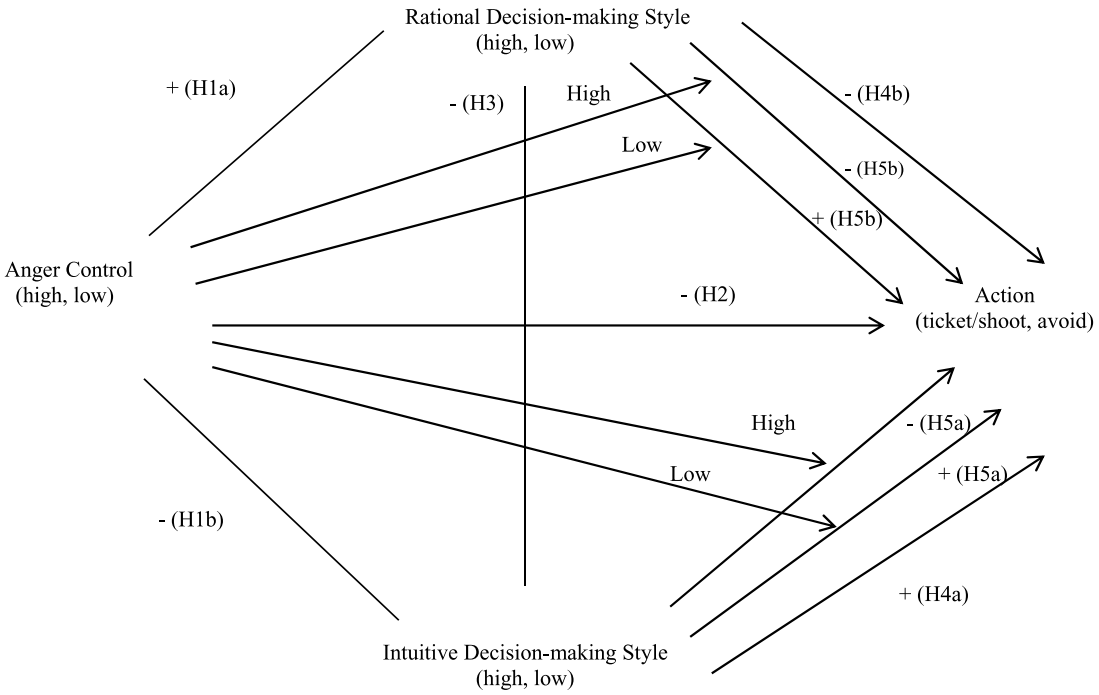

Fig. 1. Graphical summary of the independent variables, the dependent variable, and the hypotheses. *Note*: "H" denotes "Hypothesis".

briefings). Participation was voluntary. Participants were ensured that their responses would be anonymous, and that their participation or responses would in no way affect their employment.

2.2. Procedure

Data were collected in-person by the first author at the local precincts in the U.S. and by the police chief in Jamaica. Participants were asked to complete a series of questionnaires. Firstly, participants completed the General Decision-Making Style Inventory (GDMS) (Scott & Bruce, 1995). Only scores on the rational and intuitive decision-making styles were used for this study. Participants were also asked to complete a demographic measure.

Secondly, officers were randomly assigned to one of two decision-making scenarios (between-subjects design) and asked to make a decision based on the information presented. The two scenarios differed in outcome severity: one required a decision to shoot or not shoot, and the other required a decision to issue or not issue a speeding ticket. The scenario requiring a decision of shooting or not was in the form of a domestic violence altercation with options based on the continuum of force (Terril, 2001). The final and most severe option was to shoot. Finally, to explore the type of anger control tendencies of the police officers, anger control was also measured.

Table 1
Sample demographics.

Demographic	Overall	United States	Jamaica
Age (years)	35.52 (8.21)	37.15 (7.81)	32.84 (8.24)
Gender			
Male	80%	93%	70%
Female	16%	7%	30%
Race			
Caucasian	60%	97%	0%
Black	39%	1%	100%
Hispanic	1%	1%	0%
Experience (years)	10.70 (8.06)	11.50 (8.30)	9.36 (7.58)
Hours worked per week	42.80 (11.40)	40.74 (2.36)	46.40 (18.23)

2.3. Decision scenario

The scenario methodology was selected to assist with standardizing the context of the decisions across participants. This method has been recommended as a useful technique for making the stimulus situation more real and consistent across participants (Alexander & Becker, 1978). Hypothetical vignettes or scenarios are a common research tool used in ethical decision-making (e.g., Fritzsche, 2000; O'Fallon & Butterfield, 2005), decision-making under risk (e.g., Kahneman & Tversky, 1979) and medical decision-making (e.g., McKinlay, Potter, & Feldman, 1996). Given that our sample included actual police officers (with an average of 10 years' experience) we felt that the hypothetical nature of the scenario-based method would not significantly affect the quality of our data. That is, experts often provide more valid data as they engage in more concrete reasoning than novices and are more mindful of contextual uncertainties (Calderwood, Crandall, & Klein, 1987).

As mentioned, two versions of a decision-making scenario were developed with input from a subject matter expert (a Police Chief from a Midwestern town), and used as the decision-making task. Each scenario presented a situation similar to what a police officer may encounter on the job, and then asked the officers to select a course of action they would choose. The two scenarios are presented in Appendix A and varied according to the severity of the outcome associated with the decision, allowing us to test our hypotheses across a high and low stakes situation. The first scenario represented responding to a domestic violence call where an individual becomes aggressive toward the office, and required the officer to indicate his/her response on a 10 point scale with response options based on the continuum of force (Terril, 2001). The second scenario was a realistic traffic violation situation, which required a decision by an officer either to issue a ticket or not.

2.4. Measures

2.4.1. Demographic measure

Participants completed a questionnaire to assess demographics. This measure included age, race, gender, job role, hours worked per week and years of experience within law enforcement.

Table 2
Correlational analyses.

Variables	M	SD	1	2	3	4
1. Rational decison-making style[a]	4.31	.61	–			
2. Intuitive decision-making style[a]	3.27	.66	.04	–		
3. Anger control[a]	3.23	.51	.22*	.13	–	
4. Action[b]	.50	.50	−.21*	.13	−.05	–

* $p < .05$.
[a] Coded on a 5-point Likert stype scale with 1 = strongly disagree to 5 = strongly agree.
[b] Coded such that 0 = avoid and 1 = not avoid (action).

2.4.2. Anger control

Two dimensions of anger control were measured using anger control subscales: Anger-Control In (AX/Con-In), $\alpha = .87$; and Anger-Control Out (AX/Con-Out), $\alpha = .90$ from the State-Trait Anger Scale (STAS) (Spielberger, Krasner, & Solomon, 1988). The subscales were highly correlated ($r = .66$), and combined for an aggregate measure of anger control ($\alpha = .93$).

2.4.3. Decision-making style

Decision-making style was captured using the rational and intuitive subscales of the General Decision-Making Style Inventory (GDMS) (Scott & Bruce, 1995). The GDMS is a 24-item questionnaire, which measures individual decision-making styles using a 5-point rating scale (1 = strongly disagree to 5 = strongly agree). Sample items (Scott & Bruce, 1995, p. 825–826) include, "I make decisions in a logical and systematic way" (rational); and "When I make decisions, I tend to rely on my intuition" (intuitive). Cronbach's alphas for the rational and intuitive subscales were .86 and .67, respectively.

2.4.4. Dependent variable-action

The dependent variable was operationalized as the officers' intended action to the decision scenario. Decisions of issuing a ticket and shooting were coded as 'action' for analysis purposes, thus making the dependent variable a similar dichotomous variable for both scenarios. Action was coded such that 0 = avoid, and 1 = not avoid (i.e., shoot or issue ticket). For the ticket scenario, the decision not to issue a ticket was considered avoidance. For the domestic violence scenario, options 1 through 9 on the use of force continuum were considered avoidance. These decision options were collapsed and coded as '0′, while the shoot option was coded as '1′. The domestic violence variable was dichotomized due to limited variance. Specifically, in response to the domestic violence scenario, only 19% ($n = 11$) of the officers chose an option less than 9 (e.g., the use of non-lethal force).

3. Results

3.1. Common method variance

Due to the self-report nature of our measures, we addressed concerns of common method variance by applying statistical guidelines presented in the literature. We used Harman's single-factor test to determine if common method variance was a significant concern in our data. This method is widely used in behavioral research and involves conducting an exploratory factor analysis and assessing the unrotated matrix to determine if a general factor explains a majority of the variance in the variables (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). A general factor accounting for most of the variance would suggest a source of bias driving the results. A principal component analysis was conducted on the rational and intuitive decision-making styles and anger control. The number of factors was constrained to 1 to examine the amount of variance explained by a general factor. The unrotated factor solution revealed that 42% of the variance was explained by this general factor (eigenvalue = 1.27). This suggests that common method bias was not a concern in this study as another 58% of the variance was unaccounted for by this general factor.

3.2. Hypotheses

Correlational and regression analyses were conducted to test the study hypotheses. Table 2 presents the correlations between study variables, which were used to test Hypotheses 1a, 1b, 2, 3. Table 3 presents logistic regression results for Hypotheses 4a, 4b, 5a & 5b. Hypothesis 1a suggested a positive relationship between anger-control and rational decision-making style. In support of the hypothesis the data analysis indicated that those with more anger-control were also more likely to endorse a rational decision-making style. Hypothesis 1b proposed a negative relationship between intuitive decision-making style and anger control, and was not supported. Hypothesis 2 proposed a negative relationship between anger control and anger; the hypothesis was not supported. Hypothesis 3 proposed a negative relationship between intuitive and rational decision-making; the hypothesis was not supported as the styles were not significantly correlated. Hypothesis 4a, which suggested a positive relationship between intuitive decision-making style and action was not supported. Finally, Hypothesis 4b, which suggested a negative relationship between rational decision-making style and action, was supported. Specifically, for every unit increase in rational decision-making style the officer was .45 times more likely to issue a ticket or choose lethal force. The data indicate that those with a rational decision-making style were more likely to respond in a controlled manner.

Binary logistic regression was used to test the extent to which anger control moderated the relationships between the decision-making styles and action (Hypotheses 5a & 5b). First, independent variables were centered to enhance interpretability and reduce non-essential multicollinearity (Aiken & West, 1991). Interaction terms were created between the pair of the IVs (intuitive decision-making style X anger control and rational decision-making style X anger control). Each IV was first entered in Step 1 of the model followed by the interaction term in Step 2. Results revealed a marginally significant interaction ($p = .06$) between intuitive decision-making style and anger control in predicting avoidant behavior (see Table 3). Specifically, for every unit increase in the interaction term (i.e., intuitive decision-making style X anger control), the officer was almost 4 times more likely to issue a ticket or choose lethal force. The data indicate that when intuitive decision-making style and anger control are both high, officers are more likely to be impulsive; however, as indicated by Fig. 2, this likelihood reduces when high intuition is coupled with high anger control. Our results show partial support for Hypothesis 5a, while Hypothesis 5b was not supported (see Fig. 2).

3.3. Exploratory analyses

Finally, although we did not make a specific prediction, we examined the extent to which the relationship observed regarding the interaction between decision-making style and anger control

Table 3
Regresssion analyses.

Predictor variable	*B*	*SE*	*Exp (B)*	*p*	R^2	*95% CI*
Hypothesis 5a					.05	
Constant	−.05	.20	.95	.80		
Intuitive decision-making Style	.30	.31	1.35	.34		(.73, 2.49)
Anger control	−.31	.39	.74	.44		(.34, 1.60)
Intuitive × anger control	1.37	.74	3.94	.06		(.93, 16.69)
Hypothesis 5b					.05	
Constant	.01	.20	1.01	.97		
Rational decision-making style	−.81	.40	.45	.04		(.20, .98)
Anger control	.01	.40	1.01	.97		(.47, 2.20)
Rational × anger control	.40	.66	1.49	.55		(.41, 5.44)
Exploratory analysis						
Domestic violence scenario					.14	
Constant	−1.52	.40	.22	.00		
Intuitive decision-making	.74	.54	2.10	.17		(.73, 6.06)
Anger control	−1.90	1.08	.15	.08		(.02, 1.24)
Intuitive × anger control	3.53	1.64	34.04	.03		(1.36, 851.48)
Ticket Scenario					.06	
Constant	1.27	.34	3.54	.00		
Intuitive Decision-making	.40	.55	1.50	.47		(.51, 4.42)
Anger control	.54	.59	1.72	.36		(.54, 5.43)
Intuitive × anger control	1.85	1.21	6.39	.13		(.60, 68.47)

Note: Unstandardized regression coefficient = *B*. Standard error = *SE*. Interaction terms were formed by multiplying the centered independent variables. R^2 = Cox & Snell. *Exp (B)* = odds ratio for the predictor. All *CIs* relate to the *Exp (B)* and suggest significance when 1 is excluded.

and decision varied as a function of the severity of the consequences associated with the situation (i.e., high or low stakes). We ran two separate logistic regressions for the two decision scenarios. Results are presented in Table 3 and indicate that anger control significantly interacted with intuitive decision-making style to influence the decision to shoot, but not the decision to issue a ticket. Specifically, for every unit increase in the interaction term (i.e., intuitive decision-making style X anger control), the officer was almost 34 times more likely to choose lethal force. This suggests that when both intuitive decision-making and anger control are high, officers are more likely to report they would shoot; however, as indicated in Fig. 3, this likelihood is reduced when intuitive decision-making is low, and especially so when this is coupled with high anger control.

4. Discussion

The purpose of this study was to explore the effects of rational and intuitive decision-making styles and the control of anger on decision-making among police officers. It was expected that police officers' scores on intuitive and rational decision-making styles would be negatively correlated and would have opposite effects on decisions to act. That is, intuitive decision-making style was expected to be related to decisions to issue a ticket or shoot while rational decision-making style was expected to be related to decisions to avoid those choices. Also, anger control was expected to be negatively related to action and to interact with decision-making styles to influence decisions to act.

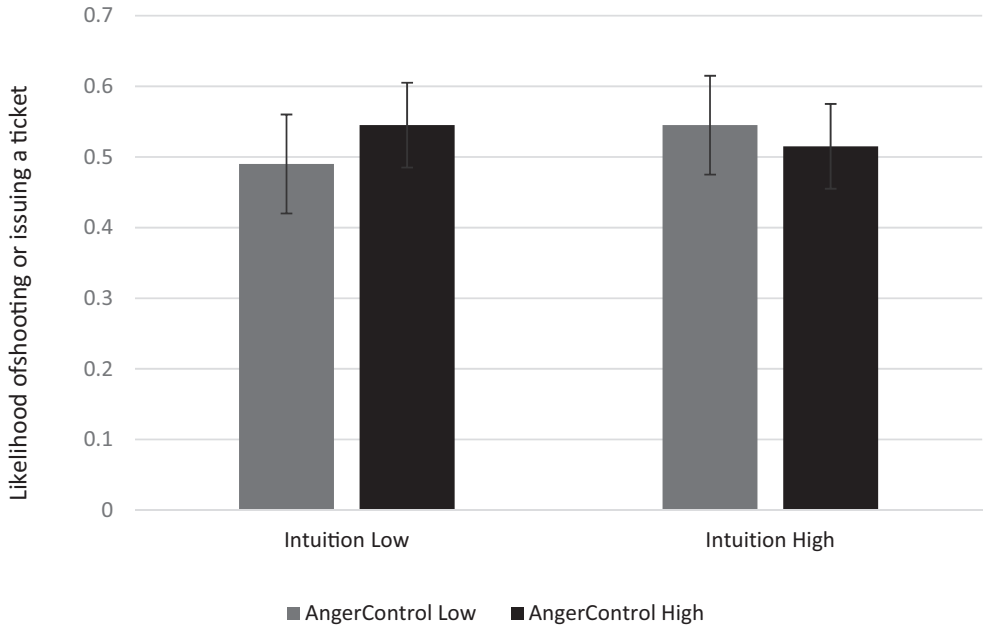

Fig. 2. Graph showing interactive effect of anger control on the relationship between intuitive decision-making-style and the likelihood of issuing a ticket or shooting. *Note*: Error bars denote SD.

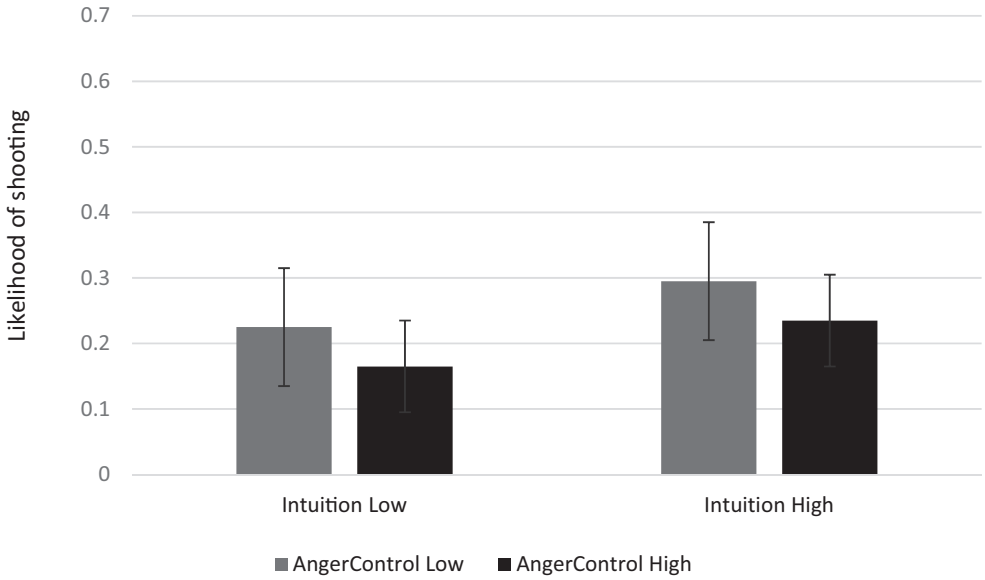

Fig. 3. Graph showing interactive effect of anger control on the relationship between intuitive decision-making-style and decisions to shoot. *Note*: Error bars denote SD.

As expected, the control of anger was related to rational decision-making style. This provides support for previous findings of anger control having a rational component as the control of anger involves conscious emotional regulation (Martin & Dahlen, 2005). As well, high intuitive decision-making style had a stronger relationship with action when police officers felt a stronger propensity to control their anger. This was especially true when officers were faced with a high stake decision (i.e. discharge a weapon). This suggests a complementary relationship between Systems 1 and 2 in the decision-making process and specifically in situations of severe consequences. The notion of System 1 and System 2 working in parallel and being interactive is not a new suggestion; however, System 1 often overrides more rational processes causing actions against more effective judgment (Epstein, 1998). This finding sheds some light on the value of intuitive reasoning in conjunction with the control of anger in police decision-making. While our study does not address the quality of police decisions, it does suggest that intuition has some potential to influence decision-makers with a tendency toward heightened felt anger.

Our initial findings only suggest marginal support for Hypothesis 5a; however; while not predicted, we found stronger support for the moderated relationship in the situation of more grave potential of consequence (i.e. discharging a weapon). The interaction between anger control and high intuition had more of an impact on changing decisions to shoot than issuing a speeding ticket. Arguably, the cognitive demands of a shoot decision require more complex thinking than those of a speeding ticket decision. Explicitly, this cognitive demand may be driven by the fact that police officers require evidence of probable cause when making decisions (Jacobs, 2013). A situation requiring a shoot decision may place more dependence on the influence of controlled processes to identify probable cause; these processes may overlap with cognitive efforts required to regulate or suppress the expression of anger. The observation of high intuitive decision-making style playing a more salient role in more complex situations further supports the value of intuition in organizations and in police work specifically. This appears to support the notion that intuition "ironically incorporates analytical processes while functioning in contrast to them" (Baylor, 1997, p. 189), as a more complex situation may require more systematic thinking.

Future research may explore the interaction between both systems as well as compare their role in effective decision-making in police work and other high impact applied settings. A better understanding of the quality of decisions made under intuitive processes in police work is warranted both for selection and training purposes. Further, while previous evidence and arguments suggest a negative correlation between intuitive and analytical cognitive processes (Hodgkinson & Sadler-Smith, 2003; Scott & Bruce, 1995) – support of the unitary structure – our findings, in contrary, support the dual process framework. Specifically, the absence of a significant and negative correlation between intuitive and rational-decision making styles suggests that the two styles may in fact be orthogonal in certain contexts. Future research exploring the factors influencing the varying patterns of the relationship between the two cognitive patterns is warranted.

Also, while our study provided an avenue for understanding the role of intuitive decision-making style in police work, we acknowledge limitations related to our data being solely self-reported. Future research may also seek to replicate our study using actual performance data from police departments. Second, given our small sample size, we were not able to conduct more robust analyses such as a confirmatory factor analysis to assess potential measurement issues, and multi-group analyses by country and scenario. Such analyses would have allowed us to assess additional interactive effects which we believe would add further value to the literature. Specifically, the ability to analyze the data by country would have allowed us to assess the effects of cultural values on decision-making across countries. The U.S and Jamaica demonstrate some cultural value differences, especially on the dimension of collectivism/individualism (Hofstede, 1984). An assessment of the influence of a collectivistic versus individualistic orientation in values on police decision-making would have contributed new insights for future research. Third, given our use of hypothetical scenarios, caution should be taken when generalizing our findings. While the scenario methodology is widely used in the decision-making literature (e.g., O'Fallon & Butterfield, 2005), it still only presents participants with fictitious contexts and behavior may, in fact, vary in real life. Especially, given the high stake nature of

the domestic violence situation, police officers may respond differently based on training, norms and other motivational factors. Fourth, having to collapse our dependent variable to two dichotomous options was less than ideal. Theoretically, this restricted the domestic violence options to be on 'equal value' with the shoot option. This presents some concerns about the forced equivalence of not shooting and not issuing a speeding ticket. That is, issuing a speeding ticket has far less severe consequences than shooting an attacker in a domestic violence situation. Additionally, the options collapsed to represent 'avoidance' in the domestic violence situation specifically represent the avoidance of shooting rather than an avoidance of action generally.

4.1. Practical applications

Practically, we believe this study adds value to police selection and decision-making training. The use of intuition, as suggested, is both probable and valuable in police work. In situations regarding immediate response, police officers may rely largely on "fast thinking" strategies for reasons related to defense as well as feasibility. Designing and developing training targeted at allowing officers to apply intuition more effectively may reduce the stress associated with decision-making, and increase effectiveness. Furthermore, training targeted at effective emotional regulation, such as the control of anger, may also be useful. This may be especially relevant in high risk situations.

Conflict of interest statement

The authors declare that they have no conflict of interest.

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Appendix A. Study vignettes

Ticket scenario: You are conducting a routine traffic operation on a Thursday afternoon when your speedometer identifies the first speeding driver for the afternoon. You decide to follow the driver who continues in excess of 20 miles over the posted speed limit for 3 blocks. The operator of the vehicle ignores your repeated efforts to effect the traffic stop, continuing to drive, ignoring your instructions. It appears the driver is attempting to elude. After one minute of continuous driving, the driver pulls over and you are not very happy with the length of time it took for this person to respond to your siren. You step out of your vehicle and walk toward the driver's side of the vehicle with ticket pad in hand. You are certain this person deserves a ticket and are annoyed by their lack of concern and respect for the law. As soon as you stop by the door, the window rolls down.

You see a crying middle-aged lady who frantically shakes her head and begins speaking, "Good afternoon sir, I. . ." You stop her mid-sentence, "Are you okay, ma'am?" She begins explaining that she did not notice she had been speeding until she noticed your siren. You are faced with the decision of giving this lady a ticket.

Domestic violence scenario: You are traveling south on Washington Avenue, when you are radioed to a domestic violence incident involving a male and female at 345 Cornell Street. While on route to the call, dispatch informs you that two other officers were already at scene engaged in a fight with the male. You later arrive at the scene and rush to assist the two other officers when you are approached by an angry female. Without any warning the female takes a swipe at you with a broken bottle. You tell her to drop the bottle but she refuses, and continues to advance toward you.

References

Aiken, L., & West, S. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.

Alexander, C. S., & Becker, H. J. (1978). The use of vignettes in survey research. *Public Opinion Quarterly*, *42*, 93–104.

Anshel, M. H. (2000). A conceptual model and implications for coping with stressful events in police work. *Criminal Justice and Behavior*, *27*, 375–400.

Baylor, A. L. (1997). A three-component conception of intuition: Immediacy, sensing relationships, and reason. *New Ideas in Psychology*, *15*, 185–194.

Bodenhausen, G., Sheppard, L., & Kramer, G. (1994). Negative affect and social judgment: The differential impact of anger and sadness. *European Journal of Social Psychology*, *24*, 45–62.

Bonanno, G. A., Papa, A., Lalande, K., Westphal, M., & Coifman, K. (2004). The importance of being flexible: The ability to both enhance and suppress emotional expression predicts long-term adjustment. *Psychological Science*, *15*, 482–487.

Calderwood, R., Crandall, B., & Klein, G. (1987). Expert and novice fire ground command decisions (KATR-858(D)-87-02F). In *Final Report under contract MDA903-85-C-0327 for the U.S. Army Research Institute Alexandria, VA*. Fairborn, OH: Klein Associates Inc.

Daus, C. S., & Brown, S. G. (2012). The emotion work of police. In N. M. Ashkanasy, C. E. J. Hartel, & W. J. Zerbe (Eds.), *Research on emotions in organizations* (pp. 305–328). UK: Emerald Group Publishing Limited.

Epstein, S. (1994). Integration of the cognitive and the psychodynamic unconscious. *American Psychologist*, *49*, 709–724.

Epstein, S. (1998). Cognitive-experiential self-theory. In D. F. Barone, M. Michel, & V. B. Van Hasselt (Eds.), *Advanced personality* (pp. 211–238). US: Springer.

Evans, J. S. (2008). Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology*, *59*, 255–278.

Finn, P., & Tomz, J. E. (1996). *Developing a law enforcement stress program for officers and their families (NCJ Publication No. 163175)*. Washington, DC: National Institute of Justice: Issues and practices. U.S. Department of Justice.

Forgas, J. P., & George, J. M. (2001). Affective influences on judgments and behavior in organizations: An information processing perspective. *Organizational Behavior and Human Decision Processes*, *86*, 3–34.

Fritzsche, D. J. (2000). Ethical climates and the ethical dimension of decision making. *Journal of Business Ethics*, *24*, 125–140.

Gambetti, E., Fabbri, M., Bensi, L., & Tonetti, L. (2008). A contribution to the Italian validation of the General Decision-making Style Inventory. *Personality and Individual Differences*, *44*, 842–852.

Garner, J., & Maxwell, C. (1999). Measuring the amount of force used by and against the police in six jurisdictions. In *Use of force by police: Overview of national and local data*. Washington, DC: U.S: Department of Justice.

Gigerenzer, G., & Goldstein, D. G. (1996). Reasoning the fast and frugal way: Models of bounded rationality. *Psychological Review*, *103*, 650–669.

Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, *54*, 493–503.

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, *85*, 348–362.

Gyurak, A., Gross, J. J., & Etkin, A. (2011). Explicit and implicit emotion regulation: A dual-process framework. *Cognition and Emotion*, *25*, 400–412.

Hodgkinson, G. P., & Sadler-Smith, E. (2003). Reflections on reflections . . . on the nature of intuition, analysis and the construct validity of the Cognitive Style Index. *Journal of Occupational and Organizational Psychology*, *76*, 279–281.

Hofstede, G. (1984). . *Culture's consequences: International differences in work-related values* (Vol. 5) Sage.

Jacobs, A. (2013). *Factors in police ignoring intuition. Unpublished manuscript*. Irvine: University of California., retrieved from http://www.dcjs.virginia.gov/vcss/training/CampusSafetyandViolencePreventionForum

Kahneman, D., & Frederick, S. (2005). A model of heuristic judgment. In K. Holyoak, & R. G. Morrison (Eds.), *The Cambridge handbook of thinking and reasoning* (pp. 267–294). Cambridge, UK: Cambridge University Press. Materials/Monday Keynote 9AM – Jacobs-Intuition Paper.pdf.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, *47*, 263–291.

Kahneman, D., & Tversky, A. (1982). The psychology of preferences. *Scientific American*, *246*, 160–173.

Keren, G., & Schul, Y. (2009). Two is not always better than one: A critical evaluation of two-system theories. *Perspectives on Psychological Science*, *4*, 533–550.
Kruglanski, A. W., & Gigerenzer, G. (2011). Intuitive and deliberate judgments are based on common principles. *Psychological Review*, *118*, 97–109.
Kruglanski, A. W., & Orehek, E. (2007). Partitioning the domain of social inference: Dual mode and systems models and their alternatives. *Annual Review of Psychology*, *58*, 291–316.
Lazarus, R. S. (1993). *Coping theory and research: Past, present, and future. Fifty years of the research and theory of RS Lazarus: An analysis of historical and perennial issues*.
Martin, R. C., & Dahlen, E. R. (2005). Cognitive emotion regulation in the prediction of depression, anxiety, stress, and anger. *Personality and Individual Differences*, *39*, 1249–1260.
Mauss, I. B., Cook, C. L., & Gross, J. J. (2007). Automatic emotion regulation during anger provocation. *Journal of Experimental Social Psychology*, *43*, 698–711.
McKinlay, J. B., Potter, D. A., & Feldman, H. A. (1996). Non-medical influences on medical decision-making. *Social Science & Medicine*, *42*, 769–776.
O'Fallon, M. J., & Butterfield, K. D. (2005). A review of the empirical ethical decision-making literature: 1996–2003. *Journal of Business Ethics*, *59*, 375–413.
Patton, J. R. (2003). Intuition in decisions. *Management Decision*, *41*, 989–996.
Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). *The adaptive decision maker*. Cambridge University Press.
Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*, 879–903.
Scott, S., & Bruce, R. (1995). Decision-making style: The development and assessment of a new measure. *Educational and Psychological Measurement*, *55*, 818–831.
Sinclair, M., & Ashkanasy, N. M. (2005). Intuition: Myth or a decision-making tool. *Management Learning*, *36*, 353–370.
Smith, E. R. (1984). Model of social inference processes. *Psychological Review*, *91*, 392–413.
Spielberger, C. D., Krasner, S. S., & Solomon, E. P. (1988). The experience expression and control of anger. In M. P. Janisse (Ed.), *Health psychology: Individual differences and stress* (pp. 89–108). New York: Springer-Verlag.
Stanovich, K. E., & West, R. F. (2000). Advancing the rationality debate. *Behavioral and Brain Sciences*, *23*, 701–717.
Terril, W. (2001). *Police coercion: Application of the force continuum*. Indianapolis, IN: LFB Scholarly Publishing LLC.