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Domain-specific preferences for intuition and deliberation in decision making☆

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ABSTRACT

There is evidence for reliable individual differences in the tendency to use an intuitive (i.e., spontaneous, affect-based) and a deliberative (i.e., effortful, planned, and analytic) decision mode. Even though other individual characteristics in decision making (e.g., risk attitude) seem to be domain-specific, it is commonly assumed that a person's decision style is relatively stable across decision domains. Using a domain-specific extension of the Unified Scale to Assess Individual Differences in Intuition and Deliberation (USID), we found that preference for intuition and preference for deliberation showed considerable variability across domains (e.g., choosing a dress vs. choosing a doctor). In addition, domain-specific preferences for intuition were consistently correlated with self-rated expertise in making decisions in the respective domain. Our results indicate that a person's domain-general decision style does not necessarily generalize across decision domains, and that the domain-specificity of preferences for intuition seems to be driven partly by differences in expertise.

1. Introduction

A popular distinction in psychology is between intuitive and deliberate mental processes. Intuitive processes are characterized as "effortless, implicit, ... and often emotionally charged" (e.g., Kahneman, 2003, p. 698). Deliberate processes are more effortful, explicit, and consciously controlled. The distinction between intuition and deliberation seems phenomenologically supported, and it has also entered psychological theorizing. Several influential psychological frameworks on human thinking and reasoning assume a dual-process structure of the mind, where an intuitive, automatic system operates alongside a deliberate, controlled one (e.g., Chaiken & Trope, 1999; Epstein, 2008; Hammond, 1996; Kahneman, 2011; Mukherjee, 2010; Sloman, 1996; Stanovich & West, 2000; for a critical discussion, see Gore & Sadler-Smith, 2011; Kruglanski & Gigerenzer, 2011). The frameworks acknowledge that both mental systems – though qualitatively distinct – jointly influence behavior.

It has been argued that there are systematic individual differences in the tendency to rely on intuitive and deliberative decision mechanisms (for an overview, see Betsch & Iannello, 2010). Some people have a strong inclination to make decisions based on intuition; others tend toward deliberation. Such individual differences in what we refer to as *decision style*[2] are also relevant in organizational contexts (Dane & Pratt, 2007). For instance, entrepreneurs have been found to have a better balance between intuitive and deliberate decision modes than actors or accountants (who lean more toward an intuitive or analytic style, respectively; Groves, Vance, Mendez, & Choi, 2008). Further, the fit between a manager's decision style and the institution's organizational structure has been shown to impact manager satisfaction, intention to exit, and actual exit (Brigham, DeCastro, & Shepherd, 2007). Finally, Khatri and Ng (2000) found that senior executives' decision styles were associated with the performance of their company.

A common assumption in research on decision styles is that they are "chronic" (Betsch, 2008, p. 231) and thus characterize a

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[2] Importantly, people's tendencies to rely on deliberation and intuition are often construed as orthogonal dimensions, and also empirically the two are only weakly, if at all linked (e.g., Hodgkinson & Sadler-Smith, 2003). Therefore, a person's decision style does not represent a preference of one decision mode (e.g., intuition) over the other (e.g., deliberation), but expresses the strength of a person's tendency to rely on the respective decision mode.

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person's decisions relatively consistently across situations. Consequently, instruments measuring individual decision styles typically ask people to respond in a way that "correspond[s] to the way you *generally* make decisions" (Schunk & Betsch, 2006, p. 399, emphasis added). However, it has been shown that other individual characteristics of decision making (e.g., risk attitude) sometimes vary across domains (e.g., Weber, Blais, & Betz, 2002). Moreover, a key aspect underlying intuition – namely, experience with a task (e.g., Hogarth, 2001; Klein, 1998) – often differs across different types of decisions. It therefore seems plausible that a person's decision style varies systematically across domains (e.g., choosing among consumer goods vs. choosing among potential romantic partners).

In this article, we studied domain-specific differences in the propensity to rely on intuition and deliberation when making decisions. Specifically, we used an instrument that captures domain-general decision styles – the Unified Scale to Assess Individual Differences in Intuition and Deliberation (USID; Betsch & Iannello, in preparation) – as well as an adapted version of the instrument that measures decision styles separately for different domains of daily life. In addition, we asked people to rate their level of expertise with making decisions in each of those domains. This approach allowed us to examine (a) the extent to which a person's decision style differs across domains; (b) how strongly a person's domain-general style correlates with their domain-specific style; and (c) the relationship between people's domain-specific decision style, on the one hand, and their reported decision expertise in the respective domains, on the other.

1.1. How to decide? Individual differences in decision-style preferences

Educational research has found that people have their own characteristic ways of organizing, representing, and processing information. These psychological regularities are often referred to as *cognitive styles* (e.g., Messick, 1984; Riding & Rayner, 1998). Differences in cognitive style are assumed to reflect trait-like propensities, rather than differences in ability. Decision styles can be viewed as a subcategory of cognitive styles (see Betsch, 2008; Betsch & Iannello, 2010). Betsch (2004) developed the Preference for Intuition and Deliberation (PID) scale to measure a person's tendency to use a particular decision mode (for alternative instruments, see Burns & D'Zurilla, 1999; Cools & Van den Broeck, 2007; Pacini & Epstein, 1999; Scott & Bruce, 1995). The PID consists of a preference-for-intuition subscale, tapping the tendency to rely on affective and implicit influences when making decisions (e.g., "My feelings play an important role in my decisions," "I am a very intuitive person"), and a preference-for-deliberation subscale, tapping the tendency to rely on explicit cognition and planning (e.g., "Before making decisions, I first think them through," "I prefer making detailed plans rather than leaving things to chance"). It is important to note that intuition and deliberation are conceived of as, in principle, orthogonal mechanisms that may operate at the same time, rather than as opposite ends of a single dimension (see Evans & St, 2008; Hodgkinson & Sadler-Smith, 2003).

Betsch (2004) showed that the PID has good internal consistency and that people with a stronger propensity to use an intuitive decision mode decide more quickly than those with a stronger propensity to use a deliberate mode. Consistent with the conception of decision styles as trait-like characteristics, she found associations between a preference for intuition and the personality dimensions of extraversion and openness to experience. A preference for deliberation, by contrast, was correlated with conscientiousness. Further, people who differ in the preference for intuition and deliberation also seem to differ in their sensitivity to outcomes in risky decision making (Schunk & Betsch, 2006). Whether a person's decision style matches the way a decision is actually made ("decisional fit") can have important implications for decision making. For instance, Betsch and Kunz (2008) demonstrated that people evaluated an object more positively when they used their preferred decision mode than when they did not. Moreover, decision makers felt less regret for negative outcomes of decisions when they experienced decisional fit than when they did not.

Despite the apparent usefulness of the PID in capturing decision styles, Betsch and Iannello (2010) highlighted several weaknesses of the instrument. First, they argued that items measuring intuition should avoid using the term "intuition" directly, because this "could activate different lay-epistemological ideas of what intuition is" and thus "can artificially increase the correlation between the scales." (p. 265) Second, performing a factor analysis on five instruments commonly used to measure individual differences in decision style, they distilled two key aspects of intuition, which they labelled "affect-based" and "automatic and spontaneous" decision making, and two key aspects of deliberation, which they labelled "cognition based" and "planned, structured" decision making; however, not all of them are included in the PID. To address these limitations, Betsch and Iannello (in preparation) developed the Unified Scale to Assess Individual Differences in Intuition and Deliberation (USID), which combines items from the PID, the Rational-Experiential Inventory (REI; Pacini & Epstein, 1999), the General Decision Making Style inventory (GDMS; Scott & Bruce, 1995), the Cognitive Style Indicator (CoSI; Cools & Van den Broeck, 2007), and the Perceived Modes of Processing Inventory (PMPI; Burns & D'Zurilla, 1999). The items of the USID are listed in Table A1 of Appendix A.

Being conceived of as a trait-like cognitive style, a person's decision style as measured by instruments such as the PID and the USID have been hypothesized to reflect "inter-temporal stability of one's decision-making behavior across various situations" (Betsch & Iannello, 2010, p. 253). Although this does not rule out some flexibility in decision style – for instance, when a situation requires deviation from the preferred style (e.g., under time pressure) – it remains unclear how strong the impact of the decision situation is relative to that of the individual's decision style, how much variability there is across situations, and which factors are associated with decision styles.

To the extent that decision styles differ systematically between domains, a domain-specific approach may in some situations be more successful in predicting a person's decision making than a domain-general approach. Next, we argue that domain-specific differences in experience may be an important variable driving differences in decision style across domains.

1.2. The intuition–expertise link: Are decision-style preferences domain specific?

A key issue in decision research has been to understand how individual dispositions are related to decision making (e.g., Franken & Muris, 2005; Glöckner & Pachur, 2012; Pachur & Galesic, 2013; Pachur, Hanoch, & Gummerum, 2010; Stout, Busemeyer, Lin, Grant, & Bonson, 2004). For instance, whether someone chooses a risky over a safe option is influenced by her general willingness to take risks. As Weber et al. (2002) demonstrated, however, a person's risk attitude can vary considerably depending on whether the task involves, for instance, recreational risks or investment risks (see also Hanoch, Johnson, & Wilke, 2006). To illustrate, an individual's tendency to skydive was only weakly associated with his or her tendency to invest in a speculative stock. Also, people seem to use different strategies in affect-rich versus affect-rich decision domains (e.g., Pachur, Hertwig, & Wolkewitz, 2014).

One reason that decision styles may likewise be domain specific is that, conceptually, intuition is strongly rooted in experience (Hogarth, 2001; Prietula & Simon, 1989). For instance, the importance of the role of experience has been central to Klein's (e.g., 1998) *recognition-primed decision model*, which proposes that intuition works by matching possible options to cue patterns stored in the decision maker's memory, representing options that were successful on previous occasions. From this perspective, intuitive processes require substantial experience to be effective. Similarly, the use of lexicographic heuristics – which allow for quick and effortless decisions, but whose effectiveness depends on an accurate representation of the cue hierarchy – seems to vary with the experience of the decision maker. For instance, Pachur and Marinello (2013) asked professional customs officers and a non-expert control group to screen passenger profiles for likely drug runners. They found that the experts were more likely to rely on a lexicographic heuristic, whereas the non-experts used a more complex strategy, that aggregates across different cues (see also Garcia-Retamero & Dhami, 2009)[3]. Individual preferences for using intuition may thus vary across domains as a function of how proficient people perceive themselves to be in making good decisions in that domain. To what extent also preference for a deliberative decision mode might be correlated with task expertise is currently unclear and will therefore be explored here. Examining the links between decision style and domain expertise is not only interesting conceptually; it may also help to foster a better understanding of individual differences in decision making.

1.3. Measuring domain-specific decision-style preferences

To test the possibility that people's preferences might differ across domains, we modified the USID to measure domain-specific tendencies for using intuition and deliberation. To select domains, in a pre-study we asked a group of students from the University of Basel ($N = 50$; 25 female; age $M = 28.6$ years, SD = 9.4; range = 18–64 years) to rate nine domains of everyday decision making in terms of importance, frequency, and their own expertise. Using these ratings, we reduced the set to six domains representing different importance levels and showing variability (across people) in the amount of expertise. These six domains were: choosing a mate, buying an electronic device (e.g., mp3 player, mobile phone), choosing a vacation destination, buying clothes, choosing a restaurant, and choosing a doctor.

We modified the items of the domain-general USID to refer specifically to decisions in each of the six domains. For the domain-specific "vacation" scale, for example, we modified the domain-general intuition item "I make quick decisions" to "I make quick decisions when deciding among vacation destinations"; similarly, the domain-general deliberation item "Before making decisions I usually think about the goals I want to achieve" was modified to "Before making decisions among vacation destinations, I usually think about the goals I want to achieve." Some of the USID items were unsuited for domain-specific adaptation and were therefore not included (e.g., the deliberation item "I prefer well-prepared meetings with a clear agenda and a strict time management"). Finally, because the items covering the "knowing" component of deliberation (e.g., "I study every problem until I understand the underlying logic"; Table A1) refer to problem solving rather than to decision-making situations, they were also not included in the domain-specific version. Overall, each domain-specific scale comprised 6 items in the deliberation subscale and 15 in the intuition subscale[4]. Appendix A (Table A2) provides a full example of a domain-specific adaptation of the USID items.

Next, we report a study in which we used both the original, domain-general version of the USID and the domain-specific adaptation to examine the extent to which domain-specific decision styles correlated with domain-general styles, how strongly domain-specific decision styles correlated among each other, and whether they correlated with self-rated decision expertise in the respective domain.

2. Method

2.1. Participants

We recruited 149 students from the University of Basel (102 female; age $M = 25.8$; SD = 7.98; range = 15–66 years). Completion of the study questionnaires took around 30–45 min. As compensation, respondents received credit points; additionally, they had the opportunity to enter a raffle for five prizes of 100 Swiss Francs each.

2.2. Material and procedure

In a computerized task, respondents were presented with the domain-specific adaptation of the USID as well as with the original, domain-general USID (Appendix A). For comparability, those USID items that were unsuited for the domain-specific version (see above) were also not included in the domain-general version. Respondents were presented with each of the seven scales (1 domain-general, 6 domain-specific), each containing 21 items. Within each scale, the intuition and deliberation items were presented in mixed random order. To control for possible order effects, we presented half of respondents with the domain-specific scales first, followed by the domain-general scale, and the other half of respondents with the domain-general scale first, followed by the domain-specific scales. For each domain-specific scale, participants were instructed to imagine a situation in the respective domain in which they had made a decision in the past. As in other instruments on decision styles, for the domain-general version of the USID, participants were instructed to answer with respect to their decision behavior *in general*. Participants indicated their agreement with each item (e.g., "When I make a decision, I trust my inner feeling and reactions", "I prefer making detailed plans rather than leaving things to chance") on a 5-point scale ranging from 1 = "I don't agree" to 5 = "I agree completely." Finally, they rated their expertise in making decisions in each of the six domains on a 5-point scale ranging from 1 = "low expertise" to 5 = "high expertise." Expertise was defined as usually making good decisions – that is, ones that were not subsequently regretted – in the domain.

3. Results

For each respondent, strength of preference for intuition and strength of preference for deliberation was calculated by determining the mean response (on the 5-point scale) across all items belonging to the respective subscale (Appendix A), with higher values indicating a stronger tendency to rely on the respective decision mode. There were thus 7 preference-for-intuition

[3] Note that this does not necessarily mean that automatic processes lead to the use of simple heuristics. Pachur and Aebi Forrer (2013) found that people who were diverted from thinking consciously about a decision problem were more likely to decide in line with a more complex, compensatory strategy than when they thought deliberately about the decision problem.

[4] Given that the intuition subscale contains more items than the deliberation subscale, asymmetries in reliability between the two scales might be expected. Below, however, we show that both subscales revealed similarly high levels of internal consistency.

Table 1
Cronbach's α for the domain-general version of the USID and the six domains of the domain-specific version.

Decision style	Domain-general	Domain					
		Mate choice	Clothing	Restaurants	Medical	Electronics	Vacation
Preference for intuition	.86	.85	.90	.89	.91	.91	.91
Preference for deliberation	.81	.84	.82	.77	.87	.80	.81

Table 2
Correlation between preference for intuition and preference for deliberation for the domain-general and domain-specific USID.

Domain-general	Domain					
	Mate choice	Clothing	Restaurants	Medical	Electronics	Vacation
–.05	–.14	**–.18**	–.09	.001	**–.18**	**–.30**

Note. Significant correlations ($p < .05$) are in bold.

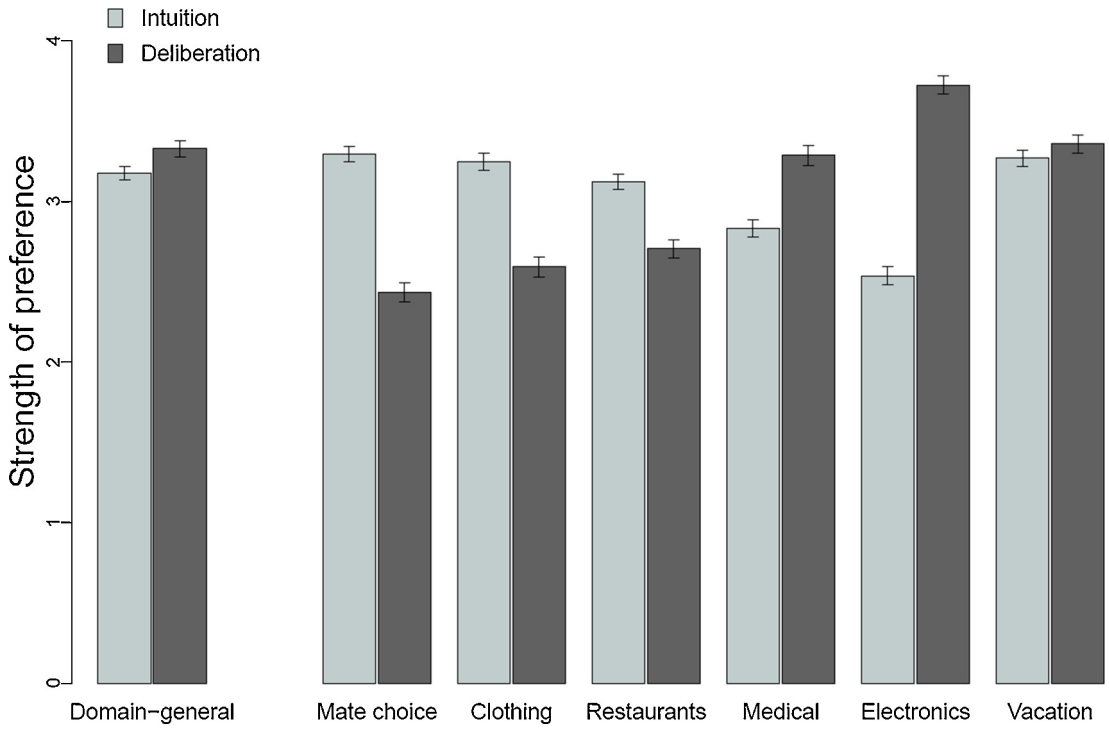

Fig. 1. Strength of preference for intuition and deliberation as measured by the domain-general and the domain-specific version of the USID. For the latter, the six domains are shown separately. Error bars indicate ± 1 standard error of the mean (corrected for the within-subjects design).

scores (1 domain-general, 6 domain-specific) and 7 preference-for-deliberation scores for each respondent.

Table 1 reports the internal consistency measure Cronbach's α (Cronbach, 1951) for the preference-for-intuition subscale and the preference-for-deliberation subscale, separately for the domain-general version of the USID and for the six domains of the domain-specific adaptation. All subscales showed high internal consistency (i.e., around or exceeding .80; Nunnally & Bernstein, 1994). From Table 2 it can be seen that, in line with previous findings (Betsch, 2004), preference for intuition and preference for deliberation were only weakly correlated. For the domain-general USID, the two scales were uncorrelated ($p = .53$); for the domain-specific USID, they were significantly negatively correlated in three of the six domains (clothing, electronics, and vacation, with $p = .03$, .03, and .001, respectively), but the correlations were rather low (ranging between $r = -.18$ and $-.30$), never accounting for more than 10% of the variance. The overall rather weak associations support the view (e.g., Evans & St, 2008) that preferences for intuition and deliberation are to some extent orthogonal; our results indicate that this also holds at the domain-specific level.

3.1. Domain-specific preferences for intuition and deliberation

Fig. 1 shows the mean strength of preference for intuition and the mean strength of preference for deliberation on the different scales. Whereas mean ratings for intuition and deliberation are about equally strong on the domain-general USID, the results of the domain-specific USID show a more complex pattern. Specifically, in the domains of mate choice, clothing, and restaurants, respondents expressed a stronger tendency to rely on intuition than on deliberation. In the medical and electronics domains, by contrast, the tendency to rely on deliberation was stronger. As an aside, male participants expressed a greater tendency to rely on deliberation than female participants, but this held only for the domain-specific USID[5].

[5] On the domain-specific USID male participants expressed a greater tendency to rely on deliberation than did female participants ($Ms = 3.20$ vs. 2.93), whereas there were no gender differences in the tendency to rely on intuition ($Ms = 3.07$ vs. 3.04). This pattern was corroborated statistically by a significant interaction

Table 3
Correlations between domain-general and domain-specific preferences for intuition, and intercorrelations among domain-specific preferences for intuition.

	Domain-general	Domain					
		Mate choice	Clothing	Restaurants	Medical	Electronics	Vacation
Domain-general	–	**.47**	**.44**	**.37**	**.31**	**.25**	**.46**
Mate choice		–	**.35**	**.26**	**.19**	.01	**.39**
Clothing			–	**.38**	**.34**	**.24**	**.40**
Restaurants				–	**.37**	**.28**	**.44**
Medical					–	**.42**	**.36**
Electronics						–	**.30**

Note. Significant correlations ($p < .05$) are in bold.

Table 4
Correlations between domain-general and domain-specific preferences for deliberation, and intercorrelations among domain-specific preferences for deliberation.

	Domain-general	Domain					
		Mate choice	Clothing	Restaurants	Doctor	Electronics	Vacation
Domain-general	–	**.58**	**.41**	**.40**	**.27**	**.27**	**.52**
Mate choice		–	**.39**	**.28**	**.25**	**.19**	**.44**
Clothing			–	**.37**	**.21**	**.29**	**.44**
Restaurants				–	**.40**	**.30**	**.38**
Medical					–	**.47**	**.30**
Electronics						–	**.26**

Note. Significant correlations ($p < .05$) are in bold.

Averaged across the six domains the strength of preference for intuition and for deliberation was virtually the same, *M*s = 3.06 vs. 3.07. As hypothesized, however, a 6 (domain) × 2 (decision style) repeated-measures ANOVA (both factors were within-subjects) on the responses to the domain-specific USID revealed a main effect of domain, $F(5, 141) = 32.15$, $p = .001$, $\eta^2 = .213$. This corroborates that there were domain-specific differences in people's preferences for intuition and deliberation. Finally, there was an interaction between decision style and domain, $F(5, 141) = 5.92$, $p = .001$, $\eta^2 = .17$, signaling that the differences in people's strength of preference for intuition and deliberation varied across domains.

Additional analyses showed that variability across the domains (using the average standard deviation across participants as a measure of variability) was substantial; in fact, it was somewhat larger than the variance across participants (averaged across domains), both for preference for intuition (average standard deviations = .70 vs. .60, respectively) and for preference for deliberation (average standard deviations = .84 vs. .80, respectively).

We next determined the intercorrelations (across respondents) of preference for intuition and deliberation between the domains, as well as the correlations between the domain-specific and the domain-general preferences. The results are shown in Table 3 (intuition) and Table 4 (deliberation). Some domain-specific decision styles (e.g., in the domains of mate choice and vacation) showed sizeable correlations with the domain-general decision style, both for intuition and deliberation. For other domains (e.g., medical and electronics), the correlation with the domain-general decision style was rather modest. These results underscore that a person's domain-general tendency to rely on intuition and deliberation does not necessarily generalize to his or her domain-specific decision styles.

The intercorrelations between the domains also suggest that a person's decision style in one domain can be relatively dissociated from her decision style in another domain. For instance, participants' tendencies to rely on intuition in the mate choice domain were uncorrelated with their tendencies to rely on intuition in the mate choice and electronics domains. Given the consistently high Cronbach's α of the scales (Table 1), the rather low (or nonexistent) intercorrelations are unlikely to be due to lack of reliability of the scales[6]. Rather, they seem to indicate genuine independencies in respondents' domain-specific inclination to rely on intuition and deliberation.

3.2. Expertise and domain-specific preferences for intuition and deliberation

As described above, several theoretical frameworks emphasize the importance of expertise for the successful operation of intuitive decision processes. People's tendency to use intuition to make decisions in a specific domain may therefore be correlated with the amount of expertise they have in that domain. In a first step, we examined respondents' ratings of their own expertise in each of the six domains. As shown in Table 5, self-rated expertise varied across domains, with people reporting the highest level of expertise in the vacation domain and the lowest level in the medical domain. The differences between the domains were corroborated by a repeated-measures ANOVA (with domain as a within-subjects factor) showing a main effect of domain, $F(5, 141) = 2.91$, $p = .016$, $\eta^2 = .093$[7].

between gender and decision style for the domain-specific USID (in a mixed effects ANOVA), $F(1, 145) = 4.17$, $p = .043$, $\eta^2 = .028$. The gender differences held similarly across the domains, as the three-way interaction between domain, decision style, and gender was not significant, $F(1, 145) = 1.44$, $p = .21$. For the domain-general USID, in contrast, the interaction between decision style and gender was not significant, $F(1, 145) = 0.95$, $p = .332$, indicating that neither preference for intuition (*M*s = 3.27 vs. 3.13) nor preference for deliberation (*M*s = 3.54 vs. 3.23) differed between the genders.

[6] Correlations between two variables can be corrected by considering the reliability of each. This can be done by applying the following correction formula (Cohen, Cohen, West, & Aiken, 2003): $\rho'_{XY} = \left(r_{XY} / \sqrt{r_{XX} r_{YY}}\right)$, where r_{XY} is the observed correlation between two variables and r_{XX} and r_{YY} represent the reliabilities of the two variables. Applying this approach to the intercorrelation between domain-specific preferences for intuition in the mate choice and vacation domains (and using Cronbach's α as an estimate of reliability; see Table 1), for instance, yields an estimate of $\rho' = .44$. This is only slightly higher than the original, "uncorrected" correlation of .39. In other words, the rather modest intercorrelations between the domain-specific preferences persist even when the reliabilities of the preference measures are taken into account.

[7] In addition, there was some indication that the pattern of differences was slightly different for male and female participants, $F(5, 141) = 2.16$, $p = .062$, $\eta^2 = .071$. For a

Table 5
Mean (and standard deviation) self-rated expertise in the six domains.

Domain					
Mate choice	Clothing	Restaurants	Medical	Electronics	Vacation
3.41 (1.02)	3.65 (.91)	3.47 (.90)	3.19 (1.11)	3.41 (1.09)	3.77 (.91)

Note. 1 = low expertise, 5 = high expertise.

Table 6
Correlations between strength of preference for decision style and amount of expertise, separately for intuition and deliberation.

	Domain					
Decision style	Mate choice	Clothing	Restaurants	Medical	Electronics	Vacation
Preference for intuition	**.40**	**.40**	**.44**	**.43**	**.30**	**.42**
Preference for deliberation	.06	.00	−.07	.13	**.20**	−.03

Note. Significant correlations ($p < .05$) are in bold.

Next, we examined the extent to which respondents' decision styles were associated with their self-rated expertise, separately for each domain. Table 6 shows that the strength of preference for intuition was indeed positively correlated with expertise in each of the six domains. No such correlation emerged for the strength of preference for deliberation.

Given the apparent association between expertise and individual preferences for intuition, differences in expertise across the domains may be one of the factors driving the domain-specific differences observed in decision style. To test this possibility, we determined for each participant the correlation (across domains) between the strength of preference for intuition and self-rated expertise in the respective domain (four participants who indicated the same level of expertise across all domains were not included in this analysis). The same analyses were run for strength of preference for deliberation. The average (individual *r*-to-*z*-to-*r* transformed) correlation for intuition was $r = .46$, $t(144) = 8.58$, $p = .001$ (one-sample *t*-test against zero, using the *z*-transformed individual *r*s); that for deliberation was $r = .05$, $t(144) = .98$, $p = .33$. Taken together, our findings indicate that a person's self-perceived proficiency in making good decisions in a domain is a key variable underlying variability in the strength of preference for intuition, both across participants and across domains.

4. Discussion

We proposed to extend the traditional domain-general approach to measuring individual differences in relying on intuition and deliberation by adopting a domain-specific perspective. Our thesis was informed by the observation that individual characteristics of decision making, such as risk attitude, are sometimes domain specific (Weber et al., 2002). Moreover, we noted that as intuition is commonly conceptualized as crucially feeding on experience, and as people's experience with making decisions is not invariant across domains, preferences for using intuition may differ in systematic ways between domains. Using a domain-specific version of the USID, we indeed found that individuals' decision styles vary considerably across everyday decision-making domains. Whereas people express a stronger tendency to rely on intuition than for deliberation in some domains, the opposite pattern can be observed in others. In addition, domain-general decision styles were only modestly correlated with domain-specific decision styles, and the strength of association between domains also varied. In some cases, it was barely possible to predict a person's decision style from one domain to another. It should be emphasized that we did not have a principled approach for distinguishing different domains, but primarily relied on a distinction between decision making domains that varied in importance and people's expertise. Other distinctions are of course possible and decision-style differences between them may be larger or smaller than observed in our study.

Given that previous research has adapted a domain-general approach to assess individual differences in preference for intuition and deliberation, our results suggest that the impact of decision styles on decision making may have been underestimated. To illustrate, Betsch and Kunz (2008) used the (domain-general) PID to relate individual differences on this measure to a specific decision task, namely pricing a consumer item (a coffee pot). Potentially, had they assessed people's decision-style preferences specifically for the consumer context, the effect of decisional fit would have been even more pronounced.

As mentioned in the introduction, there is increasing awareness that individual differences in cognitive style can play an important role in organizational behavior. For instance, it has been shown that whereas a deliberate, analytic decision style seems conducive to high performance in relatively stable industries (e.g., banking), a more intuitive decision style seems beneficial in dynamic industries (e.g., information technology; Khatri & Ng, 2000). Similarly, a misfit between a company's organizational structure and the manager's decision style has been shown to be associated with lower manager job satisfaction (Brigham et al., 2007). One important practical implication of our findings in this context is that it may be useful to develop instruments assessing applicants' (or employees') decision styles specifically for the organizational context, or ideally even tailored to the requirements of a position.

The finding that people vary in their tendencies to rely on a quick, affect-based decision mode and on a conscious, planning-based decision mode is consistent with the view that they have at their disposal a repertoire of different strategies whose use is linked to certain boundary conditions (e.g., Gigerenzer, Hertwig, & Pachur, 2011; Pachur & Bröder, 2013). That the variability in decision style is connected to variability in experience (or knowledge) gathered in the real world highlights that it may be instructive to intensify investigations on strategy selection in naturalistic settings—where this knowledge can actually be brought to bear (cf. Shanteau, in press). Interestingly, if – as has been proposed (e.g., Klein, 1998) – the successful operation of intuition depends on having developed expertise in the respective domain, people's tendency to express a weaker preference for intuition if they perceived themselves as less experienced in making decisions in a domain seems appropriate. In other words, people's tendency to rely on intuition may thus, to some extent, be adaptive.

list of the average domain-specific expertise ratings separately for male and female respondents, see Appendix B.

However, as we gauged decision expertise based on people's self-reports, we are not able to assess the quality of their decisions directly. Future studies could attempt to relate decision styles and decision expertise using more objective measures of a person's ability to make good decisions. Another interesting avenue for future research could be to test the link between intuition and expertise using a longitudinal approach. One prediction is that increasing familiarity with a decision domain should be associated with an increasing reliance on intuition.

What might be reasons for the observed differences between domains in reported expertise? As mentioned above, one important factor seems to be the frequency with which one makes decisions in the respective domain—and thus the opportunity to learn and to hone one's intuition. Frequency cannot be the only factor, however. For instance, in our pre-study (described above), participants indicated the highest frequencies of decisions in the domains of clothing and restaurants (average frequency of 45.1 and 36.1 times over the last two years, respectively) and the lowest frequencies in the vacation and medical domains (4.7 and 5.1, respectively). Average self-rated expertise in the clothing and restaurants domains was considerably higher than in the medical domain. However, respondents reported highest expertise in the vacation domain, despite having the lowest frequency. An additional determinant of perceived expertise may therefore be the amount of information people typically acquire before making a decision in the domain. For instance, they may invest considerably more search effort in deciding between vacation destinations (where poor decisions can be costly and are often irreversible) than in deciding between clothes or restaurants. Finally, another determinant could be the extent to which a domain provides the decision maker with "kind" experience (Hogarth, 2001)—that is, accurate and immediate feedback on the quality of a decision, which helps to improve decision making.

Given the link established between intuition and expertise, a closer examination of factors potentially contributing to variability in the preference for deliberation is also warranted in future research. Although decision styles are often explicitly distinguished from cognitive ability (e.g., Antonietti, 2003), this may hold only for the tendency to use intuition. Given the considerable cognitive requirements implied in common conceptualizations of deliberation (e.g., planning, goal analysis; Betsch & Iannello, 2010), it may be that individual differences in the tendency to use deliberation in fact correlate with measures of cognitive capacity (e.g., working memory).

5. Conclusion

Discussing the role of intuitive thinking in managerial decision making, Herbert Simon (1987) remarked:

> It is doubtful that we will find two types of managers (at least, of good managers), one of whom relies almost exclusively on intuition, the other on analytic techniques. More likely, we will find a continuum of decision-making styles involving an intimate combination of the two kinds of skill. We will likely also find that the nature of the problem to be solved will be a principal determinant of the mix. (p. 61)

Recent research on people's decision-style preferences supports the notion of a flexible interplay between intuition and deliberation. Moreover, our results confirm, as implied by Simon's statement, that there is substantial variability in how individual decision makers tend to solve a decision task across different types of problems; importantly, how the nature of the problem is perceived, and toward which decision style the decision maker leans, seems to depend on her proficiency for a specific decision problem.

Conflict of interest statement

The authors declare that they have no conflict of interest.

Appendix A.

Tables A1 and A2.

Table A1
The Unified Scale to Assess Individual Differences in Intuition and Deliberation (USID).

Items	Source
Preference for intuition	
Affective	
When I make a decision, it is more important for me to feel the decision is right than to have a rational reason for it	GDMS
When I make a decision, I trust my inner feeling and reactions	GDMS
With most decisions it makes sense to completely rely on your feelings	PID
I prefer drawing conclusions based on my feelings, my knowledge of human nature, and my experience of life	PID
Using my gut feelings usually works well for me in figuring out problems in my life	REI
I believe in trusting my hunches	REI
I hardly ever go wrong when I listen to my deepest gut feelings to find an answer	REI
I tend to use my heart as a guide for my actions	REI
Spontaneous	
I generally make snap decisions	GDMS
I make quick decisions	GDMS
I am often aware of how to decide even before I review all aspects	PMPI
I've had enough experience to just know what I need to do most of the time without trying to figure it out every time	PMPI
The right way to decide usually comes to mind almost immediately	PMPI
I typically figure out the way to decide swiftly	PMPI
I quickly do the right thing when deciding because I've often faced almost the same thing before	PMPI
I rarely need to mull things over; how to decide usually becomes quickly apparent	PMPI
Preference for deliberation	
Planning	
Developing a clear plan is very important to me	CoSI
I like detailed action plans	CoSI
I prefer well-prepared meetings with a clear agenda and strict time management†	CoSI
I make definite engagements, and I follow up meticulously†	CoSI
hen I make decisions, I proceed step-by-step	New
Before making decisions I usually think about the goals I want to achieve	PID
I prefer making detailed plans rather than leaving things to chance	PID
I usually have clear, explainable reasons for my decisions	REI
Knowing	
I want to have a full understanding of all problems†	CoSI
I like to analyze problems†	CoSI
I study every problem until I understand the underlying logic†	CoSI
I have no problem thinking things through carefully†	REI
I enjoy intellectual challenges†	REI
I enjoy solving problems that require hard thinking†	REI
I prefer complex problems to simple problems†	REI
I enjoy thinking in abstract terms†	REI

Note: The second column indicates the instrument from which the item was taken. GDMS = General Decision Making Style inventory (Scott & Bruce, 1995); PID = Preference for Intuition and Deliberation scale (Betsch, 2004), REI = Rational-Experiential Inventory (Pacini & Epstein, 1999); PMPI = Perceived Modes of Processing Inventory (Burns & D'Zurilla, 1999); CoSI = Cognitive Style Indicator (Cools & Van den Broeck, 2007).

† Item was not used in our study.

Table A2
A domain-specific version of the USID, as illustrated for the domain of choosing a vacation destination.

Items
Preference for intuition
When I make a decision among vacation destinations, it is more important for me to feel the decision is right than to have a rational reason for it
When I make a decision among vacation destinations, I trust my inner feeling and reactions
With most decisions among vacation destinations it makes sense to completely rely on your feelings
When choosing among vacation destinations, I prefer drawing conclusions based on my feelings, my knowledge of human nature, and my experience of life
Using my gut feelings usually works well for me in figuring out which vacation destination to choose
When choosing among vacation destinations I believe in trusting my hunches
When choosing among vacation destinations I hardly ever go wrong when I listen to my deepest gut feelings to find an answer
When choosing among vacation destinations I tend to use my heart as a guide for my actions
When choosing among vacation destinations, I make quick decisions
I am often aware of how to decide between vacation destinations even before I review all aspects
When choosing among vacation destinations I've had enough experience to just know what I need to do most of the time without trying to figure it out every time
The right way to decide among vacation destinations usually comes to mind almost immediately
I typically figure out the way to decide among vacation destinations swiftly
I quickly do the right thing when deciding among vacation destinations because I've often faced almost the same thing before
I rarely need to mull things over when choosing among vacation destinations; how to decide usually becomes quickly apparent
Preference for deliberation
When choosing among vacation destinations, developing a clear plan is very important to me
I like detailed action plans when deciding among vacation destinations
When I make decisions among vacation destinations, I proceed step-by-step
Before making decisions among vacation destinations I usually think about the goals I want to achieve
When choosing among vacation destinations I prefer making detailed plans rather than leaving things to chance
When choosing among vacation destinations I usually have clear, explainable reasons for my decisions

Appendix B.

Tables B1 and B2.

Table B1
Male and female preferences for intuition (I) and deliberation (D): average preference strength in each group.

			Domain											
Gender	$I_{general}$	$D_{general}$	I_{mate}	D_{mate}	I_{cloth}	D_{cloth}	I_{rest}	D_{rest}	I_{med}	D_{med}	$I_{electro}$	$D_{electro}$	I_{vac}	D_{vac}
Male	3.25	3.51	3.28	2.59	3.19	2.75	3.16	2.94	2.82	3.45	2.79	3.84	3.18	3.58
Female	3.13	3.23	3.32	2.37	3.28	2.52	3.10	2.59	2.84	3.21	2.42	3.65	3.31	3.24

Note. Mate = mate choice, cloth = clothing, rest = restaurants, med = medical, electro = electronics, vac = vacation.

Table B2
Male and female self-rated decision expertise in each of the six domains.

Gender	Domain					
	Mate choice	Clothing	Restaurant	Medical	Electronics	Vacation
Male	3.21	3.60	3.53	3.17	3.74	3.66
Female	3.50	3.68	3.46	3.24	3.26	3.83

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