Article

The Role of Positive Affect and Individual Differences in Intuition in the Accuracy of Pattern Recognition

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Abstract

Two studies examined the interaction of individual differences in intuitive processing style and induced positive affect in implicit pattern recognition in undergraduates. In Study 1 ($N = 187$), induced mood and intuition interacted to predict accuracy in pattern recognition using an implicit learning paradigm. Participants high in intuition in a positive mood were the most accurate. In Study 2 ($N = 90$), induced mood interacted with intuition to predict accurate reports of stimulus-reward contingencies in an operant conditioning paradigm. Intuition predicted accuracy in judgments of reward contingencies in the positive mood condition. This research suggests that individual differences in faith in intuition predict accurate implicit pattern recognition in the presence of positive affect.

Keywords

positive affect, reward learning, intuition, meaning, salience

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Although people often refer to "making sense" of experience, in practice, the sense of experience generally exists without effort (King, 2001). We live in a lawful physical world that exists independent of human interpretation. In this coherent world, humans can recognize patterns in the environment and do not have to "construct meaning." Recognizing the relevant patterns of existence, or objective truths of reality, is crucial for the survival of all animals (Geary, 2005). This process is quick and effortless, suggesting that it is not mediated through awareness (Bargh & Morsella, 2008). Events contrary to our previous experiences or expectancies might call for direct intentional reflection (i.e., sense making) but in the absence of such experiences, the detection of patterns should occur in a rapid, relatively effortless, and unconscious fashion (Heintzelman, Trent, & King, 2013; King & Hicks, 2009). The present studies extend previous research on the interplay of positive affect (PA) and individual differences in faith in intuition by examining their interaction in implicit pattern recognition.

Research on the sense that is derived from experience (or meaning making) is often posed in ways that do not speak directly to the potentially intuitive process of extracting meaning. Most relevant to the current studies, the meaning maintenance model (MMM) has focused on compensatory meaning reinstatement after threat or expectancy violation (Heine, Proulx, & Vohs, 2006). Within the MMM, meaning is defined as the "expected relationships or associations that human beings *construct and impose* on their worlds" (Heine et al., 2006, p. 90, emphasis added). For MMM, meaning is a construction, rather than an aspect of experience that is located in the external environment. In addition to MMM, Expectancy Violation Theory posits a similar role for the reinstatement of meaning after the violation of expectancies (Burgoon & Jones, 1976). According to this theory, an individual's expectations are violated when another person behaves in an unexpected manner. This violation activates a two-stage cognitive-affective process as the perceiver tries to make sense of the unexpected behavior (Burgoon, 1993). The violation can be perceived as positive or negative based on the characteristics of the violator and the circumstances of when the violation took place. Thus, whether the violation is positive or negative depends on the meaning assigned to this violation by the individual (Burgoon, Newton, Walther, & Baesler, 1989). Impressive research in support of these theories has shown that when circumstances do not make sense, individuals will reinstate meaning automatically. Such reinstatement (e.g., Proulx & Heine, 2009) occurs even when that threat is not consciously recognized (Proulx & Heine, 2008). For example, in one study, Proulx and Heine (2008) found that when an experimenter was replaced with a different experimenter outside of participants' awareness, participants were more likely to set a higher bond for a prostitute in a hypothetical court proceeding. Proulx and Heine reason that the perceptual anomaly of a different experimenter caused a threat to participants' meaning framework and that participants compensated by assigning meaning

in an alternative framework by punishing the individual who defied the rules of society.

This work supports the notion that meaning-relevant processes occur non-consciously but does not fully illuminate the variables that give rise to the extraction of sense or recognition of patterns in the absence of (or prior to) violations. More generally, one might ask, how do individuals detect pattern and meaning in the environment in the absence of threat or expectancy violation? Where does the sense of experience come from, in the absence of preexisting expectancies? How do we recognize patterns or meaningful associations that are present in novel experiences? The present studies examined performance on implicit learning tasks to explore these very questions. Before presenting the studies, we briefly review the rationale behind our prediction that individual differences in reliance on intuition will interact with induced PA to predict greater success at such tasks.

PA, Intuition, and the Detection of Sense

A large body of evidence shows that PA facilitates intuitive processing (e.g., Bodenhausen, 1993; Bodenhausen, Kramer, & Susser, 1994; Clore & Palmer, 2009; Ruder & Bless, 2003; Storbeck & Clore, 2005). If the recognition of patterns is, as we have argued, best characterized as an intuitive process, we might expect that PA should play a direct role in this process. We predict, instead, that the influence of PA on the recognition of patterns will be moderated by individual differences in intuitive processing style.

Individual differences in intuitive processing, or faith in intuition, refer to the extent to which the person characteristically relies on intuition and intuitive processing in making decisions (Epstein, Pacini, Denes-Raj, & Heier, 1996). Intuition refers to knowledge gained without the use of rational thought processes (e.g., Epstein & Pacini, 1999; Kahneman & Klein, 2009), is generally thought to occur outside of conscious awareness (Baumann & Kuhl, 2002), and is fast and effortless (Topolinski & Strack, 2009). Intuition is related to stereotypical thinking, superstitious beliefs, and the use of heuristics in problem solving (Epstein & Pacini, 1999). Heuristics are mental shortcuts used in decision making under conditions of uncertainty and include the availability, representativeness, and vividness heuristics, among others (Kahneman & Tversky, 1972; Tversky & Kahneman, 1973, 1974). According to Cognitive-Experiential Self-Theory, individuals high in dispositional faith intuition are more likely to use these heuristics when making decisions (Epstein, 1990). In their classic work, Kahneman and Tversky (1972) often referred to heuristics as intuitive processes (Tversky & Kahneman, 1983).

From a phenomenological perspective, intuition is experienced as gut feelings, hunches, or vibes (Epstein, 2008). These individual differences in faith in intuition are thought to exist on a continuum on which some people rely mostly on

intuitive processes, whereas others tend to rely on rational decision making. When faced with a major life decision, for example, an individual low on faith in intuition may rationally rate the pros and cons of each choice, whereas an individual high on faith in intuition may simply choose what "feels right."

Research has shown that the influence of PA on a wide range of outcomes, including paranormal beliefs and magical behaviors (King, Burton, Hicks, & Drigotas, 2007), referential thinking (King & Hicks, 2009), gender stereotypes (Trent & King, 2013), and feelings of meaning for various stimuli (Hicks, Cicero, Trent, Burton, & King, 2010), is moderated by faith in intuition. This research suggests that PA shifts the balance of processing over to intuition, allowing for this individual difference to guide judgments and behavior. For example, individual differences in faith in intuition have been shown to moderate the effects of PA on the accuracy of semantic coherence judgments (i.e., whether three words were related or unrelated to each other). Specifically, induced PA (vs. neutral mood) led to accuracy for these linguistic coherence judgments (Hicks et al., 2010, Study 3) only for individuals high on dispositional intuition (see also Huntsinger, 2011).

These results are provocative because they demonstrate that a well-established cognitive consequence of PA (accuracy in judgments of the overlap among weakly associated words; Baumann & Kuhl, 2002; Bolte, Goschke, & Kuhl, 2003) is moderated by faith in intuition. However, the broader conclusions about pattern recognition that can be drawn from this work are limited by the outcome used. PA has been shown to foster reliance on general knowledge structures (Schwarz, 2001), and the intuitive processing system may be viewed as a storehouse of such general knowledge (King et al., 2007). Thus, it is ambiguous whether individuals who were successful at these judgments would be especially likely to recognize pattern based not on the process of learning itself, but a lifetime of learning. Research that contrasts responses to stimuli that are known, a priori, to be meaningful or meaningless cannot tell us about the process of recognizing the novel invariances of experience. Thus, previous research has examined the role of PA and intuition in knowledge based on prior learning but has not answered the question of whether the same pattern exists when recognizing patterns in current experiences. The main contribution of the present studies over previous research is to examine the processes involved in the recognition of patterns, from incidental pattern learning and the co-occurrence of discriminative stimuli and reward opportunities.

Overview and Predictions

In the present studies, participants completed a measure of individual differences in faith in intuition and were randomly assigned to positive or neutral mood induction conditions. Study 1 examined implicit pattern learning, and Study 2 examined responses to relevant versus irrelevant characteristics of a

discriminative stimulus (DS) in an operant conditioning paradigm. We made the following hypotheses:

H1: In both studies, the effect of mood condition will be moderated by individual differences in intuition.

H2: Highly intuitive individuals in the positive mood condition will demonstrate superior pattern recognition compared to low intuitivism.

H3: People high in intuition in a positive mood would not mistakenly recognize pattern where it does not exist.

Study 1

In Study 1, participants completed an implicit pattern recognition task in which they copied strings of letters that conformed to artificial grammar rules. After the copying task, participants were asked to select stimuli that followed the same pattern as those represented in the copied stimuli. Previous research has found that participants rate more strings (correctly and incorrectly) as being pattern-congruent after threats to meaning (Proulx & Heine, 2009). If PA allows individuals high on intuition to recognize patterns in the process of implicit learning, they should correctly judge which strings conform to the same rules as in the copying portion of the task.

Method

Participants

Participants were 187 undergraduates (98 women) attending Texas A&M University who completed the study as partial completion of an introduction to psychology course requirement. Participants were recruited through an online subject pool management system. The study was approved by the Texas A&M Institutional Review Board, and all participants completed informed consent prior to participating. Median age was 19 years. Participants were 76.5% White, 6.4% African American, 4.8% Asian American, 0.5% Pacific Islander, 4.3% more than one race, and 7.5% other. Two participants, who did not complete the writing task, were excluded from the analyses.

Materials and Procedure

Faith in intuition. Participants completed five items from the faith in intuition subscale of the Rational Experiential Inventory (Epstein & Pacini, 1999),

rated on a scale from 1 (*not at all*) to 7 (*extremely much*; $M = 5.00$, $SD = 1.04$; $\alpha = .84$). The five items were identified in previous research as having the highest factor loadings (Epstein et al., 1996).

Mood manipulation

Participants were informed that they would complete a number of ostensibly unrelated tasks. For the first task, participants were randomly assigned to complete either a positive or neutral mood induction writing task. In the positive mood condition, participants wrote about their happiest life experience. In the neutral mood condition, participants wrote about their typical day. After the writing task, participants answered a few items related to the task to help ease suspicion. One of these items, "Overall, how do you feel right now," served as the mood manipulation check. This item was rated on a 1 (*very sad*) to 10 (*very happy*) scale ($M = 7.09$, $SD = 1.74$). Although it made it impossible to calculate internal reliability, we included only one item in the mood manipulation check to prevent participants from being suspicious about the nature of the manipulation.

Implicit learning task

Participants copied 45 letter strings (each consisting of six to nine letters; Dienes & Scott, 2005). Unbeknownst to participants, the letter strings conformed to a unique artificial grammar that dictated the order that each letter appeared in the string. Immediately after handing in the completed sheet, participants were informed that the letter strings in the prior task actually conformed to certain rules. They were then given a new sheet containing 60 letter strings (30 conformed to the same rules as the prior task and 30 did not). Participants were told to place an "X" next to each of the letter strings that followed the same rules as the letter strings they copied.

Results and Discussion

Preliminary Analyses

Examination of the means for faith in intuition suggested that random assignment was successful. The *M*s (*SD*) were 5.02 (1.00) and 4.99 (1.08) in the neutral and positive conditions, respectively, $t(185) = -0.225$, $p = .37$, $d = -0.03$. Participants in the positive mood condition ($M = 7.54$, $SD = 1.71$) were significantly happier than participants in the neutral mood condition ($M = 6.62$, $SD = 1.66$; $t(181) = 3.68$, $p < .01$, $d = 0.55$). Overall, participants were more likely to choose letter strings that conformed to the rules (correct hits,

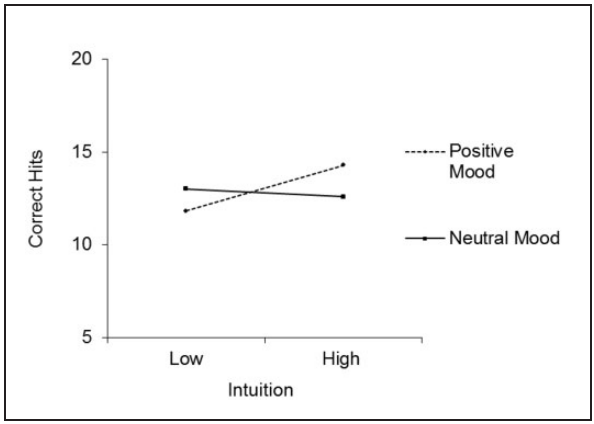

Figure 1. Identifying correct letter strings as a function of mood condition (positive vs. neutral) and intuition, Study 1.

$M = 12.92$, $SD = 5.00$, out of 30) compared to letter strings that did not (false alarms, $M = 5.21$, $SD = 4.02$, out of 30; $t(182) = 21.34$, $p < .001$, $d = 3.16$).

Positive Mood, Intuition, and the Identification of Correct Responses

First, we hypothesized that the effect of mood condition will be moderated by individual differences in intuition (H1). To test H1, mean-centered intuition scores and dummy-coded condition were entered in Step 1 of a hierarchical linear regression. The product of these terms was entered in Step 2 (Aiken & West, 1991). The main effects did not produce a significant change in R^2 ($p = .30$). The predicted interaction was significant (R^2 change $= .02$; $\beta = .21$, $p < .05$). Second, we hypothesized that highly intuitive individuals in the positive mood condition will demonstrate superior pattern recognition compared to low intuitivism (H2). As seen in Figure 1, intuition was positively associated with correctly identifying letter strings that conformed to the rules of the artificial grammar in the positive mood condition ($\beta = .26$, $p < .05$) but not in the neutral mood condition ($\beta = -.04$, $p = .70$). Third, we hypothesized that people high in intuition in a positive mood would not recognize pattern where it does not exist (H3). To test H3, a parallel analysis regressed false alarms on mood, intuition, and their interaction. Neither the main effects ($p = .79$) nor the interaction term ($p = .50$) produced a significant change in R^2.

The results of Study 1 support the prediction that the interaction of PA and intuition enhanced the accurate detection of pattern in an implicit learning context. These results differ from previous research using the same dependent variable in that they demonstrate accuracy rather than the overascription of pattern

and occurred in the absence of a provoking threat (cf., Proulx & Heine, 2009). One possible mechanism for these results is that ease of processing might have been experienced as a result of the feeling of familiarity with the patterns. Study 2 avoided this issue by employing a paradigm in which no such familiarity effects could emerge.

Study 2

Study 2 employed a version of the Salience Attribution Task (SAT; Roiser et al., 2009). The SAT involves an operant conditioning exercise in which speeded response is the rewarded behavior. A probe prompting a response is preceded by a discriminative stimulus (DS). This DS varies on two dimensions, its shape and color. In the SAT, only one stimulus dimension (color) is reliably associated with the likelihood of reward while the other (shape) is irrelevant. The dependent variable is the tendency to discriminate behaviors and subsequent reward estimates as a function of the reliable stimulus dimension. At the end of the session, participants were asked to estimate the percentage of times each of the DS was associated with reward. We predicted that within the positive mood condition, individual differences in faith in intuition would relate to increased accuracy of this estimate.

Method

Participants

Participants were 90 (49 women) undergraduates at the University of Missouri who participated as partial completion of an introduction to psychology course requirement. Participants were recruited from an online subject pool system. The study was approved by the University of Missouri Institutional Review Board, and all participants completed informed consent prior to participating. Median age was 20 years. Participants were 87.8% White, 4.4% African American, 2.2% Asian American, 3.3% Hispanic, and 2.2% other. These participants were not the same participants from Study 1.

Materials and Procedure

Participants completed the faith in intuition scale ($M = 4.99$, $SD = 1.06$; $\alpha = 89$) as described in Study 1 and the same mood manipulation (the writing task).

Salience attribution task

Participants completed a version of the SAT (Roiser et al., 2009) in private computer cubicles.[1] They were instructed to press the space bar as quickly as

possible after a probe (i.e., a black box) and that they would earn more points for quicker responses. On each trial, participants first saw a fixation point (i.e., a "+") for 1000 ms. Then, a DS was presented on both sides of the fixation point for a random interval (500–1500 ms). The DS varied along two dimensions: color (blue or red) and shape (cat or chair). Thus, DS included a red cat, a blue cat, a red chair, and a blue chair. After the DS, participants saw the probe (the black box) and pressed the spacebar as quickly as possible. After responding, participants were given feedback about whether they received points, and if so, how many. Then, their point-total was displayed for another 1500 ms. On rewarded trials, faster responses resulted in winning more points. Responding too early (i.e., before the probe) resulted in zero points, which prevented participants from continuously pressing the spacebar in an effort to respond very quickly.

Participants completed two blocks of 64 trials. In the first block, the color of the DS represented the likelihood of reward for responses to the probe while the shape of the DS was irrelevant. Regardless of shape, the red DS signaled available reward 75% of the time, and the blue signaled available reward 25% of the time. During the second block of 64 trials, all cues were equally likely to signal reward (50% of the time).

Upon completion of the SAT, participants were asked to estimate the percentage of trials each combination of DS dimensions (i.e., red cat, blue cat, red chair, blue chair) was associated with reward over the entire exercise.

Results and Discussion

Preliminary Analyses

Like Study 1, random assignment was successful. The *M*s (*SD*) for faith in intuition were 5.12 (1.03) and 4.89 (1.09) in the neutral and positive conditions, respectively, $t(89) = 1.17$, $p > .25$, $d = 0.25$. Participants in the positive mood condition ($M = 8.09$, $SD = 1.62$) were significantly happier than participants in the neutral mood condition ($M = 7.55$, $SD = 1.23$; $t(87) = -1.78$, $p < .04$, one-tailed, $d = 0.38$).

We aggregated the reward estimates for red and blue over the shapes. In general, participants learned the reliable associations between the DS colors and the likelihood of reward. For the red stimuli, $M = 57.90$, $SD = 21.97$ (actual probability = 68.75%) and for the blue stimuli, $M = 26.95$, $SD = 15.53$ (actual probability = 31.25%); $t(88) = 9.74$, $p < .001$, $d = 2.08$. One outlier was removed from all analyses. This participant had a studentized deleted residual of -2.89 (>2 is considered an outlier; Pedhazur, 1997). While the actual probability of rewarding red stimuli was 68.75% and the sample mean was 57.90%, this participant estimated it was rewarded just 1.5% of the time, which was the lowest in the sample. Similarly, this participant estimated the rate of blue stimuli

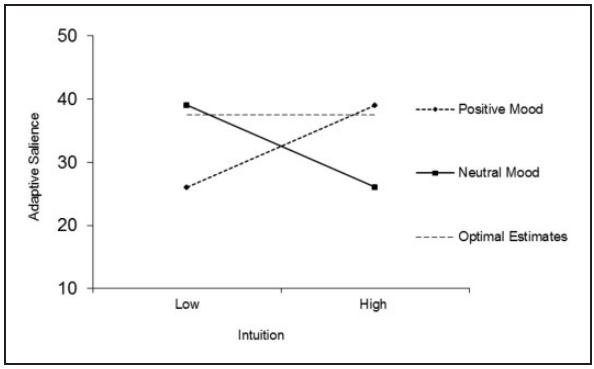

Figure 2. Differentiation between relevant discriminative stimulus dimensions in estimates of rewards, Study 2.

being rewarded at 3.5% when the actual probability was 31.25 % and sample mean was 26.95%. Thus, it is unlikely that this participant was paying attention during the task.

Reward Estimates

To examine the recognition of reward contingencies to the relevant DS dimension, following procedures used by Roiser et al. (2009), a difference score was computed between the red (higher reward) and blue DS (lower rewarded) estimates. This difference score was regressed on mood condition, intuition, and their interaction in a hierarchical regression equation. Because estimates for the red and blue DS were significantly negatively correlated ($r = -.25$, $p < .05$), we entered the centered blue estimates as a covariate (R^2 change $= .50$, $p = .000$; $\beta = -.72$, $p = .0000$). First, we hypothesized that the effect of mood on the estimate of the rate at which the stimuli were rewarded would be moderated by individual differences in intuition (H1). In the absence of main effects, the interaction step contributed significantly to the equation (R^2 change $= .04$, $p = .01$; $\beta = .29$, $p = .01$).[2] Second, we hypothesized that, in the positive mood condition, intuition would be positively related to reward estimates in the positive mood condition (H2). As shown in Figure 2, in the positive mood condition, intuition was related to accurate discrimination between the colors ($\beta = .22$). In the neutral mood condition, intuition was negatively related to such discrimination ($\beta = -.20$, both $ps = .048$).[3]

Study 2 results suggest that in the positive mood condition, faith in intuition was associated with the accurate recognition of regularity. Within the positive mood condition, intuitive individuals were more accurate in their judgments of the reward-relevance of the DS than were nonintuitive individuals in the positive

mood condition. Overall, these results are consistent with the findings of Study 1, which found that highly intuitive participants in a positive mood were more adept at recognizing patterns in the implicit learning task. Study 2 extended these results to explicit judgments of reward contingencies in an operant conditioning paradigm.

General Discussion

The present studies examined the role of PA and individual differences in intuitive processing in the detection of pattern in implicit learning and regularity in operant conditioning. As hypothesized, the effect of mood on pattern recognition was moderated by dispositional faith in intuition (H1). Results showed that dispositional intuition predicted accuracy in detecting the pattern in the implicit learning task and accuracy in explicit judgments of reward for people in a positive mood (H2). Moreover, the results suggest that highly intuitive people were not more likely to recognize patterns when they did not exist (H3). These studies provide convergent support that PA facilitates the recognition of patterns in people who rely on intuitive processing.

In previous work, researchers have found that highly intuitive people in a positive mood are more likely to attribute meaning to stimuli and are more likely to be accurate in these attributions when compared to objective criteria (Hicks et al., 2010). The current research extends the results of previous work in several ways. First, this is the first study to examine the role of PA and intuitive processing style in detecting the patterns that characterize novel experiences in an online learning task. In previous work, researchers found that intuitive individuals in a positive mood were the most accurate in detecting the meaning from stored knowledge of the associations between words. In the current study, we found that highly intuitive individuals were also the most adept at recognizing patterns from novel implicit learning experiences.

At first glance, the distinction between the online pattern recognition and the extraction of meaning from stored information may seem inconsequential. However, other areas of research draw distinctions between processes based on stored memory and processes based on the processing of novel information. For example, in the intellectual assessment literature, fluid and crystallized intelligence are thought to be distinct constructs (e.g., Cattell, 1971). Previous work in which participants draw on previously stored information may be analogous to their effectiveness in activating memories (i.e., crystallized intelligence) and identifying associations between these memories, while the current work examines the effectiveness of individuals learning and incorporating new information (i.e., fluid intelligence). In the learning and memory literature, researchers draw a distinction between short-term or working memory and long-term memory (see Cowan, 2008, for a review). The tasks in the current research require the primarily use of working memory processes, while previous research has focused

mainly on the use of long-term memory storage and activation. Thus, the finding in the current research that PA interacts with intuition to predict recognizing new patterns is a meaningful extension of previous work on this topic.

Another contribution of the present findings is that the current research examined the recognition of patterns in the absence of a threat or even preexisting expectancies. As mentioned, most previous research has viewed meaning or pattern recognition as something that is actively constructed or reinstated after an expectancy violation (Heine et al., 2006). In this research, we conceptualized pattern recognition as an aspect of experience, represented in the form of the objective values of the stimuli or invariances. The current research suggests that people high in intuition who are in a positive mood are especially adept at recognizing patterns in everyday experiences.

The recognition of patterns is a critical aspect of both cognitive psychology and mental imagery. Within cognitive psychology, recognizing patterns in the environment is necessary to process and understand visual stimuli. For example, pattern recognition is a crucial component of categorizing objects into groups (e.g., Reed, 1972). A long line of research suggests that individual differences (i.e., antecedents) affect people's ability to engage in mental imagery, which may have an important impact on cognitive ability (e.g., Kosslyn, Brunn, Cave, & Wallach, 1984). In the current research, the patterns are processed with dispositional faith in intuition as a background variable that affects the processing of visual stimuli. The outcome of this process (i.e., recognition of patterns) is a reaction to the way this visual information is processed. Faith in intuition, combined with PA, may improve mental imagery, which could lead to more accurate pattern recognition.

In Study 2, there was a cross-over interaction, shown in Figure 2, such that participants low in intuition in the neutral mood condition were roughly as accurate as intuitive individuals in the positive condition. Figure 2 suggests that PA and intuitive processing alone led to relatively poorer performance in terms of discerning the meaningfulness of the DS dimensions. Apparently, if one of these variables is present in the absence of the other, less than optimal discrimination may occur. PA has been shown to relate to making unusual associations (Isen, Johnson, Mertz, & Robinson, 1985), and intuition is related to deficits in latent inhibition (i.e., accurately disregarding irrelevant information; Kaufman, 2009). Thus, PA would appear to be especially important to pattern recognition for intuitive individuals.

The present studies suggest that the important task of recognizing patterns is, at least in part, a function of PA and intuitive processing. In two different implicit learning tasks, these variables interacted to predict greater success at accurately recognizing patterns and regularities from the world. These results suggest that understanding meaning and pattern recognition as they are present in the world may require paradigms beyond expectancy violation. Understanding the nuances of the elusive construct of meaning may require

attention to variables that not only serve the individual when the sense of the world is challenged but also those that play a role when sense is present.

Limitation and Future Directions

There are several limitations with the current research that should be considered. One potential limitation is that we interpreted the learning tasks in both studies to be implicit. However, it is possible that some of this learning took place on an explicit level. For example, in both tasks, participants could have been explicitly looking for patterns in the stimuli. In some research using the task in Study 1, researchers have asked participants if they noticed if the letter strings conformed to certain rules (Dienes & Scott, 2005). In future research, an explicit knowledge check could be included before participants decided which letter strings met the artificial grammar rules. Another potential limitation of the current research is that other factors beyond the tasks could have contributed to the pattern recognition in the studies. The major contribution of this study is that it extends previous work that has suggested people are more like to recognize patterns after threats to meaning like trauma or the existence of psychopathology. Given that many undergraduates are likely to have experienced psychopathology or trauma (Frazier et al., 2009), it is possible that participants could have been recognizing patterns as a reaction to these experiences. At the same time, there is no reason to suspect that the randomly assigned groups differed in their preexisting levels of trauma or psychopathology.

A key remaining question for future research is identifying the informational bases that undergird the performance of intuitive individuals in these tasks. On what are individuals basing their judgments (in both studies) and behaviors (in Study 2)? One potential explanation for the results of Study 1 is that the positive mood induction facilitated sensitivity to cues of ease of processing in highly intuitive individuals. Topolinski and Strack (2009) have proposed a model of accurate intuitive judgments of coherence that implicates ease of processing and facial musculature activity associated with PA in driving these judgments. Topolinski and Strack (2009) suggest that coherent stimuli are more easily processed than incoherent stimuli. This ease of processing is thought to be reflected in changes in core PA that inform intuitive judgments. Taking the results of Study 1 in conjunction with the results for semantic coherence judgments described previously (Hicks et al., 2010), might suggest that intuition, particularly when an individual is in a positive mood, reflects a heightened sensitivity to feelings of familiarity and the ease of processing this familiarity might engender. Such feelings of familiarity would seem less likely to play a role in the results for Study 2. In that study, meaningful (vs. meaningless) stimuli reliably signaled the likelihood of reward for a conditioned response. Nevertheless, learning the association between a DS and reward opportunities may likewise depend on the detection of visceral changes associated with the presence of reward.

Placing these results within the context of Topolinski and Strack's model of intuitive judgments suggests that future research might examine the role of visceral cues (particularly facial expressions suggestive of PA) as a potential factor in these effects. Monitoring facial expressions might provide clues as to the information that is providing guidance for these judgments. Following Topolinski and Strack, future research could examine the potential disruptive influence of posed facial expressions on performance in implicit learning tasks.

Declaration of Conflicting Interests

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Notes

1. The version used in this study differed in that we awarded participants points rather than money and set the reward contingencies to be more difficult to judge.
2. The predicted interaction between intuition and mood was also tested for reaction times in the SAT (H1). In the absence of a neutral control, we used rewarded trials for the nonrewarded blue stimuli as a covariate to control for individual differences in reaction time. Reaction times for the blue stimuli significantly predicted reaction times to the red DS (R^2 change = .48, $p = .000$) on the first step ($\beta = .69$, $p = .000$). Main effects, entered on the second step, did not predict reaction times to the red DS (R^2 change = .009, $p = .53$). The predicted interaction emerged on the final step (R^2 change = .032, $p = .029$; $\beta = -.27$, $p = .029$). Like in the explicit judgments, highly intuitive people in a positive mood had the fastest reaction times for the rewarded stimuli (H2).
3. To insure that the results in Figure 2 were driven by accuracy for the red stimulus estimates, we ran the same analysis for red reward estimates. There was a significant two-way interaction between mood and intuition for red reward estimates. A figure of this interaction looked essentially like the results in Figure 2.

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