



The evaluative connotation of processing fluency: Inherently positive or moderated by motivational context? ☆

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Abstract

A fundamental question for evaluation research is whether cues can impact evaluative responses directly or only in combination with contextual information. Focusing on the experience of processing fluency, the current work tested whether manipulating this cue's motivational context would moderate its evaluative impact. Because fluently processed stimuli can be assumed to communicate safety, owing to implicit signals of either familiarity (through processes monitoring perception–memory coordination), we reasoned that motivation to avoid negative events should heighten preferences for fluently processed stimuli. Following a motivation manipulation, prevention-focused, but not promotion-focused, participants preferred stimuli that they were able to process quickly (Experiment 2) and that were preceded by concordant primes (Experiment 1). These findings suggest that the value of fluent processing reflects its relation to contextual features, such as one's current motivational state.

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Understanding why one might feel good or bad about an object or person is among social psychology's fundamental aims (e.g., Allport, 1935). Investigations of emotion, motivation, and attitudes, for example, all attempt to explain how cues, such as external events or internal feelings, impact evaluation. An enduring issue is whether such cues impact evaluative responses directly or only in combination with other contextual information (e.g., James, 1884; Martin, Ward, Achee, & Wyer, 1993; Schachter & Singer, 1962; Zajonc, 1980). Evaluating relatively complex cues, such as a peer outperforming oneself, clearly would appear to require integrating a considerable amount of information. The question is whether some simple, basic external events or internal experiences can come to denote inherently positive or

negative valence. In this paper, we focus on processing fluency, a rudimentary experience of the ease with which perceptual inputs are processed. Drawing on predictions from regulatory focus theory (Higgins, 1998), we examine how the evaluative connotation of even such a basic and fundamental experience as this might vary as a function of one's motivational state.

The evaluative benefits of fluent processing

The finding that repeated exposure to a novel stimulus increases positive evaluations of the stimulus (Zajonc, 1968) has inspired much theorizing, such as that repeated exposure generates affectively neutral feelings of familiarity and processing fluency, which are interpreted according to whatever contextual cues are available (Bornstein & D'Agostino, 1994; Klinger & Greenwald, 1994; Mandler, Nakamura, & VanZandt, 1987), or that, without need for interpretation, experi-

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ences of processing fluency, which grow from repeated exposure to a stimulus, directly facilitate positive evaluations (Winkielman, Schwarz, & Fazendeiro, 2003).

In one test of these ideas, facilitating processing ease by preceding images with matching (rather than mismatching) contours increased positive but not negative ratings of the images (Winkielman & Cacioppo, 2001). Because affectively neutral activation based on familiarity or processing fluency should be equally likely to increase negative and positive ratings, this finding (as well as findings reported by Seamon, McKenna, & Binder, 1998) appears inconsistent with the view that subjective experiences of fluent processing are interpreted according to whatever task demands are present. Rather, the extant data appear more consistent with the possibility that, in an automatic manner not requiring any integration of further information, the experience of processing ease is experienced affectively positively (Winkielman et al., 2003).

A related possibility is that fluently processed stimuli and familiar stimuli both generate low levels of feature-mismatch detection during coordination of perception and memory (Smith, 2000). Thus, fluent processing could facilitate positive evaluations because low-level memory mechanisms' apparent detection of stimulus familiarity might generate positive evaluations, given the assumption that "positive affect is integral to the implicit feeling of familiarity" (Garcia-Marques & Mackie, 2000, p. 241). In this case, again in an automatic manner not requiring any integration of other information, the detection of familiarity could be assumed to generate affectively positive labels.

Returning to the broader issue of whether cues can impact evaluative responses singly or only in combination with other contextual information, then, research on processing fluency apparently suggests some agreement supporting the former possibility. Both the experience of processing fluency itself and the detection of familiarity, which fluent processing presumably signals, have been assumed to generate positive evaluations not dependent upon integrating contextual information.

Motivational context as moderator

However, an important further test of these ideas entails manipulating the context in which fluent processing occurs. Just as divergent attributional contexts facilitate divergent emotional responses to epinephrine injections (Schachter & Singer, 1962) and divergent stop-rule contexts facilitate divergent behavioral responses to mood inductions (Martin et al., 1993), divergent motivational contexts might facilitate divergent evaluative responses to processing fluency. If so, that would suggest that, rather than possessing an inherently positive evaluative meaning, processing fluency denotes positive

valence in conjunction with other pieces of information available in a particular context.

To understand how motivational context might moderate the impact of processing fluency on evaluation, it is useful to consider likely bases of the value of fluent processing. Familiar stimuli are presumed to be inherently positive in valence because repeatedly encountered objects usually are safer than never-before encountered objects (e.g., Zajonc, 2001), given that, "after all, these [familiar] objects have not killed you yet!" (Smith, 2000, p. 119). Safety, then, appears to be a principle virtue of familiarity. As alluded to above, moreover, various computational models of memory (Carpenter & Grossber, 1995; McClelland, McNaughton, & O'Reilly, 1995; Metcalfe, 1993; reviewed in Smith, 2000) would predict that fluent processing of a stimulus will generate low levels of memory-perception mismatch, which is a presumed marker of stimulus familiarity (Garcia-Marques & Mackie, 2000; Smith, 2000). Accordingly, processing fluency, by signaling familiarity (though rudimentary memory processes not necessarily generating explicitly self-reportable familiarity), also could derive value from safety.

The above considerations of the safety connotations of processing fluency might seem to attest to its inherently positive value. Another possibility, however, is that the value of such safety connotations varies greatly across motivational contexts. According to regulatory focus theory (Higgins, 1998), there is a fundamental distinction between motivational states oriented toward preventing threats to goal attainment versus promoting opportunities for goal attainment: A prevention focus, assumed to be rooted in basic needs for security, increases sensitivity to possible threats in one's environment, whereas a promotion focus, assumed to be rooted in basic needs for nurturance, increases sensitivity to possible benefits in one's environment. Supporting these predictions, the salience of safety-related versus eagerness-related cues varies as a function of one's situationally induced or chronically accessible regulatory focus (e.g., Freitas, Liberman, & Higgins, 2002; Shah, Higgins, & Friedman, 1998). In one experiment, for example, engagement in a safety-framed task (detecting "dangerous organic agents") was higher among (situationally induced) prevention-focused participants than promotion-focused participants (Freitas & Higgins, 2002). Such findings support the view that regulatory focus can be considered a motivational context impacting one's sensitivity to internal and external cues of vigilance and safety on the one hand versus eagerness and advancement on the other (Shah & Higgins, 2001).

Concerning a preference for the hypothesized safety connotations of processing fluency, then, regulatory focus theory clearly suggests that a larger effect should emerge for people oriented toward preventing negative events than for people oriented toward promoting positive

events. When oriented generally toward preventing negative events, one should be especially attentive to safety-relevant cues in one's environments, such as the safety hypothetically signaled by fluently processing a stimulus. When oriented generally toward promoting positive events, on the other hand, and therefore less concerned about negative events and so more interested in pursuing novel, risky, strategies (Friedman & Förster, 2001; Liberman, Idson, Camacho, & Higgins, 1999), one should value considerably less such hypothesized safety connotations.

In summary, we predicted that evaluative preferences for fluently processed stimuli would be greater among participants focused on avoiding negative outcomes than among participants focused on approaching positive outcomes. As described below, two experiments tested these predictions.

Experiment 1

This experiment directly replicated Winkielman and Cacioppo's (2001, Experiment 1; see also Reber, Winkielman, & Schwarz, 1998; Reber, Schwarz, & Winkielman, 2004) processing-fluency manipulation. This method entails preceding to-be-evaluated images with briefly presented matching or mismatching contour images.

However, we also manipulated participants' motivational states. We adapted a regulatory-focus manipulation shown previously to generate broad inclinations of either approach-oriented or avoidance-oriented motivational states (Freitas & Higgins, 2002). The manipulation entails assigning participants to generate approach-related strategies or avoidance-related strategies in identical content domains (such as strategies to avoid bad health versus to attain good health). In previous research, participants undergoing the approach version of this manipulation reported higher levels of task engagement when focused on an *ideal they hoped to attain*, whereas participants undergoing the avoidance version reported higher levels of enjoyment and interest when focused on a *responsibility they felt a sense of duty to attain* (Freitas & Higgins, 2002; Experiment 1). Using the same motivation manipulation, a subsequent study suggested that such feelings of interest and enjoyment grow from an experience of "feeling right" when meeting duties through a vigilant, prevention-focused motivational orientation and when attaining hopes through an eager, promotion-focused motivational orientation (Cesario, Grant, & Higgins, 2004; Experiments 3 and 4). In another example, these motivation manipulations also impacted motivational intensity, as indicated by persistence in a non-structured task (Higgins, Idson, Freitas, Spiegel, & Molden, 2003; see also Freitas, Liberman, Salovey, & Higgins, 2002, Experiment 4). By impacting such emotion- and motivation-relevant phenomena as enjoyment, interest, "feeling right," and per-

sistence, then, this manipulation appears to manipulate effectively the motivational states that participants experience.

In light of the above discussion of safety as a hypothesized source of the value of fluently processed stimuli, and given the above-reviewed evidence that safety-relevant cues are especially salient when people are oriented generally toward avoiding negative events, we anticipated that a preference for congruently primed images would be more pronounced among prevention-focused than promotion-focused participants.

Method

Participants

Fifty-five undergraduates participated in exchange for course credit.

Procedural overview

Informed that the experiment required switching back and forth between two tasks, all participants were told that one task (actually the motivation manipulation) entailed writing one-sentence strategies, whereas the other task entailed rating images of everyday objects. Participants initially completed the first part of either the promotion or prevention version of the motivation manipulation. Next, they rated either congruently or incongruently primed images, while intermittently returning to the motivation manipulation.

Motivation manipulation

Participants were assigned randomly to generate either "strategies for attaining life's successes in various ways" (in the promotion condition) or "strategies for avoiding life's failures in various ways" (in the prevention condition). Participants began by writing down three strategies for either "attaining good grades" (promotion condition) or "avoiding bad grades" (prevention condition). To maintain the motivation manipulation, at apparently random intervals during the evaluation phase of the experiment, participants were prompted to write six additional strategies, three pertaining either to "attaining good health," (in the approach condition) or to "avoiding bad health" (in the avoid condition), and three pertaining either to "attaining financial success" (in the approach condition) or to "avoiding financial failure" (in the avoidance condition). These strategies' contents (academics, health, and finances) were constant across conditions; only their motivational orientation (approach versus avoidance) varied. Participants wrote each strategy on provided paper and then pressed a key to continue the evaluation task.

Processing-fluency manipulation

This priming manipulation was adapted directly from Winkielman and Cacioppo (2001, Experiment 1).

Participants judged each of 20 (approximately 300×300 pixel) images of line drawings depicting everyday, affectively neutral objects (such as a shoe or a donkey; adapted from Snodgrass & Vanderwart, 1980), using the scale: 1 = “I don’t like it at all, 2 = “I don’t like it,” 3 = “I like it,” 4 = “I like it a lot.” To increase processing demands, and thus increase the effect of the processing-fluency manipulation, these images were altered by Winkielman and Cacioppo to induce a slight blurring of detail.¹ Each image was presented for 600 ms, immediately following a 16 ms presentation of a contour prime. Contour primes consisted of the same set of line drawings, further-degraded and absent interior detail. Half of the targets were preceded by matching primes, whereas half were preceded by mismatching primes, with counterbalancing, across participants, ensuring that all line drawings appeared equally often as primes and as targets. Following presentation of the target images, the computer paused 2 s before accepting valence judgments.²

Results

Data were analyzed in a 2 (Regulatory Focus: promotion vs. prevention) \times 2 (Prime: matching versus mismatching) ANOVA, with repeated measures on the last factor. Neither the motivation manipulation ($F < 0.10$, n.s.) nor the priming manipulation ($F[1, 52] = 1.94$, $p < .18$) yielded significant main effects. As illustrated in Fig. 1, the motivation \times prime interaction was significant, $F(1, 52) = 4.17$, $p < .05$. Among participants assigned to the avoidance condition, images preceded by congruent primes were rated more highly ($M = 2.86$) than were images preceded by incongruent primes ($M = 2.68$; $t[24] = 2.16$, $p < .05$, Cohen’s $d = .45$). In contrast, among participants assigned to the approach condition, there was no significant difference between ratings for congruently primed targets ($M = 2.79$) and incongruently primed targets ($M = 2.82$; $t < 0.05$, n.s.).

Discussion

Increasing the fluency with which target images were processed, by presenting matching rather than mismatching contour primes, increased positive evaluations of the images among prevention-focused but not promotion-focused participants. These effects do not appear likely to have resulted from unintended experimental

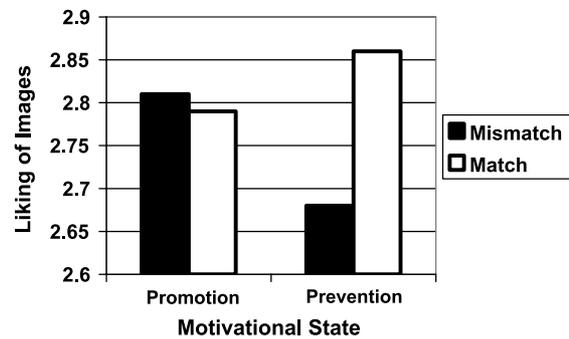


Fig. 1. Positive evaluations of images preceded by either matching or mismatching contour primes, among participants undergoing prevention-focused or promotion-focus motivation manipulation (Experiment 1).

effects on participants’ moods, given that we found no main effect of the motivation manipulation on overall liking of the images (as affective-priming models would have predicted; e.g., Forgas, 1995) and that, moreover, previous work has not found evidence of a main effect of this manipulation on mood (Cesario et al., 2004).

Experiment 2

If results from Experiment 1 reflect a fundamental quality of the general experience of processing fluency, rather than something specific to the contour-priming manipulation, then alternative methods should produce similar results. In Experiment 2, rather than manipulating conditions supporting processing fluency, we measured participants’ naturally occurring degree of ease of processing different stimuli. After manipulating participants’ motivational states in the same manner as in Experiment 1, we measured the amount of time needed to make evaluative judgments of images, by participants instructed to do so as rapidly as possible (unlike in Experiment 1, in which participants waited for a prompt before providing their responses). This design allows us to test, on a within-subjects basis, whether participants prefer those stimuli they are able to judge most quickly. Such an effect would be predicted by theories assuming that fluently processed stimuli are evaluated positively in a context-independent manner. Given our theorizing and findings from Experiment 1, however, we expected a preference for more quickly processed stimuli to be more pronounced among participants oriented generally toward avoiding negative events than among participants oriented generally toward approaching positive events.

Method

Participants

One hundred three undergraduates participated in exchange for course credit.

¹ We thank Piotr Winkielman for generously providing these images and the contour-prime images described below.

² Originally 6 s, this pause was included in Winkielman and Cacioppo’s original (2001) study to combat muscle artifacts while measuring physiological responses via facial electromyography (EMG). Such muscle artifacts are of no present concern; however, to hew closely to Winkielman and Cacioppo’s design, we maintained this pause but shortened it to 2 s.

Procedure

As in Experiment 1, participants switched back and forth between a motivation manipulation (identical to that used in Experiment 1) and an evaluation task. In the evaluation task, participants judged pictures of dogs, using the scale: 1 = “totally negative,” 2 = “negative,” 3 = “positive,” 4 = “totally positive.” To encourage participants to provide fast responses, they were instructed: “You need not give these judgments a lot of thought. Simply go with your instinct.” Throughout the remainder of the experiment, participants viewed 19 images,³ each a color photograph of a different, adult dog. To increase processing demands upon participants, and thus increase the salience of participants’ experiences of processing fluency, these images were altered to induce a slight blurring of detail (via the “texturizer” function in Microsoft Publisher software). Each (approximately 200 × 300 pixel) image was presented for 500 ms, after which participants immediately provided their valence judgments. The computer recorded the amount of time participants required to make these responses.

The primary analyses presented below are based on participants’ responses to a randomly ordered, single presentation of all of the images. To explore whether participants’ responses to additional presentations of the same stimuli would increase measurement reliability (e.g., Nunally & Bernstein, 1994), we presented each image three additional times, again in randomly varying orders. It is important to note that this design feature is intended only to explore potential increases in measurement reliability, not to gauge potential mere-exposure effects on evaluation, which much previous research suggests would not arise in this context. In a meta-analysis of 33 experiments that have employed the homogenous presentation strategy we used (i.e., repeatedly presenting the same stimuli without intermixing some new stimuli), Bornstein (1989) found that the effect of previous exposure on evaluation was near zero ($r = -.02$), whereas it was positive when presented in heterogeneous contexts ($r = .30$).

Results

Primary analyses

Individual response times above 3000 ms were replaced with the value of 3000 (treating these long reaction times instead as missing data does not alter the statistical significance of any reported results). Fewer than 3% of responses met this criterion.

Data were analyzed in a mixed linear models analysis (e.g., Bolger & Zuckerman, 1995; Bryk & Raudenbush,

1992; Kenny, Kashy, & Bolger, 1998), which can test simultaneously between-subject effects (i.e., whether the motivation manipulation would impact evaluative preferences), within-subjects effects (i.e., whether, on average, each participant’s evaluation of the 19 images would relate to his or her response times for the corresponding images), and mixed-model interaction effects (i.e., whether within-subject relations between processing time and evaluation would be different for those participants assigned to the prevention condition versus those assigned to the promotion motivation condition). Using the SAS program PROC MIXED (Littell, Milliken, Stroup, & Wolfinger, 1996), in a model predicting participants’ evaluations of each of the 19 images, participants’ response times for each of the 19 images were treated as a within-subjects factor and assignment to the promotion (coded 1) or prevention (coded 0) conditions were treated as a between-subjects factor. In the first step of our analysis, which examined only main effects, response-time was a significant predictor of evaluation ($b = -.00026$, $SE = .000047$, $t(1853) = 5.50$, $p < .001$), indicating that, on average, participants rated most positively those images which they responded most quickly. There was no main effect of assignment to the different regulatory-focus conditions ($t < 0.02$, n.s.). Next, while controlling for both main effects, the response-time × regulatory focus interaction was included in the model, yielding a significant, positive effect ($b = .000145$, $SE = .000047$, $t(1820) = 3.06$, $p < .005$), indicating that the relation between response-time and evaluative judgments was significantly more negative in the prevention condition than in the promotion condition. This interaction is illustrated in Fig. 2, which plots predicted evaluative judgments for individuals in the promotion and prevention conditions scoring 1 *SD* above and below the response-time mean.

Follow-up analyses showed that, among participants assigned to the prevention condition, the effect of response time on evaluative judgments was signifi-

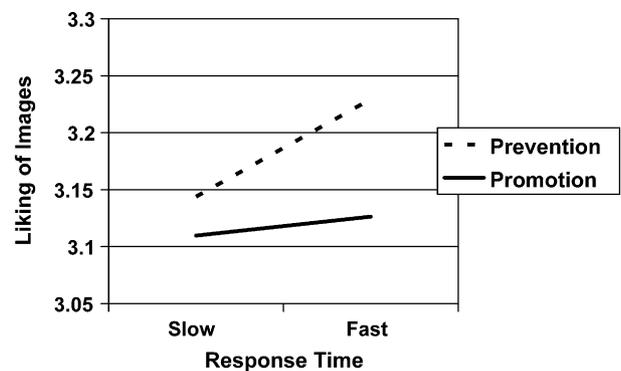


Fig. 2. Predicted values of positive evaluations of images for participants scoring 1 *SD* above and below the mean in time required to evaluate the images, among participants assigned to a prevention-focused or promotion-focus motivation manipulation (Experiment 2).

³ We intended to present 20 images, as was done in Experiment 1, but a computer-programming error permitted presentation of only 19 of them.

cantly negative ($b = -.00018$, $SE = .000034$, $t(916) = 5.28$, $p < .0001$). In contrast, among participants assigned to the promotion condition, the effect of response time on evaluative judgments was not statistically significant ($b = -.00003$, $SE = .000033$, $t(904) = 1.05$, $p > .29$).

Ancillary analysis: Do observed effects reflect qualities of the images themselves?

Although consistent with our predictions, it is possible that the above-reported, within-subject correlations between processing speed and evaluation reflect something specific about the images used, such as their differential ambiguity, rather than a more general experience of processing fluency.⁴ If some of the images were systematically more ambiguous than others, for instance, all participants may have responded more slowly to those particular images, and processing speed could then be considered a proxy for image ambiguity. To address this possibility, we re-computed all analyses controlling for average response times and ratings of the images. That is, across-subject average evaluations for each image were subtracted from each participant's rating of each image, and across-subject average response times for each image were subtracted from each participant's response time for each image. Based on these difference-score variables, within-subject correlations between evaluation and response time are independent of any effects of the particular images on group means in evaluation and response time. All that remains are participants' idiosyncratic response times, which we assume are a good measure of processing fluency, and their idiosyncratic evaluations of the stimuli, which we hypothesize to covary meaningfully with processing fluency. Following this procedure, all effects reported above remained statistically significant. The response-time \times motivation interaction again was significantly positive ($b = .000120$, $SE = .000045$, $t(1820) = 2.49$, $p < .02$), indicating, as before, that the relation between response-time and evaluative judgments was significantly more negative in the prevention condition ($b = -.00014$, $SE = .000032$, $t(916) = 4.28$, $p < .0001$) than in the promotion condition ($b = -.00003$, $SE = .000030$, $t(904) = 0.83$, $p > .40$).

Ancillary analysis: Gains in reliability through multiple assessments?

As mentioned above, we also gauged whether including three additional assessments of response times and evaluative ratings might improve measurement reliability. Analyzing participants' average evaluations (across four trials) and response times (across four trials) for each of the 19 images yields results indistinguishable

from those described above.⁵ However, whereas participants' four evaluative ratings of each image were highly reliable (average Chronbach's α across the 19 images = .93), their four response times were considerably less so (average Chronbach's α across the 19 images = .49). Moreover, participants responded most quickly to the final presentation ($M = 614$ ms), followed by the third ($M = 652$ ms), second ($M = 796$ ms), and initial presentation ($M = 1198$ ms) of the images, $F(3, 303) = 273.13$, $p < .0001$. The relatively low reliability of the response-times, coupled with evidence that participants responded much more quickly to the later presentations of the images than to the initial presentations, suggests that participants apparently were able to complete the later trials simply by retrieving their initial evaluations of each image. Accordingly, findings from the final three trials appear less relevant than findings from the first trial (highlighted in Fig. 2) to our aim of understanding how people's processing-fluency experiences impact their formation of evaluative judgments, given that participants' evaluative responses on those final trials appear to reflect the retrieval of already formed, stored judgments. Finally, consistent with Bornstein's (1989) aforementioned meta-analysis-based conclusion that boredom, rather than increased liking, grows from homogeneous re-presentation of stimuli (without presenting also some new stimuli), evaluative ratings were most positive on the initial presentation ($M = 3.11$), followed by the second ($M = 3.07$), third ($M = 3.06$), and fourth presentation ($M = 3.05$), $F(3, 303) = 7.53$, $p < .01$.

Discussion

Participants assigned to a prevention-focused manipulation expressed a preference for those images they were able to evaluate most quickly, whereas no such preference emerged among participants assigned to a promotion-focused manipulation. Moreover, the effects were not easily attributable to particular qualities of the images, such as differential ambiguity among them. These considerations further suggest that the experience of processing fluency appears most likely to facilitate

⁵ The response-time \times motivation interaction again was significantly positive ($b = .000328$, $SE = .000095$, $t(1852) = 3.47$, $p < .001$), with the relation between response-time and evaluative judgments again significantly more negative in the avoidance condition ($b = -.00043$, $SE = .000069$, $t(935) = 6.13$, $p < .001$) than in the approach condition ($b = -.00010$, $SE = .000064$, $t(917) = 1.55$, $p > .12$). Once again, controlling for across-subject average image ratings and response times did not affect the findings' statistical significance: The same response-time \times motivation interaction emerged ($b = .000261$, $SE = .000095$, $t(1852) = 2.95$, $p < .005$), with the relation between response-time and evaluative judgments again significantly more negative in the avoidance condition ($b = -.00033$, $SE = .000065$, $t(935) = 5.06$, $p < .001$) than in the approach condition ($b = -.00007$, $SE = .000060$, $t(917) = 1.16$, $p > .24$).

⁴ We thank an anonymous reviewer for this suggestion.

positive evaluation among participants in motivational states oriented avoiding negative outcomes.

General discussion

Understanding how perceptual and phenomenological information generates evaluative responses is critical to the psychology of evaluation. A core aspect of this understanding concerns whether affective cues facilitate evaluative responses directly or only in combination with other available pieces of information. This issue's centrality to explaining processes underlying evaluation, reflected, for example, in the constraints it places on emerging computational models of emotion (e.g., Prinz, 2002), has earned it enduring interest.

Focusing on the experience of processing fluency, the current work tested whether manipulating this cue's motivational context would moderate its evaluative impact. Two experiments tested these ideas. Across both, we manipulated participants' general motivational states by having them write a series of avoidance-oriented strategies or approach-oriented strategies that bore no relevance to the evaluation task. In Experiment 1, we found that prevention-focused participants, but not promotion-focused participants, rated congruently primed images more positively than incongruently primed images. In Experiment 2, we measured the time required for participants to evaluate different stimuli. A preference for quickly processed stimuli was more pronounced among prevention-focused than promotion-focused participants. These findings converge to suggest that the value of fluent processing reflects its relation to contextual features, such as one's current motivational state.

Underlying mechanism

As stated earlier, we assume, along with others (Smith, 2000; Zajonc, 2001), that a principal virtue of familiarity is its communication of safety. As reviewed above, moreover, processing fluency can be expected to generate low-level indicators of familiarity (e.g., Garcia-Marques & Mackie, 2000; Smith, 2000). Given these conceptual foundations for the possibility that processing fluency, through generating low-level indicators of familiarity, signals safety, we hypothesized that participants especially sensitive to safety cues would be especially likely to value the experience of processing fluency. Although strongly supporting this prediction of moderation by motivational context, the current studies did not directly examine the hypothesized mediating mechanism, the presumed safety connotations of processing fluency. It remains possible, then, that something else about the experience of processing fluency renders it especially valuable to people oriented generally toward avoiding negative outcomes.

Several alternative explanations appear unlikely, however. Because findings from Study 2 held when controlling for the images' across-subject average ratings, for example, it seems unlikely that aspects of the images themselves, such as their degree of ambiguity, differentially appealed to prevention-focused versus promotion-focused participants. Neither in Study 1 nor Study 2, moreover, did we find main effects of the motivation manipulation on overall evaluations of the images, which fails to support a possible alternative view that the motivation manipulations exerted their effects by impacting participants' overall moods. Finally, in a reanalysis of data from Study 2, we computed the average standard deviation each subject demonstrated in his or her evaluation of the 19 images, and we found no differences on this measure between participants assigned to the promotion condition (average $SD = .1603$) and those assigned to the prevention condition (average $SD = .1688$), $t = 0.70$, $p > .50$. This absence of a significant difference in the spread of participants' ratings of the different images fails to support a possible alternative explanation based on potential differences between promotion-focused and prevention-focused participants in overall sensitivity to perceptual cues.

Based on the conceptual analysis given above, as well as on the lack of empirical support for viable alternative explanations, then, we view the current data to provide tentative support for the hypothesis that increased sensitivity to safety-related contextual cues is the mechanism underlying prevention-focused participants' stronger preference for processing fluency. Only future empirical work can elucidate less tentatively this hypothesized mediating mechanism. However, the current findings, by providing the first evidence of which we are aware that manipulating a contextual variable can moderate the impact of processing fluency on evaluation, appears to represent a promising beginning.

Strong or weak case of contextual moderation?

As stated above, we assume that the experience of processing fluency has a direct impact on low-level indicators of familiarity, but we hypothesize that the safety connotations of familiarity are valued in relation to one's current motivational orientation. In theory, then, phenomenological experiences denoting safety sometimes could conflict with a current motivational orientation or goal, such as the aim of seeking out danger in order to demonstrate fearlessness (e.g., Victor, 2002). In those cases, following our perspective, experiences of processing fluency should be actively devalued. More commonly, however, it would seem that safety would be either valued or not especially important, but rarely in direct conflict with a current aim. In our studies, for example, we did not find evidence that the experience of processing fluency was actively devalued among

participants oriented toward approaching positive outcomes; instead, this experience appeared more highly valued in some motivational contexts (a prevention focus) than in others (a promotion focus).

Our approach, then, may appear closer to a “weak” contextual-moderation claim (i.e., that a cue’s valence is more extreme in some contexts than others) than to a “strong” contextual-moderation claim (i.e., that a cue’s valence reverses across contexts). This discussion, however, highlights a difference between our account and traditional accounts of the strong/weak contextual-moderation distinction. Following some definitions, “weak” contextual-moderation hypotheses posit that cues possess default evaluative meanings, but that those meanings can be overridden by contextual features (Martin & Whitaker, 2000). In contrast, our claim is that the experience of processing fluency takes on positive value when it supports one’s motivational priorities, which differs clearly from the idea that the experience of processing fluency already possesses a default positive value that is then overridden. Future empirical work would be needed to help distinguish these different accounts of underlying process.

Attributional and motivational contexts

While broadly consistent with other approaches emphasizing how affective cues may interact with contextual information to impact evaluative responses (e.g., Martin et al., 1993), the current approach differs from them in an important way. Most theories concerning the evaluative impact of contextual cues center on understanding attributions for phenomenological experiences. Martin and Whitaker (2000), for example, found, under certain conditions, that participants interpreted an experience of difficulty to have grown from an appropriately thorough review of facts underlying a tough choice. In that study, as well as in Lazarus’s (1991) and Schachter and Singer’s (1962) attributional analyses of emotions, the attribution of the cause of a subjective experience is presumed central to its evaluative impact. Our work, on the other hand, suggests that contextual moderation of evaluation does not always require that one first experience some internal cue and then try to interpret its cause. Rather, different motivational states may make entire classes of strategically distinct cues more or less salient. Cues denoting safety, for example, appear especially salient when one is motivated generally to avoid negative events. Accordingly, in the context of a particular motivational state, before even experiencing some internal cue, and thus before it is possible to make an attribution concerning the cue’s origins, one may be predisposed to attend to it. This emphasis on understanding how people interpret the *meaning* of an experience versus on how they attribute the *cause* of an experience accords with Schwarz’s (2004) recent work on meta-cognition. Differing from Schwarz’s focus on how interpretations of subjective experience can be driven by

naïve theories of emotional and cognitive processing, however, our work highlights how those interpretations can be moderated by the motivational contexts in which they occur.

Generality of findings

Finally, future work needs to test further the generality of our reported results. Of the many indicators of processing fluency, for instance, we examined only two, processing speed and compatibility in contour priming. Given Zajonc’s (2001) suggestion that a communication of safety may be the basis of repeated-exposure effects on evaluation, however, future work might profitably examine whether motivational contexts can moderate those effects as well. In another type of processing-fluency effect, much research has shown that people evaluate more positively composite stimuli averaged from many others (e.g., Rhodes, Halberstadt, & Brajkovich, 2001). As we have assumed to be true of the processing-fluency effects we have examined, coordination of perception and memory may be expected to generate rudimentary indicators of familiarity in that case as well. To the degree that perceiving faces depends on comparing newly encountered face exemplars to face prototypes represented in memory, for example, the process of perceiving composite face images abstracted from many others should generate fewer discrepancies from memory-based face prototypes, thus generating basic, rudimentary indicators of familiarity. Accordingly, given our reasoning that the safety connotations of familiarity should be especially salient when one is oriented toward avoiding negative outcomes, we would expect motivational context to moderate affective evaluation effects in that case as well. We look forward to future research testing such predictions.

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