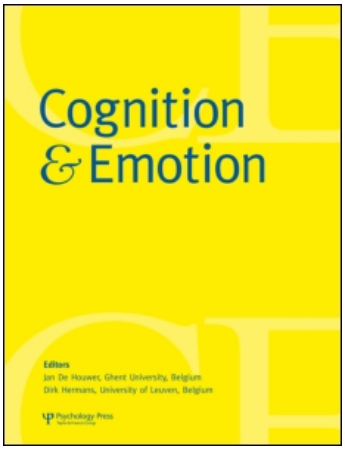

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Subliminal mere exposure and explicit and implicit positive affective responses

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BRIEF REPORT

Subliminal mere exposure and explicit and implicit positive affective responses

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Research suggests that repeated subliminal exposure to environmental stimuli enhances positive affective responses. To date, this research has primarily concentrated on the effects of repeated exposure on explicit measures of positive affect (PA). However, recent research suggests that repeated subliminal presentations may increase implicit PA as well. The present study tested this hypothesis. Participants were either subliminally primed with repeated presentations of the same stimuli or only exposed to each stimulus one time. Results confirmed predictions showing that repeated exposure to the same stimuli increased both explicit and implicit PA. Implications for the role of explicit and implicit PA in attitudinal judgements are discussed.

Keywords: Positive affective; Mere exposure; Subliminal priming; Implicit affect.

Repeated subliminal exposure to the same stimuli has been shown to increase self-reported positive affect (PA; Monahan, Murphy, & Zajonc, 2000). This mood elevation, in turn, has been suggested to account for traditional mere exposure effects. When an unconscious event (i.e., subliminal repeated exposures) increases mood, that mood is unconsciously attributed to a target of evaluation, enhancing the likeability of the target (Zajonc, 2000). Mere exposure influences explicit PA (Monahan et al., 2000), but there is good reason to suspect it might influence implicit affect as well. For example, research using facial electromyography has shown that familiarity is associated with immediate subtle changes in facial musculature activity suggestive of a more subtle form of PA (Harmon-Jones & Allen, 2001; Winkielman & Cacioppo, 2001). Although it has been suggested that repeated stimuli may increase implicit PA (Winkielman & Berridge, 2004), there have not been any empirical findings to directly support this argument.

Recent research, using a new self-report-based measure of implicit affect, has shown that

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implicit and explicit affect differentially predict thought, behaviour, and endocrine response (Quirin, Kazén, & Kuhl, 2009a; Quirin, Kazén, Rohrmann, & Kuhl, 2009b). The present study examined the possibility that subliminal repeated exposure to stimuli, indeed, increases not only explicit but also implicit self-reported PA. We predicted that, controlling for explicit PA, participants who were repeatedly exposed to stimuli would show higher levels of implicit PA.

METHOD

Participants

One hundred ten undergraduates participated for partial fulfilment of a research requirement in introductory psychology.

Procedures

Participants were instructed that a white slide would be briefly presented in the middle of the computer screen, each slide would be filled with either small black circles or small black ovals, and their task was to respond as quickly as possible by pressing the "Z" key if they believed circles were on the slide or the "/" key if they believed ovals were on the slide. Unbeknown to participants, each slide was preceded for 5 ms by a Chinese ideograph. In the experimental condition, 5 Chinese ideographs were presented in random order five times each (following Monahan et al., 2000). In the control condition, 25 different Chinese ideographs were presented in random order. The Chinese ideographs were immediately masked by a response trial for 100 ms. After each response a "+" sign appeared in the middle of the screen for 1 s to indicate that the next trial was about to start.

After priming, participants completed measures of implicit and explicit PA. A modified version of the Implicit Positive and Negative Affect Test (IPANAT; Quirin et al., 2009a) was used to assess implicit PA. For this IPANAT, participants are instructed to rate words, purportedly from an artificial language, on how well the words are associated with different moods. In this study, participants rated 6 different mood adjectives on how well they were represented by 6 different artificial words (SAFME, VIKES, TUNBA, TALEP, and BELNI). The positive mood adjectives included "happy", "cheerful", and "pleased" ($M = 2.10$, $SD = 0.44$, $\alpha = .87$). All adjectives were rated on a 1 (*Doesn't fit at all*) to 4 (*Fits very well*) scale.

As a measure of explicit PA, participants then rated how much they were experiencing three positive mood adjectives ("happy", "joy", "pleased") "right now", on a 1 (*Not at all*) to 7 (*Extremely much*) scale ($M = 4.03$, $SD = 1.22$, $\alpha = .81$; based on Diener & Emmons, 1984; Diener, Smith, & Fujita, 1995).

Finally, participants were debriefed and probed for suspicion. No one reported seeing the ideographs, or expressed suspicion about the purpose of the study.

RESULTS

Explicit and implicit PA were only marginally correlated ($r = .17$, $p = .07$). Replicating previous research (Monahan et al., 2000), participants in the experimental condition reported higher explicit PA ($M = 4.32$, $SD = 1.08$) compared to controls ($M = 3.75$, $SD = 1.30$); $t(108) = -2.50$, $p < .05$; $d = 0.49$. In addition, participants in the experimental condition were higher on implicit PA ($M = 2.20$, $SD = 0.43$) compared to controls ($M = 2.00$, $SD = 0.43$); $t(108) = -2.51$, $p < .05$; $d = 0.48$.

Analyses of covariance (ANCOVAs) were conducted to ensure that the effects of exposure on implicit and explicit PA were not driven by changes in the other PA measure. Results paralleled those of the *t*-tests. Controlling for implicit PA, the main effect of the priming condition on explicit PA remained significant, $F(1, 107) = 4.52$, $p < .05$; $\eta_p^2 = .041$. Similarly, controlling for explicit PA, the main effect of priming on implicit PA remained significant, $F(1, 107) = 4.61$, $p < .05$; $\eta_p^2 = .041$.

DISCUSSION

Repeated subliminal exposures uniquely influenced both explicit and implicit PA. Even after controlling for explicit PA, individuals who were repeatedly exposed to the same Chinese ideographs showed enhanced implicit PA. These results support the notion that exposure to unconscious stimuli independently influences explicit and implicit affective responses.

As previously mentioned, PA elicited by repeated exposure is believed to colour a variety of subsequent evaluations (Schwarz & Clore, 1996). For example, Monahan et al. (2000) demonstrated that repeated exposure to Chinese ideographs increases likeability ratings for those stimuli *and* for similar (pictures of new ideographs) and novel (pictures of polygons) visual stimuli. The current findings further highlight the robustness of this type of affect-transfer effect: repeatedly exposed stimuli even bias evaluations of targets from different modalities (i.e., nonsense words) than the primed stimuli (i.e., nonsense pictures).

It is important to note, however, that repeated exposure had a relatively independent effect on the explicit and implicit mood ratings (e.g., explicit mood did not mediate the relationship between repeated exposure and implicit mood). As such, future studies should clarify the mechanisms that contribute to each type of mood rating. Although the current findings tentatively suggest repetition may trigger both conscious and unconscious affective responses, future research needs to assess multiple implicit measures to substantiate this possibility.

Furthermore, research should examine whether explicit and implicit affect independently (or converge to) influence different types of subsequent evaluations. For example, it is possible that explicit mood underlies diffuse affect-transfer effects such as when repetition leads to enhanced likeability of *new* stimuli (Monahan et al., 2000). This possibility suggests that mood attribution cues would effectively attenuate the contribution of explicit mood on these types of judgements. However, *previously* viewed stimuli might elicit a more automatic, fluency-triggered positive response best captured by implicit PA measures. If this type of affective change occurs without awareness, mood-attribution cues should not eliminate the effects of the primes on the likeability of stimuli (e.g., Winkielman, Zajonc, & Schwarz, 1997). This would suggest that implicit mood may account for the residual effects of mere exposure on likeability of primed targets. Explicit attributional cues would, presumably, not influence implicit PA. It is important to assess both explicit and implicit affect to better understand the influence of affective responses on cognitive and behavioural processes.

In a related vein, Topolinski and Strack (2008, 2009, in press-a, in press-b) recently introduced a fluency-affect model of intuitive judgements. This model focuses on processing ease and subtle indicators of PA as important links in the chain of intuitive judgements. From this perspective, fluid processing (such as that caused by repeated subliminal presentations) leads to subtle, positive changes in core affect (i.e., affect that is diffuse, automatic, and relatively "free floating;" Russell, 2003; Topolinski & Strack, 2009). This fluency-triggered affect is believed to lead the types of "gut feeling" that influence intuitive judgements (e.g., Reber, Wurtz, & Zimmerman, 2004; Topolinski & Strack, 2009; Wurtz, Reber, & Zimmerman, 2008). The present results suggest that the IPANAT may be a viable way to assess such subtle affective changes.

Overall, these findings further illustrate the power of subliminal repeated exposure on affect. Upon reflection, it should not be surprising that subliminal exposure would influence implicit PA. Perhaps more surprising is the robust effect of such priming on explicit mood. Measuring affect on a variety of levels (implicit, explicit, and psychophysiological) will allow us to more effectively track the range of mere exposure effects.

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