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Attentional rubbernecking: Cognitive control and personality in emotion-induced blindness

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Emotional stimuli often attract attention, but at what cost to the processing of other stimuli? Given the potential costs, to what degree can people override emotion-based attentional biases? In Experiment 1, participants searched for a single target within a rapid serial visual presentation of pictures; an irrelevant, emotionally negative or neutral picture preceded the target by either two or eight items. At the shorter lag, negative pictures spontaneously induced greater deficits in target processing than neutral pictures did. Thus, attentional biases to emotional information induced a temporary inability to process stimuli that people actively sought. Experiment 2 revealed that participants could reduce this effect through attentional strategy, but that the extent of this reduction was related to their level of the personality trait *harm avoidance*. Participants lower in harm avoidance were able to reduce emotion-induced blindness under conditions designed to facilitate the ignoring of the emotional stimuli. Those higher in harm avoidance were unable to do so.

People seem prone to attend to emotional information even when it is task irrelevant (e.g., Vuilleumier, Armony, Driver, & Dolan, 2001). For example, in real life, highway drivers often slow down to view accidents on the side of the road, thus inspiring the term "rubbernecking." In the laboratory, most studies use response time measures to infer the degree of emotional facilitation or interference (Fox, Russo, Bowles, & Dutton, 2001; MacLeod, Mathews, & Tata, 1986; Öhman, Flykt, & Esteves, 2001; Pratto & John, 1991), but the consequences of selective attention can extend far beyond response time effects. Whereas attended items typically are processed fast and accurately, unattended stimuli often go unnoticed even when passing before one's eyes (Chun & Marois, 2002; Mack & Rock, 1998; Most, Scholl, Clifford, & Simons, 2005; Most et al., 2001).

We investigated whether preferential attention to task-irrelevant emotional pictures would induce temporary visual processing impairments even for targets that people actively searched for, as well as the degree to which people could strategically override such impairments. We used a rapid serial visual presentation (RSVP) in which stimuli were presented sequentially and quickly (100 msec/item). When people look for two targets within an RSVP stream, an *attentional blink* (AB) often occurs: If the second target (T2) occurs too soon after the first target (T1), attention to and detection of T1 often impairs detection of T2 (Chun & Potter, 1995; Raymond, Shapiro, & Arnell, 1992). Recent evidence has demonstrated that an AB can occur even when people search for a single target. For example, unexpected oddball items or irrelevant distractors semantically or visually similar to a target can capture attention, thereby inducing spontaneous blindness for the target (Barnard, Scott, Taylor, & Knightly, 2004; Folk, Leber, & Egeth, 2002; Marois, Todd, & Gilbert, 2003; Pashler & Shiu, 1999).

Emotional stimuli within an RSVP stream might also elicit a spontaneous AB even when task irrelevant. Indeed, rapidly presented emotional pictures tend to elicit electrophysiological indexes of preferential processing (Schupp, Junghöfer, Weike, & Hamm, 2004), and emotional words tend to be noticed even during the typical AB time window following T1 (Anderson & Phelps, 2001). Furthermore, studies reported concurrently with the present one suggest that irrelevant emotional words within an RSVP stream can cause mild deficits for processing of nonemotional targets, although they have not considered whether such effects occur automatically or whether they can be controlled by the observer (Arnell, Killman, & Fijavz, 2004; Barnard, Ramponi, Battye, & Mackintosh, 2005).

In two experiments, we instructed participants to look for a single rotated landscape or architectural photo within an RSVP stream of upright landscape/architectural photos, and an emotionally negative or a neutral picture pre-

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ceded the target. In Experiment 1, we predicted that negative pictures would produce greater impairments in target processing than neutral pictures would. Furthermore, because trait anxiety appears linked to emotion-based attentional biases (Mathews & Mackintosh, 1998; McNally, 1996), we predicted that individual differences related to trait anxiety would modulate the magnitude of this effect. In Experiment 2, we investigated whether people could voluntarily suppress such emotion-induced impairments and, if so, whether such cognitive control might also be modulated by personality.

EXPERIMENT 1

Method

Participants. Three hundred seventy-two students in an introductory psychology study pool completed the harm avoidance component of the Tridimensional Personality Questionnaire (Cloninger, Przybeck, & Svrakic, 1991), developed to tap into potentially heritable, stable personality traits related to the intensity of responses to aversive stimuli. Low harm avoidance scores tend to be associated with carefree and confident temperaments, risk-taking behaviors, and quick recovery from stress, whereas high scores tend to be associated with anxious and tense temperaments, risk-avoiding behavior, and slow recovery from stress. Scores can range from 0 to 34. The mean score was 14.4 ($SD = 6.5$). Those scoring in the top and bottom quartiles were contacted for participation. Participants were 11 high scorers (5 males, 6 females; $M = 25.8$, $SD = 2.8$) and 10 low scorers (5 males, 5 females; $M = 3.4$, $SD = 2.3$).

Materials and Procedure. Stimuli were color photographs—56 emotionally negative, 56 neutral, 56 scrambled negative, 252 upright landscape/architectural, and 84 target (42 landscape/architectural photos rotated 90º to the left or right)—presented on an 85-Hz CRT monitor and measuring 15.2 cm wide × 11.4 cm high. Emotional and neutral pictures were drawn mostly from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2001; see the Appendix) and were supplemented by similar pictures drawn from publicly available sources. Negative pictures were of people or animals and included graphic images of violence, distress, and medical trauma. The neutral pictures were balanced with the negative pictures for numbers of depictions of people and animals. Scrambled versions of the negative pictures served as controls, ensuring that behavioral differences elicited by the negative and neutral conditions were due to emotionality of the pictures rather than low-level visual features such as color. Scrambled-negative pictures were created by dividing each negative picture into an 8 × 6 grid and randomly reordering the segments. Compensating for the fact that this scrambling introduced artificial junctions of features, all experiment stimuli—including target, nontarget, and distractor items—appeared with 1-pixel lines at the sites where the segment junctions occurred in the scrambled pictures.

Trials consisted of an RSVP stream of 17 images, each presented for 100 msec (see Figure 1). Except for two images, all were upright landscape/architectural photographs. Depending on the trial, the 4th, 6th, or 8th stimulus was the critical distractor—a neutral, negative, or scrambled-negative picture. In addition, each trial also included a target: a landscape/architectural photo rotated 90º to the left or right, which appeared either two or eight items after the critical distractor (lag 2 and lag 8, respectively).

The participants began with a 16-trial practice session that included no critical distractors or pictures from the actual experiment. Next, to ensure fully informed consent, the participants were shown samples of each type of critical distractor. Instructions emphasized that the rotated target would always be a landscape/architectural photo and that the participants should ignore all pictures of people or animals. The computer randomized the order of the trials, as well as which pictures were paired with which lag. The participants took part in six blocks of 28 trials each. At the end of each trial, the participants pressed either a left-arrow key or a right-arrow key to indicate which way the target had been rotated.

After completing all 168 trials, the participants rated each negative and neutral picture for valence (from 1, *very negative*, to 9, *very*

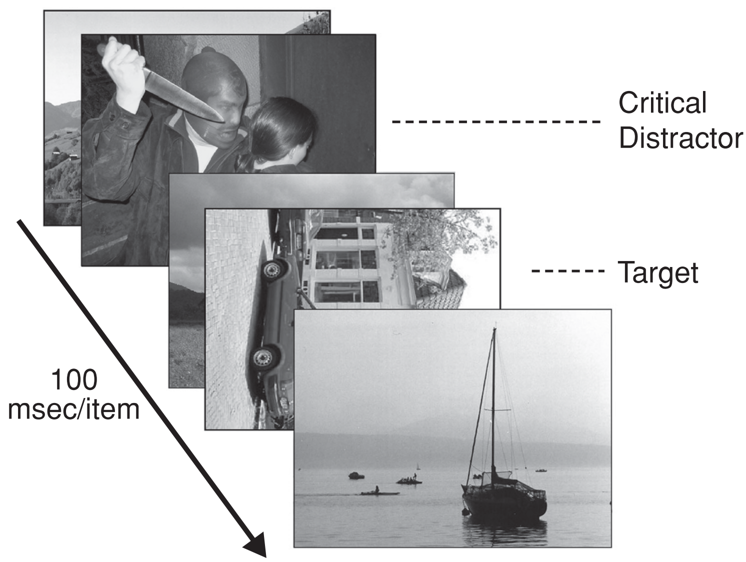

Figure 1. Example of part of an RSVP trial. Here, the critical distractor is a negative picture and appears two items before the rotated target. Note that all pictures were presented with 1-pixel lines at the locations where segment junctions would be in the scrambled-negative pictures. These lines are not included in this figure for the sake of clarity.

positive) and arousal (from 1, *unstimulating*, to 9, *very stimulating*). This phase was included to verify that participants found the negative set of pictures more emotional than the neutral set and to explore whether differences in subjective ratings could predict performance in the negative and neutral conditions. The pictures appeared in random order. Each picture was presented for 1 sec, after which participants rated its valence, and then again for 1 sec, after which participants rated arousal. Finally, an additional 16 positive pictures were presented and rated in the same way in order to diminish aftertastes left by the negative images.

Results

Participants were significantly worse at detecting a sole target in an RSVP stream when an emotionally negative picture, rather than a neutral or scrambled-negative picture, preceded it (see Figure 2). The valence $\times$ lag interaction was significant [$F(2,40) = 16.38, p < .001$]. At lag 2, mean accuracies depended on the valence of the critical distractor (negative, $M = 71\%$, $SD = 14\%$; neutral, $M = 85\%$, $SD = 9\%$; scrambled-negative, $M = 91\%$, $SD = 6\%$).[1] However, at lag 8, participants' mean accuracies were comparable in all conditions (negative, $M = 91\%$, $SD = 6\%$; neutral, $M = 93\%$, $SD = 4\%$; scrambled-negative, $M = 94\%$, $SD = 5\%$). Within the negative and neutral conditions—but not the scrambled-negative condition—two-tailed t tests revealed that accuracy was significantly worse at lag 2 than at lag 8, indicative of a spontaneously induced AB that recovered once the target was temporally more separated from the critical distractor [negative, $t(20) = 6.56, p < .001$; neutral, $t(20) = 4.81, p < .001$; scrambled-negative, $t(20) = 1.68, p = .109$]. An independent within-subjects ANOVA revealed that by lag 8, there were no significant differences due to valence [$F(2,40) = 2.24, p = .120$]. Therefore, we operationalized *emotion-induced blindness* as the difference in accuracy between the neutral and negative conditions at lag 2.[2] All subsequent analyses reflect data from lag 2.

To explore whether effects of valence might diminish once the emotional pictures were no longer surprising, we included an examination of whether such effects differed between the first and second halves of the experiment. A 2 (valence: negative vs. neutral) $\times$ 2 (half: first vs. second half of experiment) $\times$ 2 (harm avoidance: high vs. low score) ANOVA revealed a main effect of valence [$F(1,19) = 11.59, p = .003$], indicating that emotional pictures caused more interference than did neutral ones. (Neutral and scrambled-negative conditions controlled for different factors, so we compared them with the negative condition separately.) Unlike in experiments in which attentional effects dwindle with repeated presentations (Harris & Pashler, 2004; Marois et al., 2003), emotion-induced blindness did not diminish with increasing numbers of trials; that is, the experiment half did not interact with valence [$F(1,19) = 1.18, p = .291$].

Contrary to our predictions, harm avoidance did not modulate emotion-induced blindness. There was neither a main effect of harm avoidance score [$F(1,19) = 2.14, p = .160$] nor an interaction between this measure and valence [$F(1,19) = 1.96, p = .178$]. Indeed, emotion-induced blindness was robust regardless of harm avoidance score, and the mean accuracy difference between the neutral and negative conditions among high scorers ($M = 13\%$, $SD = 19\%$) was comparable to that among low scorers ($M = 18\%$, $SD = 15\%$).

Our results are not likely attributable to low-level feature differences between the negative and neutral pictures (e.g., color). This was determined through the inclusion of the scrambled-negative pictures, which caused significantly less interference than that caused by both the unscrambled-negative pictures [$t(20) = 5.79, p < .001$] and the neutral pictures [$t(20) = 3.48, p = .002$; all t tests were two-tailed].

Participants' subjective ratings of the critical distractors confirmed that the negative set was evaluated as

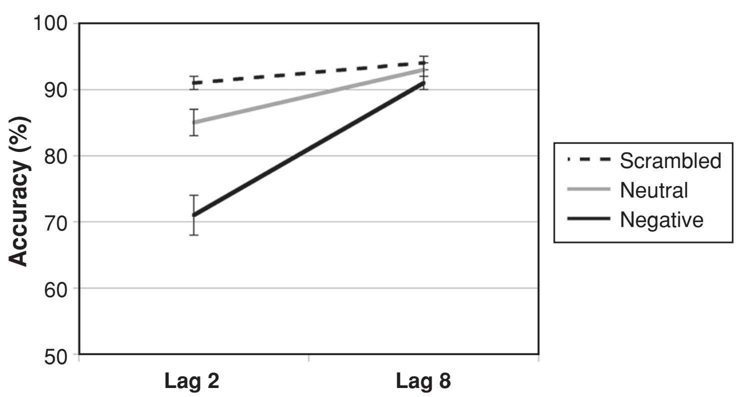

Figure 2. Mean accuracies with standard error bars from Experiment 1. At lag 2, accuracy in reporting the target substantially decreased following a negative picture versus a neutral or scrambled-negative picture. By lag 8, however, accuracy in all conditions recovered to above 90%.

being more negative than the neutral set [negative, M = 1.93, SD = .63; neutral, M = 5.77, SD = .67; $t(18)$ = 16.3, $p < .001$] and more arousing [negative, M = 7.49, SD = .94; neutral, M = 4.38, SD = .86; $t(18)$ = 9.42, $p < .001$]. (Two participants scoring low in harm avoidance opted not to continue with the subjective ratings.) Participants scoring high in harm avoidance rated the emotional pictures more negatively than did those scoring low in harm avoidance [high HA, M = 1.64, SD = .29; low HA, M = 2.32, SD = .77; $t(17)$ = 2.72, p = .015]. Although high scorers tended also to rate neutral pictures more negatively than low scorers did, and both emotional and neutral pictures as more arousing, these differences were not significant. Neither ratings of valence nor those of arousal predicted degree of emotion-induced blindness.

EXPERIMENT 2

Experiment 1 showed that attention to irrelevant emotional pictures caused temporary impairments for identifying the one target that people searched for. It is possible that this occurred automatically and that participants could not help but attend to the emotional pictures, which were of items (people and animals) that they knew to be task irrelevant. Yet there is reason to question the automaticity of emotion-based attentional biases. For example, recent evidence has suggested that emotional stimuli lose their power to draw attention in contexts that tax attentional capacity limitations (Harris & Pashler, 2004; Pessoa, McKenna, Gutierrez, & Ungerleider, 2002). However, attentional manipulations in such previous studies have often involved clear spatial separations between neutral targets and emotional distractors, as well as changing the relevance of the emotional stimuli (e.g., attending either to emotional faces or to houses or oriented lines; see also Bishop, Duncan, Brett, & Lawrence, 2004). Participants often had foreknowledge about where the relevant and irrelevant stimuli would appear, thus negating the need to disengage from emotional distractors after they were presented. It is therefore important to ask whether people can impose voluntary control over attention to irrelevant emotional stimuli that cannot be differentiated from targets by their spatial location. Might preferential processing of such stimuli be modulated through attentional strategies independently of cognitive load, such as the specificity with which people search for a target?

To manipulate attentional tuning, we varied the relative specificity with which participants searched for targets in Experiment 2. Depending on the condition, they searched either for a rotated picture of a building or for a rotated picture that could be of a building or a landscape. We hypothesized that more specific knowledge of the target's potential identity should help participants focus attention and ignore irrelevant emotional stimuli, thereby diminishing emotion-induced blindness. Although individual differences in harm avoidance did not predict the degree of emotion-induced blindness in Experiment 1, personality differences might emerge under conditions designed to aid ignoring of emotional distractors. In previous studies, trait anxiety has been found to correlate inversely with attentional control (Derryberry & Reed, 2001, cited in Derryberry & Reed, 2002), which is consistent with theories positing inverse relationships between anxiety and cognitive efficiency (Eysenck & Calvo, 1992). Participants low in harm avoidance might be able to use more specific target information to increase attentional focus, whereas those higher in harm avoidance might not.

Method

Participants. Twenty-three students participated for monetary compensation. In contrast to Experiment 1, they were not prescreened on the basis of their harm avoidance scores. One participant reported hitting the wrong response keys, and indeed her overall accuracy was more than two standard deviations from the group mean. Her data were excluded from analyses, leaving a participant population of 8 males and 14 females.

Materials and Procedure. The participants completed a 34-item harm avoidance scale (Cloninger et al., 1991) and then completed four blocks of 70 trials each. In two blocks, the target was always a picture of a rotated building, and the participants were informed of this at the start of the blocks. These blocks represented the *specific attentional set* condition. In the other two blocks, the target in each trial was a rotated picture of either a building or a landscape with no building, and the participants were informed that it could be either. These blocks represented the *nonspecific attentional set* condition. In actuality, all analyzed trials, regardless of condition, contained targets randomly drawn from the same pool of pictures of buildings. The specificity of participants' attentional set was manipulated through the inclusion of "filler trials" that were not analyzed. In the specific attentional set condition, filler trials contained buildings as targets; in the nonspecific attentional set condition, they contained landscapes with no buildings as targets. Filler trials contained no critical distractors. Each block contained 14 negative, 14 neutral, 14 scrambled-negative, and 28 filler trials. The same negative, neutral, and scrambled-negative distractors were used as in Experiment 1, and the nondistractor/nontarget pictures were drawn from a pool of 276 landscapes containing no buildings. The two conditions were presented in alternating blocks, with half the participants receiving the specific attentional set condition first. Unlike in Experiment 1, the participants received immediate auditory feedback about their accuracy on each trial, and they were not asked to rate the neutral and negative pictures in a follow-up procedure. Otherwise, the procedure was identical to that used in Experiment 1.

Results

As in Experiment 1, effects of emotionality were absent by lag 8: There were no significant differences due to valence or attentional set (see Table 1). Therefore, accuracy at lag 2 served as an index of emotion-induced blindness. A 2 (specific vs. nonspecific attentional set) × 2 (negative vs. neutral valence) ANOVA revealed that target processing deficits were greater following a negative picture than following a neutral picture [$F(1,21)$ =

Table 1
Mean Target Identification Accuracies (in Percentages) in Experiment 2

	Specific Attentional Set				Nonspecific Attentional Set			
	Lag 2		Lag 8		Lag 2		Lag 8	
Distractors	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Neutral	91	7	94	7	86	12	94	6
Negative	83	14	96	6	73	12	94	12
Scrambled negative	95	6	96	5	92	6	96	5

18.51, $p < .001$]. Visual processing impairments following the distractors overall were reduced in the specific—versus the nonspecific—attentional set condition [$F(1,21) = 12.42, p = .002$], but the interaction between attentional set condition and valence was not significant [$F(1,21) = 1.56, p = .225$]. Thus, emotion-induced blindness, defined as the difference in accuracy between the neutral and negative conditions, seemed present regardless of attentional set.

However, it was in the specific attentional set condition—designed to facilitate ignoring of emotional distractors—that individual differences emerged as a function of harm avoidance. In the nonspecific attentional set condition, there was no relationship between harm avoidance and emotion-induced blindness ($r = -.25, p = .270$), but a strong correlation emerged in the specific attentional set condition; that is, participants scoring low in harm avoidance were able to avoid distraction by the emotional pictures but those scoring higher could not ($r = .58, p = .005$). Indeed, the correlation between harm avoidance scores and difference in emotion-induced blindness between the specific and nonspecific attentional set conditions was also significant ($r = -.59, p = .004$) (see Figure 3). This difference is also evident in Figure 4, in which a median split divides those scoring in the top half of harm avoidance scores (3 males, 7 females) from those scoring in the bottom half (4 males, 6 females).

Experiment 1 demonstrated that the scrambled-negative pictures caused significantly less interference than did either the neutral or the negative pictures; in Experiment 2, the scrambled-negative pictures allowed us to gauge whether the attentional manipulation affected general performance. To the contrary, a 2 (specific vs. nonspecific attentional set) × 2 (lag 2 vs. lag 8) ANOVA for the scrambled-negative trials revealed not only that there was minimal effect of lag [$F(1,21) = 3.16, p = .09$], but also that there was no reliable effect of attentional set condition [$F(1,21) = 2.23, p = .150$]. Therefore, differences in emotion-induced blindness between the specific and nonspecific attentional set conditions are not likely due to differences in task difficulty.

DISCUSSION

Over and beyond distraction caused by neutral but novel pictures, irrelevant emotional pictures induced temporary visual processing impairments for targets that people actively searched for. Participants frequently failed to discriminate targets appearing soon after an emotionally negative picture, but this blindness was no longer evident after 800 msec. Importantly, this phenomenon was open to the influence of volitional control, but the degree to which individuals could impose control depended on their personalities.

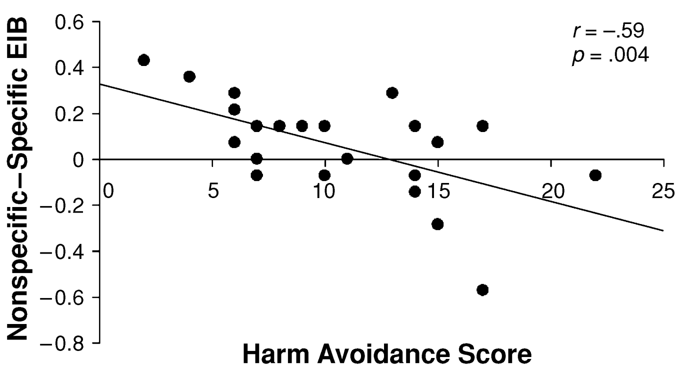

Figure 3. Correlation between harm avoidance score and the difference in emotion-induced blindness (EIB) between the specific and nonspecific attentional set conditions in Experiment 2. As harm avoidance decreased, the degree to which emotion-induced blindness was smaller in the specific attentional set condition increased.

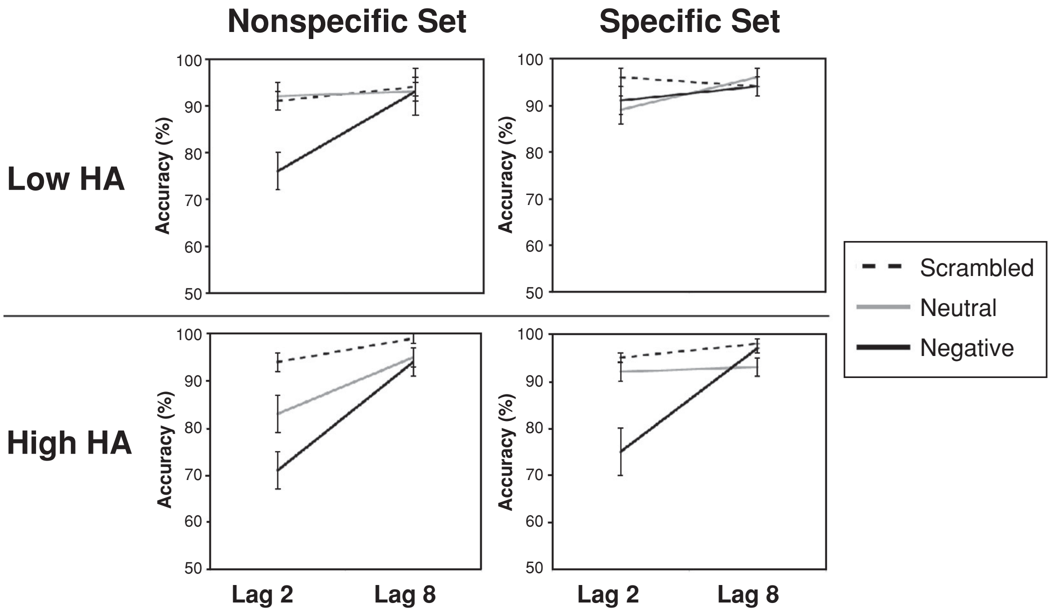

Figure 4. Mean accuracies with standard error bars in Experiment 2 as a function of harm avoidance score and attentional set condition. High and low scorers on the harm avoidance (HA) scale were determined via a median split (2 participants whose scores fell on the median are not represented). In the nonspecific attentional set condition, participants exhibited emotion-induced blindness (the difference in accuracy between the neutral and negative conditions at lag 2) regardless of whether they scored high or low in harm avoidance. However, in the specific attentional set condition, low scorers were able to ignore the emotional stimuli, eradicating emotion-induced blindness. High scorers were not able to do this and continued to exhibit emotion-induced blindness.

Previous research has demonstrated that high attentional load can reduce the processing of emotional stimuli (Harris & Pashler, 2004; Pessoa et al., 2002). However, effects of capacity limitation should not be confused with whether or not people can voluntarily control preferential attention to always irrelevant emotional stimuli. Our data indicate that such preferential processing can be modulated through attentional strategy in some people. However, the extent to which participants could overcome their emotion-induced blindness depended on their level of harm avoidance. All participants experienced emotion-induced blindness when unsure about target identities, but when given more specific target information, those scoring low in harm avoidance were able to use this knowledge to filter out irrelevant emotional distractors, whereas individuals high in harm avoidance could not. If given specific enough target information, it is possible that a broader range of individuals would be able to impose such effective control.

What factors underlie individual differences in cognitive control over emotion-induced blindness? One possibility is that people high in harm avoidance were simply more sensitive to the emotional nature of the pictures. In keeping with this hypothesis, high harm avoidance participants rated emotional stimuli more negatively than the low harm avoidance participants did in Experiment 1. However, heightened sensitivity seems inadequate to explain the interaction between personality and attentional set condition. First, ratings of unpleasantness did not correlate with emotion-induced blindness in Experiment 1. Second, there is no clear reason why increased sensitivity would correlate only with performance when participants utilized a specific attentional set. An alternative, but related, possibility is that participants scoring higher in harm avoidance might have been more motivated to monitor for emotional distractors. However, if this were true, it would again have been reasonable to expect high scorers to show greater emotion-induced blindness regardless of attentional set condition.

It is noteworthy that attentional control (assessed via self-report) appears to be related inversely to trait anxiety (Derryberry & Reed, 2001, cited in Derryberry & Reed, 2002), and that low attentional control has been linked to difficulty disengaging from negative stimuli (Derryberry & Reed, 2002). Evidence has suggested that many emotion-based attentional biases reflect delayed disengagement from such stimuli (Fox et al., 2001), and this would seem particularly applicable to the emotion-induced blindness revealed here. After all, the induced impairments in visual processing endured after the emotional stimuli were no longer present. Individual differences in disengagement from the emotional distractors could have stemmed from differences in initial engagement with them—those with better attentional control could have filtered them out more efficiently from the start, for example—or, assuming that everyone engaged them equally, from differences in ability to shift attention away (or a combination of both). Both cases are consistent with evidence and theories suggesting inverse relationships between anxiety and attentional control and between anxiety and working memory (Eysenck & Calvo, 1992), which in turn is associated with the ability to ignore distractors (de Fockert, Rees, Frith, & Lavie, 2001). Together, these factors might help explain why individual differences in harm avoidance predicted performance specifically under conditions in which participants could try to exert voluntary focusing of attention. Given the opportunity, participants scoring low in harm avoidance might have been able to focus attention more narrowly, whereas those scoring higher could not.

The attentional blink paradigm may prove particularly useful for elucidating the relationship between attentional strategy and personality in determining emotion-induced blindness, as well as determining what sorts of emotional stimuli are most likely to hold attention. Indeed, one question arising from these initial experiments is whether emotion-induced blindness is attributable to the negative valence of the distractors or, instead, to emotional arousal in general. In the studies presented here, these two factors were confounded, but it seems reasonable to hypothesize that equally arousing, but less aversive, images (e.g., erotic pictures) would have had a similar effect. Finally, the present paradigm also holds promise for measuring the time course of disengagement from emotional stimuli among different populations.

Outside of the lab, the human propensity to attend to emotionally evocative information sometimes displays itself near scenes of highway traffic accidents, where drivers craning their necks for better views have inspired the term "rubbernecker." Our lab finding appears analogous; even as task-relevant information continued to flow by, participants often remained fixated on the emotional picture presented a couple of items previously. Does this phenomenon reflect a fundamental, uncontrollable human tendency, or can people force themselves to "keep their eyes on the road"? Our data suggest that the answer lies somewhere in between and likely depends on both an individual's personality and the extent to which a situation requires broad tuning of attention.

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NOTES

1. One potential confound is that the negative pictures included images that might themselves be interpreted as being rotated (e.g., people lying on their sides). Participants searching for rotated scenes might have been more distracted by the negative pictures because of their more "sideways" nature. However, when all trials containing these negative pictures were removed from the analysis, mean accuracies for each condition remained unchanged.

2. Because this experiment involved target discrimination rather than target detection, one could argue that these performance deficits do not reflect "blindness" strictly defined. We note that a pilot version of this experiment involving target detection yielded similar deficits following emotional pictures.

APPENDIX
Reference Numbers to Images Taken From the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2001)

Negative Images			Neutral Images		
1050	3100	6313	1450	2480	2870
2800	3102	6350	1640	2485	2890
3000	3110	6560	1670	2487	4100
3010	3120	7361	1942	2495	4233
3015	3130	9040	2020	2500	4533
3030	3140	9253	2190	2515	4536
3053	3168	9405	2200	2516	4571
3060	3170	9410	2210	2520	4605
3061	3261	9433	2214	2560	4631
3062	3266	9570	2215	2570	5410
3063	3301	9571	2221	2575	7503
3064	3350	9800	2230	2580	7550
3071	3550	9810	2250	2590	8040
			2270	2600	8160
			2372	2620	8311
			2383	2702	9070
			2385	2749	9210
			2410	2840	9331
				2850	

Note—Stimuli included 39 negative IAPS images (valence = 1.85, *SD* = .43; arousal = 6.34, *SD* = .63) and 55 neutral IAPS images (valence = 5.32, *SD* = .78; arousal = 3.72, *SD* = .80), which were supplemented by similar images drawn from publicly available sources.

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