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Brief article

The flexibility of emotional attention: Accessible social identities guide rapid attentional orienting

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ABSTRACT

There is extensive evidence that emotional—especially threatening—stimuli rapidly capture attention. These findings are often explained in terms of a hard-wired and relatively inflexible fear module. We propose an alternative, more flexible mechanism, arguing that motivational relevance is the crucial factor driving rapid attentional orienting. To test our hypothesis, we endowed initially neutral face stimuli with relevance by randomly assigning them to a social in-group or out-group during a 1-min learning phase, and used these faces as cues in a dot probe task to measure rapid attentional orienting. Across three experiments, we observed attentional orienting toward faces assigned to the out-group. Initial rapid orienting (after 100 ms, Experiments 1 and 2) was observed only for familiar faces for which group membership was explicitly encoded, suggesting that rapid orienting may be based on affectively charged memory traces. At a later time point (after 500 ms, Experiment 3), attention was deployed toward unfamiliar faces sharing a physical attribute (background color) with the familiar out-group faces, suggesting a more time-consuming on-line appraisal of the stimulus. The amount of attentional bias to out-group faces was correlated with individual differences in the accessibility of group identification. Our findings demonstrate that attentional prioritization mechanisms can be flexibly tuned by a brief learning phase of social identity. This is consistent with the idea that attention mechanisms subserving the selection and prioritization of emotional aspects of the environment are not static and hard-wired, but may rapidly adapt to recent changes in motivational contingencies.

1. Introduction

Due to capacity limits, the brain cannot exhaustively process all incoming information (Marois & Ivanoff, 2005). Behavioral and neuroimaging research demonstrates that emotional information is prioritized: emotional stimuli grab attention, are detected more easily and are more likely to reach awareness than neutral stimuli ('emotional attention', see Vuilleumier and Brosch (2009) for a review). Most empirical studies focus on rapid attention capture by threatening stimuli, such as angry (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van Ijzendoorn, 2007) or Black male (Trawalter, Todd, Baird, & Richeson, 2008) faces. These results are often explained in the framework of a *fear module* subserving the rapid detection of evolutionary threat (Öhman & Mineka, 2001, see also Öhman, 2005). The affective quality that drives attention capture is considered relatively stable or hard-wired, based on associations learned very early on in life or a biological preparedness to fear certain kinds of stimuli (Seligman, 1971). Consequently, the capacity of an emotional stimulus to rapidly capture attention (or not) is thought to be relatively inflexible.

We have proposed an alternative mechanism, arguing that the relevance of a stimulus for the needs and goals of

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the organism organizes emotional attention, with threatening stimuli being merely one of many potentially relevant stimulus classes (Brosch, Sander, Pourtois, & Scherer, 2008; Cunningham, Van Bavel, & Johnsen, 2008). This claim has important theoretical implications for the flexibility of attentional prioritization, since motivational relevance may change frequently to reflect the context and the changing motivations of the perceiver (e.g., Lazarus, 1991; Lewin, 1926). In the current research, we examined the hypothesis that rapid attentional orienting mechanisms can flexibly adapt to new motivational contingencies.

To endow neutral stimuli with relevance, we capitalized on the important role of social categorization in human cognition (e.g., Brewer, 1988). Assigning people to arbitrary social groups can lead to changes in evaluation and behavior toward in-group and out-group members, even in the absence of longstanding categories, stereotypes or attitudes (Tajfel, Billig, Bundy, & Flament, 1971). In other words, otherwise neutral targets are rapidly endowed with affective meaning when they are categorized as in-group or out-group members (Van Bavel & Cunningham, 2009). In the current experiments, we randomly assigned photos of individual faces to a pre-existing in-group or out-group (we indicated group membership by the background color of each photo) during a learning phase, and then used these faces as cues in an dot probe task to measure rapid attentional orienting (MacLeod, Mathews, & Tata, 1986).

2. Experiment 1

We employed a social learning paradigm (adapted from Van Bavel, Packer, & Cunningham, 2008) in which New York University students learned about ostensible members of their in-group (NYU), an out-group (University of Toronto; UT) and individuals not affiliated with any of the groups (neutral control faces). Following the learning phase, photos of in-group, out-group and neutral faces were presented as cues in an attentional dot probe task (presentation time 100 ms, see Fig. 1). In this task, participants respond to a target that replaces one of two simultaneously presented pictorial cues. Previous research using this paradigm (e.g., Brosch et al., 2008) has demonstrated faster response times when the target replaces emotional cues, rather than neutral cues, reflecting a rapid orienting toward the emotional stimulus. Importantly, the allocation of individual photos to each group and the meaning of the background colors (in-group versus out-group) were counterbalanced across participants. As such, any observed attentional modulations were not due to visual differences, but rather changes in the motivational relevance of the stimuli occurring during a brief, 1-min learning phase.

2.1. Methods

2.1.1. Participants

Thirty New York University students (18 females; mean age = 20.0 years) participated in exchange for partial course credit. All participants were right-handed and had normal or corrected-to-normal vision.

2.1.2. Stimuli

Stimuli consisted of 30 Caucasian faces. For each face, three versions were created, using either a blue, green, or gray background. Color meaning (in-group/out-group) and assignment of faces to the in-group/out-group/neutral were counterbalanced across participants. This design ensured that participants were equally likely to see each face as an in-group or out-group member and there were no structural differences (e.g., attractiveness) between in-groups and out-groups across participants.

2.1.3. Procedure

2.1.3.1. Learning task. Participants viewed 30 faces (10 in-group, 10 out-group, 10 neutral) for 2,000 ms each. Inter-stimulus interval was 500 ms. Timing parameters were adapted from previous work (Bernstein, Young, & Hugenberg, 2007; Van Bavel, Swencionis, O'Connor, & Cunningham, 2012). Faces were presented in random order. Participants were told that they would see people affiliated with NYU and UT as well as people unaffiliated with either university and were instructed to remember the group affiliation of each face.

2.1.3.2. Dot probe task. Participants performed a standard dot probe task (Fig. 1; MacLeod et al., 1986). Each trial started with a fixation cross. The cue, consisting of two images (faces on their respective color backgrounds) presented on the left and right side of the monitor, was presented for 100 ms. In each of 120 experimental trials, one image was a face belonging to one of the groups, the other was a neutral face. We also included 60 filler trials with cues consisting of images of both in-group and out-group faces to ensure that each individual cue stimulus appeared equally often during the experiment. Following offset of the cue, the target, a horizontally or vertically oriented rectangle, appeared for 100 ms, replacing one of the images. The target replaced the group cue in 50% of the trials ("valid" trials) and the neutral cue in the other 50% ("invalid" trials). Participants were instructed to keep fixated on the fixation cross during the experiment, and to indicate the orientation of the target rectangle by pressing the "B" key when the orientation of the target rectangle was horizontal, and the "N" key when the orientation was vertical. Participants were encouraged to respond as quickly and accurately as possible. Participants had a maximum of 1300 ms to respond, after which the next trial started. The task started with a practice block where participants received feedback about the accuracy of their responses. Participants repeated the practice block until their performance level was at 80% or more correct responses. The practice block was followed by 180 trials presented across two blocks.

2.1.4. Data analysis

2.1.4.1. Dot probe task. Data from two participants were excluded from the analysis due to an error rate above 20%. Average error rate of the remaining participants was 7.7%. RTs of correct responses lying within three SD of the individual mean RT were analyzed with a 2 (*cue group*:

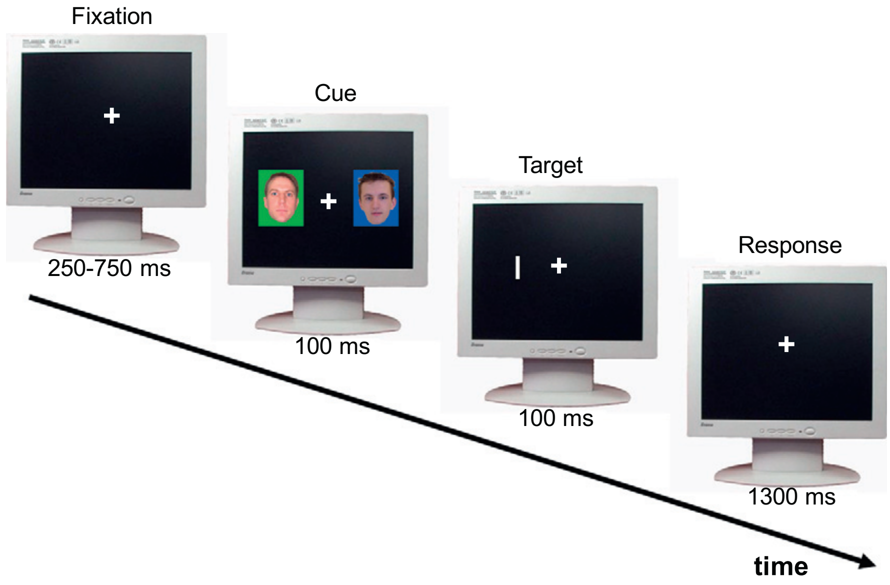

Fig. 1. Illustration of the experimental sequence. Each trial started with a fixation cross. Then the cue, consisting of two images presented on the left and right sides of the monitor, was presented for 100 ms. Following offset of the face pair, the target, a horizontally or vertically oriented rectangle, appeared for 100 ms in the location of one of the previously presented faces. Participants responded to the orientation of the target by pressing a key. Images are not shown to scale.

in-group, out-group) × 2 (*cue validity*: valid, invalid) × 2 (*target side*: left, right) mixed-model ANOVA.

2.2. Results

2.2.1. Dot probe task

We analyzed whether response times toward the targets varied as a function of the group membership of the preceding cues. Table 1 shows the mean RTs for the different conditions.

The ANOVA revealed a two-way-interaction *cue group* - × *cue validity*, $F(1,27) = 4.12$, $p = .05$, partial $\eta^2 = .13$. Bonferroni-corrected post hoc tests revealed that attention was captured by *out-group* faces (valid: 547 ms, invalid: 560 ms, $p < .03$), but not by in-group faces (valid: 548 ms, invalid: 547 ms, $p = .82$).

2.3. Discussion

As predicted, rapid attentional orienting mechanisms can flexibly prioritize motivationally relevant stimuli. Target stimuli were detected more rapidly when they were preceded by images of out-group members (faster responses in valid compared to invalid trials). Previous research has shown that White participants rapidly orient towards photos of Black males, their racial out-group (Trawalter et al., 2008). Whereas this effect has been interpreted in terms of the longstanding stereotype associating Black men with danger (Donders, Correll, & Wittenbrink, 2008), we showed a conceptually similar pattern of results following a 1-min group learning task. Moreover, a separate pilot study ($N = 69$) confirmed that NYU students do not find UT students (mean threat rating = 2.3/6) more threatening than NYU (3.2) students (if anything, they find them less threatening, $p < .001$). Therefore, the current findings are consistent with the idea that attention mechanisms subserving the selection and prioritization of emotionally relevant aspects of the environment are not hard-wired to respond to threatening stimuli, but rapidly adapt to recent changes in the immediate motivational context.

We suggest that prioritization may be driven by the reactivation of affectively charged memory representations that were encoded as the result of a previous experience (Brosch, Pourtois, & Sander, 2010), in the current research the association of a stimulus with a salient social group during a very brief learning phase. When the stimulus is encountered again, these representations may allow for a fast evaluation of the stimulus (‘appraisal shortcuts’, see Brosch et al., 2010; Fazio, 1986), and influence rapid attentional processes. Indeed, people notice stimuli more easily when their attitudes toward those stimuli are accessible, i.e. more likely to become spontaneously activated upon encountering the object (Roskos-Ewoldsen & Fazio, 1992). To evaluate this hypothesis, in the next experiment we manipulated the accessibility of the motivational relevance of our stimuli. During the attention task, we presented photos that participants had previously encoded during the learning task (familiar in-group/out-group), but also photos of unfamiliar individuals displayed on the same background colors (unfamiliar in-group/out-group). We hypothesized that rapid attention capture would be observed for familiar, but not for unfamiliar out-group faces,

Table 1
Mean RTs for the valid and invalid trials for the different conditions (valid trials: target replaces the group cue, invalid trials: target replaces the neutral cue). Standard errors in parentheses.

Group	Invalid	Valid	Cueing effect
In-group	547 (13)	548 (13)	$p = .82$
Out-group	560 (15)	547 (13)	$\boldsymbol{p = .03}$*

* $p < .05$.

which may require more time-consuming "on-line" appraisal (Moors, 2010).[1]

Similarly, we assumed that individual differences in the relevance of these group memberships would be related to the amount of rapid attention modulation. People vary in the extent to which they identify with social groups, and the psychological significance of these collective identities moderates their attitudes and behaviors toward in-group and out-group members (Ashmore, Deaux, & McLaughlin-Volpe, 2004). Therefore, we expected the largest attentional biases in participants with more accessible collective identitification with NYU versus UT.

3. Experiment 2

To test our hypotheses, we modified our paradigm by including trials with unfamiliar faces (photos of unfamiliar individuals displayed on the background colors indicating in-group and out-group, respectively) to the dot probe task and added measures of collective identity. We also added a surprise memory task to assess the efficacy of the learning procedure.

3.1. Methods

3.1.1. Participants

Forty New York University students (30 females; mean age = 19.7 years) participated in exchange for partial course credit. All participants were right-handed and had normal or corrected-to-normal vision.

3.1.2. Stimuli, procedure and data analysis

Stimuli, procedure, and data analysis were similar to Experiment 1, with the following modifications:

3.1.3. Stimuli

Stimuli consisted of 60 Caucasian faces, divided into familiar (30 faces presented during learning phase and attention task) and unfamiliar (30 faces presented during the attention task but not the learning phase) faces.

3.1.4. Procedure

3.1.4.1. Learning task. Identical to Experiment 1.

3.1.4.2. Collective identification. Participants answered six questions assessing their collective identification with in-group (NYU) and out-group (UT) using a 6-point Likert scale: "I value being a member of NYU/UT," "I am proud to be a member of NYU/UT," "Belonging to NYU/UT is an important part of my identity." Ratings and reaction time (RT) were recorded.

3.1.4.3. Dot probe task. For 240 experimental trials, familiar in-group and out-group faces were paired with familiar neutral faces, while unfamiliar in-group and out-group faces were paired with unfamiliar neutral faces. We also included 120 filler trials with cues consisting of images of both in-group and out-group faces (both either familiar or unfamiliar) to ensure that each individual cue stimulus appeared equally often during the experiment.

3.1.4.4. Face recognition task. Participants were shown the 20 familiar faces from the initial learning phase (10 in-group and 10 out-group faces) interspersed with 20 unfamiliar in-group and out-group faces not presented during the learning phase (but presented during the dot probe task), and were asked to indicate whether they had seen the face during the initial learning phase or not (not taking into account their presentation during the dot probe task).

3.1.5. Data analysis

3.1.5.1. Dot probe task. Data from one participant were excluded from the analysis due to an error rate above 20%. Average error rate of the remaining participants was 6.9%. RTs of correct responses lying within three SD of the individual mean RT were analyzed with a 2 (*cue group*: in-group, out-group) $\times$ 2 (*cue familiarity*: familiar, unfamiliar) $\times$ 2 (*cue validity*: valid, invalid) $\times$ 2 (*target side*: left, right) mixed-model ANOVA.

3.1.5.2. Collective identification. We computed an index of collective identification *strength* by separately adding the three ratings for in-group and out-group items (Ashmore et al., 2004) and an index of *accessibility* by computing the difference of the log-transformed RTs for in-group and out-group ratings. Positive collective identification accessibility scores indicate higher relative accessibility of in-group identification.[2]

3.2. Results

3.2.1. Manipulation checks

Participants reported higher collective identification strength for NYU ($M = 14.4/18$, $SE = .4$) than for UT ($M = 3.8$, $SE = .2$), thus identifying more with their in-group than the out-group, $t(38) = 26.3$, $p < .001$. In the recognition test, participants correctly identified in-group ($M = 14.2/20$, $SE = .4$) and out-group ($M = 13.8$, $SE = .4$) members above chance ($ps < .001$), confirming that participants were able to distinguish between familiar and unfamiliar faces.

3.2.2. Dot probe task

We analyzed whether response times toward the targets varied as a function of the group membership of the preceding cues. Table 2 shows the mean RTs for the different conditions.

[1] Our manipulation of stimulus familiarity also controlled for a potential low-level stimulus confound. In our stimuli, group membership (in-group/out-group/neutral control stimuli) was indicated by background color. Even though the meaning of the colors was counterbalanced across participants, the attention system may be tuned towards the low-level physical feature of color instead of the actual in-group or out-group member. However, selective orienting towards familiar, but not unfamiliar out-group members (or vice versa) would rule out this alternative explanation.

[2] Although this is the first time to our knowledge that anyone has reported individual differences in identity accessibility, we used in-group–out-group difference scores to rule out basic individual differences in RTs and because intergroup difference scores are more sensitive measures in many domains (e.g., Mummendey, Otten, Berger, & Kessler, 2000; Van Bavel et al., 2008).

Table 2
Mean RTs for the valid and invalid trials for the different conditions (valid trials: target replaces the group cue, invalid trials: target replaces the neutral cue). Standard errors in parentheses.

Group	Familiarity	Invalid	Valid	Cueing effect
In-group	Familiar	533 (10)	531 (10)	$p = .47$
	Unfamiliar	535 (10)	530 (10)	$p = .19$
Out-group	Familiar	534 (10)	522 (9)	$\mathbf{p < .01}$*
	Unfamiliar	527 (9)	530 (10)	$p = .41$

* $p < .05$.

Responses were faster in valid (528 ms) compared to invalid trials (532 ms), $F(1,38) = 4.25$, $p < .05$, partial $\eta^2 = .10$, and in trials where the target was cued by an out-group face (528 ms) compared to an in-group face (532 ms), $F(1,38) = 6.38$, $p = .02$, partial $\eta^2 = .14$. Most importantly, these effects were qualified by the three-way *cue group* × *cue familiarity* × *cue validity*, $F(1,38) = 4.56$, $p < .04$ interaction, partial $\eta^2 = .11$. Bonferroni-corrected post hoc tests revealed that attention was captured by *familiar* out-group faces (valid: 522 ms, invalid: 534 ms, $p < .01$), thus replicating Experiment 1, but not by other stimuli ($ps > .19$, see Fig. 2A).

3.2.3. Collective identification accessibility and attention

As predicted, participants with higher relative in-group identification accessibility showed increased attention toward *familiar* out-group faces, $r(38) = .34$, $p = .03$ (see Fig. 2B). Identification accessibility was not correlated with other attentional biases ($ps > .19$).

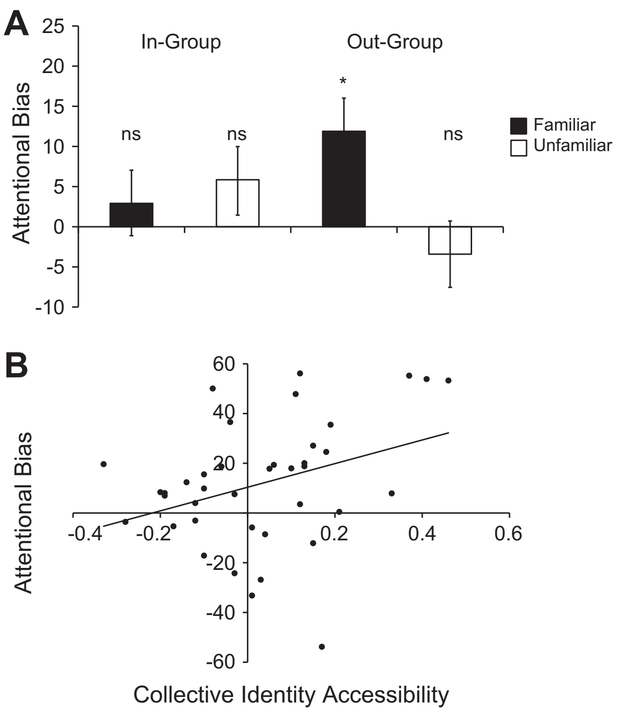

Fig. 2. Rapid attention capture by familiar out-group faces. (A) Attentional bias scores ($RT_{invalid} - RT_{valid}$) in ms, positive scores indicate faster responses in validly cued trials compared to invalidly cued trials (error bars represent standard errors). (B) Correlations between collective identity accessibility scores (*x*-axis) and attentional bias towards familiar out-group faces (*y*-axis). Participants with higher relative in-group identification accessibility showed increased attention toward familiar out-group faces.

3.3. Discussion

We replicated and extended our results by showing that rapid, reflexive attentional orienting (after 100 ms) was specific to familiar out-group faces (i.e. faces for whom the out-group membership had been encoded in the learning phase). This finding is consistent with our suggestion that rapid attentional prioritization of familiar stimuli may be enhanced by the reactivation of affectively charged memory traces—appraisal shortcuts (Brosch et al., 2010; Fazio, 1986, see also Brosch, Pourtois, Sander, & Vuilleumier, 2011). As outlined previously, motivational relevance is not a time invariant construct, but may change frequently to reflect the changing motivations of the perceiver (e.g., Lazarus, 1991; Lewin, 1926). With increasing processing time, additional, increasingly complex types of evaluative processes may contribute to the appraisal of the environment (see Cunningham, Zelazo, Packer, & Van Bavel, 2007; Sander, Grandjean, & Scherer, 2005). Thus, we hypothesized that unfamiliar stimuli may require more controlled and time-consuming "on-line" processing for appraisal of their relevance and attentional deployment.

4. Experiment 3

To test this hypothesis, we measured attentional deployment at a later time point (500 ms after cue presentation) in Experiment 3. This presentation duration allows for multiple shifts of attention and saccades (Rayner, 1998), and is susceptible to more strategic on-line considerations and top-down attentional control (see, e.g., Cooper & Langton, 2006; Koster, Verschuere, Crombez, & Van Damme, 2005). We hypothesized that attentional bias toward unfamiliar out-group members may arise with additional time, allowing for a more thorough stimulus appraisal. In contrast, we did not expect to observe effects of the attentional capture by familiar out-group faces at this time point any more, as rapid reflexive shifts of attention have been shown to disengage from the source of the stimulation after 200–300 ms and may in some cases even lead to slower responses at the previously cued location (Klein, 2000).

4.1. Methods

4.1.1. Participants

Forty New York University students (29 females; mean age = 19.3 years) participated in exchange for partial course credit. All participants were right-handed and had normal or corrected-to-normal vision.

4.1.2. Stimuli, procedure and data analysis

Stimuli, procedure, and data analysis were identical to Experiment 2, except that cues during the attention task were presented for 500 ms instead of 100 ms. Data from three participants were excluded from the analysis due

Table 3
Mean RTs for the valid and invalid trials for the different conditions (valid trials: target replaces the group cue, invalid trials: target replaces the neutral cue). Standard errors in parentheses.

Group	Familiarity	Invalid	Valid	Cueing effect
In-group	Familiar	561 (13)	557 (12)	$p = .45$
	Unfamiliar	558 (14)	564 (12)	$p = .27$
Out-group	Familiar	564 (12)	565 (13)	$p = .98$
	Unfamiliar	565 (12)	553 (12)	$\boldsymbol{p = .01}$*

* $p < .05$.

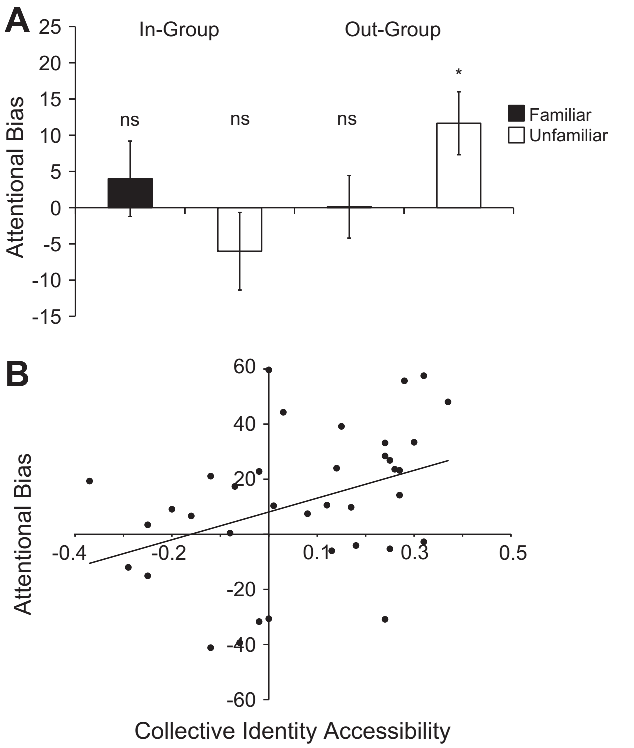

Fig. 3. Attention capture by unfamiliar out-group faces. (A) Attentional bias scores ($RT_{invalid} - RT_{valid}$) in ms, positive scores indicate faster responses in validly cued trials compared to invalidly cued trials (error bars represent standard errors). (B) Correlation between collective identity accessibility scores (*x*-axis) and attentional bias towards unfamiliar out-group faces (*y*-axis). Participants with higher relative in-group identification accessibility showed increased attention toward unfamiliar out-group faces.

to error rates above 20%. The average error rate of the remaining participants was 4.9%.

4.2. Results

4.2.1. Manipulation check

Participants reported higher collective identification strength for NYU ($M = 15.2/18$, $SE = .3$) than for UT ($M = 4.6$, $SE = .4$), identifying more with their in-group than the out-group, $t(36) = 17.3$, $p < .001$. In the recognition test, participants correctly identified familiar and unfamiliar in-group ($M = 14.0/20$, $SE = .4$), and out-group ($M = 14.0$, $SE = .4$), members above chance ($ps < .001$).

4.2.2. Dot probe task

We analyzed whether response times were modulated as a function of the group membership of the cues. Table 3 shows the mean RTs for the different conditions.

Again, the *cue group* $\times$ *cue familiarity* $\times$ *cue validity* interaction reached significance, $F(1,36) = 5.36$, $p = .03$, partial $\eta^2 = .13$. As predicted, post hoc tests revealed that rapid attention allocation was elicited by *unfamiliar* out-group faces (valid: 553 ms, invalid: 565, $p = .01$), but not by other stimuli ($ps > .26$, see Fig. 3A).

4.2.3. Collective identification accessibility and attention

As predicted, subjects with higher in-group identification accessibility showed increased attention to *unfamiliar* out-group faces, $r(36) = .38$, $p = .02$ (see Fig. 3B). Identification accessibility was not correlated with other attentional biases (all $ps > .73$).

4.3. Discussion

We replicated and extended our finding of a flexible orienting of attention based on motivational stimulus relevance. Different from Experiment 2, attention was modulated toward unfamiliar out-group faces when participants had more time to process faces.

5. General discussion

Three experiments provided evidence that emotional attention can flexibly adapt to new motivational contingencies. After a brief social learning phase, targets were detected more rapidly when replacing out-group members. Previous research had shown that members of threatening out-groups capture attention, and explained this effect in terms of a fear module: "the stereotype that young Black men are threatening and dangerous has become so robust and ingrained in the collective American unconscious that Black men now capture attention, much like evolved threats such as spiders and snakes" (Trawalter et al., 2008, p. 1322). In contrast, our findings reveal rapid attentional capture after a mere 1-min learning task in which people learned the group membership of otherwise neutral faces. The minimal learning manipulation employed in our experiments led to a change in attentional prioritization, consistent with our hypothesis that emotional attention mechanisms subserving the selection and prioritization of relevant aspects of the environment are not static and hard-wired, but may rapidly adapt to recent changes in motivational contingencies.

The pattern of results indicates that emotional attention is directed to different stimuli over time, consistent with the operation of two mechanisms underlying attentional effects of motivationally relevant stimuli, as suggested by work on attentional mechanisms (Luck, Woodman, & Vogel, 2000) and the preferential role of emotion in attention and perception (Brosch et al., 2010; Cunningham & Brosch, 2012). Experiments 1 and 2, which, due to the speed of the stimulus presentation, tapped the reflexive, initial allocation of attention, revealed attentional bias towards *familiar* out-group members. As our experimental controls mitigates any low-level perceptual interpretation of the attentional effects, the findings can only be accounted for by the social learning manipulation. Our findings are thus consistent with the suggestion that rapid orienting toward motivationally relevant stimuli may be based on affectively charged memory traces. When reactivated, such memory traces may enable participants to rapidly retrieve the emotional relevance of the stimulus (Brosch et al., 2010; Fazio, 1986), which in turn may influence attentional prioritization. Experiment 3 tapped more controlled orienting mechanisms by allowing sufficient processing time for more elaborate stimulus appraisal and multiple attention shifts and saccades. Here, participants oriented attention toward *unfamiliar* out-group members. This mechanism may subserve the on-line relevance appraisal of unfamiliar individuals who were not previously encoded as out-group members.

Note that in Experiment 3, no orienting toward familiar out-group faces was observed any more. This is consistent with the time course of rapid reflexive shifts of attention, which have their onset at 50–100 ms and disengage from the source of the stimulation after 200–300 ms (Klein, 2000), whereas more controlled shifts of attention (which are assumed to subserve a more thorough appraisal of the unfamiliar out-group stimuli in Experiment 3) have a longer onset and yield maximal facilitation effects at SOAs between 400 and 800 ms (Shepherd & Muller, 1989). Thus, our findings suggest that motivational relevance and the resulting attentional prioritization may change dynamically over time as different evaluative processes come online (see Cunningham et al., 2007; Sander et al., 2005). Indeed, we predict that under certain circumstances (e.g., with the motivation to engage in deeper encoding and/or additional processing time), attention may preferentially shift to in-group members (see Van Bavel, Packer, & Cunningham, 2011).

The data presented here support the notion that attention mechanisms subserving the selection and prioritization of emotional aspects of the environment are not static and hard-wired, but may rapidly adapt to recent changes in motivational contingencies. Additional work is needed to fully explore the mechanisms underlying the two processes outlined above (rapid reactivation of affectively charged memory traces and controlled on-line appraisal) and their impact on attentional prioritization. A combination of EEG and fMRI may be useful to help establish the neural substrates and time course of these effects. For instance, we anticipate that amygdala/hippocampus may be involved in rapid reactivation, and fronto-parietal attention regions in controlled prioritization.

Experiments 2 and 3 showed that the amount of attention capture was correlated with collective identification accessibility, suggesting that individual differences in the accessibility of motivational concerns may guide attention capture. Despite the centrality of identity accessibility in the field of intergroup relations (Turner, Oakes, Haslam, & McGarty, 1994), this is the first demonstration that individual differences in collective identity accessibility predict behavior, to our knowledge. Indeed, identity accessibility was a better predictor of attention than identity strength. Future research should explore identity accessibility as a potentially important component of collective identification.

6. Conclusion

The current research demonstrates for the first time that emotional attention can be flexibly tuned to rapidly prioritize motivationally relevant information. These findings suggest that the motivational relevance of a stimulus is the crucial factor driving emotional attention and show that the capacity of an emotional stimulus to capture rapid attention may be less hard-wired than previously thought..

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