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IS IT FAMILIAR OR POSITIVE? MUTUAL FACILITATION OF RESPONSE LATENCIES

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We provide evidence for a previously unstudied consequence of the relationship that familiarity has with positive affect: Positive affect and familiarity exert a bi-directional impact on latencies to judgments about the other. Experiment 1 showed that this association caused predictable facilitation and inhibition patterns on both evaluative and recognition task response times in an implicit association paradigm. In Experiment 2 participants in a forced recognition task decided which of two symbols (one primed with a subliminal happy face and the other with a subliminal neutral circle) they had seen before. Because of the intrinsic association between familiarity and positivity, the positivity activated from the subliminal happy prime facilitated familiarity judgments. Implications of these results for cognitive-affective relations are discussed.

Consider the following phenomena. Repeatedly exposing participants to stimuli increases their liking for those stimuli (Zajonc, 1968; see Bornstein, 1989, for a review) as well as for other similar stimuli (Gordon & Holyoak, 1983). Familiarity induced via previous exposure makes repeated statements seem valid (e.g., Arkes, Hackett, & Boehm, 1989; Begg, Anas, & Farinacci, 1992; Begg & Armour, 1991), repeated names seem famous (Jacoby, Kelley, Brown, & Jasechko, 1989), and repeated faces seem happy (Claypool, Hugenberg, Housley, & Mackie, 2007). The fluency

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with which repeated stimuli are processed makes them more familiar (Jacoby & Dallas, 1981; Jacoby & Whitehouse, 1989) and induces more positive reactions and evaluations (Reber, Winkielman, & Schwarz, 1998; Winkielman & Cacioppo, 2001). Repeatedly exposing participants to stimuli even puts those participants in a positive mood (Garcia-Marques & Mackie, 2000; Monahan, Murphy, & Zajonc, 2000).

On the basis of such evidence, and inspired by Tichener (1910), we have suggested that positivity is intrinsic to familiarity (e.g., Claypool, Hall, Mackie, Garcia-Marques, 2008; Garcia-Marques, 1999; Garcia-Marques & Mackie, 2000; Garcia-Marques, Mackie, Claypool, & Garcia-Marques, 2004). According to this view, repeated exposure to a stimulus activates a positive feeling of familiarity. Studies showing that repetition-induced fluency is associated with a wide range of positive physiological reactions and evaluations have led others to make similar arguments (Reber, Schwarz, & Winkielman, 2004; Reber et al.,1998; Winkielman & Cacioppo, 2001).

Further evidence of the intrinsic association between familiarity and positivity comes from studies showing the impact is bi-directional. That is, positivity induced by sources other than repetition can also be mistakenly interpreted as familiarity. For example, Garcia-Marques et al. (2004) showed that smiling novel faces were more likely to be incorrectly judged as familiar than were novel faces with neutral expressions, and that subliminal association with a positively-valenced prime led to false recognition of novel words as familiar (see also Phaf & Rotteveel, 2005). Similarly, Monin (2003) showed that the more attractive faces were perceived to be, the more familiar they seemed, even when participants expressed feelings of familiarity using an affectively-incongruent response (Corneille, Monin, & Pleyers, 2005). Moreover, Housley, Claypool, Mackie, and Garcia-Marques (2010) showed that subliminally associating ingroup pronouns (which are known to elicit positivity, see Perdue, Dovidio, Gurtman, & Tyler, 1990) with nonsense syllables increased their perceived familiarity. Thus the assumption of an association of familiarity and positivity makes sense of a wide range of empirical findings demonstrating that judgments of either familiarity or positivity can be influenced by the other. Familiar stimuli are judged to be more positive, and positive stimuli are judged to be more familiar.[1]

In the experiments reported here, we seek to show that the typical connection between familiarity and positive affect can also result in a different type of outcome: facilitation of responding. Because familiarity and positive affect are so intimately connected, we expect that each facilitates the judgment of the other. When either of these constructs is activated, one's ability to render a judgment of the other should be facilitated. That is, when positivity is activated, making a judgment that something is familiar will be facilitated, resulting in faster reaction times. At the same time, when familiarity is activated, making a judgment of positivity will be facilitated, with the same reaction-time consequences. By the same reasoning, the activation of positivity might retard the judgment of novelty, and the activation of novelty might decelerate the judgment of positivity. We thus intend to demonstrate a novel and unique outcome of the relationship familiarity has with positive

1. According to a cue-learning approach (see Unkelbach, 2006, 2007), this close association has been learned on the basis of subjective experience, and thus different experiences might undermine the typical association between familiarity and positivity (see also Schwarz, 2004). Our facilitation hypothesis about processing consequences, like previous studies showing judgmental consequences, assumes as a default that familiarity and positivity share affective valence.

affect: when the two concepts are activated together or in close proximity, response latencies to judgments of positivity and familiarity are facilitated.

EXPERIMENT 1

We tested this prediction first using a well-established technique typically used to assess associations between mental constructs. The Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) has been used to provide evidence that an established association between a bi-polar target (such as flowers vs. insects) and a bipolar attribute (such as pleasant vs. unpleasant) impacts response latencies when the dimensions are judged together. For example, participants might be required to quickly categorize stimuli (flower or insect names) using just two response keys, and then to categorize words as positive or negative, using the same two response keys. The basic assumption of the procedure is that the task will be easier, and therefore participants will respond faster, when targets that are associated in memory share the same response key than when they do not. So when highly associated categories (e.g., flower + pleasant) share a response key (compatible trials), performance is faster than when less associated categories (e.g., insect + pleasant) share a key (incompatible trials). Thus response facilitation and inhibition implicitly assess the differential association of the concepts in memory.

Inverting the logic of this paradigm, we predict that the typical association of familiarity and positivity will also impact the speed with which each is judged, influencing response times to such judgments in predictable ways. Because perceiving a stimulus as familiar typically activates positivity, responses to a positive stimulus will be facilitated when it is paired with something familiar, compared to when it is paired with something novel. Similarly, we predict that responses to something familiar will be facilitated when it is paired with something positive rather than something negative. More specifically, we predict participants to be faster in pressing a key to evaluate a stimulus or to signal its familiarity/novelty if the categories Positive and Previously Presented or Negative and New are associated with the same key (compatible trials) than when the categories of Positive and New or Negative and Previously Presented are associated with the same key (incompatible trials). We tested this response facilitation hypothesis across both types of judgments: evaluation (positivity versus negativity) and familiarity (previously presented versus new). Because judgments of memory can rely on both explicit recollection and feelings of familiarity (Jacoby, 1991), we expected response times to be slower on the familiarity compared to the evaluation task. Nevertheless, we expected response times to be faster in compatible rather than incompatible trials, regardless of judgment type.

METHOD

Participants and Design. A total of 71 psychology undergraduates (56 women) from Instituto Superior de Psicologia Aplicada (Lisbon, Portugal) participated in this study. Both factors of the 2 (Compatible vs. Incompatible trials) x 2 (Evaluation vs. Recognition tasks) design were manipulated within subjects.

The right or left position on the screen where compatible and incompatible stimuli and specific category labels appeared, as well as task order (compatible first vs. incompatible first), were all counterbalanced, creating 8 (2x2x2) different groups of participants.

Materials. Sixteen stimuli were selected for each of the four categories used in the study (city names that would be and would not be repeated; positive vs. negative words). At the outset of the experiment, all city names were completely unfamiliar to the Portuguese population. Each had 2-3 syllables and used Portuguese phonemes. Positive and negative words were selected from the Portuguese norms compiled by Garcia-Marques (2003) and were rated as moderately familiar.

Procedure. Presentation of stimuli and recording of responses were controlled by an E-Prime program. Participants were seated in front of a computer to participate in a set of cognitive studies. Their first was a memorization task, in which one of the city lists was presented on the computer screen. Each name was presented at the center of the screen for 3 seconds. This task served to make one set of city names familiar, which would be relevant later in the experimental session. Next, participants received instructions very similar to the ones used in the IAT and performed two practice blocks of trials with two neutral categories: upper vs. lower case letters and blue vs. red color. For each block, a stimulus word appeared on the screen and participants were to categorize it in a particular way, by pressing the appropriately labeled key. In one block, participants pressed one key if the word was printed in upper case letters and a different key if it was printed in lower case letters. On the second practice block, participants pressed one key if the word was printed in red and a different key if it was printed in blue.

Upon completion of the practice trials, the first experimental block (which included 32 trials) was introduced. On 16 trials in this block, participants were shown city names presented in all upper case letters. Importantly, 8 of these city names had appeared in the memorization task completed earlier in the experiment (i.e., were Old) whereas 8 others had not (i.e., were New). On the other 16 trials in this same block, participants were shown 8 positively and 8 negatively valenced words, always in lower-case letters. For each trial, participants had to categorize the target word as quickly and as accurately as possible. Specifically, they were instructed that if the target word was in lower case letters that they should categorize it by valence, pressing one key if it was "positive" and a different key if it was "negative." Additionally, they were told that if the word was in upper case letters, they should categorize it by level of familiarity, pressing one key if it had been previously "presented" and a different key if it was "new." We used the term "presented" and not "old" in order to equate the valence of both terms used to classify stimulus levels of familiarity ("new" and "presented").

For half the participants, this first experimental block included the "compatible" trials. For these, the same response key was used to denote "positive" responses on evaluative trials and "presented" on familiarity judgment trials, and a different response key was used to denote "negative" responses on evaluative trials and "new" on familiarity judgment trials. We term these the "compatible" trials because we surmise that both a positive response and a familiar (previously presented) response generate the same feeling. For the other half of the participants, the first experimental block included "incompatible" trials. For these, the same response key was used to denote "positive" responses on the evaluative trials and

"new" on familiarity judgment trials, and a different response key was used to denote "negative" responses on evaluative trials and "presented" on familiarity judgment trials.

The category labels were permanently shown at the top right and top left corners of the display, indicating the assignment of categories to the respective responses keys (S left, L right). On each trial, the stimulus remained on the screen until a response was registered. The inter-trial interval was 150ms. Upon completion of the first experimental block, participants completed a second experimental block (again of 32 trials), engaging in either compatible or incompatible trials, whichever they had not already done.

RESULTS

Since our hypothesis depended on whether positivity and familiarity were in fact judged on the same response key or not, we tested our hypothesis by calculating for each participant the mean response latencies associated with correct responses on the two tasks for compatible and incompatible trials. Logarithm transformations of these means were performed to deal with heterogeneity and nonnormality assumptions of the ANOVA model. However, to facilitate interpretation, they are presented in their original scale (see Figure 1). These means were subjected to a 2 (compatible vs. incompatible trials) x 2 (evaluation vs. recognition task) repeated-measures ANOVA. Overall, participants were faster to make evaluative judgments (M = 1512ms; SD = 536) than to make familiarity judgments (M = 1782ms; SD = 614), $F(1,69) = 34.62$, $p < .001$, as we had foreseen. Of more theoretical importance, and consistent with predictions, response latencies were 165ms faster for the compatible trials (M = 1565; SD = 539) than for the incompatible trials (M = 1730; SD = 611), $F(1,69) = 23.09$, $p < .001$. That is, trials with the categories presented and positive assigned to the same response key induced faster reactions than trials where positivity and familiarity were not associated with the same response key. This is exactly the facilitation pattern we predicted based on the typical or default association of familiarity and positivity.[2]

A marginally significant interaction (see Figure 1) between the two factors suggested that compatibility had a slightly stronger impact on the evaluation task (Difference = 226.50) than on the recognition task (Difference = 102.50), $F(1,69) = 3.63$, $p < .061$. To show that the predicted compatibility effect occurred regardless of the type of response rendered, however, we performed two ANOVAs, one for each task, introducing the type of (correct) response given by participants as a new factor.

For the evaluation task, means were subjected to a 2 (Compatible vs. Incompatible trials) x 2 (Response: Positive vs. Negative) repeated-measures ANOVA. The theoretically important consistency effect was strongly significant, $F(1,69) = 15.47$, $p < .001$, regardless of whether participants evaluated a word as positive or as negative (interaction with response type, $F < 1$). In addition, no main effect of re-

2. Although the appropriate conditions for testing our hypothesis are when correct judgments are made, we also looked at latencies on trials where incorrect responses were made. Because they were not distributed across all cells of the design we could not analyze them.

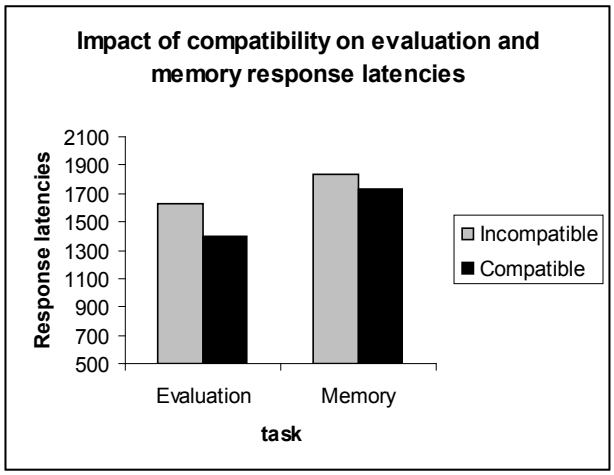

FIGURE 1. Impact of compatibility and type of task on response latencies.

sponse type was found ($F < 1$), suggesting that participants took the same amount of time to render a positive and a negative response.

For the memory task, reaction time means were subjected to a 2 (Compatible vs. Incompatible trials) x 2 (Response: Presented vs. New) repeated-measures ANOVA. In addition to the strongly significant predicted compatibility effect, $F(1,69) = 26.21$, $p < .001$, there was a main effect of type of response, $F(1,69) = 35.78$, $p < .001$, suggesting that participants were faster to correctly recognize that an item had been presented before ($M = 1637$ms; $SD = 501$) than to correctly recognize that it had not ($M = 1973$ms; $SD = 580$). Importantly, however, this factor did not moderate the predicted compatibility effect, $F(1,69) = 1.07$, $p < .304$.That is, whether rendering a hit or a correct rejection, participants were faster to make the familiarity judgments on compatible trials than on incompatible trials.[3]

The absence of interactions in both the analyses just described is important because it illustrates the robustness and generalizability of the effect. That is, these findings show that the predicted facilitation effect occurred regardless of the type of response made (positive versus negative; Presented versus New). Thus, it is not the case that the compatibility effect occurred only when making positive judgments or only when making Presented (old) judgments. The pattern of results

3. Consistent with our expectations, facilitation occurred significantly for both evaluation and memory tasks in Study 1, but was more muted for the memory task. That pattern is consistent with the fact that memory judgments entail both automatic and controlled aspects. Confirming this, analyses of the estimates for the controlled and automatic components in the task (following Stewart, von Hippel & Radvansky, 2009) revealed that whereas the evaluative task was dominated by the automatic process ($M = .817$; M control = .668; $F(1,61) = 21.744$; $p < .0001$), estimates of the controlled ($M = .434$) and automatic components ($M = .497$) in the memory task were equivalent, $F(1,61) = 2.377$; $p = .128$. In fact, when we control for the difference between the automatic and controlled components in the main analysis (reported in the main text), the marginal interaction between compatibility and trial type disappears, suggesting that differences in facilitation are mediated by the relative weight of the controlled component

found is exactly the one expected if the typical association of familiarity and positivity is assumed: both characteristics influence response times when judgments are made about the other.[4]

This pattern of results is congruent with our hypothesis that the association typically found between positivity and familiarity will influence response latencies in systematic and predictable ways. When the feeling activated by the valence of one stimulus and the old or novel status of another stimulus were compatible, responding was facilitated, compared to when they were incompatible.

EXPERIMENT 2

The tasks in Experiment 1 required participants to explicitly categorize target stimuli into superordinate concepts (evaluation: positive vs. negative; and previous presentation: old vs. new), and thus the results may reflect a general association between these superordinate concepts rather than specific reactions to the target stimuli themselves. That is, it is possible that the results in Experiment 1 were obtained because the general concept of "familiarity" (activated by the experimenter) primed the general concept of "positive evaluation" (also activated by the experimenter), and vice versa. In Experiment 2, we wanted to show that exposure to a positive stimulus is itself sufficient to trigger such facilitation effects, demonstrating that stimuli that are "familiar" or "positive" actually share perceptual properties. Thus, Experiment 2 was developed to demonstrate that the effects obtained in Experiment 1 would replicate even when the concept of valence was never explicitly activated at all. Because familiar stimuli typically feel positive, the mere presentation of a positive stimulus should itself facilitate latencies for subsequent correct judgments of whether a stimulus is familiar without the evaluative category of the stimuli even being consciously activated.

This type of impact on judgment latency is well captured by an evaluative priming procedure (Fazio, Sanbonmatsu, Powell, & Kardes, 1986), in which valenced objects are presented as primes, and participants subsequently categorize presented target words as positive or negative. Activation of valence (from the prime) affects evaluation speed of the target objects. When the evaluative connotations of a prime and a target match, response times are facilitated. But when these evaluative connotations mismatch, the evaluative tone of the prime interferes with responding to the target, and thus response times are not facilitated and may even be inhibited. Thus the close association between the prime and target valence facilitates target response times.

4. Although our hypotheses focused on response times when correct judgments were made, we analyzed judgment accuracy as well. Performance was better on the evaluation task (M = 81% correct) than on the memory task (M = 69% correct), $F(1,69) = 32.47$, $p < .001$. A significant trial type effect, $F(1,69) = 23.32$, $p < .001$, replicated previous studies by revealing that participants were more accurate on compatible trials (M = 78% correct) than on incompatible trials (M = 71% correct). However a significant two-way interaction, $F(1,69) = 18.66$, $p < .001$, indicated that this effect held only for evaluations (M compatible = 88% vs. M incompatible = 68%), but not for memory trials (both Ms = 68%). Correct recognition in this paradigm was both low and impervious to the compatibility manipulation. Nevertheless, when recognition was correct, that is when familiarity was activated, the co-activation of positivity facilitated responding, as predicted.

In our second experiment, we used an evaluative priming paradigm to test the facilitation hypothesis that given the typical, intrinsic relationship between affect and familiarity, positive evaluative primes should facilitate responses to familiar stimuli.

Participants had to decide which of two symbols had been presented before, with one subliminally primed with a happy face and the other primed with a neutral circle (see Garcia-Marques et al., 2004). We expected positive affect elicited from the prime to influence response speed, facilitating the identification of an old stimulus it was presented with.

To test this hypothesis, participants were asked to choose which of a set of two stimuli had been previously presented. This two-alternative forced choice procedure heightens the role of relative familiarity of the stimuli as a basis for making judgments (Aggleton & Shaw, 1996; Bastin & Van der Linden, 2003; Parkin, Yeomans, & Bindschaedler, 1994), while discouraging the change of criterion for old and new responses sometimes associated with affective priming effects (see, for example, Macmillan & Creelman, 2005, p. 179). Thus, we expected the forced-choice format to increase the sensitivity of response latencies to the association between familiarity and positivity.

This two-alternative forced decision task also allowed us to create a situation similar to the one in Experiment 1, where two different sources of feelings would be consistently or inconsistently activated. That is, by presenting pairs of "new" and "old" stimuli and by priming one with a positive stimulus and the other with a neutral stimulus, we expected to facilitate correct response latencies when *positive* stimuli were associated with *old* stimuli and *neutral* stimuli were associated with *new* stimuli, compared to when *positive* stimuli were associated with *new* stimuli and *neutral* stimuli were associated with *old* stimuli.

METHOD

Participants and Design. A total of 35 (8 male) Portuguese undergraduates participated in a 4 (Repetition status of stimuli: Old/Old, New/New, Old/New, New/Old) x 2 (Affective prime position: Happy face/Circle vs. Circle/Happy Face) x 2 (Counterbalance of New and Old Lists) factorial design, with only the latter counterbalancing factor manipulated between participants.

Procedure. Participants were invited to take part in a study of how Europeans deal with symbols that are not part of their regular alphabet. In a first task, participants were asked to familiarize themselves with a set of 32 such symbols, presented on a computer screen for one second each. Immediately after, they performed a 15-minute filler task, in which a European map was presented sequentially 20 times, each time highlighting a different country whose name was to be chosen from a list of nine countries.

In the following recognition task, participants were presented with pairs of symbols (both presented 2cm from the center of the screen) and were asked to decide which symbol was previously presented. A total of 64 pairs were randomly presented, with 16 pairs belonging to one of four conditions: (1) a condition in which both symbols were old (O/O conditions); (2) a condition in which both symbols were new (N/N conditions); (3) a condition with a new symbol on the left of the screen and an old symbol on the right (N/O condition); and (4) a condition with an

old symbol on the left of the screen and a new symbol on the right (O/N). Participants were required to press the s (left) or the l (right) key to signal which symbol, the one on the left or the one on the right, had been previously presented.

Symbol presentation was immediately preceded (exactly in the same location) by the subliminal (under 12 ms) simultaneous presentation of a happy face and a neutral circle. More specifically, on some trials, the symbol on the left was primed with the happy face, and the symbol on the right with the neutral circle (☺/○). On other trials, the symbol on the right was primed with the happy face, and the symbol on the left was primed with the neutral circle (○/☺). The diameter of these primes was 3cm and symbols were presented in a circle to completely mask the prime. Previous data had established that the presentation of these two stimuli (happy faces, circles) was associated with different mood ratings (happiness and neutrality, respectively) both in supraliminal and subliminal conditions (see Garcia-Marques et al., 2004) and that experimental conditions did not allow participants to detect that these stimuli were presented. Thus in the critical trials, participants saw either a new stimulus on the left and an old stimulus on the right or vice versa, and in half of each of these cases, the old stimulus was preceded by a positive prime and the new by a neutral prime, whereas in the other half of the cases, the old stimulus was preceded by the neutral prime and the new stimulus was preceded by the positive prime.

RESULTS

The N/O and O/N trials offer us the conditions to directly test our hypothesis. These trials were re-coded as "consistent" when the happy prime was associated with the old stimulus and the neutral prime was associated with the new stimulus and as "inconsistent" when the happy prime was associated with the new stimulus and the neutral circle was associated with the old stimulus. Log transformed latencies of correct responses[5] on consistent and inconsistent trials were directly compared. Consistent with our hypotheses, participants' correct responses were faster on consistent trials (M = 1594ms; SD = 425.22) than on inconsistent trials (M = 2115ms; SD = 564.31), $t(34) = 5.91$, $p < .001$. That is, participants correctly responded that a symbol was old more quickly when it was primed with a happy face compared to when it was primed with a neutral circle.

Importantly, this reaction-time advantage on consistent trials was evident only when participants made correct responses (circumstances in which the intended co-activation of positivity and familiarity occurred). An ANOVA that compared correct and incorrect response patterns on consistent and inconsistent trials revealed that the expected main effect of level of consistency, $F(1,34) = 13.57$, $p < .001$, ($Mconsistent$ = 1692ms; SD = 425 vs. $Minconsistent$ = 1978 ms; SD = 720) was qualified by the type of response, $F(1,34) = 33.98$, $p < .001$. Whereas participants'

5. Although our hypotheses focused on response latencies, we also analyzed judgment accuracy. The proportion of correct responses in the trials critical to our hypothesis test (N/O and O/N trials) was only 53% (basically chance). Response accuracy in N/N and O/O trials was also at chance, 49%. Nevertheless, the forced choice paradigm allowed us to again show that when correct judgments were made, judgments were faster when positivity was activated and the stimulus was recognized as old (co-activation of positivity and familiarity).

correct responses were faster on consistent trials than on inconsistent trials as just described, log latencies of incorrect responses did not differ across consistent (M = 1840ms; SD = 497) and inconsistent (M = 1790ms; SD = 564) trials, $F(1,34) = 1.15$, $p < .290$. Remember that an incorrect response on a consistent trial would occur when a participant selected as old the new item that was primed with the neutral circle. Similarly, an incorrect response on an inconsistent trial would occur when a participant selected as old the new item that was primed with the positive prime. Thus it was important that there was no facilitation of incorrect responses in the inconsistent versus consistent trials, which would have suggested that the presence of the smile prime itself speeded responses or that any positively-primed stimulus would be selected faster. Since this did not occur, it eliminates any impact of the positive prime alone as an explanation for our main finding of importance. Our results cannot be explained simply by saying that the positive prime facilitated any response (see Corneille et al., 2005, for a similar finding). Equally, these data show that facilitation does not occur unless familiarity and positivity are co-activated as intended. Thus, the pattern of results clearly indicates that the effect on participants' correct response times arose when the two sources of positive feelings (positivity from the prime, and positivity from familiarity) were co-activated.[6]

The results from Study 2 also supported the hypothesis that the association that positivity has with familiarity will influence response latencies in systematic and predictable ways. When the feeling promoted by a positive affective prime was congruent with the feeling generated by previous exposure, responding was facilitated, compared with when there was incongruence of valences arising from familiarity and primed affect.

GENERAL DISCUSSION

Our studies provide evidence of a heretofore unstudied consequence of the fact that re-exposure to a previously encountered stimulus is associated with a subjective feeling of familiarity that typically is inherently positive (Garcia-Marques et al., 2004; Harmon-Jones & Allen 2001; Jacoby & Kelley, 1990; Jacoby, Kelley, & Dywan, 1989; Pittman, 1992; Tichener, 1910). The two studies show that because familiarity is felt positively, the experience of familiarity facilitates the speed with which a positively valenced stimulus is responded to and the presence of positively valenced stimuli facilitates the speed with which a stimulus is recognized. Thus, when affective positive priming and prior exposure both contribute to a subjective experience of positivity, we may expect their compatibility to facilitate correct judgments of one another.

Both of our experiments furnish clear evidence of a strong impact of both sources of feelings on such response latencies. In Experiment 1, participants responded relatively slowly when trying to associate the concept of Familiarity with a Negative valence compared to when they could simply press a button to report familiarity and positivity with the same response key. Experiment 2 suggests that this

6. Although this co-activation defined the conditions under which our hypotheses could be best tested, we also looked at response times in the O/O and N/N trials, in which no correct response was possible. In these trials, participants were faster to select whatever stimulus was primed with a happy face (M = 1829msc) than to select the stimulus primed with a circle (M = 2003msc; $F(1,34) = 8.39$; $p < .007$).

association exists at the stimulus level, and not just at the superordinate category level. When we promoted congruence of feelings activated at the stimulus level, the subjective positive experience of the stimulus itself facilitated participants' correct "old" responses. In that experiment, no reference was ever made to a valence dimension, but its subliminal activation was able to facilitate response times as we predicted.

These studies focus on the benefits that congruence of feelings brings to speed of decision making about both valence and recognition. Previous research has shown that the activation of one feeling can promote a congruent judgment of the other (see Garcia-Marques et al., 2004; Zajonc, 1968). For example, the subliminal presentation of a happy prime has been shown to trigger false feelings of familiarity for subsequently presented stimuli (Garcia-Marques et al., 2004). Yet in Study 2, in particular, the association between familiarity and positivity was revealed more clearly in the response times than in biased judgments. Why is this so? The answer lies no doubt in the nature of the tasks used in the different paradigms. Whereas most prior work has required simple yes or no judgments about a single stimulus at a time (see Garcia-Marques et al., 2004 for example), Experiment 2 made use of a recognition forced-choice task which often, contrary to expectations, reduces performance accuracy (see Green & Moses, 1966; Kroll, Yonelinas, Dobbins, & Frederick, 2002; Macmillan & Creelman, 2005; Yonelinas, Hockley, & Murdock, 1992). Performance was also likely hampered by the inclusion in this study of the N/N and O/O trials—forced choice pairings of old with old items and new with new items pose more difficult memory tests (O'Reilly & Rudy, 2000). In fact, the use of the forced recognition paradigm, or the introduction of the four types of trials, appeared to prevent positivity biasing judgments toward familiarity and biased/accurate responding (see Housley, Huber, Clark, Curran & Winkielman, 2008 for another situation in which forced-choice and yes/no paradigms produce different judgments). However, we did find in these conditions facilitation of responses to whatever stimulus was primed with the happy face. That meant that when faced with two stimuli that had never been seen before, participants responded more quickly to choose the one that was positive (perhaps relying on this as a signal of familiarity) and when both stimuli were familiar, they responded more quickly to the one that was also positive (perhaps using the double cue of actual familiarity plus positivity). Thus although the judgment data suggested that these always incorrect forced choice judgments were difficult, the response data suggested that participants used positivity cues in a manner consistent with our hypotheses. In addition, facilitation of reaction times in the absence of other response effects could reflect a trade-off (Woodworth, 1899) between response time and biased/accurate responding. Previous research has alerted us to the fact that task characteristics, as well as time, attention levels and some individual differences can be associated with different levels of a speed-accuracy trade-off (see Forster, Higgins, & Bianco, 2003).

Our demonstration that the association of familiarity with positivity promotes facilitation of evaluative and memory judgments is both novel and suggestive of many intriguing ideas for future work. Future studies might, for example, examine the role of negative affect and whether it does or does not facilitate novelty judgments. Although we provide evidence that positivity can facilitate a familiar response (as in Experiment 2), this need not mean that negativity would facilitate a new response. Because our Experiment 2 did not include negative affective primes,

this possibility remains an open question that should be addressed in subsequent studies. In addition, future studies should investigate the implications of our findings for many real-world phenomena. In the arena of jury decision making, our results suggest that jurors might be especially fast to decide that a well-known (or famous) defendant is not guilty, compared to making that same positive judgment for an unknown person. In the realm of hiring, these results suggest that the smile on a previously-seen job candidate may facilitate how quickly a manager makes a decision about his/her credentials versus how quickly that same decision would be made for a smiling new candidate. And regarding product evaluations, positive attributes in a new product might be more slowly recognized than negative attributes, whereas the opposite might be true for well-known products. Though the magnitude of our effects may seem small, they could nevertheless have substantial impacts on such daily decisions and judgments. Particularly in rushed or stressful judgment contexts, milliseconds could make the difference in moving from one product to another or in deciding whether a particular CV should be more carefully considered or set aside.

Perhaps even more important are the implications of our results for fundamental questions about the nature of affect and cognition. This new evidence of a facilitation effect promoted by the association between the familiarity and positive valence of stimuli furnishes additional evidence for the claim that processing a familiar stimulus is felt positively. The implications of considering affect as a phenomenal experience associated with a so-called cognitive processing judgment like familiarity are far reaching. Phenomena like the mere exposure effect, for example, need not be regarded as involving mis-attribution (as Bornstein claimed) or as having two separate cognitive and affective components (as Zajonc, 1968 claimed). Like Moliére's Bourgeois Gentleman, Monsieur Jordain, who one day realized that he had unknowingly been speaking prose all his life, perhaps we should also begin to realize that by studying memory, we are also studying affect.

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