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► **To cite this version:**

Olivier Corneille, Sandie Mauduit, Rob Holland, Madelijn Strick. Liking Products by the Head of a Dog: Perceived Orientation of Attention Induces Valence Acquisition. *Journal of Experimental Social Psychology*, 2008, 45 (1), pp.234. 10.1016/j.jesp.2008.07.004 . hal-00645176

HAL Id: hal-00645176

<https://hal.science/hal-00645176>

Submitted on 27 Nov 2011

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Accepted Manuscript

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PII: S0022-1031(08)00113-3
DOI: [10.1016/j.jesp.2008.07.004](https://doi.org/10.1016/j.jesp.2008.07.004)
Reference: YJESP 2115

To appear in: *Journal of Experimental Social Psychology*

Received Date: 22 May 2008
Accepted Date: 1 July 2008

Please cite this article as: Corneille, O., Mauduit, S., Holland, R., Strick, M., Liking Products by the Head of a Dog : Perceived Orientation of Attention Induces Valence Acquisition, *Journal of Experimental Social Psychology* (2008), doi: [10.1016/j.jesp.2008.07.004](https://doi.org/10.1016/j.jesp.2008.07.004)

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Liking Products by the Head of a Dog : Perceived Orientation of Attention Induces Valence
Acquisition

Olivier Corneille, Sandie Mauduit¹, Rob Holland² & Madelijn Strick²

Université catholique de Louvain

¹ Université Paris X Nanterre

² Radboud University Nijmegen

Key words : Attitudes, Implicit evaluative learning, Theory of Mind

Running head : Valence acquisition

Number of words : 2496

Contact author : Olivier Corneille Catholic University of Louvain Psychology Dpt-PSOR Place

Cardinal Mercier, 10 B-1348 Louvain-la-Neuve, Belgium Phone: +32+ (0) 10 47 86 42 Fax:

+32+ (0) 10 47 37 74 Email: olivier.corneille@uclouvain.be

Abstract

We show that the valence acquired by an object is sensitive to the perceived attention it receives and that this effect occurs in a quite implicit fashion. Participants were exposed to products (i.e., peppermint brands) associated with the head of dogs oriented toward them, looking straight ahead, or oriented away from them. Participants then completed an affective priming task, which allowed us to assess the valence acquired by the products in a task free of desirability concerns. Results show that the valence of the products increased linearly as the perceived orientation of attention of the targets moved toward them. This finding suggests that mimetic desire effects may be activated in a quite implicit fashion. The theoretical and social implications of this finding are discussed.

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Paying attention to others' orientation of attention is of paramount importance for our survival and well-being. It is telling in this regard that of all primates the human eye is the most conspicuous (Kobayashi & Kohshima, 2001), that human beings pay automatic attention to eye gaze (e.g., Friesen & Kingstone, 2003), and that deficits in joint attention are associated with the autism syndrom (e.g., Baron-Cohen, Wheelwright, & Jolliffe, 1997; Senju, Yaguchi, Tojo, & Hasegawa, 2003). Empirical evidence also suggests that Theory of Mind and joint attention phenomena generalize to communication in other species (e.g., Povinelli & Eddy, 1996) and to inter-species communication (e.g., Hare & Tomasello, 2005).

Theory of Mind research has led to major advances in our understanding of the cognitive processes underlying people's capacity to explain and predict their own and other people's actions. Yet, surprisingly little is known about the evaluative consequences of paying attention to others' orientation of attention. One hypothesis investigated here is that a positive valence is spontaneously acquired by stimuli that are perceived to be objects of attention. This hypothesis is reminiscent of René Girard (1987)'s *mimetic desire* hypothesis, which states that people's desires are not autonomous but rather based on the imitation of what they perceive other people desire. If true, this phenomenon may have critical social implications, in particular for the emergence of interpersonal and intergroup conflicts.

To the best of our knowledge, only three recent studies are relevant to this issue. These studies all involved evaluative measures of stimuli previously associated with human faces whose eye gaze orientation toward stimuli varied. Two of these studies found better liking of objects previously associated with an eye gaze directed at them (Bayliss, Paul, Cannon & Tipper, 2006),

an effect that vanished when eyes were replaced by arrows as orienting stimuli (Bayliss et al., 2006) or when the faces looked disgusted (Bayliss, Frischen, Fenske & Tipper, 2007). However, these studies relied on explicit evaluative ratings of the objects. As such, these ratings might have been sensitive to desirability concerns and/or sensitive to conscious inferences made about the objects from the attention they received. A third study relied on an implicit evaluative measure and found better liking of products previously associated with attractive faces looking straight ahead (i.e., at the participants) rather than at, or away from, the products (Strick, Holland & Van Knippenberg, 2008). However, participants in this study were asked to process orientation-irrelevant features of the faces (i.e., categorize the eyes as open or closed) instead of the orientation of their eye gaze toward the stimuli.

Hence, it remains to be examined whether paying attention to the orientation of attention toward a stimulus influences the valence that this stimulus acquires when evaluative goals and desirability concerns are minimized and when participants are not concurrently engaged in another attentional task. In this research, we addressed this question by having participants process the orientation of the head of dogs toward products. Participants were exposed to various dog-product associations and asked to respond upon each trial to the orientation of the dog toward the product. Participants then completed an affective priming task (Fazio, Sanbonmatsu, Powell, & Kardes, 1986), which allowed us to assess the valence acquired by the product.

The advantage of using an affective priming task is that this task is free from desirability concerns as it does not require participants to evaluate stimuli on which an affective measure is taken. The use of dogs' heads instead of human faces further contributed to make the evaluative context rather implicit in the task and to minimize the risk that reasoned inferences would be drawn about the products' qualities (i.e., peppermint brands) from the perceived orientation of attention of the target toward the product.

The use of dog heads might seem surprising in the context of a research consisting of an evaluative extension of joint attention and Theory of Mind research. Yet, our choice makes both empirical (see above) and theoretical sense. Several authors noted that *Canis familiaris* and *Homo sapiens* may have evolved similar social and communicative skills adapted for communicative interactions. Comparative work involving canids and primates also suggests that dogs' social skills may represent a special case of convergent cognitive evolution with human (Hare & Tomasello, 2005). Because of the uniqueness of communication that exists between dogs and humans, we thought that valence acquisition may be spontaneously activated upon processing the orientation of attention of the dogs toward the stimuli.

Method

Participants and design

Seventy-four female undergraduate students (mean age = 19.7) participated for course credits in an experiment where perceived orientation of attention (toward the product, neutral, away from the product) was manipulated within-participants. Dogs' attractiveness was also manipulated but this factor had neither main nor moderating effects and will not be further discussed.

Materials and procedure We borrowed from Strick et al. (2008) 20 pictures of unfamiliar peppermint brands, ranging from 4.93 to 6.93 cm in width and from 3.73 to 5.66 cm in height. Dog heads were 12 pictures of dogs presented without ears, ranging from 3.65 to 4.50 cm in width and from 4.08 to 5.76 cm in height. Participants were exposed to 100 head orientation-product associations. Half of these associations were attentionally neutral, with the head of a dog looking straight ahead. The remaining associations were attentionally relevant and involved either an orienting away or an orienting toward target 1. Each object was presented 5 times with

various dog 5 heads but always with a same head orientation. Associations of products with specific dog heads and locations of dogs relative to products (i.e., left or right) were fully randomized.

Each association remained on the screen for 1500 msec and was directly replaced by a blank screen asking participants to respond fast and accurately whether the dog looked (by pressing key 'a') or did not look (by pressing key 'p') at the object. Response times on this task were irrelevant to our research interest and also irrelevant in general as participants could enter their responses only after 1500 msec. This task simply aimed at minimizing evaluative goals in the exposure phase of the experiment while ensuring (1) that participants would process the dog's head orientation of attention toward the product and (2) that exposure times to the various dog-product associations would be kept constant. Because all products were presented for a same number and period of time, mere exposure effects were unconfounded with effects of perceived orientation of attention.

Participants then performed an affective priming task. They were asked to indicate as quickly and accurately as possible whether a target word following a prime was positive (by pressing key 'p') or negative (by pressing key 'n'). Each trial started with a centred fixation cross presented for 1500 ms, after which a prime was presented for 200 ms and directly followed by a target word. Primes were products presented in the exposure phase and targets were positive and negative nouns frequently used in French (e.g., "maladie", "disease"; "vacances", "holidays"). Each product prime was followed twice by 2 positive and 2 negative target words, resulting in 4 data points for each product and totalling 80 trials.

Results

RTs associated with incorrect responses or latencies shorter than 200 ms or longer than 1500 ms were excluded from analyses (e.g., Pleyers, Corneille, Yzerbyt & Luminet, 2007). Then, we computed a score reflecting positive valence acquisition by subtracting for each product the mean RT to positive words from the mean RT to negative words. These scores were averaged across the various products pertaining to a same orientation condition. More positive values on this score reflect a more positive valence acquisition as participants took relatively longer for categorizing evaluatively the negative than the positive target words that followed the product prime. These scores were subjected to a repeated-measures ANOVA. A linear effect of perceived orientation of attention was obtained, $F(1,73) = 5.45, p < .03$, with positive valence acquisition increasing linearly as the dog's head moved toward the product (see Figure). The residual was not significant $F(1, 73) = 1.68, p = .199$; hence, only a linear effect was obtained.

Discussion

We found that a stimulus acquires a more positive valence when perceived to be an object of attention. This finding was obtained in a task where evaluative goals were minimized. Indeed, the products were not directly evaluated in our experiment. Rather, participants processed dog heads orientation in the first part of the experiment and the valence of words in the affective priming task. The use of dog heads further contributed to minimize the risk of having participants purposely draw reasoned inferences about products. Hence, the present research suggests that perceived orientation of attention influences valence acquisition in a quite implicit fashion. This finding should contribute to the literature on attitudes formation and implicit affective learning.

Interestingly, many studies have examined the attentional implications of affects but only a handful have started to examine the reversed relation (Fenske & Raymond, 2006; Veling, Holland & van Knippenberg, in press). This report may thus also contribute to the research devoted to the evaluative consequences of attention. Yet, the present research should be mainly

considered as an evaluative extension of joint attention and Theory of Mind research, a topic which may receive increasing attention in the forthcoming years. Clearly, our finding may have crucial implications for interpersonal and intergroup relations. Negative emotions such as jealousy and envy may arise from desiring objects of attention in others, leading to interpersonal and intergroup conflicts perhaps even no matter the true value and relevance of the attended-to objects (e.g., Salovey, 1991; Salovey & Rodin, 1989).

René Girard's *Mimetic Desire Theory* (e.g., Girard, 1987) consists of a radical extension of the latter principle. It suggests that people cannot help but desiring things that are perceived to be objects of attention. The main challenge of cultures is then to find out an adaptive way to regulate conflicts that arise from these emotions. To be sure, we do not mean to argue here that people become obligatory envious of objects that are attended to by *dogs*. Yet, the present research suggests that the valence acquisition mechanism examined here may be so routinized that it gets activated as soon as we are consciously processing the orientation of attention of targets who have, as dogs, some communicational relevance to us.

A tricky issue is whether our participants processed dogs as intelligent agents orienting consciously their attention relative to the products or as mere orienting cues devoid of any goal and intention. As mentioned in the introduction, Bayliss et al (2006) found no evaluative effect when using arrows instead of eye gaze. Yet, a critical reader may correctly point out that such effect might have emerged if we had used arrows in the present research. If it had, would this finding suggest that arrows and dog heads are processed both as intelligent agents or, alternatively, that they are processed both as mere orienting cues? There is no simple answer to this question as people are, to a large extent, left free to attribute or not conscious intentions to living and non-living entities. Indeed, it is now well established that people may infer human intentions in non-living stimuli (e.g., Dik & Aarts, 2007; Hassin, Aarts & Ferguson, 2004 ;

Michotte, 1963). Conversely, they occasionally deny human qualities even to human beings (Leyens et al., 2000).

The latter issue is complicated by the fact that researchers have no direct access to people's inferences. Hence, participants may retrospectively claim, on the basis of a highly biased introspective process, that they inferred an intention in some categories of stimuli (e.g., eye gaze and dog heads) but not in other (e.g., arrows). It is further complicated by the fact that dog heads, eye gaze and arrows display asymmetries in their perceptual load and so can hardly be compared when it comes to evaluating their attentional effects. Finally, it is also complicated by the fact that human beings sometimes orient their attention independent of any conscious intention, such as when they move automatically their eyes towards a visual stimulus crossing unexpectedly their visual field.

Aside from these methodological and theoretical issues that are at the core of contemporary psychological research, one should more generally note that the evaluative impact of intelligent entities and non-intelligent ones (assuming the latter finding would be obtained) may partly rely on the same mechanisms. For instance, people may process for a longer time or more in-depth an object that is perceived to be attended to, with orienting toward target stimuli speeding up or deepening the processing of the object. This process may increase the perceptual fluency of objects that are perceived to be attended to, resulting in more positive valence acquisition for these objects (e.g., Reber, Winkielman & Schwarz, 1998). Another possibility is that people experience a greater facility at orienting their gaze toward an object that is perceived to be attended to. This facilitated or more active eye gaze may in turn result in a positive valence acquisition for this object (Simojo, Simion, Shimojo & Schieir, 2003).

Clearly, it was beyond the scope of the current flash report endeavour to provide definite answers to the latter mediating issues. The study of how human and non-human species make

sense of the intentions of other organisms in intra and inter-species communication has known major developments in various psychological fields, yet is still in its infancy. One fascinating feature of this research is that it showed that inferring erroneously a conscious intention in an organism may facilitate the cognitive and affective development of this organism, such as when people come to see a smile purposely directed at the them in the face of their newborn or come to perceive empathic intentions in the behavior of their dogs.

The goal of the current research was more modestly devoted to contribute to initiating a stimulating empirical and theoretical debate on the evaluative consequences of joint attention and Theory of Mind phenomena. To some extent, whatever the underlying mechanism involved, the social implication of our work would also remain the same. That is, no matter whether non-intelligent agents would lead to similar evaluative effects, our findings show that these effects do occur upon processing intelligent ones and do so in a quite implicit fashion. Again, we believe this effect may have crucial implications for people's emotional and social regulation. We hope the future research will examine more closely its underlying mechanisms and boundary conditions, we believe for the best in advancing our understanding of interpersonal and intergroup conflicts.

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Footnote :

¹Whereas the number of products associated with attentionally-neutral and attentionally relevant orientations were equated (i.e., 10 versus 10), there was a slight difference within the latter orientation condition, with 6 products associated with a looked-away orientation and 4 associated with a looked-at orientation. This difference is originally due to the fact that we crossed the orientation factor with the attractiveness factor and could not divide evenly 5 products within each level of the attractiveness factor. We do not deem this difference problematic in the context of our predictions, though.

Figure : Mean positive valence acquisition of products as a function of perceived orientation of attention (standard error bars added).

