

Unconscious Emotion

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ABSTRACT—*Conscious feelings have traditionally been viewed as a central and necessary ingredient of emotion. Here we argue that emotion also can be genuinely unconscious. We describe evidence that positive and negative reactions can be elicited subliminally and remain inaccessible to introspection. Despite the absence of subjective feelings in such cases, subliminally induced affective reactions still influence people's preference judgments and even the amount of beverage they consume. This evidence is consistent with evolutionary considerations suggesting that systems underlying basic affective reactions originated prior to systems for conscious awareness. The idea of unconscious emotion is also supported by evidence from affective neuroscience indicating that subcortical brain systems underlie basic "liking" reactions. More research is needed to clarify the relations and differences between conscious and unconscious emotion, and their underlying mechanisms. However, even under the current state of knowledge, it appears that processes underlying conscious feelings can become decoupled from processes underlying emotional reactions, resulting in genuinely unconscious emotion.*

KEYWORDS—*affect; automaticity; consciousness; emotion; neuroscience*

To say that people are conscious of their own emotions sounds like a truism. After all, emotions are feelings, so how could one have feelings that are not felt? Of course, people sometimes may be mistaken about the cause of their emotion or may not know why they feel a particular emotion, as when they feel anxious for what seems no particular reason. On occasion, people may even incorrectly construe their own emotional state, as when they angrily deny that they are angry. But many psychologists presume that the emotion itself is intrinsically conscious, and that with proper motivation and attention, it can be brought into the full light of awareness. So, at least, goes the traditional view.

Our view goes a bit further. We suggest that under some conditions an emotional process may remain entirely unconscious, even when the

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person is attentive and motivated to describe his or her feelings correctly (Berridge & Winkielman, 2003; Winkielman, Berridge, & Wilbarger, in press). Such an emotional process may nevertheless drive the person's behavior and physiological reactions, even while remaining inaccessible to conscious awareness. In short, we propose the existence of genuinely unconscious emotions.

THE TRADITIONAL VIEW: EMOTION AS A CONSCIOUS EXPERIENCE

The assumption that emotions are always conscious has been shared by some of the most influential psychologists in history. In his famous article "What Is an Emotion," James (1884) proposed that emotion is a perception of bodily changes. This perception forms a conscious feeling, which is a necessary ingredient of both simple affective states, such as pleasure and pain, and more complex emotions, such as love or pride. Conscious feeling is exactly what distinguishes emotion from other mental states. Without it, "we find that we have nothing left behind, no 'mind-stuff' out of which the emotion can be constituted . . ." (p. 193). For Freud (1950), too, emotions themselves were always conscious, even if their underlying causes sometimes were not: "It is surely of the essence of an emotion that we should feel it, i.e. that it should enter consciousness" (pp. 109–110).

The assumption that affective reactions are conscious is widely shared in the contemporary literature on emotion. Explaining how most researchers use the term "affect," Frijda (1999) said that the term "primarily refers to hedonic experience, the experience of pleasure and pain" (p. 194). Clore (1994) unequivocally titled one of his essays "Why Emotions Are Never Unconscious" and argued that subjective feeling is a necessary (although not a sufficient) condition for emotion. In short, psychologists past and present generally have agreed that a conscious feeling is a primary or even a necessary ingredient of affect and emotion.

IMPLICIT EMOTION AND UNCONSCIOUS AFFECT

By contrast, it is now widely accepted that cognitive processes and states can be unconscious (occurring below awareness) or implicit (occurring without attention or intention). So, it may not require much of a leap to consider the possibility of unconscious or implicit emotion. As Kihlstrom (1999) put it,

Paralleling the usage of these descriptors in the cognitive unconscious, "explicit emotion" refers to the person's conscious awareness of an emotion, feeling, or mood state; "implicit emotion", by contrast, refers to changes in experience, thought, or

action that are attributable to one's emotional state, independent of his or her conscious awareness of that state. (p. 432)

Unconscious Elicitation of Conscious Affective Reactions

Research advances in the past few years challenge the traditional view by demonstrating "unconscious emotion," at least in a limited sense of unconscious causation. Several studies have shown that stimuli presented below awareness can elicit an affective reaction that is itself consciously felt. An example is subliminal induction of the mere-exposure effect, that is, a positive response to repeatedly presented items. In one study, some participants were first subliminally exposed to several repeated neutral stimuli consisting of random visual patterns. Later, those participants reported being in a better mood—a conscious feeling state—than participants who had been subliminally exposed to neutral stimuli that had not been repeatedly presented (Monahan, Murphy, & Zajonc, 2000). In other studies, changes in self-reported mood have been elicited by subliminal presentation of positive or negative images, such as pictures of snakes and spiders presented to phobic individuals (Öhman, Flykt, & Lundqvist, 2000).

But asserting that subliminal stimuli may cause emotion is different from asserting that emotional reactions themselves can ever be unconscious (Berridge & Winkielman, 2003; Kihlstrom, 1999). The research we just mentioned still fits into the conventional view that once emotions are caused, they are always conscious. In fact, these studies relied on introspective reports of conscious feelings to demonstrate the presence of emotion once it was unconsciously caused.

So the question remains: Can one be unconscious not only of the causes of emotion, but also of one's own emotional reaction itself—even if that emotional reaction is intense enough to alter one's behavior? Studies from our lab suggest that the answer is yes. Under some conditions, people can have subliminally triggered emotional reactions that drive judgment and behavior, even in the absence of any conscious feelings accompanying these reactions.

Uncorrected and Unremembered Emotional Reactions

In an initial attempt to demonstrate unconscious emotion, a series of studies examined participants' ratings of neutral stimuli, such as Chinese ideographs, preceded by subliminally presented happy or angry faces (Winkielman, Zajonc, & Schwarz, 1997). Some participants in those studies were asked to monitor changes in their conscious feelings, and told not to use their feelings as a source of their preference ratings. Specifically, experimental instructions informed those participants that their feelings might be "contaminated" by irrelevant factors, such as hidden pictures (Study 1) or music playing in the background (Study 2). Typically, such instructions eliminate the influence of conscious feelings on evaluative judgments (Clore, 1994). However, even for participants told to disregard their feelings, the subliminally presented happy faces increased and subliminally presented angry faces decreased preference ratings of the neutral stimuli. This failure to correct for invalid feelings indicates that participants might not have experienced any conscious reactions in the first place. Indeed, after the experiment, participants did not remember experiencing any mood changes when asked about what they had felt during the rating task. Still, memory is not infallible. A skeptic could argue that participants had conscious feelings immediately after subliminal exposure to emotional faces, but simply failed to remember the feelings later. Thus, it is open to debate whether these studies demonstrate unconscious emotion.

Unconscious Emotional Reactions Strong Enough to Change Behavior

We agreed that stronger evidence was needed. Proof of unconscious emotion requires showing that participants are unable to report a conscious feeling at the same time their behavior reveals the presence of an emotional reaction. Ideally, the emotional reaction should be strong enough to change behavior with some consequences for the individual. To obtain such evidence, we assessed participants' pouring and drinking of a novel beverage after they were subliminally exposed to several emotional facial expressions (Berridge & Winkielman, 2003; Winkielman et al., in press). The general procedure of these experiments can be seen in Figure 1. Participants were first asked if they were thirsty. Next, they were subliminally exposed to several emotional expressions (happy, neutral, or angry) embedded in a cognitive task requiring participants to classify a clearly visible neutral face as male or female. Immediately afterward, some participants rated their feelings on scales assessing emotional experience and then were given a novel lemon-lime beverage to consume and evaluate. Other participants consumed and evaluated the beverage before rating their feelings. Specifically, in Study 1, participants were asked to pour themselves a cup of the beverage from a pitcher and then drink from the cup, whereas in Study 2, participants were asked to take a small sip of the beverage from a prepared cup and then rate it on various dimensions, including monetary value.

In both studies, conscious feelings were not influenced by subliminal presentation of emotional faces, regardless of whether participants rated their feelings on a simple scale from positive to negative mood or from high to low arousal, or on a multi-item scale asking about specific emotions, such as contentment or irritation. That is, participants did not feel more positive after subliminally presented happy expressions than after subliminally presented neutral expressions. Nor did they feel more negative after angry expressions than after neutral expressions. Yet participants' consumption and ratings of the drink were influenced by those subliminal stimuli—especially

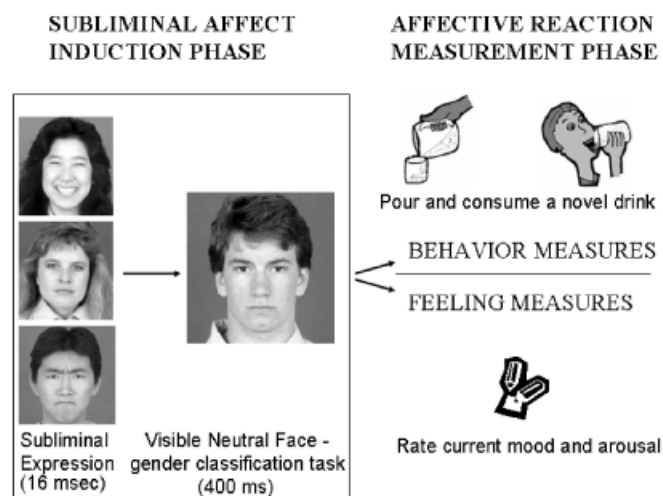


Fig. 1. Sequence of events in research investigating the impact of subliminally presented emotional facial expressions. First, participants are subliminally exposed to several expressions of the same valence (happy, neutral, or angry). The expressions are hidden by a visible neutral face that participants classify as male or female. Second, participants pour and drink a beverage and report their conscious feelings (in counter-balanced order).

when participants were thirsty. Specifically, thirsty participants poured significantly more drink from the pitcher and drank more from their cup after happy faces than after angry faces (Study 1). Thirsty participants were also willing to pay about twice as much for the drink after happy than after angry expressions (Study 2). The modulating role of thirst indicates that unconscious emotional reactions acted through basic biopsychological mechanisms that determine reactions to incentives, such as a drink, rather than through cognitive mechanisms influencing interpretation of the stimulus (Berridge & Winkielman, 2003; Winkielman et al., 2002).

In summary, the studies just described show that subliminally presented emotional faces can cause affective reactions that alter consumption behavior, without eliciting conscious feelings at the moment the affective reactions are caused. Because the influence of emotional faces on consumption behavior was observed also for those participants who rated their feelings immediately after the subliminal presentation of the faces, these results cannot be explained by failures of memory. Thus, we propose that these results demonstrate unconscious affect in the strong sense of the term—affect that is powerful enough to alter behavior, but that people are simply not aware of, even when attending to their feelings.

Support From Evolution and Neuroscience

From the standpoint of evolution and neuroscience, there are good reasons to suppose that at least some forms of emotional reaction can exist independently of subjective correlates. Evolutionarily speaking, the ability to have conscious feelings is probably a late achievement compared with the ability to have behavioral affective reactions to emotional stimuli (LeDoux, 1996). Basic affective reactions are widely shared by animals, including reptiles and fish, and at least in some species may not involve conscious awareness comparable to that in humans. The original function of emotion was to allow the organism to react appropriately to positive or negative events, and conscious feelings might not always have been required.

The neurocircuitry needed for basic affective responses, such as a “liking” reaction¹ to a pleasant sensation or a fear reaction to a threatening stimulus, is largely contained in emotional brain structures that lie below the cortex, such as the nucleus accumbens, amygdala, hypothalamus, and even lower brain stem (Berridge, 2003; LeDoux, 1996). These subcortical structures evolved early and may carry out limited operations that are essentially preconscious, compared with the elaborate human cortex at the top of the brain, which is more involved in conscious emotional feelings. Yet even limited subcortical structures on their own are capable of some basic affective reactions. A dramatic demonstration of this point comes from affective neuroscience studies with anencephalic human infants. The brain of such infants is congenitally malformed, possessing only a brain stem, and lacking nearly all structures at the top or front of the brain, including the entire cortex. Yet sweet tastes of sugar still elicit positive facial expressions of liking from anencephalic infants, whereas bitter tastes elicit negative facial expressions of disgust (Steiner, 1973).

Even in normal brains, the most effective “brain tweaks” so far discovered for enhancing liking and related affective reactions all involve deep brain structures below the cortex. Thus, animal studies have shown that liking for sweetness increases after a drug that

activates opioid receptors is injected into the nucleus accumbens (a reward-related structure at the base of the front of the brain). Liking reactions to sugar can even be enhanced by injecting a drug that activates other receptors into the brain stem, which is perhaps the most basic component of the brain. Such examples reflect the persisting importance of early-evolved neurocircuitry in generating behavioral emotional reactions in modern mammalian brains (Berridge, 2003; LeDoux, 1996). In short, evidence from affective neuroscience suggests that basic affective reactions are mediated largely by brain structures deep below the cortex, raising the possibility that these reactions might not be intrinsically accessible to conscious awareness.

KEY QUESTIONS FOR FUTURE RESEARCH

As we have argued, there are good theoretical reasons why some emotional reactions might be unconscious, and we suggest that our recent empirical evidence actually provides an example. However, several critical issues need to be addressed by future research.

The studies discussed here focused only on basic liking-disliking, so it is possible that the crucial property of unconscious emotion is simply positive-negative valence, rather than qualitative distinctions associated with categorical emotion (fear, anger, disgust, joy, etc.). However, evidence suggests that subcortical circuitry may be capable of some qualitative differentiation. For example, human neuroimaging studies reveal differential activation of the amygdala in response to consciously presented facial expressions of fear versus anger (Whalen, 1998). If future research shows that subliminally presented expressions of fear, anger, disgust, and sadness can create qualitatively different physiological and behavioral reactions, all without conscious experience, then there may indeed exist implicit affective processes deserving the label “unconscious emotion” in its strongest sense. Studies that simultaneously measure psychophysiology, behavior, and self-reports of emotion could be particularly useful to address such issues (Winkielman, Berntson, & Cacioppo, 2001).

The studies discussed here employed basic affective stimuli, such as subliminally presented facial expressions, to influence emotional behavior without eliciting conscious feelings. Future studies might address whether more complex stimuli that derive their positive or negative value from a person’s cultural environment can also influence emotional behavior without eliciting any accompanying feelings. A related question concerns whether stimuli presented above the threshold of awareness can also change emotional behavior and physiology without influencing feelings.

The studies described here suggest that under some conditions emotional reactions are genuinely unconscious. But obviously many emotional states are conscious, even when elicited with subliminal stimuli (Monahan et al., 2000; Öhman et al., 2000). What determines when a basic emotional reaction is accompanied by conscious feelings? Is it possible for even a strong emotional reaction to be unconscious? What are the neural mechanisms by which emotion is made conscious? How do behavioral consequences of conscious and unconscious reactions differ?

Finally, a question of practical importance to many emotion researchers, as well as clinicians, concerns the meaning of people’s reports of their own emotions. The existence of verifiable but unconscious emotional reactions does not mean that subjective feelings are merely “icing on the emotional cake.” At least, that is not our view. We believe that self-reports of feelings have a major place in emotion

¹We use the term “liking” to indicate an unconscious reaction, not a conscious feeling of pleasure.

research and treatment. However, it is also clear that psychologists should not limit themselves to subjective experiences. A combination of approaches and techniques, from psychology and human and animal affective neuroscience, will best lead to understanding the relation between conscious and unconscious emotions.

Recommended Reading

- Bargh, J.A., & Ferguson, M.L. (2000). Beyond behaviorism: On the automaticity of higher mental processes. *Psychological Bulletin*, *126*, 925–945.
- Berridge, K.C., & Winkielman, P. (2003). (See References)
- Damasio, A.R. (1999). *The feeling of what happens: Body and emotion in the making of consciousness*. New York: Harcourt Brace.
- Wilson, T.D. (2002). *Strangers to ourselves: Discovering the adaptive unconscious*. Cambridge, MA: Harvard University Press.
- Zajonc, R.B. (2000). Feeling and thinking: Closing the debate over the independence of affect. In J.P. Forgas (Ed.), *Feeling and thinking: The role of affect in social cognition* (pp. 31–58). New York: Cambridge University Press.
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REFERENCES

- Berridge, K.C. (2003). Pleasures of the brain. *Brain and Cognition*, *52*, 106–128.
- Berridge, K.C., & Winkielman, P. (2003). What is an unconscious emotion: The case for unconscious 'liking.' *Cognition and Emotion*, *17*, 181–211.
- Clore, G.L. (1994). Why emotions are never unconscious. In P. Ekman & R.J. Davidson (Eds.), *The nature of emotion: Fundamental questions* (pp. 285–290). New York: Oxford University Press.
- Freud, S. (1950). *Collected papers, Vol. 4* (J. Riviere, Trans.). London: Hogarth Press and Institute of Psychoanalysis.
- Frijda, N.H. (1999). Emotions and hedonic experience. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 190–210). New York: Russell Sage Foundation.
- James, W. (1884). What is an emotion. *Mind*, *9*, 188–205.
- Kihlstrom, J.F. (1999). The psychological unconscious. In L.A. Pervin & O.P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 424–442). New York: Guilford Press.
- LeDoux, J. (1996). *The emotional brain: The mysterious underpinnings of emotional life*. New York: Simon & Schuster.
- Monahan, J.L., Murphy, S.T., & Zajonc, R.B. (2000). Subliminal mere exposure: Specific, general, and diffuse effects. *Psychological Science*, *11*, 462–466.
- Öhman, A., Flykt, A., & Lundqvist, D. (2000). Unconscious emotion: Evolutionary perspectives, psychophysiological data and neuropsychological mechanisms. In R.D. Lane, L. Nadel, & G. Ahern (Eds.), *Cognitive neuroscience of emotion* (pp. 296–327). New York: Oxford University Press.
- Steiner, J.E. (1973). The gustofacial response: Observation on normal and anencephalic newborn infants. *Symposium on Oral Sensation and Perception*, *4*, 254–278.
- Whalen, P.J. (1998). Fear, vigilance, and ambiguity: Initial neuroimaging studies of the human amygdala. *Current Directions in Psychological Science*, *7*, 177–188.
- Winkielman, P., Berntson, G.G., & Cacioppo, J.T. (2001). The psychophysiological perspective on the social mind. In A. Tesser & N. Schwarz (Eds.), *Blackwell handbook of social psychology: Intraindividual processes* (pp. 89–108). Oxford, England: Blackwell.
- Winkielman, P., Berridge, K.C., & Wilbarger, J. (in press). Unconscious affective reactions to masked happy versus angry faces influence consumption behavior and judgments of value. *Personality and Social Psychology Bulletin*.
- Winkielman, P., Zajonc, R.B., & Schwarz, N. (1997). Subliminal affective priming resists attributional interventions. *Cognition and Emotion*, *11*, 433–465.