# What Every Skeptic Should Know About Subliminal Persuasion

*Classic research by cognitive and social psychologists suggests that subliminally presented stimuli can be perceived and can influence individuals' low-level cognitions. More recent investigations suggest that such stimuli can also affect individuals' high-level cognitive processes, including attitudes, preferences, judgments, and even their behavior.*

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*The report of my death was an exaggeration.*

—Mark Twain, in a note to the *New York Journal*, June 1, 1897

Readers of the SKEPTICAL INQUIRER are well acquainted with instances of mismatch between popular belief and scientific evidence. Despite an utter lack of scientific support, for example, many individuals place a great deal of belief in such topics as astrology (Carlson 1985; Dean 1987), facilitated communication (Dillon 1993; Mulick, Jacobson, and Kobe 1993), homeopathy (Barrett 1987), alien abductions (Carlsburg 1995; Randles 1993; Turner 1994) and even Elvis sightings (Moody 1987).

Issues such as these are "slam dunks" for skeptics: There can be little reconciling such beliefs with evidence that simply does not exist.

In other cases, though, where there is *some* scientific support on which to pin one's belief, there may still be more belief than is warranted. Graphologists, for example, who use samples of individuals' handwriting to determine enduring aspects of their personalities, consistently claim greater predictive validity than can be supported empirically (Nevo 1986; Scanlon and Mauro 1992). Some might argue the same for ESP, for which some evidence might actually exist (Bem and Honorton 1994; but see Hyman 1994). It is in domains such as these that the skeptic's role is more subtle, but just as important. One key aspect of this role is to determine what the available scientific evidence does and does not support. With this in mind, our purpose here is to explore the psychological research on subliminal persuasion, an area in which popular belief may again outstrip available evidence.

Subliminal persuasion refers to the use of subliminally presented stimuli, or messages presented to individuals beneath their level of conscious awareness, that are intended to influence their attitudes, choices, or actions. Not surprisingly, reports that unscrupulous marketers were using this technique to influence consumer behavior have historically prompted alarm (Cousins 1957; Key 1980). Yet, as many writers have suggested, such panic is probably unwarranted: There is simply no good evidence to support the conclusion that subliminal messages implanted in advertisements can exert an influence over whether one drinks Coke or Pepsi, endorses a particular viewpoint, or votes for candidate X over candidate Y (Moore 1988; Pratkanis and Greenwald 1988; Trappey 1996; Vokey and Read 1985).

Or is there? We will explore why the notion of subliminal persuasion might not be as far-fetched as some have supposed. Our point of departure, in particular, is an article appearing in the SKEPTICAL INQUIRER in 1992 by Anthony Pratkanis (see also Moore 1992). In his article, Pratkanis traced the historical roots of the belief in the powers of the unconscious, nicely debunked James Vicary's famous "Eat Popcorn/Drink Coke" hoax, and described the compelling results of some of his own research on the ineffectiveness of subliminal self-help audio tapes.

Still, for all its strengths, we believe the Pratkanis article, and others like it, may have left readers with an incomplete picture of the state of the art regarding subliminal presentation of stimuli. Accordingly, we endeavor to acquaint readers of the SKEPTICAL INQUIRER with the varied (and thriving) use of subliminally presented stimuli in cognitive and social psychological research. Specifically, we review evidence suggesting that cognition can occur without conscious awareness, and that this unconscious cognition can be affected by subliminal stimuli, thereby influencing individuals' judgments, attitudes, and even their behavior. Indeed, this recent evidence suggesting that subliminal stimuli can influence behavior gives us pause in contemplating the possible effectiveness of subliminal persuasion in advertising.

## Clarifying Ambiguities

The exact meaning of "subliminal" has been a source of controversy and confusion for decades. A common definition, however, is that a stimulus is subliminal (that is, below threshold) if it cannot be verbally identified (e.g., Cheesman and Merikle 1986; Fowler 1986, Greenwald and Draine 1997). The threshold used in this definition is that of conscious awareness, sometimes called a *subjective* threshold (Cheesman and Merikle 1986). This definition, of course, allows for the possibility that an individual perceives that *some* material was presented, but requires that its exact nature be unidentifiable. Nearly all of the studies we review use this definition, while the remaining adhere to a more conservative one: that individuals be unable to report even the presence of the stimulus.

Furthermore, there is a critical distinction to be made between subliminal *perception* and subliminal *persuasion.* Subliminal perception refers simply to the perception of stimuli that are below the threshold of conscious awareness.[1] Subliminal persuasion, on the other hand, requires that the subliminally presented stimulus have some *effect*, not simply on an individual's judgments, but on his or her attitudes or behavior. As others have noted, subliminal perception need not imply subliminal persuasion (e.g., Moore 1988).

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In this article, we restrict our discussion of subliminally presented stimuli to only those methods that are well supported by research evidence. Thus, audio self-help tapes with subliminal suggestions to "lose weight" or "be assertive" are not considered, nor are "backmasked" messages hidden in recorded music, or instances of messages embedded within pictures (such as the word "sex" airbrushed onto ice cubes or Ritz crackers). Research has shown convincingly that none of these methods is effective (Greenwald, Spangenberg, Pratkanis, and Eskenazi 1991; Moore 1982, 1988; Pratkanis 1992; Pratkanis and Greenwald 1988; Thorne and Himelstein 1984; Vokey and Read 1985). We focus instead on subliminal visual priming techniques, whereby stimuli are presented very quickly, and are typically followed immediately by a "pattern mask," such as a geometric shape or a series of random letters. This mask is intended to disrupt the individual's conscious processing of the stimuli—a bit like immersing pasta in cold water to halt the cooking process.[2]

## Unconscious Processing: Out of Sight, But Not Out of Mind

Ask people to name a psychologist and there is disappointingly little variation in their answers. Virtually all of them name Sigmund Freud (with Dr. Joyce Brothers and TV's Frasier Crane running a distant second and third). Many people might be surprised to learn, then, that contemporary psychology bears little resemblance, either in substance or in methodology, to the work of Freud (Stanovich 1992). That said, at least one idea often attributed to Freud—the unconscious—has made a comeback in contemporary cognitive and social psychology (Bornstein and Pittman 1992; Cohen and Schooler 1997; Erdelyi 1996; Greenwald 1992; Kihlstrom 1987; Uleman and Bargh 1989). Modern psychologists do not subscribe to all of Freud's notions regarding the unconscious; instead, the term refers simply to those mental processes that occur without conscious monitoring or guidance. Viewed in this way, the unconscious figures prominently in many contemporary psychological theories (Greenwald and Banaji 1995; Wegner 1994). For example, numerous studies have shown that some memories that cannot be recalled consciously may nevertheless exert influence on a variety of mental processes (Schacter 1987). Others have noted that stereotypes can be readily applied without any conscious effort or awareness (Gilbert and Hixon 1991; Spencer, Fein, Wolfe, Fong, and Dunn 1998). Indeed, stereotypes seem to be most readily applied at those times when one's conscious capacities are the most limited (Bodenhausen 1990; Bodenhausen and Lichtenstein 1987; Macrae, Milne, and Bodenhausen 1994).

Furthermore, the causal determinants of behavior—why we do what we do—can also be unavailable to conscious awareness. People are notoriously poor at articulating the true causes of their actions and recognizing the importance of critical causal stimuli (Nisbett and Wilson 1977). In one experiment, participants were given a sentence-completion task containing a number of words related to the elderly (e.g., *old, wise, retired*). Later, after the experiment had ostensibly ended, these individuals walked more slowly to the elevator than participants in a control group, as if they had internalized the concept of "elderly." None of them showed any recognition of their decreased walking speed or of the high frequency of words related to the elderly in the sentence-completion task (nor could the effect be attributed to other plausible alternative factors, such as depressed mood). The result, concluded the researchers, was a direct effect of unconscious processing on behavior (Bargh, Chen, and Burrows 1996).[3]

Thus, ample evidence attests to the fact that much of what goes on in the mind is unavailable to conscious awareness. Note, however, that the "elderly words" experiment, as well as the research on stereotype activation, used stimuli that were, or could have been, consciously perceived. Since this article's primary concern is the influence of *subliminal* stimuli, we turn to whether subliminally presented stimuli can actually be perceived, while still remaining unavailable to conscious awareness.

We believe that the research literature leaves little doubt that the answer is yes. Many researchers have reported, for example, that words presented subliminally can influence subsequent judgments. Dixon (1981, see also Epley 1998a) found that participants given a subliminal prime (e.g., the word *pencil*) were faster than those who had not seen the prime to later identify a related word (e.g., *write*). Likewise, Marcel (1983) found that participants' identification of a color on a computer screen was facilitated when it was preceded subliminally by the name of the color, but was delayed when preceded by the name of a different color. Although these early studies have been criticized on methodological grounds (Holender 1986; Merikle 1982), similar effects have been found using methodologies developed to address these criticisms (Greenwald Draine, and Abrams 1996; Greenwald and Draine 1997; Merikle and Joordens 1997).

In all, dozens of studies using implicit tests of perception now attest to the fact that subliminally presented stimuli can be perceived (for reviews, see Bornstein and Pittman 1992; Greenwald 1992). But can they persuade?

## Ghosts In the Machine: Subliminal Influences on Cognition

For many, the Eiffel Tower is a beloved symbol of Paris. But this was not always true. When the structure was built in 1889, it was despised by many—some Parisians even advocated its destruction (Harrison 1977). Likewise, popular reactions to new artistic movements that are now cherished, from Impressionist painting to rock and roll music, were initially negative (Sabini 1995).

How can these changes of heart be understood? One answer has been proposed by Robert Zajonc (1968), who suggests that "mere exposure" leads to liking: The more one sees something, the more one comes to like it. Thus, the more times people were exposed to the Eiffel Tower, paintings by Monet and Renoir, and the music of Elvis and the Beatles, the more

positive their evaluations became.

Experiments have demonstrated that this mere exposure effect is reliable, and, furthermore, that the phenomenon does not depend on one's conscious awareness of the exposure. In one study using subliminal stimuli, for example, participants were shown several irregular polygons for one millisecond, five times each. In a subsequent phase of the study, they were given pairs of figures, one that had been flashed to them previously and one they had never seen. Participants were then asked to make two judgments: which one had they seen before, and which one did they liked better. Although they were unable to determine which figure they had seen (these guesses did not depart reliably from a chance base-rate of 50 percent), participants did show an increased liking for the familiar shapes, preferring them 60 percent of the time (Kunst-Wilson and Zajonc 1980; see also Epley 1998b; Seamon, Marsh, and Brody 1984).

Other experiments have broadened the generalizability of this result. In one study, participants were subliminally exposed to a photograph of one of two males who posed as research subjects. Later, when participants engaged in a task with both confederates that involved several scripted disagreements between the two, they sided more often with the one whose picture they had previously seen, and also reported liking that individual more than his counterpart (Bornstein et al. 1987). Mere exposure evidently leads to liking, even when that exposure is beneath the level of conscious awareness.[4]

In other research, experimenters have shown that subliminal exposure to words related to various personality traits can influence how people judge others around them. In particular, exposure to words related to hostility (Bargh and Pietromonaco 1982), kindness, and shyness (Bargh, Bond, Lombardi, and Tota 1986) have been found to produce corresponding personality judgments (i.e., rating others as hostile, kind, or shy). Other investigators have demonstrated that subliminal exposure to pleasant and unpleasant photographs can also affect how target individuals are judged (Krosnick, Betz, Jussim, and Lynn 1992).

Subliminally presented stimuli can also affect judgments about the self, a point made in one of our favorite experiments in this literature. Psychology graduate students were asked to write down three of their ideas for possible research projects. They were then either exposed to a photograph of a familiar postdoctoral student from their laboratory or of the scowling face of their faculty advisor. Unaware that they had seen anything but flashes of light, the students were then asked to rate the quality of the research ideas they had listed. As predicted, those who had been exposed to the scowling face of their advisor rated their own ideas less favorably than did those who had been exposed to the smiling postdoc (Baldwin, Carrel, and Lopez 1991).

A follow-up experiment by the same authors makes a similar point. Catholic undergraduate women rated themselves more negatively on a series of trait adjective scales (e.g., honest/dishonest, moral/immoral) after subliminal exposure to a picture of the pope, but not after exposure to the advisor photograph used in the first study. Moreover, this was true only for participants who indicated that they practiced their religion regularly (Baldwin et al. 1991). This suggests that the effect of subliminal stimuli can be quite complex, mediated here by the personal relevance of the stimuli.

In all, these studies serve to demonstrate that subliminal stimuli can influence high-level cognitive processes, including preferences for geometric shapes, liking of individuals, personality judgments, and ratings of one's self-concept. Of course, to be of any use in a consumer context, these effects must go further. In addition to altering a consumer's *attitudes*, a marketer desires to affect his or her *behavior*. (It is not enough that one likes Pepsi, one has to buy some!) And as students of social psychology know, one need not follow from the other: There is often less correspondence between individuals' attitudes and behaviors than one might expect (LaPiere 1934; Regan and Fazio 1977; Wicker 1969). Therefore, it is incumbent upon us to document instances in which subliminally presented stimuli influence individuals' behavior. Such influence has only recently been documented, and only a handful of supportive experiments exist. Nevertheless, we find these experiments interesting and compelling. A full accounting of the possibility (or impossibility) of subliminal advertising warrants their consideration.

**Subliminal persuasion requires that the subliminally presented stimulus have some *effect*, not simply on an individual's judgments, but on his or her attitudes or behavior. As others have noted, subliminal *perception* need not imply subliminal *persuasion*.**

## Subliminal Influences on Behavior

Can subliminally presented stimuli influence behavior? Recent investigations suggest that the answer may be yes. For example, Neuberg (1988) has argued that subliminally presented stimuli can influence behavior indirectly, by way of activating concepts that can influence the way individuals interpret the behavior of others. These interpretations, then, can lead individuals to opt for certain behavioral responses. For example, if the concept of hostility were activated subliminally, and caused individuals to "read" hostility into the behavior of others, these individuals might then choose to adopt a hostile course of action themselves. Though such an indirect effect is a far cry from the mindlessly acquiescent behavior conjured by the words "subliminal advertising," it nonetheless would represent an instance of subliminally presented stimuli affecting behavior.

To test this hypothesis, Neuberg confronted participants with a "Prisoner's Dilemma," an exercise in which individuals must choose to either cooperate or compete with another participant (Luce and Raiffa 1957). Before choosing, participants completed

questionnaires designed to assess their proclivity toward cooperation versus competition, and were exposed subliminally to either neutral words (e.g., *house, water, sound*) or competition-related words (e.g., *hostile, adversary, cutthroat*). Although the primes did not influence the behavior of those with a cooperative orientation, participants predisposed to compete did so to a greater extent when they were exposed to competitive words than when exposed to neutral words (Neuberg 1988).

More recently, Bargh and colleagues have provided even more compelling evidence that subliminal stimuli can influence behavior (Bargh et al. 1996; Bargh 1997). In contrast to Neuberg's notion of an indirect influence on behavior, Bargh suggests that subliminally presented stimuli can influence behavior *directly*—that the influence is unmediated by conscious thought and results from a direct perception-behavior link that operates not unlike a reflex. How might this hypothesis be put to the test? Previous research has established that exposing white participants to words stereotypically associated with African Americans tends to automatically activate the concept of hostility (Devine 1989). To find out if such exposure might also induce hostile behavior, Bargh and colleagues (1996) asked participants to perform a tedious task on a computer. Unbeknownst to the participants, the computer not only administered the task but also exposed them, subliminally, to photographs of either black or white faces. Then, after many trials, the computer presented them with a bogus error message—"F11 error: failure saving data"—and informed them that they would have to start the task again from the beginning.

Participants' reactions to this news were videotaped using a hidden camera and were rated by judges (who were unaware of the participants' experimental condition) to determine the amount of hostility they exhibited. Results indicated that those exposed to black faces did indeed respond in a more hostile, frustrated manner than those exposed to white faces.

In an extension of this work, Chen and Bargh (1997) exposed participants to photographs of black or white faces and asked them to play a game with another participant who had not seen any photographs. Ratings provided by the second, naive participant once again indicated greater hostility among those presented with black faces as opposed to white faces. Indeed, these naive participants responded to the original participants' hostility with hostility of their own, causing the entire interaction to be rated by outside observers as more hostile when the original participant had been exposed to black faces, as opposed to white.

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Finally, direct evidence of subliminal influences on behavior is also surfacing from neuropsychologists who are taking advantage of recent advances in brain imaging. For example, after participants have learned to respond to an odd number with their right hand and an even number with their left, the subliminal presentation of a number (odd or even) produces cortical activation in the corresponding hemisphere of the brain (left or right). This activation is located in the motor cortex, the area of the brain that controls movement (Dehaene et al. 1998).

These experiments raise more questions than they answer. What exactly are the mechanisms that allow subliminally presented stimuli to influence behavior? Is the process indirect, as Neuberg (1988) argues, direct and unmediated, as Bargh and colleagues (1996) maintain, or both? In addition, the magnitude and generalizability of these effects have yet to be investigated. Extraordinary claims demand extraordinary evidence, and the evidence we have reviewed in this section falls short of extraordinary. Still, the topic is intriguing, and we eagerly await the results of future investigations.

### What About Subliminal Advertising?

For some, the bottom line of research on subliminal persuasion is, well, the bottom line—whether the effects of subliminal stimuli can be harnessed in a consumer setting. Although we hesitate to offer any conclusions, we note that several of the critical requirements for subliminal advertising have been met through scientific research. In particular, as we have detailed, subliminally presented stimuli can influence high-level cognitive processes, and, in some cases, can even influence behavior. Nevertheless, many remain skeptical (Moore 1982, 1988, 1992; Pratkanis 1992; Pratkanis and Greenwald 1988), and it is easy to see why. In each of the studies we reviewed, care was taken to be certain that conditions were perfect: Participants were seated at specific distances from the video or computer screen, their attention was focused in just the right direction, at just the right moment, and extraneous stimuli were kept to a minimum. Such variables are notoriously difficult to control in the real world. In addition, influence from weak, subliminal stimuli is likely to pale in comparison to the highly salient and powerful stimuli already competing for our attention (Moore 1982).

The phenomena we have reviewed may well represent the hot-house products of cleverly crafted laboratory experiments, delicate flowers that would wilt in the harsh environment of the everyday marketplace. Even if this were the case, however, we hasten to point out that it would not challenge the basic validity of the studies we discussed in this article (Mook 1983). It would, instead, merely highlight the challenge of applying insights based on laboratory experiments to consumer behavior. Moreover, despite a lack of evidence for the applicability of subliminal messages to advertising, we suggest there is no a priori reason why such applications are not possible.

In sum, we offer no conclusions regarding the plausibility or

effectiveness of subliminal advertising; we only suggest that it may, in fact, be possible, and acquaint readers with the empirical research upon which we base that suggestion. To assert that it is *impossible* for subliminally presented stimuli to influence behavior—even consumer behavior—would be, not unlike the premature reports of Mark Twain's death in the *New York Journal*, an exaggeration.

## Acknowledgments

We thank Steven Fein, Thomas Gilovich, Justin Kruger, Dennis Regan, and Leaf Van Boven for their helpful comments on an earlier draft of this article.

## Notes

1. Note that there is a certain "tree-falling-in-the-forest-with-no-one-there-to-hear-it" paradox here: If *subliminal* means that the individual cannot identify the stimulus, how can it be shown that he or she has indeed perceived it? To accomplish this, researchers typically resort to "implicit" tests of perception, whereby the stimulus is shown to have affected the individual's judgments.

2. Unlike the pasta analogy, however, processing of the stimuli can (and does) continue beneath the level of conscious awareness, even after the introduction of the pattern mask. This continued processing is evidenced by the effects, detailed in the next sections, that these subliminal primes have on the processing of subsequently presented stimuli.

3. One of us has obtained a similar finding. After exposure to words related to conformity (e.g., *comply, follow, obey*), people were especially likely to conform to an established group norm, again without realizing that the words had influenced their behavior (Epley and Gilovich in press).

4. In fact, it appears that mere exposure effects are even stronger when the stimuli are subliminal, apparently because people are unable to correct their positive appraisals for the fact that they have seen something previously (Bornstein 1989; Bornstein and D'Agostino 1992, 1994).

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