Subliminal Stimuli: Hidden Forces Shaping Your Every Move

Authored by

mohammad looti

June 16, 2026

Subliminal stimuli (/s?b?l?m?n?l/; literally "below threshold"), contrary to supraliminal stimuli or "above threshold", are any sensory stimuli below an individual's threshold for conscious perception. A recent review of functional magnetic resonance imaging (fMRI) studies shows that subliminal stimuli activate specific regions of the brain despite participants being unaware. Visual stimuli may be quickly flashed before an individual can process them, or flashed and then masked, thereby interrupting the processing. Audio stimuli may be played below audible volumes or masked by other stimuli.

Effectiveness

Applications of subliminal stimuli often base themselves on the persuasiveness of the message. Importantly, research on action priming has shown that subliminal stimuli can trigger only actions a receiver of the message plans to perform anyway; however, consensus of this finding remains unsubstantiated by other research. Most actions can be triggered subliminally only if the person already has the potential to perform a specific action. The following sections have more information on specific studies which investigate the effectiveness of subliminal stimuli.

Method

The threshold in subliminal stimuli research is the level at which the participant is not aware of the stimulus being presented. Researchers determine a threshold for the stimulus that will be used as the subliminal stimulus. That subliminal stimulus is then presented during the study at some point and measures are taken to determine the effects of the stimulus. The way in which studies operationally define thresholds depends on the methods of the particular article. The methodology of the research also varies by the type of subliminal stimulus (auditory or visual) and the dependent variables they measure.

Objective Threshold

The objective threshold is found using a forced choice procedure, in which participants must choose which stimulus they saw from options given to them. Participants are flashed a stimulus (e.g. the word "orange") and then given a few choices and asked which one they saw. Participants must choose an answer in this design. The objective threshold is obtained when participants are at chance level of performance in this task. The length of presentation that causes chance performance on the forced choice task is used later in the study for the subliminal stimuli.

Subjective Threshold

The subjective threshold is determined by when the participant reports that his or her performance

on the forced choice procedure approximates chance. The subjective threshold is 30 to 50 ms slower than the objective threshold, demonstrating that participants are able to detect the stimuli is present sooner than their perceived accuracy ratings would indicate. In other words, stimuli presented at a subjective threshold have a longer presentation time than those presented at an objective threshold. When using the objective threshold, primes neither facilitated nor inhibited the recognition of a color. However, the longer the duration of the priming stimuli, the greater effect it had on subsequent responding. These findings indicate that the results of some studies may be due to their definition of below threshold.

Direct and Indirect Measures

Perception without awareness can be demonstrated through the comparison of direct and indirect measures of perception. Direct measures use responses to task definitions as per the explicit instructions given to the subjects. Indirect measures use responses that are not a part of the task definition given to subjects. Both direct and indirect measures are displayed under comparable conditions except for the direct or indirect instruction. For example, in a typical Stroop Task, subjects are given the task of naming the color of a patch of ink. A direct measure is 'accuracy'--true to the instructions given to the participants. The popular indirect measure used in the same task is 'response time'--subjects are not told that they are being measured for response times.

Similarly, a direct effect is the effect of a task stimulus on the instructed response to that stimulus, usually measured as accuracy. An indirect effect is an uninstructed effect of the task stimulus on behavior, sometimes measured by including an irrelevant or distracting component in the task stimulus and measuring its effect on accuracy. These effects are then compared on their relative sensitivity: an indirect effect that is greater than direct effect indicates existence of unconscious cognition.

Visual Stimuli

In order to study the effects of subliminal stimuli, researchers will often prime the participants with specific visual stimuli, often images, and determine if those stimuli elicit different responses. Subliminal stimuli have mostly been studied in the context of emotion, in particular, researchers have focused a lot of attention to the perception of faces and how subliminal presentation to different facial expression affects emotion. Visual subliminal stimuli has also been used to study emotion eliciting stimuli and simple geometric stimuli. A significant amount of research has been produced throughout the years to demonstrate the effects of subliminal visual stimuli.

Images

Attitudes can develop without being aware of its antecedents. Individuals viewed slides of people performing familiar daily activities after being exposed to either an emotionally positive scene, such as a romantic couple or kittens, or an emotionally negative scene, such as a werewolf or a dead body between each slide and the next. After exposure from something which the individuals consciously perceived as a flash of light, the participants gave more positive personality traits to those people whose slides were associated with an emotionally positive scene and vice versa. Despite the statistical difference, the subliminal messages had less of an impact on judgment than the slide's inherent level of physical attractiveness.

Individuals show right amygdala activity in response to subliminal fear, and greater left amygdala response to supraliminal fear. People were exposed to a subliminal image flashed for 16.7 milliseconds that could signal a potential threat and again with a supraliminal image flashed for half a second. Furthermore, supraliminal fear showed more sustained cortical activity, suggesting that subliminal fear may not entail conscious surveillance while supraliminal fear entails higher-order processing.

Emotion Eliciting Stimuli

A subliminal sexual stimulus has a different effect on men compared to women. Men and women were subliminally exposed to either a sexual or a neutral picture, and their sexual arousal was recorded. Researchers examined the accessibility of sex-related thoughts after following the same procedure with either a pictorial judgment task or lexical decision task. The results revealed that the subliminal sexual stimuli did not have an effect on men, but for women, lower levels of sexual arousal were reported. However, in conditions related to accessibility of sex-related thoughts, the subliminal sexual stimuli led to higher accessibility for both men and women.

Subliminal stimuli can elicit significant emotional changes, but these changes are not valuable for a therapeutic effect. Spider-fearful and non-fearful undergraduates experienced either a positive, negative, or neutral subliminal prime followed immediately by a picture of a spider or a snake. Using visual analogue scales, the participants rated the affective quality of the picture. No evidence was found to support that the unpleasantness of the pictures can be modulated by subliminal priming. In fact, the non-fearful participants rated the spiders as more frightening after being primed with a negative stimuli, however, for the fearful participants, this effect was not found.

Simple Geometric Stimuli

Laboratory research on unconscious perception often employs simple stimuli (e.g., geometric shapes or colors) in which visibility is controlled by visual masking. Masked stimuli are then used to prime the processing of subsequently presented target stimuli. For instance, in the Response Priming paradigm, participants have to respond to a target stimulus (e.g., by identifying whether it

is a diamond or a square) which is immediately preceded by a masked priming stimulus (also a diamond or a square). The prime has large effects on responses to the target; it speeds responses when it is consistent with the target, and slows responses when it is inconsistent. Response priming effects can be dissociated from visual awareness of the prime, such as when prime identification performance is at chance, or when priming effects increase despite decreases in prime visibility.

The presentation of geometric figures as subliminal stimuli can result in below threshold discriminations. The geometric figures were presented on slides of a tachistoscope followed by a supraliminal shock for a given slide every time it appeared. The shock was administered after a five-second interval. Electrical skin changes of the participants that occurred before the reinforcement (shock) or non-reinforcement were recorded. The findings indicate that the proportion of electrical skin changes that occurred following subliminal visual stimuli was significantly greater than expected. In contrast, the proportion of electrical skin changes that occurred in response to the stimuli which were not reinforced was significantly less. As a whole, participants were able to make below threshold discriminations.

Word and Non-word Stimuli

Another form of visual stimuli are words and non-words. In a set of experiments, words and non-word were used as subliminal primes. Primes that work best as subliminal stimuli are words that have been classified several times before they are used as primes. Word primes can also be made from parts of practiced words to create new words. In this case, the actual word used as a prime can have the opposite meaning of the words it came from (its "parents"), but it will still prime for the meaning of the parent words. Non-words created from previously practiced stimuli have a similar effect, even when they are unpronounceable (e.g., made of all consonants). These primes generally only increase response times for later stimuli for a very short period of time (milliseconds).

Masking Visual Stimuli

Visual stimuli are often masked by forward and backward masks so that they can be displayed for longer periods of time, but without the subject being able to tell what the prime is. A forward mask displayed before the prime for a short period of time and usually a backward mask will follow the prime. This prevents recognition of the prime by the subject.

Auditory Stimuli

Auditory Masking

One method for creating subliminal auditory stimuli is called masking. This method involves hiding the target auditory stimulus in some way. Auditory subliminal stimuli are shown to have some effect on the participant, but not a large one. For example, one study used other speechlike sounds to cover up the target words. The study found evidence of priming in the absence of awareness of the stimuli. But the effects of these subliminal stimuli were only seen in one of the outcome measures of priming, while the effects of conscious stimuli were seen in multiple outcome measures. However, the empirical evidence for the assumption of an impact of auditory subliminal stimuli on human behavior remains weak: In an experimental study on the influence of subliminal target words (embedded into a music track) on choice behavior for a drink, authors found no evidence for a manipulative effect.

Self-help Audio Recordings

A study investigated the effects on self-concept of Rational Emotive Behavior Therapy and auditory subliminal stimulation (separately and in combination) on 141 undergraduate students with self-concept problems. They were randomly assigned to one of four groups receiving either Rational-Emotive Therapy, subliminal stimulation, both, or a placebo treatment. Rational-Emotive Therapy significantly improved scores on all the dependent measures (cognition, self-concept, self-esteem, anxiety), except for behavior. Results for the subliminal stimulation group were similar to those of the placebo treatment except for a significant self-concept improvement and a decline in self-concept related irrational cognitions. The combined treatment yielded results similar to those of Rational-Emotive Therapy, with tentative indications of continued improvement in irrational cognitions and self-concept from posttest to follow-up.

Another study investigated the effects of self-help tapes on self-esteem and memory. Volunteers who wanted to improve their self-esteem or memory were recruited and completed several self-esteem and memory tests before being given a self-help tape. Subjects were given a self-esteem audio tape or a memory audio tape, but half of the tapes were mislabeled and half were correctly labeled. After listening to the tapes daily for five weeks, subjects came back and repeated the self-esteem and memory tests. There was no significant change from the first set of testing to the second, although subjects believed that their self-esteem or memory improved based on which tape they believed they had, even when they had a mislabeled tape (those who had tapes labeled as self-esteem tapes felt their self-esteem had increased and the same with memory). This effect is often referred to as a placebo. There are multiple other studies on subliminal self-help with different measures and have given similar results.

Consumption and Television

Some studies have looked at the efficacy of subliminal messaging in television. Subliminal

messages produce only one-tenth of the effects of detected messages and the findings related the effects of subliminal messaging were relatively ambiguous. Also, participants' ratings of positive response to commercials are not affected by subliminal messages in the commercials.

Karremans suggests that subliminal messages have an effect when the messages are goal-relevant. Subliminally priming a brand name of a soft drink (Lipton Ice) made those who were thirsty want the Lipton Ice. However, those who were not thirsty were not influenced by the subliminal messages. Karremans did a study assessing whether subliminal priming of a brand name of a drink would affect a person's choice of drink, and whether this effect is caused by the individual's feelings of being thirsty. In another study, participant's ratings of thirst were higher after viewing an episode of The Simpsons that contained single frames of the word "thirsty" or of a picture of a Coca-Cola can. Some studies have shown greater effects of subliminal messaging with as high as 80% of participants showing a preference for a particular rum when subliminally primed by the name placed in an ad backward.

Many authors have continued to argue for the effectiveness of subliminal cues in changing consumption behavior, citing environmental cues as a main culprit of behavior change. Authors who support this line of reasoning cite findings such as the research that showed slow-paced music in a supermarket was associated with more sales and customers moving at a slower pace. Findings such as these support the notion that external cues can affect behavior, although the stimulus may not fit into a strict definition of subliminal stimuli because although the music may not be attended to or consciously affecting the customers, they are certainly able to perceive it.

Subliminal messaging is prohibited in advertising in the United Kingdom.