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IMPLICIT ASSOCIATION TEST (IAT)

The idea that human thinking and feeling can operate outside conscious awareness and without conscious control is well established. Researchers arrived at this conclusion less from complex theorizing about the nature of the mind than from evidence generated by several unique methods. This evidence revealed that much of social cognition occurs without conscious awareness, control, intentional thought, or self-reflection. Thus implicit forms of preference of both individuals and social groups have come to form a critical component in the understanding of intergroup relations.

One method that contributes to this understanding is the *Implicit Association Test* (IAT). The IAT is a measure of implicit cognition, assessing the relative strength of associations between semantic concepts that may not be consciously accessible. For example, the IAT might provide evidence that, in the person being tested, the category "woman" is associated more with family than with career, while the category "man" reveals the opposite association. Indeed, the presence of such associations can be detected by the IAT even if the person is not aware of them or if the person consciously endorses an opposing belief.

The IAT has been used to study a diverse range of psychological concepts, and its primary use has been in the analysis of unconscious intergroup attitudes and stereotypes and group identity. Notably, the IAT has been used to study many aspects of implicit intergroup cognition, including its relationship to self-report, its development, neural correlates, and ecologically realistic behaviors.

Description of the Method

The IAT is a computer-based reaction-time task that measures the relative strength of associations between concept–attribute pairs by instructing participants to classify four sets of stimuli into two superordinate categories using just two response keys. During a typical IAT, participants use two response keys to classify concept stimuli presented sequentially on a computer screen (e.g., faces of Blacks and Whites, representing the concept *race*); for example, pressing the left key to indicate the face is Black and the right key to indicate the face is White. In addition, participants use the same two keys to classify attribute stimuli (e.g., good words such as *happy, nice, pleasant* or bad words such as *terrible, awful, violent*).

For half the trials, a particular concept category (White) and attribute category (good) share the same response key, while the contrasting categories share the other response key. And for the second half of the trials, the pairings reverse so that the opposite categories share the same response key (Black with good, and White with bad). The logic of the IAT is simple: When two concepts are more strongly associated with each other, it should be easier for participants to classify them when they share the same response key than when they share different response keys. In other words, participants should be both faster to respond and more accurate when two closely related concepts share the same response key.

The IAT stimuli can appear in several formats, including pictures and words presented either visually or aurally. Response latencies and errors are recorded and compared to those generated by the first set of trials. The particular pairings described above are counterbalanced across participants to control for potential order effects. (For a sample IAT task, visit http://implicit.harvard.edu)

Each participant receives a single score upon completing an IAT, called the IAT score or the D-score. This score is a measure of effect size computed by calculating the difference between the mean response latency for the two double-categorization blocks and dividing that difference by its associated pooled standard deviation. The D-score indicates the strength of an individual's association between categories and attributes, with larger scores indicating stronger associations. (For more information about how to score an IAT, please see the recommended readings at the end of this entry.)

Discoveries About Intergroup Cognition

Perhaps because the IAT was first introduced using social groups as the target domain, it has been most heavily used by those interested in the implicit intergroup attitudes, stereotypes, and self-concepts of numerous groups: race/ethnicity, gender, age, nationality, religion, body weight, disability, sexual orientation, and political ideology, to name just a few. As such, the IAT has been instrumental in generating a vast body of descriptive work to document the nature of implicit social cognition in intergroup contexts.

Researchers interested in understanding dual-process theories of social cognition and intergroup relations have used the IAT to measure the degree to which (and the conditions under which) explicitly stated prejudices and implicitly measured associations are consistent. Moreover, the IAT has helped shed light on intergroup cognition by providing key insights into the nature of implicit bias among majority and minority populations, including the developmental origins and neural basis of implicit social cognition as well as the effect of intergroup contact on the reduction of implicit intergroup bias. Notably, the IAT has been implemented online at http://implicit.harvard.edu, which serves primarily as an educational site with an attached spin-off research site, allowing data to be gathered from samples well beyond the convenience of college.

Dissociation With Explicit Evaluation

Assessments of bias as measured by the IAT do not always produce results consistent with self-report measures. In fact, a weak correlation or no correlation at all is obtained between the IAT and self-report measures of bias when there is a strong desire on behalf of the participant to self-report egalitarian views. These results are particularly common in the United States when researchers are studying socially sensitive topics such as race attitudes and stereotypes. Indeed, research has documented that people are reluctant to endorse views that are frowned upon in their culture when anonymity is not assured (e.g., stating a preference for Whites over Blacks or agreeing with a negative stereotype about Blacks).

Thus, while race bias is typically detected using the IAT, such bias is more difficult to detect, if it is detected at all, using self-report measures. Such data relating the IAT to self-report measures of bias support the idea that social cognition derives from two independent pathways, one that is relatively automatic, unconscious, and inaccessible and another that is readily available to introspection and to willful efforts of control. Notably, when the groups involved are not socially charged, the IAT and self-report measures of bias tend to report similar findings.

Evidence About Bias

Majority and Minority Intergroup Bias

Research with the IAT has revealed a striking finding among adult participants—only majority group members from socially valued groups exhibit positive implicit ingroup bias. Thus, White Americans consistently show strong ingroup bias, whereas Black Americans do not. Similar observations have been obtained for other majority–minority group contrasts in the United States and in numerous other countries around the world.

Development of Implicit Intergroup Bias

A child-friendly version of the IAT (Child IAT) was developed to measure the acquisition of implicit associations as they emerge. Collectively, this research has demonstrated that implicit intergroup biases emerge surprisingly early in life at adultlike levels of magnitude, casting doubt on the conventional view that such implicit associations form only over a protracted period of exposure to cultural beliefs. While implicit attitudes emerge very quickly and undergo little change across development, implicit stereotypes seem to take longer to form, appearing to be much more flexible. Ongoing developmental research using the

Child IAT promises to shed light on the cognitive and cultural origins of implicit intergroup bias, while revealing how and when such implicit associations can be modified.

Malleability of Implicit Intergroup Bias

Considerable research has been concerned with understanding the malleability of implicit intergroup bias. Research using the IAT has shown that although the IAT taps an aspect of intergroup cognition that is difficult to control, this implicit cognition, contrary to intuition, is likely quite malleable. Indeed, studies have shown that the mere presence of members of an outgroup (Black) can reduce the degree of implicit anti-Black IAT bias, that imagery exercises can lower the degree of stereotypes of women, and that consistent exposure to women teachers can change girls' stereotypes.

Construct and Predictive Validity of the IAT

Research examining the construct validity of the IAT has demonstrated that it is difficult to produce a desired outcome (i.e., fake the test) and that the strength of implicit associations are often uncorrelated with a person's self-professed beliefs, especially when the domain of interest is susceptible to the common desire to appear unbiased in the eyes of friends, family, and peers. This is precisely the sort of finding one would expect from a measure of *implicit* bias. Categories expected to elicit positive attitudes (e.g., flowers) compared to other categories (e.g., insects) do so. Known-groups tests give further support to the IAT by showing that those expected to have stronger positive associations between concept and attribute indeed show such effects (e.g., members of dominant social groups show greater implicit positivity toward their ingroup than do members of nondominant social groups).

The IAT is also known to be related to several measures of brain activity, with the first studies demonstrating greater amygdala activation to Black faces in those participants who also showed stronger anti-Black IAT bias. Given the strong involvement of the amygdala in emotional learning, such a result (the correlation between amygdala involvement and degree of attitudinal bias) ought to be expected from an attitude measure. Recently,

an identity IAT (measure of association of self with another) predicted activation in the medial prefrontal cortex, showing the activation of different neurons when individuals thought about someone similar to or different from them based on group membership.

The IAT measures the relative strength of association between different concepts. Research has revealed that differences in the magnitude of these associations correlate with differences in actual behavior. In answer to questions concerning the predictive validity of the IAT using real-world samples, a review of all peer-reviewed published papers exploring the predictive validity of the IAT has shown that although both explicit and implicit measures predict intergroup discrimination, the IAT outperforms explicit measures in this context. In particular, implicit intergroup bias measured by the IAT is a better predictor of nonverbal behaviors and decisions made under pressure than are explicit measures of intergroup bias.

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See also Children: Stereotypes and Prejudice; Implicit Prejudice; Modern Forms of Prejudice; Prejudice; Self-Esteem; Social Identity Theory; Social Representations; Stereotyping

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IMPLICIT PREJUDICE

Although there is some debate among psychologists as to what implicit prejudice is and how best to define it, *implicit prejudice* is most commonly described as a prejudice (i.e., negative feelings and/or beliefs about a group) that people hold without being aware of it. One can harbor implicit prejudice on the basis of race (implicit racism), sex (implicit sexism), age (implicit ageism), ethnicity (implicit ethnocentrism), or any number of other social groups. Of the various forms of implicit prejudice, implicit racism has probably received the most research attention.

Implicit prejudice is thought to operate automatically, with little intention or control on the part of the person. In addition, people are often unwilling or unable to acknowledge their implicit prejudice. Implicit prejudice can be contrasted with explicit prejudice, which is prejudice of which people are aware and that they agree with and endorse consciously. As discussed below, implicit prejudice can have a wide range of effects on judgments and behavior toward members of different groups. It tends to appear in people's judgments and behavior toward targets of their prejudice both subtly and accidentally. Because it seeps into the behavior of people who see themselves as unprejudiced, it is believed to be a particularly insidious form of prejudice.

For example, consider a White individual who considers himself a relatively open-minded, prejudice-free person. He tries to be fair to everyone and treat people equally. However, imagine he

harbors negative feelings toward, say, Blacks. These are feelings he doesn't readily acknowledge and wouldn't admit to others; indeed, he may adamantly deny them. However, in interactions with Blacks, he appears somewhat distant and aloof. Although he doesn't mean to, he makes less eye contact, smiles less, and generally exudes less warmth with them than he does with Whites.

We would consider this person to be relatively low in explicit prejudice—he would claim, and would perhaps believe, to feel neutrally or positively toward Blacks, and he would certainly disavow blatantly racist notions like racial discrimination in housing and employment. However, he exemplifies implicit prejudice because of his negative feelings and behavior toward Blacks and his lack of awareness of these feelings and behaviors. It is the coupling of unintentional negativity and a lack of awareness that is the hallmark of implicit prejudice. This entry describes the concept of implicit prejudice, explores its manifestations and measures, and summarizes critiques of the idea.

Origins and Prevalence

Most researchers would agree that, to some extent, socialization processes affect us all. That is, our parents, teachers, peers, television, and other forms of media have an impact on our attitudes and beliefs. Implicit prejudice researchers point to the negative depiction of various groups, particularly Blacks, in popular culture and the media as a primary origin of implicit prejudice. Overhearing prejudicial remarks from our peers and parents is also thought to influence our racial attitudes. These cultural associations are likely incorporated into memory without our awareness or consent, and the process is said to begin in childhood. By adulthood, negative associations in memory involving Blacks (and other stigmatized groups) have become so ingrained that they are capable of being automatically activated upon seeing a Black individual.

While many people are aware of the fact that some minority groups are negatively depicted in society, people tend to be unaware of the impact of these negative associations on their attitudes. In fact, it is common for people to overtly deny that media and other socialization factors influence their attitudes. However, research shows that humans are capable of learning associations implicitly—without