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DEVELOPING IMPLICIT SOCIAL COGNITION IN EARLY CHILDHOOD

Methods, phenomena, prospects

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Overview

Social cognition concerns young children's knowledge of themselves, other people and the groups to which they belong. This type of knowledge can operate at a conscious and deliberate level (explicit knowledge) and also at an unconscious and nonverbal level (implicit knowledge). Implicit social cognition can exert a powerful influence on children's behavior. Social psychologists have studied implicit social cognition in adults, but implicit cognition has only recently become a focus of study in children. Implicit measures permit assessment of spontaneous aspects of children's thinking which may not always be captured accurately by conventional verbal reports. Children may not be able to verbalize or explain what they know or feel. They may also distort their true beliefs or attitudes to experimenters based on 'social desirability' of what they think the adult wants to hear. In such cases, measures of implicit social cognition can provide a valuable, even unique, window into children's thinking. This chapter describes the newly emerging field of implicit social cognition from preschool through elementary school. A special emphasis is placed on discoveries concerning young children's thinking and understanding of themselves and their social groups in the domains of gender and race.

Why study children's implicit understanding?

Social psychology as well as cognitive science studies with adults distinguish between deliberate, controlled, and conscious processes and more automatic and unconscious cognitive ones. These are captured by two types of measures: *explicit* and *implicit* measures (e.g. Greenwald and Banaji, 1995; Jacoby, 1991). In explicit measures,

participants are often asked to provide verbal self-reports of their reactions and are aware of what is being assessed. In implicit measures, there is no self-report and participants are not necessarily informed about what is being assessed. When socially sensitive domains are measured in adults, such as racial stereotypes, implicit measures have often been shown to be *more* predictive of actual behavior than explicit measures.

In developmental science, experimental techniques designed to measure implicit social cognition are just emerging. Some relevant measures tap children's verbal responses indirectly, without requiring much introspection on the child's part. For example, one task involves showing children pictures of ambiguous situations and asking them to interpret these situations (Killen *et al.*, 2008) – which is sometimes referred to as an 'indirect' measurement technique. However, a stronger case for an implicit measure is one that bypasses verbal responses entirely. In one such case the child is simply given social items and characteristics and instructed to sort which go together most naturally (for example, the social items 'man' vs 'woman' and the characteristics of 'rough' vs 'gentle'). Children and adults find certain pairings to be more natural or 'congruent', and they group them with more facility than the opposite pairings. Such categorization tasks constitute an implicit measure of social cognition, one that the child may not be able to explain, but nonetheless can be measured.

The Implicit Association Test (IAT) is a widely used implicit measure in adult social psychology (Greenwald *et al.*, 1998). The adult IAT is an easy-to-administer sorting task that measures the strength of association among two pairs of categories. People generally find it easier (they are faster) to give the same response to items if they are associated in memory than if they are not. The IAT permits assessment of both *beliefs* (cognitive, non-valenced associations about groups) and *feelings* (affective, valenced associations about groups) without verbal report.

Young children's implicit understanding: conceptual distinctions

Beliefs and feelings are two facets of psychology that are important to investigate in childhood social cognition. Beliefs concern cognitive non-valenced mental representations – for example, the belief that 'math is for boys' is a *stereotype* and the belief that 'I am a boy' is part of a *self-concept*. In contrast, when affective or valenced feelings about a person or group are involved this is said to reflect an *attitude*. The feeling that item (or group) A is more likeable or nice, and item (or group) B is less likeable or mean are attitudes toward these social groups.

Beliefs and attitudes about groups (and about the self) are among the most important constructs in social psychology (Greenwald *et al.*, 2002). Although stereotypes, self-concepts, and attitudes can be studied using verbal reports in children, such approaches have often been stymied when probing the youngest children – due to children's inability to introspect about their beliefs/feelings or due to 'social desirability' distortions or both. Therefore, researchers have begun to explore the feasibility of investigating these fundamental aspects of the child's developing mind using implicit measures. In particular, the adult IAT procedure has been adapted for use with young children. It is often administered in conjunction with conventional tests

using verbal introspective reports, and the relation between implicit and explicit measures is a topic of growing interest.

How to study children's implicit understanding: measuring implicit gender self-concept

Child-friendly versions of the IAT task have been created (Baron and Banaji, 2006; Cvencek *et al.*, 2011b). The Preschool IAT (PSIAT) is an adaptation of the IAT for children that we have developed in our laboratory and successfully used with children as young as 4.5 years of age. The PSIAT is suitable for children who do not read, because it includes: (a) the simultaneous presentation of visual and auditory stimuli, (b) detailed, color-coded visual reminders for children, and (c) a shorter protocol than that used with adults and older children (for methodological details see Cvencek *et al.*, 2011a). This experimental technique is useful for examining a range of stereotypes, self-concepts, and attitudes in preschoolers.

As an example of the utility and power of the child-friendly IAT, we can consider the child's self-identification regarding their own gender – whether they are a boy or a girl. Previous research has established that such gender self-concepts (the self-labeling of oneself as a boy or girl) are clearly and easily measurable using explicit measures by 3–4 years of age, if not younger (e.g., Leaper, in press; Martin and Ruble, 2010; Ruble and Martin, 1998). We recently demonstrated the validity and value of measuring gender self-concepts using a child-friendly IAT procedure.

Figure 4.1 provides a schematic overview of the Child IAT procedure that can be used to study young children's implicit social cognition. At the beginning of the procedure, the children are first told that they will 'play a game on a computer'. Children are then told that they will see and hear words during the game and will have to press a button to 'let the computer know which word it is'. During a gender

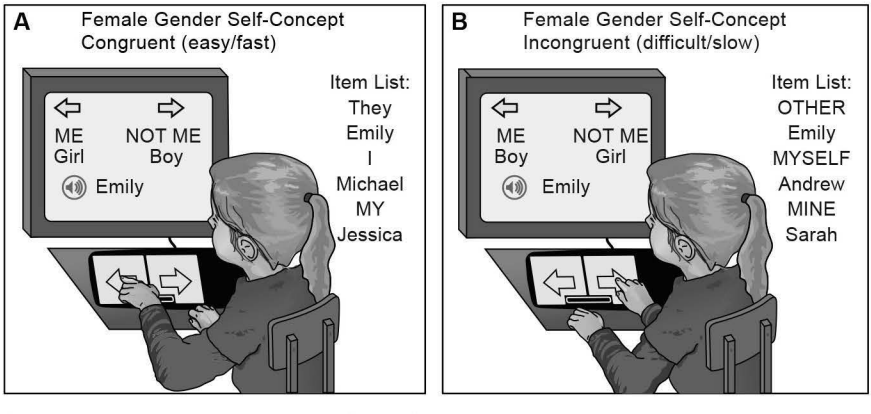

Figure 4.1 A schematic overview of the Child IAT technique for studying children's implicit social cognition. From Cvencek *et al.* (2011b), p. 769. Copyright © 2011 Society for Research in Child Development, Inc. Adapted with permission.

self-concept IAT, in one task, *me* words and *girl* names share a response key, with *not-me* words and *boy* names sharing the other response key (Figure 4.1, Task A). For girls with a strong own-gender identification, this would be an easy, 'congruent' task because it fits their own gender self-concept (*me = girl*). In the other task, two of the response assignments are reversed, such that *me* and *boy* share one key while *not-me* and *girl* share the other key (Figure 4.1, Task B). For girls who identify strongly with their gender, this would be an 'incongruent' task and therefore more difficult. Girls with a strong own-gender self-concept (*me = girl*) should respond faster to the congruent task (Task A) than the incongruent task (Task B).

In our laboratory this Child IAT measure of gender self-concept was administered in five studies of boys and girls as young as 5 years old. Figure 4.2 plots the gender self-concept results for the studies. Data for the Studies 1–2 were collected with elementary school samples in the U.S. and Singapore; data for Studies 3–5 were collected with preschoolers in the US (see figure caption for details). In all five studies, the implicit measure of gender self-concepts showed, as expected, that girls significantly paired *me = girl* more strongly than boys do, with boys showing the *me = boy* pattern. These gender self-concept findings are consistent with previous research using explicit measures (see Ruble and Martin, 1998, for a review). These results are also useful because they establish that, even at the youngest preschool ages tested, the

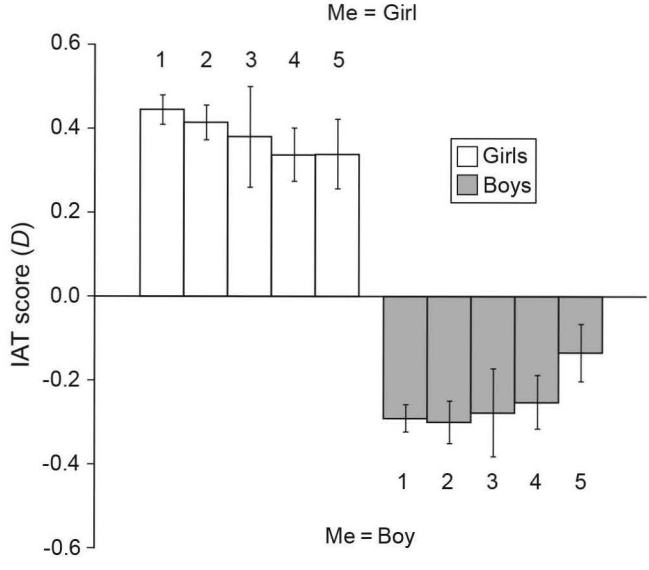

Figure 4.2 Implicit measurement techniques provide a continuous measure with sensitivity to individual differences in *stronger* or *weaker* identifications with own-gender. All participants were in preschool or elementary school. Data are plotted separately for each study, as indicated by the number (1, 2, 3, 4, and 5) above/below each bar. Study 1 = Cvencek *et al.* (2011b). Study 2 = Cvencek *et al.* (2014b). Studies 3–5 = Cvencek *et al.* (2014a). *Ns* of 222, 155, 39, 96, and 60 are associated with Studies 1, 2, 3, 4, and 5 respectively. Error bars = *SEs*.

children have an understanding of their gender identity at an implicit level and this understanding can be measured and yields robust results while bypassing verbal report. The validity of our measuring instrument has been established (see Cvencek *et al.*, 2011b and Cvencek *et al.*, 2011a for more details).

The Child IAT and PSIAT methods go beyond the simple dichotomous classification of children into those who do/do not self-identify with their own-gender – which are often the dependent measures used in explicit measurement systems. The implicit measurement techniques are useful beyond this because they provide a continuous measure with a rational zero point, good internal consistency, and a sensitivity to individual differences in *stronger* or *weaker* identifications with own-gender on an interval scale (see Figure 4.2; and Cvencek *et al.*, 2011a for details). The ability to capture the strength or weakness of the social identification – and not merely its presence and absence – will be increasingly useful for predictions in longitudinal studies.

In-group preferences

At a young age, children's developing identity is shaped, in part, by their sense of self in relation to others: children feel a strong sense of relationship with the groups to which they belong ('in-groups'). In-groups are social categories that are related to the self and serve as one of the primary organizers of social knowledge. In development, in-groups emerge fairly early: children's recognition that others are 'like me' (Meltzoff, 2007, 2013) quickly translates to a *preference* or *liking* for the in-group members. How early such in-group preferences are formed and how early they begin to influence observable behavior is an emerging topic of the social cognition research in childhood.

Children's gender in-group preferences were measured using the PSIAT. In a study with 4.5-year-olds, Cvencek *et al.* (2011a) found that both girls and boys exhibited significant 'in-group' preferences, with girls holding that *girls = good* and boys that *boys = good*. Figure 4.3 displays the scores for the PSIAT gender attitude measure of 4.5-year-old girls and boys. The majority of the girls' scores is in the *girls = good* direction, and the majority of the boys' scores is in the *boys = good* direction. Crucially, the PSIAT in-group preference measure (a) correlated significantly with an explicit self-report measure of in-group preference and (b) predicted variance in parents' reports of their children's gendered play activities beyond that predicted by the explicit measure.

Both boys and girls demonstrated a preference for their own in-group, but it is also interesting that this in-group effect was more pronounced in girls than it was in boys (Figure 4.3B). Why would 4.5-year-old girls have stronger own-gender preference than 4.5-year-old boys (a result also found in adults)? One source could be more frequent interactions with maternal than paternal caregivers: positive attitudes towards one's *mother* may generalize to positive attitudes toward all females (i.e. *female = good*). For girls, the influence of this positive attitude towards one's mother works in the same direction as their in-group preference, and the two influences may combine, thus resulting in stronger own-gender preferences for girls than for boys. For boys, the

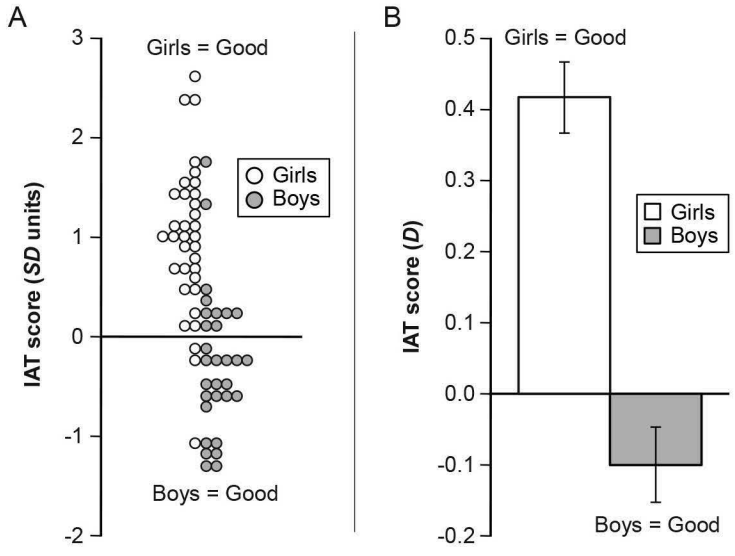

Figure 4.3 At a very young age, children already have a strong implicit sense of preference for the groups to which they belong ('in-groups'). The data plotted are from 4.5-year-old children. Individual scores (A) and mean scores (B) for the PSIAT measure of gender attitudes are plotted in standard deviation [*SD*] and IAT score [*D*] units, respectively. $N = 64$. (Panel (A) adapted and corrected from Cvencek *et al.* (2011a); the original figure had a few values for the boys mis-plotted; the original statistical tests were correct.). Error bars = *SE*s.

two influences work in the *opposite* directions. Another hypothesis about the source of the stronger own-gender preferences in girls may be diffuse negative perception of males: greater tendencies towards 'rough-and-tumble' play behaviors in boys are documented even during preschool years (e.g. Pellegrini, 1987). Young children of both genders may develop feelings that boys in general are the more rowdy and 'trouble-making' gender, contributing to the observed pattern of results.

The origins of STEM stereotypes in children

Research has examined how gender stereotypes influence participation and achievement in science, technology, engineering, and math (STEM) disciplines. In North America, England, and other cultures there is a widespread *stereotype* among adults that math is a male domain. Such gender stereotypes may have pernicious developmental consequences – playing a role in undermining young girls' mathematical performance and curtailing their aspirations about the future. Recent research has investigated *when* these stereotypes develop in elementary school children and *how* they influence children's emerging self-concepts, their interest in math, and their math achievement.

In one study with elementary-school children, participants completed Child IAT measures of gender self-concept, math–gender stereotype and math self-concept

(Cvencek *et al.*, 2011b). Elementary school years were chosen, because during this time girls' grades in mathematics are higher than boys' and they are not significantly behind boys on standardized test scores. Remarkably, the children demonstrated the cultural stereotype that 'math is for boys' as early as Grade 2. These findings suggest that the math–gender stereotype is acquired early and prior to ages at which there are actual differences in math achievement. These societally held stereotypes, once assimilated by the child, may have a detrimental effect on children's emerging math identities.

Other research using different implicit methods further corroborates that implicit math–gender stereotypes can be detected among: (a) 5-year-old Asian-American girls using a memory recall paradigm (Ambady *et al.*, 2001), (b) 7-year-old Caucasian-American girls using a picture-sorting and drawing task (Steele, 2003), and (c) 9-year-old German girls using a Child IAT (Steffens *et al.*, 2010). When the Child IAT methods were extended to adolescent girls in the Steffens *et al.*'s German sample, implicit math–gender stereotypes were predictive of math self-concepts and enrollment preferences in math classes above and beyond explicit math–gender stereotypes. This suggests that implicit gender stereotypes may be an important contributing factor to several different math-related outcomes for female students.

The impact of math–gender stereotypes on children's actual math achievement has been a topic of interest for those interested in connecting social cognition to school success. Research on *stereotype threat* (Steele, 1997) has provided convincing evidence for the impact of gender stereotypes on girls' math achievement (e.g. Aronson and Good, 2003). The underlying assumption of the stereotype threat model is that female students enter the testing situation with a concern that their poor performance will confirm a widely held stereotype about the poor mathematical ability of females. As a result, they experience 'stereotype threat', which then disrupts their performance on a math achievement test. Such detrimental effects of math–gender stereotypes have also been demonstrated with Asian-American girls as young as 5 years of age (Ambady *et al.*, 2001) and Italian girls as young as 6 years of age (Galdi *et al.*, 2014).

Cross-cultural studies have begun to investigate whether children's implicit self-concepts are similarly shaped by the prevailing cultural stereotypes. Singaporean children excel in math (OECD, 2011), but very little is known about their math stereotypes. In a recent study, Singaporean elementary school children (7–11 years old) completed Child IAT measures of gender self-concept, math–gender stereotype, and math self-concept, as well as a standardized math achievement test (Cvencek *et al.*, 2014b). The students demonstrated stereotypes about the math ability of girls, despite the fact that there were no gender differences in actual math achievement when the same children were given a standardized math test. In addition, Singaporean children's math–gender stereotypes increased as a function of age. Although the youngest Singaporean children did not show significant evidence of the stereotype (whereas American children did), the older Singaporean children began to demonstrate the stereotype, perhaps suggesting that that math–gender stereotypes reach Singaporean children through print and electronic media and the worldwide web

as they become older (see Cvencek *et al.*, 2014b for a further discussion of cross-cultural effects).

Race attitudes and stereotypes

Race is another early emerging and important aspect of social categorization that features prominently in children's thinking. Do in-group preferences about race form as early and in the same fashion as the in-group preferences about gender? Using the Child IAT, Dunham and colleagues examined the development of implicit race attitudes in children aged 6–10. The results showed that at 6 years of age children already have positive race attitudes towards their own in-group. This effect was particularly pronounced when that in-group was contrasted with a minority out-group or the out-group was low in social status (Dunham *et al.*, 2006; Newheiser and Olson, 2012; Rutland *et al.*, 2005).

Children also hold stereotypical beliefs regarding race. One widespread cultural stereotype about race purports that Asian students are the 'model minority' who excel in math. A recent study explored the degree to which elementary and middle-school students hold racial stereotypes about who can be good at math (Cvencek *et al.*, in press). The Child IAT measure of math–race stereotype revealed that children associated *Asian* = *math* at the implicit level. Statistical analyses further suggest a developmental change in implicit math–race stereotypes – these stereotypes were significantly stronger in adolescence than in elementary school. The explicit measures in this study also assessed whether children were *aware* of the stereotype that Asians are good at math (cultural knowledge), and also whether they *endorsed* this particular stereotype (personal belief). Results showed that children were aware of and also endorsed the racial stereotype that 'Asians are good at math'. Interestingly, the Child IAT appeared to be more strongly related to the general awareness of cultural stereotypes than the personal endorsement of them. It seems likely, based on these findings and others, that children first recognize and register the cultural stereotypes and then are increasingly likely to take them on as their personal beliefs. We argue that cultural stereotypes are internalized and influence children's developing self-concepts (Cvencek *et al.*, 2011b).

Affective-cognitive consistency: how children organize their social knowledge

Stereotypes and attitudes do not exist in isolation. They are situated within a larger network of self-related concepts, beliefs, and evaluations. In adults, these cognitive networks tend to organize themselves to become mutually consistent or balanced (e.g. Greenwald *et al.*, 2002; Heider, 1946). These notions from social psychology about cognitive balance or consistency have recently been applied to young children. This research explores the degree to which children's cultural stereotypes and their self-concepts are in balance. It is predicted, for example, that a boy who associates *self* with *male* (gender self-concept), and also associates *math* with *male* (cultural stereotype), should be prone to develop the additional connection of *self* with *math* (math self-concept).

Recent research suggests that principles of cognitive consistency operate in elementary school children in the U.S. (Cvencek *et al.*, 2011b). More recently and for theoretical reasons, principles of cognitive consistency were also tested in East Asian cultures. These cultures are considered to be 'collectivist' in their interpersonal orientation (Brewer and Chen, 2007), meaning that they are not as individualistic or focused on the self as most Western cultures. Therefore, it was of considerable interest for developmental theory to find that even in collectivist cultures, children's social cognition during elementary school years is already organized according to the principles of cognitive consistency (Cvencek *et al.*, 2014b). We have hypothesized that the pressure to bring one's beliefs and attitudes into balance with each other and to be internally consistent may be a culturally universal mechanism or pressure that motivates psychological change in children's social-cognitive development. Thus the push towards cognitive balance may be a key mechanism of change in children's social-cognitive development.

Future directions

The construct of self-esteem is one of the most central constructs in social psychology, and it is thought to underlie a range of psychological and behavioral reactions in people. Interest in self-esteem can be traced at least back to William James's (1890) theorizing about self-feeling and self-love in his book *Principles of Psychology*. Developmental scientists have since sought techniques for exploring the origins, causes, and developmental changes in self-esteem. Yet, as important a construct as this is, developmental scientists have been unsuccessful in getting at it in young children.

Harter (2006) has done some of the best and most influential work on the development of self-esteem in children. According to her, young children (ages 3–7) can evaluate themselves in terms of *particular* cognitive abilities, but show no measurable evidence of *integrating* the domain-specific self-evaluations into a higher-order, overall evaluation of themselves, or global self-esteem.

The fact that young children cannot verbally formulate a global evaluation of themselves does not, however, dictate that they lack general self-esteem (*me = good*). We took up the challenge of testing for the existence of self-esteem at ages younger than Harter had shown it (Cvencek *et al.*, 2014a). The results from this ongoing work suggest that self-esteem is already strong in children as young as 5 years of age when tested with PSIAT techniques. Future studies will explore whether this early self-positivity may serve as a foundation for and interact with the formation of in-group biases that develop based on in-group membership characteristics.

The newly emerging ways of measuring implicit self-esteem have implications for educational theory and practice. Feelings of self-esteem may be connected to school readiness and educational success. Children commonly experience 'corrections' and failure in school contexts, since few of them consistently score 100 per cent on all tests. It would be desirable to assess self-esteem and problem-solving persistence in an integrative study of very young children. The availability of the self-concept PSIAT will also make it possible to conduct studies with preschoolers to explore the emergence

of academic self-concepts (e.g. children's identification with math or reading) and how well they predict young children's subsequent educational achievement.

Conclusion

The study of implicit social cognition and inter-group relations in young children unites social, developmental, and cognitive psychology with education and informs an interdisciplinary 'science of learning' (Meltzoff *et al.*, 2009; Olson and Dweck, 2008). Future studies will profit from comparing implicit, unconscious measurement tools with verbal, deliberate measures in the same children both cross-sectionally and longitudinally – an effort that promises to advance our knowledge about the mechanisms, developmental timeline, and personal experiences surrounding young children's development. Although the formal, experimental study of implicit social cognition is relatively new, its usefulness and promise has already been shown by producing results in multiple domains of inter-group relations (gender, race), across diverse age groups (preschool, elementary school and beyond), and cross-culturally in different countries (U.S., Singapore, Japan, Italy, Germany).

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