



# Implicit measures for preschool children confirm self-esteem's role in maintaining a balanced identity☆



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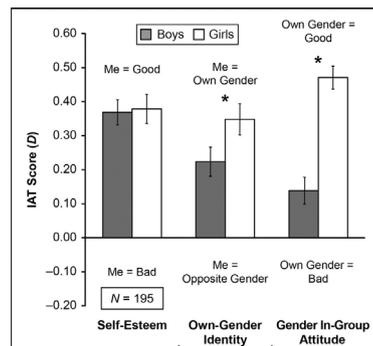
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## HIGHLIGHTS

- Assessed implicit self-esteem, gender identity and gender attitudes in 5-year-olds
- Documented strong implicit self-esteem (self-positivity) in 5-year-olds
- Girls identified more strongly with *own-gender* than boys.
- Girls demonstrated stronger *gender in-group preference* than boys.
- Implicit self-esteem serves an identity-maintenance function, even in preschoolers.

## GRAPHICAL ABSTRACT

Results for implicit measures of 5-year-old children. \* = significant sex differences. Error bars = SE. For boys, effect sizes ( $d$ ) of .98, .51, and .35 are associated with the measures of self-esteem, gender identity and gender in-group attitude, respectively. For girls, effect sizes ( $d$ ) of .88, .76, and 1.40 are associated with the measures of self-esteem, gender identity and gender in-group attitude, respectively.



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## ABSTRACT

Self-esteem is one of social psychology's central constructs. Despite the wide endorsement of the importance of self-esteem, there remains substantial variation in theoretical conceptions of *how* self-esteem functions. To help address this point, 234 5-year-old children were tested in 3 studies that used a new implicit measure, the Preschool Implicit Association Test (PSIAT). The PSIAT assessed associations of (a) *me* with *good* (self-esteem), (b) *me* with *boy* or *girl* (gender identity), and (c) *boy* or *girl* with *good* (gender attitude). The results documented self-esteem in 5-year-olds, as well as own-gender identity and gender in-group preferences. Interestingly, children who had high self-esteem and strong own-gender identity displayed strong gender in-group preferences, supporting balanced identity theory's theoretical expectations that implicit self-esteem serves an identity-maintenance function, even for young children. By preschool age, children display fundamental properties of adult implicit social cognition that relate to maintenance and functioning of group identities.

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## 1. Introduction

Psychological interest in self-esteem—positive self-evaluations—can be traced to James (1890) theorizing about self-love in *Principles of Psychology*. Self-esteem is widely conceived as a relatively stable trait, consisting of positive self-regard or attitude, and arising in normal development (Allport, 1955; Maslow, 1951; Rogers, 1959). Despite the wide endorsement of the importance of self-esteem, there remains substantial variation in theoretical conceptions of *how* self-esteem functions in ways that justify its status as an essential ingredient of personality.

## 2. An identity maintenance function of self-esteem

Several theories that are not routinely grouped together offer conceptions that treat self-esteem as a relatively stable trait having a central role in the formation and maintenance of social identities. These include: (a) social identity theory's view that low self-esteem motivates identification with positively regarded groups (Tajfel & Turner, 1979), (b) self-affirmation theory's view that high self-esteem provides a resource to affirm a threatened identity (Steele, 1988), (c) self-verification theory's view that people seek to maintain stable and coherent self-views (Swann, 1983), (d) Farnham, Greenwald, and Banaji's (1999) analysis of self-esteem's connection to in-group favoritism, and (e) balanced identity theory's view that identities, attitudes, and self-esteem self-organize to maintain affective–cognitive consistency (Greenwald et al., 2002). This paper examines the balanced identity theory (BIT) view that self-esteem—conceived as an association of self with positive valence—is the central gear of an affective–cognitive system that interrelates associations of self with a social category (identity) to associations of the social category with valence (group attitude).

## 3. Limitations of self-esteem measures

In the most widely used self-esteem measures, respondents are typically aware that they are responding to items that measure positive self-regard. This transparency can cause these measures to function more to reveal impression management strategies than to reveal self-esteem (Paulhus, 2002).

A recent method for assessing self-esteem that may avoid self-presentational distortion is the Implicit Association Test (IAT; Greenwald & Farnham, 2000; Greenwald, McGhee, & Schwartz, 1998). In adult subjects, IAT measures of self-esteem have been found to correlate only weakly with self-report measures of self-esteem (Greenwald & Farnham, 2000; Rudolph, Schröder-Abé, Schütz, Gregg, & Sedikides, 2008). The theoretical significance of discrepancies between explicit and implicit measures of self-esteem remains to be determined (cf. Valiente et al., 2011).

Also to be noted is that various proposed implicit measures of self-esteem correlate only weakly with one another (cf. Bosson, Swann, & Pennebaker, 2000). This may reflect only that most of the implicit measures are psychometrically weak (Buhrmester, Blanton, & Swann, 2011). Although some studies have confirmed predictions for correlations involving IAT-measured self-esteem (Bosson et al., 2000; Greenwald & Farnham, 2000; Rudolph et al., 2008), the totality of available evidence about IAT measures of self-esteem remains quite limited, justifying further studies such as the present one.

The strongest evidence for validity of IAT measures of self-esteem comes from empirical tests of the predictions of BIT's *balance–congruity principle* (Cvencek, Greenwald, et al., 2015; Greenwald et al., 2002). BIT's balance–congruity principle describes constraints on interrelations among sets of associations involving the self, social groups, and positive or negative valence. For example, in the presence of high self-esteem, the balance–congruity principle expects the maintenance of the identity association between self and a positively (but not a negatively) valenced

group. Balanced identity findings help to build a case for nomothetic validity of IAT measures of self-esteem.

## 4. Balanced identity and self-esteem in children

Balance–congruity principle predictions have been confirmed using samples of adults and older children (for a review see Cvencek, Greenwald, & Meltzoff, 2012). Research indicates that balanced identity organizations may be apparent in elementary-school children (Cvencek, Meltzoff & Greenwald, 2011; Dunham, Baron, & Banaji, 2007), but such organization has yet to be examined in preschoolers.<sup>1</sup> Although preschoolers may exhibit a variety of self-related concepts, they may not have organized them yet in a balanced or consistent fashion.

Harter and colleagues' work using pictorial self-report (Harter & Pike, 1984) indicates that young children (ages 3- to 7-years-old) can evaluate themselves in terms of how good they are in *particular* areas (such as math, physical achievements, etc.). These domain-specific self-evaluations are strongly positive for the majority of young children (Harter, 2012), which agrees with research showing that most adults have a positive attitude toward self (Baumeister, 1982; Greenwald, 1980; Taylor & Brown, 1988). Nevertheless, Harter (2006) could find no evidence of children integrating their domain-specific self-evaluations (“I am pretty good at climbing”) into a global self-evaluation (see also Marsh, Ellis, & Craven, 2002). The lack of an accepted measure of self-esteem for preschoolers added further significance to the present attempt to extend BIT's interpretation of self-esteem's identity-maintenance role to preschoolers.

## 5. Variation in own-gender identities and gender in-group preferences

As part of investigating affective–cognitive consistency in the current study, special attention is paid to gender differences in children's implicit gender identity and gender attitudes.

Previous studies of implicit cognition with both adults (Greenwald et al., 2002; Rudman & Goodwin, 2004) and children (Cvencek, Meltzoff & Greenwald, 2011) showed that the implicit gender identity of males is weaker than the implicit gender identity of females. In addition, gender attitude IAT measures reveal stronger gender in-group preference in women than in men (Rudman & Goodwin, 2004), and in girls than in boys (Cvencek, Greenwald & Meltzoff, 2011). The present research offers an additional opportunity to assess own-gender identity and gender in-group preference using implicit measures very early in development.

## 6. Goals of the present research

This research sought to validate a recently developed measure of implicit self-esteem for young children, the Preschool Implicit Association Test (PSIAT; Cvencek, Greenwald, & Meltzoff, 2011) by testing whether the pattern of correlations obtained at younger ages agrees with that obtained with older children and adults. Three predictions were made: (a) 5-year-old children will demonstrate strong implicit self-positivity on the PSIAT self-esteem measure, (b) 5-year-olds will identify with their own-gender (based on and extending Ruble, Martin, & Berenbaum, 2006), and (c) 5-year-old girls will show stronger gender in-group preferences than 5-year-old boys (based on and extending Cvencek, Greenwald & Meltzoff, 2011).

<sup>1</sup> Dunham et al.'s (2007) study included 5-year-olds, but with only nine in their sample and no statistical assessment of preschoolers, there was insufficient basis for generalizing to a preschool population.

## 7. Method

Three studies were conducted to examine self-esteem in very young children. The studies also included gender identity and gender attitude measures, because correlational analyses of the three measures could serve to validate the self-esteem measure by confirming its having expected correlations with these other measures. Study 1 ( $N = 42$ ) examined whether 5-year-old children show evidence of implicit self-esteem using PSIAT measures. Study 2 ( $N = 111$ ) replicated the methods of Study 1 in a larger sample of 5-year-olds, including variations of additional contextual factors in the interest of further method development. Study 3 ( $N = 81$ ) replicated the designs of Studies 1 and 2 with a novel set of stimuli to represent self and other categories in gender identity and self-esteem tests. A preliminary analysis of variance on the PSIAT scores revealed no significant main effect of study (3 levels), or any significant interaction effect of study with subject gender, PSIAT measure type (3 levels) or the interaction of PSIAT type with gender (all  $p$  values  $> .081$ ). (This preliminary analysis, along with analyses justifying combining across procedural factors, are reported in the Supplementary material.) These preliminary results justified combining the three studies into one sample having substantial power.

### 7.1. Subjects

Two hundred thirty-four 5-year-old children ( $M = 60.85$  months,  $SD = 0.89$  months; 124 boys and 110 girls) participated in the three studies. According to parental report, the racial/ethnic makeup of the sample was 83.8% White, 1.8% Asian, 1.4% African American, 0.5% Native American, 11.7% more than one race, and 0.9% other/unknown; 5.5% reported Hispanic ethnicity. Subjects were recruited by calling families from a university-maintained database of research volunteers. Each family received \$10 for participation.

## 8. Materials and procedure

Children were tested individually in a quiet room (3.0 m  $\times$  2.4 m) while seated at a desktop computer (53.3 cm screen). The experimenter was present and gave instructions orally.

### 8.1. Representing self

The conception of the study was to use unfamiliar and gender-unassociated physical objects to represent the categories of *me* and *not-me* in the PSIAT procedures. Small flags were selected in part because “flag” is within the standard vocabulary of a 5-year-old (Fenson et al., 2007). Two sets of four flags served as stimuli in Studies 1 and 2: *White-Blue* flags (red, white, and blue national flags of Croatia, France, Russia, and state flag of Iowa) and *Yellow-Black* flags (red, yellow, and black national flags of Angola, Belgium, Germany, and Uganda; see Supplementary material). Study 3 used novel flags created to permit greater control over the flags' colors and designs. In this study, two sets of flags were created using three colors (yellow, white, and blue; see Supplementary material). Study 3's flags differed systematically by being designed with two pattern characteristics: Half of the flags included both a foreground circle and background stripes; the remainder had a foreground star and background rectangles.

Children first learned to distinguish the flags that were assigned to them (i.e., “these are your flags”) from those that were not (i.e., “these flags are not yours”). This random assignment was achieved by the experimenter giving the child four stickers that depicted the “flags that are yours” (see Fig. 1).<sup>2</sup> Each flag was mounted on a 25.4 cm high,

black plastic flagpole and situated on the tabletop used for testing. Children were instructed that the stickers would help them to recognize “their” flags, and also that the stickers representing their flags would be theirs to keep when they completed the computer game.

### 8.2. Apparatus and experimental stimuli

The set of *my* flags was placed close to the children, and the *not-my* flags were more distant, but also in sight. The computer screen displayed each set of four flags, one on the left side of the screen, the other on the right (counterbalanced; see Fig. 1).

The computer keyboard had two large, color-coded response buttons—one orange and one purple. Wide orange and purple stripes (each 10 cm wide) appeared correspondingly on the left and right sides of the computer screen, indicating which button was correct for the flags shown on that side.

During the three PSIATs, children sorted stimuli belonging to six categories: *me* (images of “my flags”), *not-me* (images of “not-my flags”), *good* (print and sound recordings of “good words”), *bad* (print and sound recordings of “bad words”), *boys* (photographs of boys), and *girls* (photographs of girls). Each PSIAT alternated between picture and word (simultaneous voice plus print) stimuli from one trial to the next (all individual stimuli are described in detail below). To avoid the requirement of an ability to read, each stimulus of a verbal word started simultaneously with the onset of the printed word on the screen. Similarly, the onset of each flag picture was synchronized with a short beep sound. The intertrial interval was 500 ms.

For each PSIAT, erroneous key press responses were followed by a red question mark. Children were instructed that, when they saw the “?” they should press the correct key to “continue the game.” As is standard in IAT procedures with adults, response latencies were recorded to occurrence of correct responses. Breaks of approximately 5 min were taken after completing each of the three PSIATs, with optional additional breaks when the experimenter deemed warranted to maintain the children's attention on the task. After completing the three PSIATs, children were given an opportunity to exchange their flag stickers for another sticker set of four flags. This was done to assess children's preference for their own flags.

## 9. PSIAT testing procedure

All children completed PSIAT measures of self-esteem, gender identity, and gender attitudes (128 trials total per PSIAT; see Supplementary material for details).

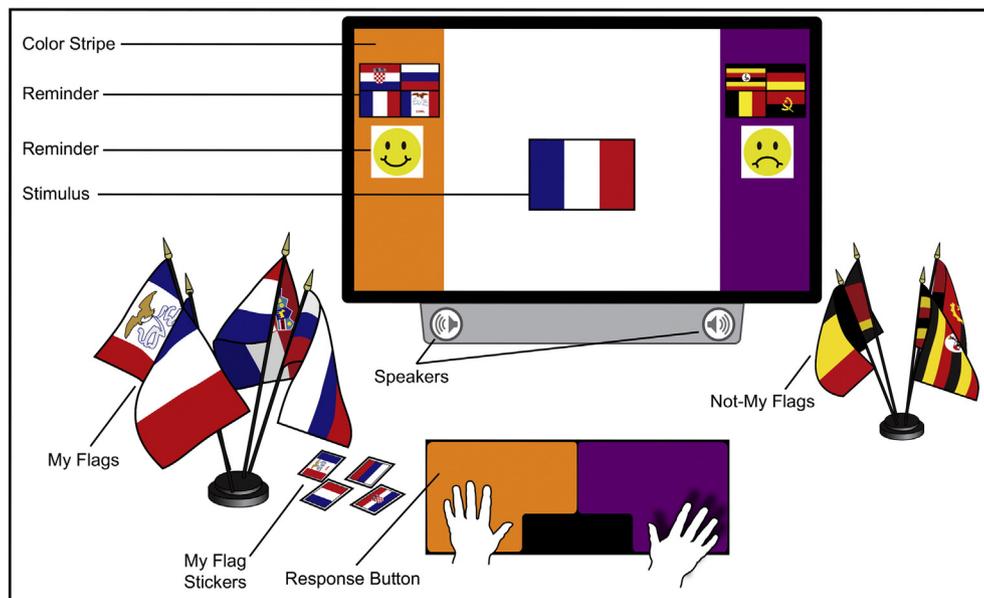
### 9.1. Self-esteem

Children sorted stimuli representing four categories: *me*, *not-me*, *good*, and *bad*. Four pictures of white-blue flags and four pictures of yellow-black flags comprised the *me* and *not-me* concepts, respectively. Four *good* words (fun, good, happy, nice) and four *bad* words (bad, mad, mean, yucky) represented the good and bad categories, respectively. In one combined task, *my* flags and *good* words shared a response key, with *not-my* flags and *bad* words sharing the other response key. The other combined task reversed the response assignments for *good–bad* words. Numerically positive self-esteem PSIAT scores indicated stronger association of *me* with *good* than with *bad*.

### 9.2. Gender identity

Children sorted stimuli representing the four categories: *me*, *not-me*, *boys*, and *girls*. The same flags used for the self-esteem PSIAT represented *me* and *not-me* for this measure. Four pictures of boys and four pictures of girls (see Supplemental material) represented the *boy* and *girl* categories, respectively. In one combined task, *my* flags and *boy* pictures shared a response key, with *not-my* flags and *girl* pictures

<sup>2</sup> In this figure—and elsewhere in the paper—the “flags that are yours” and the “flags that are not yours” will be referred to as “my flags” and “not-my flags,” respectively, because that is how a child would refer to them.



**Fig. 1.** Child's view of the apparatus used for the Self-esteem PSIAT. During the PSIAT, children categorize stimuli from four categories (*me*, *not-me*, *good*, and *bad*). The four categories are assigned to two response buttons, one operated with the left hand and the other with the right hand. Stimuli are presented one at a time, in the center of the screen (53.3 cm screen). Presentation of each stimulus on the screen is synchronized with the sound presentation through the speakers. Colored stripes on either side of the screen (one orange and one purple) contain visual reminders for each of the four categories. Reminders for *my flags* and *not-my flags* appear as a collage of all *my flag* and *not-my flag* stimuli respectively. Reminders for good and bad words appear (below the two collages) as smiley and frowny faces, respectively. The child's task is to sort the stimulus by pressing one of the response buttons that are color-coded so they match the colors on the screen. Actual *my flags* and *not-my flags* appear on flagpoles close to (*my flags*) and away from (*not-my flags*) the child. Stickers used in flag assignment task (see text) are placed next to the *my flags*. Figure drawn to scale.

sharing the other response key. In the other combined task, two of the response assignments were reversed, such that *my flags* and *girl* pictures shared one key while *not-my flags* and *boy* pictures shared the other key. An *own-gender identity* would be manifest if boys showed a stronger association of *my flags* with *boy* than with *girl*, and similarly if girls showed a stronger association of *my flags* with *girl* than with *boy*.

### 9.3. Gender in-group attitude

Children sorted stimuli representing *boys*, *girls*, *good*, and *bad*, using the four boy and four girl photographs from the identity PSIAT and the *good* and *bad* words from the self-esteem PSIAT. In one combined task, *good* words and *boy* pictures shared a response key, as did *bad* words and *girl* pictures. In the other combined task, left versus right assignment of *boy*–*girl* pictures was reversed. A *gender in-group preference* would be manifest if boys showed a stronger association of *boy* with *good* than with *bad*, and similarly if girls showed a stronger association of *girl* with *good* than with *bad*.

### 9.4. Counterbalancing

Studies 1 and 2 had 24 conditions counterbalancing three procedural factors: PSIAT order (6 levels: Each of the three PSIATs equally often in first, second, and third experimental positions), combined task order (2 levels: Each of the two combined tasks in first and second positions within each PSIAT), and *flag type* (2 levels: white–blue versus yellow–black flags in Study 1; Star versus Circle flags in Study 3) assigned as *my flags* were all counterbalanced across subjects. In Study 2, three additional factors were fully counterbalanced: Experimenter (2 levels: male or female experimenter), voice for audio stimuli (2 levels: male versus female voice) and left–right assignment of *my* and *not-my flags* (2 levels: *my flags* on the left versus *my flags* on the right).

## 10. PSIAT measure computation

Subjects were excluded using three criteria employed routinely in previous IAT studies with children (e.g., Cvencek, Meltzoff &

Greenwald, 2011): (a) 10% or more of responses faster than 300 ms, (b) error rate of 35% or greater in at least one IAT, or (c) average response latency 3 *SDs* above the mean response latency for the whole sample in at least one of the three IATs. The error rate criterion is not routinely used with adult subjects, but has been adopted for children because error rates in children can indicate poor comprehension of spoken stimuli. These criteria excluded 39 subjects, leaving 195 (99 boys and 96 girls) for analyses. Analyses of the reduced sample, as expected, had greater statistical power than analyses of the full sample, although patterns of statistically significant findings were unchanged.

PSIAT scores were computed from the response latencies using the *D* score—an effect-size-like index with possible range of  $-2$  to  $+2$  (Greenwald, Nosek, & Banaji, 2003). For each PSIAT measure, Cronbach's alpha was calculated using *D* scores computed from 20-trial subsets of each IAT. Cronbach's alpha for gender identity, self-esteem, and gender attitude PSIATs were respectively:  $\alpha = .83$ ,  $\alpha = .77$ , and  $\alpha = .76$ .

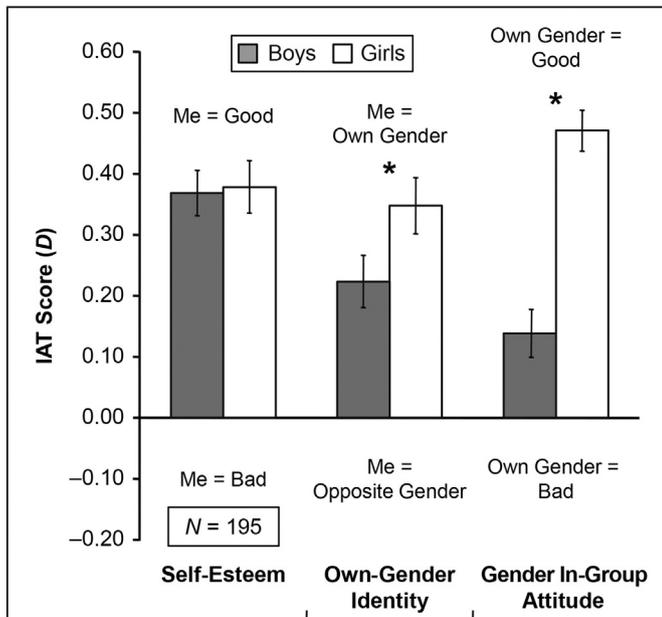
## 11. Results

### 11.1. Flag manipulation check

For the flag manipulation check, 135 children (70%) chose to keep their originally assigned flags, statistically greater than chance (50%),  $t(194) = 5.81$ ,  $p = 10^{-8}$ ,  $d = 0.91$ , indicating that children preferred their own flags.

### 11.2. PSIAT measures

Fig. 2 displays the results for the three PSIAT measures. Based on previous findings with implicit measures in adults and older children, preschool boys and girls were expected to differ in the strength of their own-gender identities (Rudman & Goodwin, 2004) and gender in-group attitudes (Skowronski & Lawrence, 2001), but not in their self-esteem (Greenwald & Farnham, 2000).



**Fig. 2.** Results for implicit measures of 5-year-old children. \* = significant sex differences. Error bars = SE. For boys, effect sizes ( $d$ ) of .98, .51, and .35 are associated with the measures of self-esteem, gender identity and gender in-group attitude, respectively. For girls, effect sizes ( $d$ ) of .88, .76, and 1.40 are associated with the measures of self-esteem, gender identity and gender in-group attitude, respectively.

### 11.3. Self-esteem

Overall, children associated *me* with *good* more than with *bad*,  $t(194) = 12.95$ ,  $p = 10^{-28}$ ,  $d = 0.93$ . This occurred equally for boys ( $M = .37$ ;  $SD = .37$ ),  $t(98) = 9.72$ ,  $p = 10^{-16}$ ,  $d = 0.98$ , and girls ( $M = .38$ ;  $SD = .43$ ),  $t(95) = 8.64$ ,  $p = 10^{-13}$ ,  $d = 0.88$ .

### 11.4. Gender identity

Children associated *my* flags with their *own gender* more than with *opposite gender*,  $t(194) = 8.86$ ,  $p = 10^{-16}$ ,  $d = 0.63$ . Girls showed stronger own-gender identity ( $M = .35$ ;  $SD = .45$ ),  $t(95) = 7.45$ ,  $p = 10^{-11}$ ,  $d = 0.76$ , than did boys ( $M = .22$ ;  $SD = .43$ ),  $t(98) = 5.12$ ,  $p = 10^{-6}$ ,  $d = 0.51$ . This difference was:  $t(193) = 1.95$ ,  $p = .053$ ,  $d = 0.28$ .

### 11.5. Gender in-group attitude

Children associated their *own gender* more than the *opposite gender* with *good*,  $t(194) = 10.41$ ,  $p = 10^{-20}$ ,  $d = 0.75$ . This occurred both for boys ( $M = .14$ ;  $SD = .40$ ),  $t(98) = 3.44$ ,  $p = .001$ ,  $d = 0.35$ , and girls ( $M = .47$ ;  $SD = .33$ ),  $t(95) = 13.69$ ,  $p = 10^{-24}$ ,  $d = 1.40$ . However, for girls the association of *own gender* with *good* was decidedly stronger than that for boys,  $t(193) = 6.29$ ,  $p = 10^{-9}$ ,  $d = 0.90$ .

### 11.6. Affective–cognitive consistency

Past tests of balanced identity have used a statistical *4-test-method* as an indicator of affective–cognitive consistency among the measures of self-esteem, gender identity, and gender attitudes (Greenwald et al., 2002). This method applies a series of four statistical tests to results from a two-step hierarchical linear regression in which each of the three measures, in turn, serves as a criterion measure that is predicted by the other two. In Step 1, the criterion is predicted solely by the multiplicative product of the other two measures. In Step 2, the two measures are added individually to the regression (see Supplementary material for a detailed report of the results using the 4-test method).

Passing of all four tests of the 4-test method has been used, since its introduction in 2002, as a criterion for theoretical confirmation of the balance–congruity principle. However, the 4-test method has some complexities that would be desirable to circumvent. It requires a total of 12 statistical tests—four in each of the three 2-steps regressions. A recent meta-analysis of 36 studies with implicit and explicit measures introduced a potential improvement on the 4-test method, by computing a within-study meta-analysis of the first two test results (Cvencek, Greenwald, et al., 2015). This new meta-analytic approach was applied to the present data.

The within-study meta-analysis makes use of (a) the  $r$  coefficient of the product term from Step 1 (Test 1 of the 4-test method) and (b) the partial  $r$  for the product term in Step 2 (Test 2 of the 4-test method). Test 1 produced an  $r$  value for each of the three types of association measures being predicted by the product of the other two when that product was the sole predictor in the first step of the 2-step regression. Test 2 produces three partial  $r$ s ( $pr$ ) values in the second regression step, each being a measure of unique prediction by the product term. Using random-effects analyses of Fisher Z transformations of these  $r$  values, the three occurrences of each of Tests 1 and 2 were meta-analytically combined for each independent sample, with results being reported after transformation back to the correlation metric.

Within-BID effect sizes were computed on the combined data set involving all three samples, as justified by the previously described preliminary analysis that found no main effect of study or interaction effect involving subject gender, the repeated-measures variation of association measure, or the interaction of gender with association measure. This analysis found that the predicted effect of product terms for Test 1 of the 4-test method was significant (average  $r = .293$ ,  $p = .00002$ ). For Test 2, the average  $pr$  coefficient was positive as predicted for the 4-test method,  $pr = .071$ ,  $p = .087$ . These findings provide substantial confirmation for BIT's expectations (see Supplementary material for additional details of the results using the within-study meta-analysis).

## 12. General Discussion

Using a recently developed method (PSIAT) to assess strengths of associations with self in young children, the present study observed levels of implicit self-esteem and own-gender identity comparable to those previously observed in older samples, and also found gender differences in gender in-group preferences similar to those previously observed both in older children and in adults.

Although both girls and boys displayed implicit preference for their own gender, girls demonstrated a significantly stronger gender in-group preference. Correlations among the measures of implicit self-esteem, gender identity, and gender attitude importantly confirmed theoretical expectations of balanced identity theory (BIT) by showing that each association measure was significantly predicted by the product of the other two. Thus, even as early as preschool, children displayed a form of affective–cognitive organization strikingly similar to patterns previously observed repeatedly in older children and adults (Cvencek et al., 2012).

### 12.1. Functions of self-esteem

The present findings bear on the proposition that self-esteem serves an *identity-maintenance* function, as described in balanced identity theory (BIT). BIT conceives self-esteem as an association (of self with positive valence) that plays a central role in a cognitive–affective configuration that also includes association of self with social categories (e.g., gender identity) and associations of those social categories with valence (e.g., gender attitude).

The association-strength measures obtained using the PSIAT enabled finding confirmatory evidence for BIT's theoretical expectations in subjects younger than those tested in any previous research. Previous

tests had provided support with adults (Greenwald et al., 2002; Greenwald, Rudman, Nosek, & Zayas, 2006) and elementary-school children (Cvencek, Kapur, & Meltzoff, 2015; Dunham et al., 2007). The present results extend previous BIT research by demonstrating that the principles of cognitive balance operate in 5-year-old children. The finding raises the possibility that the underlying principle of balance-congruity in children's representations may arise even earlier than 5 years of age and exert pressure on mental organization. Of course, BIT's conception of self-esteem's identity maintenance function does not exclude self-esteem serving other possible functions, as hypothesized in several other theories (Deci & Ryan, 2000; Greenberg, Pyszczynski, & Solomon, 1986; Leary & Baumeister, 2000).

### 12.2. Representational structure of self-esteem

There exist multiple conceptions of self-esteem's structure, ranging from simple associations of self with valence (*me = good*) to complex, multi-component cognitive schemas (Blascovich & Tomaka, 1991). Because measures based on cognitively more complex conceptions of explicit self-esteem are not presently available for young children (Harter, 2012) the present research is necessarily silent on the validity of those more complex conceptions for preschool children. However, the present findings give some validation to the conception of self-esteem as an associative link between self and valence (*me = good*), which is what was tested here. Given the contemporary wide endorsement of dual-process models (Stanovich, West, & Toplak, 2014), the associative structural conception of (IAT-measured) self-esteem may be seen as co-existing with more cognitively complex representations (cf. Rudman, Dohn, & Fairchild, 2007).

### 12.3. Self-esteem in relation to varying own-gender identities and gender in-group preferences

Levels of self-esteem observed with 5-year-olds in this research match observations in previous studies with older samples. At this point one can only speculate about the developmental roots of self-positivity in children, but several streams of data and theory may be relevant. Recent theories of social-cognitive development have argued that infants and toddlers recognize similar morphological features and action patterns between self and others, thereby judging the extent to which others are "like me" (Meltzoff, 2007, 2013) even before preschool. When combined with warm and consistent care, feelings of attachment and "trust" (Erikson, 1963; Harris, 2007) may develop, which are integral to a sense of positive self-esteem (Brown, 1998). Children who feel loved by others may internalize this to love themselves (Thompson, 2008). Once these feelings develop, they may guide the way children perceive others, and prompt them to interpret the world as a more accepting place (see also, Kamins & Dweck, 1999).

A challenging question is to explain the similarity between the present results with 5-year-olds and the previous work with adults and older children in terms of own-gender identity and gender in-group preferences being stronger in girls than in boys. Three possible explanations for early emergence of stronger own-gender identity in girls can be provided. First, girls begin verbal gender labeling earlier than boys (at about 19 vs. 21 months of age), which may contribute to gender identity becoming more automatic (Hilliard & Liben, 2010; Zosuls et al., 2009). Second, girls in Western culture characteristically wear more gender-distinctive clothes than boys (Ruble, Lurye, & Zosuls, 2007). Third, girls predominantly experience caretakers who are own-gender role models (Zosuls et al., 2009).

Among possible explanations for early emergence of stronger gender in-group preference in girls, three candidate origins deserve consideration. First, positive attitudes toward one's mother may generalize to all females (i.e., *female = good*). For boys, the positive attitude towards one's mother works in the opposite direction from gender in-group preference, and the two influences may tend to cancel each

other (e.g., Rudman & Goodwin, 2004). Second, young children may develop feelings that boys are aggressive and "get in trouble" more, leading to a weaker gender in-group preference in boys (e.g., Giles & Heyman, 2005). Third, children's experiences with gender roles, including the division of labor in the home, may contribute to associating females with being "nurturing" and "warm," which has a positive valence (e.g., Sinno & Killen, 2009).

### 12.4. Measurement of self-esteem in preschoolers

Previous researchers documented the difficulties in using self-report to measure self-esteem in children as young as those studied here (Harter, 2006; Marsh et al., 2002). Haltiwanger (1989) has argued that young children's global self-esteem may be manifest in their *behavior* even if not in their explicit verbal self-report. Using reports by the children's own preschool teachers (Q-sort methods), Haltiwanger and Harter (1988); also Verschuere, Marcoen, & Buyck, 1998) identified behaviors that possibly reflect high self-esteem in preschoolers (e.g., displays of confidence, independence, etc.). However, such measures can be susceptible to inflated gender differences, because preschool teachers tend to view girls as more confident than boys (Fuchs-Beauchamp, 1996).

In the present research, the PSIAT measure allowed us to assess group-associations (gender attitude) and self-associations, in both valenced (self-esteem) and non-valenced (gender identity) domains, in ways that did not rely on children's verbal self-report or teacher's evaluations. The PSIAT's use of flags was based on an established social psychological phenomenon—the *mere ownership effect* (Beggan, 1992). The present successful use of this approach with 5-year-olds suggests the possibility of adapting other measures of implicit self-esteem, such as birthday preference (Jones, Pelham, Mirenberg, & Hetts, 2002) and name-letter preference (Hoorens, Nuttin, Herman, & Pavakanun, 1990) for use with preschoolers.

### 12.5. Validity of IAT self-esteem measures

The present studies add to the body of evidence for the validity of IAT measures of self-esteem. Specifically, Bosson et al. (2000) reported that, of the seven implicit self-esteem measures examined in tests of adults, the IAT had the highest test-retest reliability ( $r = .69$ ), and Krause, Back, Egloff, and Schmukle (2011) showed that, of the five implicit self-esteem measures they examined, the IAT measure displayed: (a) the best split-half reliability ( $r = .75$ ) and (b) the best temporal stability over a 4-week period ( $r = .54$ ). Similarly, in all three studies reported here, internal consistencies of the PSIAT measures of self-esteem and gender self-concept PSIATs revealed satisfactorily high values, ranging from  $\alpha = .70$  to  $.89$ .

Recently, IAT self-esteem measures in adults independently predicted the perception of being valued—a real-life criterion derived from sociometer theory (Back et al., 2009). However, the strongest evidence of the validity of IAT self-esteem measures comes from the evidence supporting BIT's balance-congruity principle (Greenwald et al., 2002). In adults, IAT measures of self-esteem have been shown to be related to measures of gender identity and gender attitudes according to the balance-congruity principle (Cvencek et al., 2012). The present demonstration of significant statistical support for the balance-congruity expectations in studies with 5-year-old children adds to the evidence for construct validity of IAT self-esteem measures.

## 13. Conclusion

The present studies provide empirical evidence for positive self-esteem in 5-year-olds, an age earlier in development than can be established using available self-report measures. Additionally, the data provided by preschool children confirmed the operation of affective-cognitive consistency among gender identity, gender attitudes, and

self-esteem. These findings establish that important properties of self-esteem exist in early childhood, consistent with theories that describe an identity-maintenance function of self-esteem.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.jesp.2015.09.015>.

## References

- Allport, G. W. (1955). *Becoming: Basic considerations for a psychology of personality*. New Haven, CT: Yale University Press.
- Back, M. D., Krause, S., Hirschmüller, S., Stopfer, J. M., Egloff, B., & Schmukle, S. C. (2009). Unraveling the three faces of self-esteem: A new information-processing sociometer perspective. *Journal of Research in Personality*, 43, 933–937. <http://dx.doi.org/10.1016/j.jrp.2009.04.002>.
- Baumeister, R. F. (1982). A self-presentational view of social phenomena. *Psychological Bulletin*, 91, 3–26. <http://dx.doi.org/10.1037/0033-2909.91.1.3>.
- Beggan, J. K. (1992). On the social nature of nonsocial perception: The mere ownership effect. *Journal of Personality and Social Psychology*, 62, 229–237. <http://dx.doi.org/10.1037/0022-3514.62.2.229>.
- Blascovich, J., & Tomaka, J. (1991). Measures of self-esteem. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp. 115–160). San Diego, CA: Academic Press.
- Bosson, J. K., Swann, W. B., Jr., & Pennebaker, J. W. (2000). Stalking the perfect measure of implicit self-esteem: The blind men and the elephant revisited? *Journal of Personality and Social Psychology*, 79, 631–643. <http://dx.doi.org/10.1037/0022-3514.79.4.631>.
- Brown, J. D. (1998). *The Self*. New York, NY: McGraw-Hill.
- Buhrmester, M. D., Blanton, H., & Swann, W. B., Jr. (2011). Implicit self-esteem: Nature, measurement, and a new way forward. *Journal of Personality and Social Psychology*, 100, 365–385. <http://dx.doi.org/10.1037/a0021341>.
- Cvencek, D., Greenwald, A. G., Meltzoff, A. N., Maddox, C. D., Nosek, B. A., Rudman, L. A., ... Banaji, M. R. (2015a). *Multi-laboratory meta-analytic evaluation of balanced identity theory*. (Manuscript submitted for publication).
- Cvencek, D., Kapur, M., & Meltzoff, A. N. (2015b). Math achievement, stereotypes, and math self-concepts among elementary-school students in Singapore. *Learning and Instruction*, 39, 1–10. <http://dx.doi.org/10.1016/j.learninstruc.2015.04.002>.
- Cvencek, D., Greenwald, A. G., & Meltzoff, A. N. (2011a). Measuring implicit attitudes of 4-year-olds: The Preschool Implicit Association Test. *Journal of Experimental Child Psychology*, 109, 187–200. <http://dx.doi.org/10.1016/j.jecp.2010.11.002>.
- Cvencek, D., Greenwald, A. G., & Meltzoff, A. N. (2012). Balanced identity theory: Review of evidence for implicit consistency in social cognition. In B. Gawronski, & F. Strack (Eds.), *Cognitive consistency: A fundamental principle in social cognition* (pp. 157–177). New York, NY: Guilford Press.
- Cvencek, D., Meltzoff, A. N., & Greenwald, A. G. (2011b). Math-gender stereotypes in elementary school children. *Child Development*, 82, 766–779. <http://dx.doi.org/10.1111/j.1467-8624.2010.01529.x>.
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11, 227–268. [http://dx.doi.org/10.1207/S15327965PLI1104\\_01](http://dx.doi.org/10.1207/S15327965PLI1104_01).
- Dunham, Y., Baron, A. S., & Banaji, M. R. (2007). Children and social groups: A developmental analysis of implicit consistency in Hispanic Americans. *Self and Identity*, 6, 238–255. <http://dx.doi.org/10.1080/15298860601115344>.
- Erikson, E. H. (1963). *Childhood and society*. New York, NY: Norton.
- Farnham, S. D., Greenwald, A. G., & Banaji, M. R. (1999). Implicit self-esteem. In D. Abrams, & M. Hogg (Eds.), *Social identity and social cognition* (pp. 230–248). Cambridge, MA: Blackwell Publishers.
- Fenson, L., Marchman, V. A., Thal, D. J., Dale, P. S., Reznick, J. S., & Bates, E. (2007). *The MacArthur-Bates Communicative Development Inventories User's Guide and Technical Manual* (2nd ed.). Baltimore, MD: Brookes.
- Fuchs-Beauchamp, K. D. (1996). Preschoolers' inferred self-esteem: The Behavioral Rating Scale of Presented Self-esteem in Young Children. *The Journal of Genetic Psychology*, 157, 204–210. <http://dx.doi.org/10.1080/00221325.1996.9914858>.
- Giles, J. W., & Heyman, G. D. (2005). Young children's beliefs about the relationship between gender and aggressive behavior. *Child Development*, 76, 107–121. <http://dx.doi.org/10.1111/j.1467-8624.2005.00833.x>.
- Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The causes and consequences of a need for self-esteem: A terror management theory. In R. F. Baumeister (Ed.), *Public self and private self* (pp. 189–212). New York, NY: Springer-Verlag. [http://dx.doi.org/10.1007/978-1-4613-9564-5\\_10](http://dx.doi.org/10.1007/978-1-4613-9564-5_10).
- Greenwald, A. G. (1980). The totalitarian ego: Fabrication and revision of personal history. *American Psychologist*, 35, 603–618. <http://dx.doi.org/10.1037/0003-066X.35.7.603>.
- Greenwald, A. G., & Farnham, S. D. (2000). Using the Implicit Association Test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology*, 79, 1022–1038. <http://dx.doi.org/10.1037/0022-3514.79.6.1022>.
- Greenwald, A. G., Banaji, M. R., Rudman, L. A., Farnham, S. D., Nosek, B. A., & Mellot, D. S. (2002). A unified theory of implicit attitudes, stereotypes, self-esteem, and self-concept. *Psychological Review*, 109, 3–25. <http://dx.doi.org/10.1037/0033-295X.109.1.3>.
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology*, 74, 1464–1480. <http://dx.doi.org/10.1037/0022-3514.74.6.1464>.
- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology*, 85, 197–216. <http://dx.doi.org/10.1037/0022-3514.85.2.197>.
- Greenwald, A. G., Rudman, L. A., Nosek, B. A., & Zayas, V. (2006). Why so little faith? A reply to Blanton and Jaccard's (2006) skeptical view of testing pure multiplicative theories. *Psychological Review*, 113, 170–180. <http://dx.doi.org/10.1037/0033-295X.113.1.170>.
- Haltiwanger, J. (1989, April). Behavioral referents of presented self-esteem in young children. Paper presented at the Meeting of the Society for Research in Child Development. Kansas City: MO.
- Haltiwanger, J., & Harter, S. (1988). A behavioral measure of young children's presented self-esteem. Unpublished manuscript, University of Denver, Denver, CO.
- Harris, P. L. (2007). Trust. *Developmental Science*, 10, 135–138. <http://dx.doi.org/10.1111/j.1467-7687.2007.00575.x>.
- Harter, S. (2006). Developmental and individual difference perspectives on self-esteem. In D. K. Mroczek, & T. D. Little (Eds.), *Handbook of personality development* (pp. 311–334). Mahwah, NJ: Erlbaum.
- Harter, S. (2012). *The construction of the self: Developmental and sociocultural foundations* (2nd ed.). New York, NY: Guilford Press.
- Harter, S., & Pike, R. (1984). The pictorial scale of perceived competence and social acceptance for young children. *Child Development*, 55, 1969–1982. <http://dx.doi.org/10.2307/1129772>.
- Hilliard, L. J., & Liben, L. S. (2010). Differing levels of gender salience in preschool classrooms: Effects on children's gender attitudes and intergroup bias. *Child Development*, 81, 1787–1798. <http://dx.doi.org/10.1111/j.1467-8624.2010.01510.x>.
- Hoorens, V., Nuttin, J. M., Jr., Herman, I. E., & Pavakanun, U. (1990). Mastery pleasure versus mere ownership: A quasi-experimental cross-cultural and cross-alphabetical test of the name letter effect. *European Journal of Social Psychology*, 20, 181–205. <http://dx.doi.org/10.1002/ejsp.2420200302>.
- James, W. (1890). *Principles of psychology*. New York, NY: Holt.
- Jones, J. T., Pelham, B. W., Mirenberg, M. C., & Hetts, J. J. (2002). Name letter preferences are not merely mere exposure: Implicit egotism as self-regulation. *Journal of Experimental Social Psychology*, 38, 170–177. <http://dx.doi.org/10.1006/jesp.2001.1497>.
- Kamins, M. L., & Dweck, C. S. (1999). Person versus process praise and criticism: Implications for contingent self-worth and coping. *Developmental Psychology*, 35, 835–847. <http://dx.doi.org/10.1037/0012-1649.35.3.835>.
- Krause, S., Back, M. D., Egloff, B., & Schmukle, S. C. (2011). Reliability of implicit self-esteem measures revisited. *European Journal of Personality*, 25, 239–251. <http://dx.doi.org/10.1002/per.792>.
- Leary, M. R., & Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology*. 32. (pp. 1–62). San Diego, CA: Academic Press. [http://dx.doi.org/10.1016/S0065-2601\(00\)80003-9](http://dx.doi.org/10.1016/S0065-2601(00)80003-9).
- Marsh, H. W., Ellis, L. A., & Craven, R. G. (2002). How do preschool children feel about themselves? Unraveling measurement and multidimensional self-concept structure. *Developmental Psychology*, 38, 376–393. <http://dx.doi.org/10.1037/0012-1649.38.3.376>.
- Maslow, A. H. (1951). Higher needs and personality. *Dialectica*, 5, 257–265. <http://dx.doi.org/10.1111/j.1746-8361.1951.tb01056.x>.
- Meltzoff, A. N. (2007). 'Like me': A foundation for social cognition. *Developmental Science*, 10, 126–134. <http://dx.doi.org/10.1111/j.1467-7687.2007.00574.x>.
- Meltzoff, A. N. (2013). Origins of social cognition: Bidirectional self-other mapping and the “like-me” hypothesis. In M. Banaji, & S. Gelman (Eds.), *Navigating the social world: What infants, children, and other species can teach us* (pp. 139–144). New York, NY: Oxford University Press.
- Paulhus, D. L. (2002). Socially desirable responding: The evolution of a construct. In H. I. Braun, D. N. Jackson, & D. E. Wiley (Eds.), *The role of constructs in psychological and educational measurement* (pp. 49–69). Mahwah, NJ: Erlbaum.
- Rogers, C. R. (1959). A theory of therapy, personality, and interpersonal relationships, as developed in the client-centered framework. In S. Koch (Ed.), *Psychology: A study of a science*, 3. (pp. 184–256). New York, NY: McGraw-Hill.
- Ruble, D. N., Lurye, L. E., & Zosuls, K. M. (2007). Pink frilly dresses (PFD) and early gender identity. *Princeton Report on Knowledge*, 2 Retrieved January 12, 2013, from [http://www.princeton.edu/prok/issues/2-2/pink\\_frilly.xml](http://www.princeton.edu/prok/issues/2-2/pink_frilly.xml).
- Ruble, D. N., Martin, C. L., & Berenbaum, S. A. (2006). Gender development. In N. Eisenberg (Ed.), (6th ed.). *Handbook of child psychology: Social, emotional, and personality development*, 3. (pp. 858–932). New York, NY: Wiley.
- Rudman, L. A., & Goodwin, S. A. (2004). Gender differences in automatic in-group bias: Why do women like women more than men like men? *Journal of Personality and Social Psychology*, 87, 494–509. <http://dx.doi.org/10.1037/0022-3514.87.4.494>.
- Rudman, L. A., Dohn, M. C., & Fairchild, K. (2007). Implicit self-esteem compensation: Automatic threat defense. *Journal of Personality and Social Psychology*, 93, 798–813. <http://dx.doi.org/10.1037/0022-3514.93.5.798>.
- Rudolph, A., Schröder-Abé, M., Schütz, A., Gregg, A. P., & Sedikides, C. (2008). Through a glass, less darkly? Reassessing convergent and discriminant validity in measures of implicit self-esteem. *European Journal of Psychological Assessment*, 24, 273–281. <http://dx.doi.org/10.1027/1015-5759.24.4.273>.
- Sinno, S. M., & Killen, M. (2009). Moms at work and dads at home: Children's evaluations of parental roles. *Applied Developmental Science*, 13, 16–29. <http://dx.doi.org/10.1080/1088690802606735>.
- Skowronski, J. J., & Lawrence, M. A. (2001). A comparative study of the implicit and explicit gender attitudes of children and college students. *Psychology of Women Quarterly*, 25, 155–165. <http://dx.doi.org/10.1111/1471-6402.00017>.
- Stanovich, K. E., West, R. F., & Toplak, M. E. (2014). Rationality, intelligence, and the defining features of type 1 and type 2 processing. In J. W. Sherman, B. Gawronski, &

- Y. Trope (Eds.), *Dual-process theories of the social mind* (pp. 80–91). New York, NY: Guilford Press.
- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), *Advances in experimental social psychology: Social psychological studies of the self: Perspectives and programs*. 21. (pp. 261–302). San Diego, CA: Academic Press. [http://dx.doi.org/10.1016/S0065-2601\(08\)60229-4](http://dx.doi.org/10.1016/S0065-2601(08)60229-4).
- Swann, W. B., Jr. (1983). Self-verification: Bringing social reality into harmony with the self. In J. Suls, & A. G. Greenwald (Eds.), *Psychological perspectives on the self*. 2. (pp. 33–66). Hillsdale, NJ: Erlbaum.
- Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin, & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Monterey, CA: Brooks-Cole.
- Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, 103, 193–210. <http://dx.doi.org/10.1037/0033-2909.103.2.193>.
- Thompson, R. A. (2008). Early attachment and later development: Familiar questions, new answers. In J. Cassidy, & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 348–365) (2nd ed.). New York, NY: Guilford.
- Valiente, C., Cantero, D., Vázquez, C., Sanchez, Á., Provencio, M., & Espinosa, R. (2011). Implicit and explicit self-esteem discrepancies in paranoia and depression. *Journal of Abnormal Psychology*, 120, 691–699. <http://dx.doi.org/10.1037/a0022856>.
- Verschueren, K., Marcoen, A., & Buyck, P. (1998). Five-year-olds' behaviorally presented self-esteem: Relations to self-perceptions and stability across a three-year period. *The Journal of Genetic Psychology*, 159, 273–279. <http://dx.doi.org/10.1080/00221329809596151>.
- Zosuls, K. M., Ruble, D. N., Tamis-LeMonda, C. S., Shrout, P. E., Bornstein, M. H., & Greulich, F. K. (2009). The acquisition of gender labels in infancy: Implications for gender-typed play. *Developmental Psychology*, 45, 688–701. <http://dx.doi.org/10.1037/a0014053>.