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Short Communication

Are implicit and explicit measures of self-esteem related? A meta-analysis for the Name-Letter Test

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Abstract

A meta-analysis of the empirical literature was conducted to examine the strength of empirical associations between explicit (questionnaire) measures of self-esteem and one of the most frequently used implicit self-esteem measures – the Name-Letter Test (Nuttin, 1985). Results indicated that the NLT was consistently, albeit weakly, related to explicit self-esteem measures. Also, increasing the accessibility of explicit self-esteem (by administering the questionnaire measure prior to the implicit measure) increased the magnitude of association. Discussion centers on the role of psychometric factors in dissociations between explicit and implicit self-esteem measures. Implications for measurement and conceptualization of self-esteem also are discussed.

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1. Introduction

Self-esteem is one of the most frequently studied individual differences in psychology, as it has been found to predict important outcomes such as academic performance, depression, relationship

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dissatisfaction, and delinquency (see Baumeister, Campbell, Krueger, & Vohs, 2003). Traditionally, this research has relied on self-report questionnaires, with the Rosenberg (1965) inventory being the most commonly used. Self-report measures are not without their drawbacks, however, as some people may prefer not to admit having negative feelings about themselves (e.g., Schneider & Turkat, 1975; Paulhus, 1991). The veracity of self-esteem reports also can be questioned without assuming any motivated distortion on behalf of the respondents because self-knowledge is known to be flawed (e.g., Dunning, Heath, & Suls, 2005). For example, people are often unrealistically optimistic about their abilities (see Wilson & Dunn, 2004).

1.1. *Implicit self-esteem*

The idea that there is more to self-esteem than what is captured by self-reports is reflected in the notion of *implicit* self-esteem. Greenwald and Banaji (1995) defined the concept as “the introspectively unidentified (or inaccurately identified) effect of the self-attitude on evaluation of self-associated and self-dissociated objects” (p. 11). Implicit self-esteem is supposed to reflect *self-evaluative associations* (e.g., Greenwald et al., 2002), with most measures designed to capture the strength of associative links between mental representations of ‘self’ and particular evaluative content. In this spirit, several implicit self-esteem measures (see e.g., Bosson, Swan, & Pennebaker, 2000) have been devised, but the two most commonly used measures are the Name-Letter Test measure (NLT; from Nuttin, 1985) and the Self-esteem Implicit Association Test (IAT; Greenwald & Farnham, 2000).

The NLT relies on how positively the respondents evaluate the letters in their name (relative to other letters). Typically, respondents are presented with an array of letters and symbols, and are asked to rate the likeability of each based on quick gut impressions (e.g., Koole, Dijksterhuis, & van Knippenberg, 2001). The NLT score is typically derived by subtracting the baseline liking of letters (average liking by people who do *not* have the letter in their name) from respondents’ evaluations of their initials, and then averaging the two difference scores (e.g., Kitayama & Karasawa, 1997). Evaluations of first and last initials are usually correlated above .30 (see Bosson et al., 2000), indicating at least a modest degree of internal consistency. The robust tendency for people to rate their initials as more likeable than other letters across different cultures and languages has been documented in numerous studies (e.g., Hoorens, Nuttin, Erdélyi Herman, & Pavakanun, 1990).

The self-esteem IAT, on the other hand, relies on the ease with which the respondents categorize pairs of self-related (or unrelated) and positively (or negatively) valenced stimuli (Greenwald & Farnham, 2000). It is commonly found that respondents are faster when self-relevant stimuli (such as personal pronouns) are paired with positive versus negative stimuli, presumably reflecting positive self-associations (e.g., Greenwald et al., 2002). The general premise is that implicit self-esteem measures tap non-conscious, automatic self-evaluations (e.g., Bosson et al., 2000; see Koole & DeHart, 2007 for review), yet assumptions regarding awareness and control over measurement outcomes have seldom been directly supported (see Fazio & Olson, 2003; Gawronski, LeBel, & Peters, 2007; Krizan, in preparation).

The notion of *implicit* self-esteem and the use of implicit, indirect measures of self-esteem automatically raise important questions about the nature of self-esteem. Is it best to think of self-esteem as a unidimensional construct that can be examined directly or indirectly with explicit and

implicit measures, respectively? Or might explicit and implicit self-esteem be orthogonal constructs? The empirical question that bears directly on this issue is to what extent are explicit and implicit measures of self-esteem associated with each other. On one hand, initial studies suggested that implicit measures had weak to null associations with conventional explicit self-esteem measures, such as Rosenberg's (1965) inventory (e.g., Bosson et al., 2000; Greenwald & Farnham, 2000). This led some researchers to suggest that "... implicit and explicit measures clearly tap different constructs" (Bosson et al., 2000, p. 638) and to call into question use of the term *self-esteem*, as it is traditionally understood, to apply to both explicit and implicit measures of self-evaluation. On the other hand, some researchers have warned against over-interpreting dissociations between measures involving radically different tasks (as implicit and explicit self-esteem measures usually do). For example, Kihlstrom (2004) cautioned that "... only when sources of method variance are minimized, if not eliminated, can we hope to determine the true relation between explicit and implicit measures" (p. 207). Moreover, even if the independence of implicit self-esteem measures from conscious, explicit self-esteem measures is not a consequence of methodological differences, it is unclear what can be concluded from such dissociations. Just because explicit measures clearly tap conscious content does not necessarily mean that implicit measures tap unconscious content.

1.2. *The present meta-analysis*

Clarification about the relationship between explicit and implicit self-esteem measures and its theoretical import involves three main issues. First, the magnitude of the association between explicit and implicit self-esteem measures in the empirical literature needs to be established. To this end, this paper reports a meta-analysis assessing the magnitude of association between explicit self-esteem measures and one of the most commonly used implicit measures, the Name-Letter Test (NLT; e.g., Koole et al., 2001). Second, psychometric properties of explicit and implicit measures need to be adequately considered when interpreting the association between them. We thus discuss the factors that may increase or decrease the association between explicit and implicit measures of self-esteem, in addition to hypotheses about the influence of self-esteem accessibility on explicit–implicit correspondence. Finally, we suggest caution in drawing inferences about the nature of "implicit" self-esteem from explicit–implicit correlations and propose that the purported implicit features of implicit self-esteem measures need to be identified (e.g., lack of intention and/or awareness in self-evaluation). These issues are considered in the discussion where we also stress the importance of examining unique predictive validity of each type of measure.

1.3. *Explicit and implicit measures of self-esteem contrasted*

In accord with dual-process theories of human cognition (e.g., Chaiken & Trope, 1999; Strack & Deutsch, 2004), explicit self-esteem is conventionally thought to reflect the operation of the rational, reflexive system, whereas implicit self-esteem is thought to reflect the operation of the experiential, impulsive system (see Koole & DeHart, 2007; Spalding & Hardin, 1999). If explicit and implicit self-esteem are shaped by distinct processes, low correlations between implicit and explicit measures should be expected (see Kihlstrom, 2004; Koole & DeHart, 2007). In fact, such dissociations would be desirable if the two types of measures are considered to reflect independent

processes. However, lack of correspondence between explicit and implicit measures *should not* be taken as evidence that these measures purely reflect deliberative versus associative processes because other factors also may contribute to dissociations. This leads us to the discussion of factors that moderate the explicit–implicit relation.

1.4. Moderators of the explicit–implicit relationship

Correlations between explicit and implicit attitudinal measures in general (e.g., prejudice) show substantial variation (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005; Nosek, 2005). As suggested above, besides the lack of introspective access, other factors can contribute to dissociations between explicit and implicit measures. These include measurement error, unique method variance, and the lack of conceptual correspondence in stimuli used by direct (“explicit”) and indirect (“implicit”) measures (see Gawronski et al., 2007; Ranganath, Smith, & Nosek, *in press*). All of these factors also may be responsible for dissociations among implicit measures just mentioned.

In the case of self-esteem and the NLT, all of these sources of potential explicit–implicit dissociation are relevant. First, lower stability of the NLT (compared to conventional self-esteem measures) may attenuate correlations. Test–retest correlations tend to be around .60 across periods of several weeks (Bosson et al., 2000; Koole et al., 2001), which is relatively low compared to those of explicit self-esteem scores which tend to be above .80 (e.g., Bosson et al., 2000). Moreover, NLT scores are reliably affected by self-evaluative conditioning (Baccus, Baldwin, & Packer, 2004; Dijksterhuis, 2004). Second, unique method variance of the NLT (e.g., soliciting fast “gut” reactions) likely imposes a ceiling on the maximum obtainable correlation. Indeed, when explicit self-evaluations are made under cognitive load, they correlate more strongly with the NLT (Koole et al., 2001), presumably because respondents have to rely more on their quick gut reactions like in the case of the NLT. Finally, the lack of conceptual correspondence in the target of measurement probably reduces correlations – the fact that participants are rating Name-Letters rather than global self-descriptive statements is a case in point. When these constraining influences are taken into account, the explicit–implicit correlations in general are often much higher (e.g., Hofmann et al., 2005).

For an in-depth review of the associations of explicit self-esteem measures and the self-esteem IAT the readers are referred to a recent meta-analytic review by Hofmann et al. (2005). The use of IATs to measure implicit trait constructs has received substantial criticism, however (see e.g., Mierke & Klauer, 2003; Rothermund & Wentura, 2004). Moreover, the IAT self-esteem measure tends to be uncorrelated with the NLT implicit self-esteem measure (e.g., Bosson et al., 2000; Krizan & Suls, *submitted for publication*). Thus, the link between explicit self-esteem and the NLT measure deserves systematic study in its own right, as findings regarding the IAT should not be assumed to apply to the NLT or other implicit measures.

The above discussion suggests there are several “mundane” reasons for expecting explicit and implicit measures of self-esteem to have a weak correspondence, although they should be somewhat related if implicit measures actually capture the influence of self-attitude on self-associated objects (as stated in Greenwald and Banaji’s 1995 definition). Indeed, when some explicit–implicit correspondence has been observed, it is often invoked as evidence for construct validity of implicit self-esteem measures (given convergence with explicit measures, see Bosson et al., 2000;

Greenwald & Farnham, 2000). The extent to which the self-attitude will influence evaluations of self-associated objects should, however, depend on the accessibility of that attitude. Global self-esteem, like any other attitude, should vary in its accessibility (e.g., Martin & Tesser, 1996). Therefore, the explicit–implicit relation should vary as a function of self-esteem accessibility. When self-esteem is very accessible, it should exert a stronger influence on evaluations of personal initials on the NLT. For example, responding to a standard self-esteem inventory should increase self-esteem accessibility because participants are required to introspect about their self-worth. Thus, we hypothesized that responding to a standard self-esteem measure prior (rather than subsequently or on a different occasion) to the NLT should increase self-esteem accessibility, and thereby color people's evaluations of their initials, resulting in a higher explicit–implicit correlation (consistent with the automatic activation of attitudes effects, see Fazio, Sanbonmatsu, Powell, & Kardes, 1986). Several investigators have observed such an order effect in the domain of implicit self-esteem (e.g., Bosson et al., 2000; Krizan & Suls, submitted for publication). We tested this hypothesis meta-analytically.

2. Method

2.1. Selection of studies

An initial computer-based information search of the PsychINFO and Dissertation Abstracts International databases (1985–2005) was conducted to identify studies reporting the relationship between the NLT measure and global self-esteem measures (keywords included in this search were *implicit self-esteem*, *implicit egotism*, and *Name-Letter*). Additionally, a request for unpublished data concerning the association between measures of implicit and explicit self-esteem was posted on the Society for Personality and Social Psychology listserv during February, 2005.

The criteria for inclusion in the final analysis included (a) measurements of explicit self-esteem with either Rosenberg's (1965) Self-Esteem Inventory or Tafarodi and Swann's (1995) Self-Liking and Self-Competence Scale, and (b) single administrations of any variant of the Name-Letter Test measure (Nuttin, 1985). All but three samples employed the Rosenberg's measure (the two types of explicit measures tend to correlate very highly, see Mar, DeYoung, Higgins, & Peterson, 2006). The final criterion for inclusion was the use of North American or European samples. Although cross-cultural variables such as individualism–collectivism are important for implicit self-esteem research (see e.g., Kitayama & Karasawa, 1997), there were too few studies conducted in collectivist cultures that met our inclusion criteria to permit a meaningful meta-analytic comparison. This literature search (together with data from our own laboratory) yielded a final set of 10 separate investigations that provided 20 independent data points. All effect sizes were derived from separate samples.

2.2. Coding of relevant information

Most of the studies included in the meta-analysis reported results from more than one sample. Information for each sample was coded separately. All coding was performed by the first author. All data sets but one (DeHart, Pelham, & Tennen, 2006) utilized students as participants. The

majority of the studies were conducted in North America. Besides the effect size (r) and sample size, the order of measures was recorded for each sample. Recall the prediction that self-evaluative thoughts should be more accessible when participants completed the explicit self-esteem measure prior to the implicit measure in the same laboratory session compared to when they completed the explicit measures afterwards or at another time. For 10 of the data sets meeting inclusion criteria, the explicit self-esteem measure was completed prior to the implicit measure at the same session. Four of the remaining data sets involved administration of explicit measures following the implicit measures within the same session, and four data sets were from studies in which the explicit measure was administered an appreciable length (1–12 weeks) of time prior to administering the implicit measure. For two data sets the measures were either counterbalanced or the order could not be ascertained.

2.3. Calculation and aggregation of study effect sizes

Effect sizes were computed and aggregated using the Comprehensive meta-analysis software package (Borenstein & Rothstein, 1999), which executes Hedges and Olkin (1985) procedures to aggregate study effect sizes. Zero-order correlations between scores on the explicit and implicit measures were entered as effect sizes. These correlations were converted to z -scores using Fisher's transformation, and the weighted mean of the effect size across investigations was computed, with greater weight given to larger samples.

In addition to calculating the average effect size across study outcomes, ρ , the homogeneity statistic (Q) was computed to ascertain whether the variability associated with the average effect size was large enough to reject the hypothesis that the study outcomes were drawn from a common population. Because of the *a priori* hypothesis concerning explicit self-esteem accessibility on correspondence between explicit and implicit measures, significant heterogeneity was not considered a necessary condition for conducting the moderator analysis. The self-attitude accessibility hypothesis was tested by using order of measure administration as a grouping variable in the effect size calculations.

3. Results

Prior to data analysis, the distribution of data points was inspected for outliers. One data set (Bosson, Brown, Zeigler-Hill, & Swann, 2003) was excluded because it reported a correlation ($-.19$) that was more than three standard deviations from the meta-analytic mean, and it was the only statistically significant negative correlation (there were only two other negative correlations, neither exceeding $-.07$).

The results for a random-effects model (which assumes heterogeneity in study outcomes, see Borenstein & Rothstein, 1999) of associations between explicit self-esteem and the NLT measure of implicit self-esteem are displayed in Table 1. The meta-analysis involved a total of 19 data points with a total of 5,527 participants from 10 separate investigations. One sample was particularly large ($N = 2,686$; Vonk, 2005), and thus received the greatest weight in the aggregation procedures. However, removing this sample from the analysis did not change the results in any appreciable way so the results reported below include the data from that sample.

Table 1

Overall meta-analytic results for the correlations between the Name-Letter Test and explicit self-esteem

	ρ	K	N	z	95% CI	SD_{ρ}
Random-effects model ^a	0.115	19	5,527	8.52	.089–.142	.014

Note. ρ = mean population correlation; K = total number of study correlations; N = total sample size; z = value of test statistic assuming population correlation of zero; 95% CI = the lower and upper values of the 95% confidence interval for average-effect size; SD_{ρ} = standard deviation of population correlations.

^a Results based on a fixed-effects model were identical.

Based on the random-effects model, the estimated population correlation between scores on explicit self-esteem and the NLT was .115, $z = 8.52$, $p < .001$, 95% CI = .089–.142. The dispersion of study means was generally low ($SD_{\rho} = .014$). Variability among study outcomes was non-significant, $Q(18) = 15.6$, $p > .50$. According to the fail-safe statistic, there would have to be about 12 missing data points per available data point for the effect to be nullified (*fail-safe* $N = 231$). In sum, studies generally found weak but fairly consistent positive correlations between explicit measures of self-esteem and the NLT measure of implicit self-esteem.

3.1. Moderating role of self-attitude accessibility

To test the hypothesis about the effects of accessibility of self-attitude on the explicit–implicit correspondence, the *measure order* factor was used as a grouping variable in the meta-analysis assuming a fixed-effects model. In this analysis, the Q_B statistic reflects the level of heterogeneity between defined sub-groups and represents an inferential test of effect size differences between these groups.

Using a fixed-effects model to examine differences in explicit–implicit correspondence as a function of self-attitude accessibility revealed a marginally significant impact of ‘measure order,’ $Q_B(1, 16) = 3.02$, $p = .08$. As predicted, the NLT measure was associated more strongly with measures of explicit self-esteem when the latter were administered prior to the implicit measure, $r(10) = 0.146$, $z = 6.50$, $p < .0001$. When the explicit self-esteem measure was administered second or at another time, the relationship was marginally lower, $r(8) = .097$, $z = 5.65$, $p < .0001$. Thus, making explicit self-esteem accessible by administering explicit measures prior to implicit measures raised the correlation (see Table 2).

Table 2

Accessibility of self-attitude as a moderator of explicit–implicit correlations for the Name-Letter Test

Between-group comparison	ρ	K	N	z	95% CI	SD_{ρ}
$Q_B = 3.02$, $df = 1$, $p = .08$						
High self-attitude accessibility	0.146	10	2,017	6.50	.102–.190	.022
Low self-attitude accessibility	0.097	8	3,427	5.65	.063–.130	.017

Note. ρ = mean population correlation; K = total number of study correlations; N = total sample size; z = value of test statistic assuming population correlation of zero; 95% CI = the lower and upper values of the 95% confidence interval for the average-effect size; SD_{ρ} = standard deviation of population correlations.

4. Discussion

The major meta-analytic result was that the NLT measure was consistently, albeit modestly, related to explicit self-esteem measures. Also, administering explicit self-esteem measures prior to the NLT seemed to increase the explicit–implicit correspondence.

4.1. Name-Letter Test as an indicator of self-esteem

These findings provide further evidence regarding the NLT as a measure of self-evaluation. From the perspective of convergent validity, the NLT modestly reflects self-esteem as traditionally conceptualized, which is consistent with Greenwald and Banaji's (1995) claim that implicit self-esteem reflects an influence of self-attitude on self-associated objects. The magnitude of the effect size confirmed that most variance in the NLT is not accounted for by explicit self-esteem measures. On a practical level, then, the measures are largely independent and reflect independent influences. Inferring that the remaining variance represents the sole influence of implicit self-evaluative processes would be unwarranted, however. As indicated earlier, error variance, unique method variance and lack of conceptual correspondence can all contribute to explicit–implicit dissociations. If all these influences were controlled, the correlation between explicit self-esteem measures and the NLT would likely be substantially higher. These observations suggest that although the relation between the NLT and explicit self-esteem is small, it is likely meaningful. For example, at least one study found that aggregating multiple administrations of NLT (which removes some of the measurement error) substantially increased the explicit–implicit correspondence (see DeHart et al., 2006). If researchers are interested in trait aspects of implicit self-esteem, then the method of aggregation should be a useful tool.

The correspondence between explicit self-esteem and the NLT was marginally higher in studies where the explicit measure was administered immediately prior to the implicit measure. This is consistent with our reasoning that the influence of self-attitude on self-associated objects should depend on the accessibility of that attitude. This finding further suggests that the NLT captures the effects of explicit self-esteem on letter-evaluations – an influence that is stronger when self-attitude is made cognitively accessible. Documentation of this order effect also contributes to the growing literature on the malleability of implicit self-esteem (e.g., DeHart & Pelham, 2007; Dijksterhuis, 2004). Although it is often assumed that implicit self-esteem reflects habitual, automatic self-evaluative associations that are resistant to change (see Koole & DeHart, 2007), seemingly minor contextual variations can influence NLT scores. So whereas implicit responses might be difficult to control, they are not necessarily difficult to change (see also Blair, 2002).

In the long run, however, the utility of implicit self-esteem measures is likely to depend on their ability to predict psychological phenomena of interest above and beyond the predictive power of explicit measures. For example, Spalding and Hardin (1999) have found implicit measures to independently predict non-verbal signs of anxiety, while explicit measures predicted self-ratings of anxiety. Such studies are an exception rather than a rule, and much more work of this kind is necessary if implicit measures of self-esteem are to reach the practical utility of explicit measures.

5. Conclusions

In this paper, we examined whether one of the most commonly used implicit self-esteem measures, the Name-Letter Test, is related to self-reported self-esteem, and have argued that it is important to take psychometric factors into account when interpreting explicit–implicit relations.

Despite several psychometric characteristics of implicit measures that may constrain the magnitude of explicit–implicit correlations, the NLT measure was modestly associated with explicit self-esteem, particularly when the latter was made accessible via administration just prior to the implicit measure. These results suggest that the NLT is a valid *indirect* measure of self-esteem as captured by self-report measures, particularly when self-esteem is accessible, but they say little about what implicit processes are involved. As noted earlier, finding dissociations between explicit and implicit measures does not necessarily mean that they measure conscious versus unconscious processes, respectively (although such a correspondence might predict a dissociation of the measures). Whether an outcome of an indirect measurement procedure assesses unconscious processes requires empirical proof (DeHouwer, 2006). Offering such proof will often involve probing the phenomenology of participants responding to implicit measures (e.g., Krizan, in preparation, see Gawronski et al., 2007 for discussion). Ultimately, however, the utility of implicit measures should be judged based on their incremental validity relative to explicit self-esteem measures.

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