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Self-esteem revisited: Performance on the implicit relational assessment procedure as a measure of self- versus ideal self-related cognitions in dysphoria.

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Abstract

Although depression is characterized by low self-esteem as measured by questionnaires, research using implicit measures of self-esteem has failed to reveal the expected differences between depressed and non-depressed individuals. In this study, we used an implicit measure which enables the differentiation of ideal Self and actual Self-esteem, through the introduction of propositions: “I am” versus “I want to be”. We measured implicit relational associations about actual and ideal self in low (N=27) versus high dysphoric (N=29) undergraduates. Our data revealed that dysphoric individuals have a higher ideal-self-esteem, and lower actual self-esteem in comparison to healthy participants. The results underscore the need to go beyond simple associations and suggest that the use of individual–specific propositions could enhance our understanding of the implicit measurement of self-esteem. Furthermore, these results underscore the importance of actual versus ideal self-discrepancy theories, which might guide the content of therapeutic interventions.

Keywords: IRAP, Self-Esteem, Depression, implicit, ideal self

Self-esteem is one of the most extensively investigated constructs across various areas of psychology. One area of investigation in which its relevance seems almost self-evident is research on depression. It is generally assumed that depressed individuals have less positive self-esteem than non-depressed individuals. Moreover, negative self-schemata are central to the cognitive theory of depression (Beck, Rush, Shaw & Emery, 1979; Clark, Beck, & Alford, 1999). Research with self-esteem questionnaires such as the Rosenberg Self-Esteem Questionnaire (Rosenberg, 1965) supports this idea (e.g., Ingram, Miranda, & Segal, 1998, for a review).

Recently, however, results with so-called implicit measures of self-esteem have failed to reveal the expected differences in self-esteem between depressed and non-depressed people (e.g., Risch et al., 2010). This research is of high importance for the analysis and treatment of human psychopathology because, within cognitive therapy models, it is assumed that crucial dysfunctional schemata are not always consciously accessible and thus cannot be reported per se (Beck et al., 1979; Young, 1994). Whereas questionnaire self-esteem measures typically register non-automatic (e.g., deliberative) evaluations of the self, implicit self-esteem measures are designed to capture more automatic (e.g., unintentional) evaluations of the self (De Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009). For instance, De Raedt, Schacht, Franck, and De Houwer (2006) used the Implicit Association Test (IAT) as an implicit measure of self-esteem. They asked participants to categorize words that appeared on a computer screen as referring to “me” (e.g., own name), “not-me” (e.g., other name), “negative” (e.g., evil) or “positive” (e.g., happy) by pressing one of two keys. During a consistent block of trials, the same key was pressed for “me” and “positive” words and the other key was pressed for “not-me” and “negative” words. During an inconsistent block, the first key was assigned to “me” and “negative” words and the second key to “not-me” and “positive” words. Intriguingly, both depressed and non-depressed participants were faster in

the consistent than in the inconsistent block, a result that is typically taken to reflect positive self-esteem (but see Blanton & Jaccard, 2006). Whereas De Raedt et al. (2006) found a similar IAT effect in depressed and non-depressed participants, some studies even revealed a larger advantage on consistent versus inconsistent trials in formerly depressed than never-depressed participants (Gemar, Segal, Sagrati, & Kennedy, 2001, Franck, De Raedt & De Houwer, 2008). This suggests even more positive implicit self-esteem in individuals who are vulnerable to depression.

As a possible solution to this conundrum, De Raedt et al. (2006) proposed that IAT effects and other implicit measures of self-esteem might not reflect *actual* self-esteem but *ideal* self-esteem. The ideal self can be defined as a representation of the attributes a person would like to have. Zentner and Renaud (2007) have argued that (1) the ideal self functions as an incentive for future behavior, a self "to be approached or avoided" (Cross & Markus, 1991), and (2) that the ideal self is an evaluator of actual self-esteem. Moreover, numerous studies have provided compelling evidence for the role of discrepancies between ideal and actual views of the self in relation to depressive disorders (e.g., Moretti & Higgins, 1999; Tangney, Niedenthal, Covert & Hill-Barlow, 1998). Implicit self-esteem measures such as the IAT might not be able to distinguish between actual and ideal self-esteem. The self-esteem IAT and other currently available implicit self-esteem measures were designed to assess the association between the concepts "self" and "positive" or "negative" without taking into account the way in which those concepts are associated. Whereas actual and ideal self-esteem can both be conceptualized as involving an association between the concepts "self" and "positive" or "negative", the way in which these concepts are related must differ for the representation of the actual self (e.g., I AM positive or negative) and ideal self (e.g., I WANT TO BE positive or negative). In other words, actual and ideal self involve the same associations but different propositions (i.e., informational units that also specify *how* concepts

are related). Therefore, in order to distinguish actual and ideal self at the implicit level, we need an implicit measure that can capture propositional information.

For this purpose, we used a self-esteem variant of the Implicit Relational Assessment Procedure (IRAP; Vahey, Barnes-Holmes, Barnes-Holmes, & Stewart, 2009). The IRAP (Barnes-Holmes et al., 2006) is a relatively new measure that is specifically designed to capture how objects are related to each other. In our study we used two IRAPs, i.e. the actual self IRAP (with the two sample stimuli: "I AM", "I AM NOT"), and the ideal self IRAP (with the two sample stimuli: "I WANT TO BE" or "I DON'T WANT TO BE").

Although these particular versions of the self-esteem IRAP have not been used before, many studies confirm that the IRAP provides a valid measure of how participants automatically relate various kinds of objects (see Drake et al., 2010, for a review). Assuming that the ease with which individuals automatically relate certain objects in certain ways is mediated by propositional knowledge in memory (see Hughes, Barnes-Holmes, & De Houwer, 2011, for an in depth discussion), one can thus argue that performance on the IRAP provides an implicit measure of propositional knowledge. Importantly, propositional knowledge, whether it is deemed to be consciously accessible or not, is the basic material targeted in cognitive therapies. The self-esteem IRAP that we used in this study may be able to differentiate between ideal self and actual self in that it does not merely capture the association between the concepts "self" and "positive" or "negative", but the way in which these concepts are related (i.e., I AM versus I WANT TO BE). According to the ideas of De Raedt et al. (2006), one can therefore predict that depressed individuals would show higher implicit ideal self-esteem and lower actual self-esteem than non-depressed individuals. As a first test of this hypothesis, we examined dysphoric and non-dysphoric students. Dysphoric students have been shown to be prone to depression (e.g. Ingram & Siegle, 2009), and can thus be considered as a clinical analogue sample. In line with previous findings that

depression might be related to discrepancies between ideal and actual views of the self (e.g., Moretti & Higgins, 1999; Tangney, Niedenthal, Covert & Hill-Barlow, 1998), we hypothesized that dysphoric students would display more positive ideal self-esteem than actual self-esteem whereas the reverse would be true for non-dysphoric students.

Method

Participants

In this experiment, 72 undergraduates participated in return for course credits. They were recruited by means of an on-line participant panel system after completing the BDI-II-NL (van der Does, 2002) as a screening measure. Upon invitation for the experiment, they completed the BDI-II-NL again. Based on the attrition data based on task requirements, our final sample consisted of 56 participants (see below for detailed information).

Using the cut-off score that is recommended in the BDI-II-NL manual, the final sample was divided into a low BDI group (≤13) consisting of 27 undergraduates (21 women and 6 men) aged between 18 and 30 years (M = 20.56, SD = 2.41) and a high BDI group (≥14) of 29 undergraduates (26 women and 3 men) aged between 18 and 30 years (M = 19.52, SD = 2.26). Assignment to BDI groups was based on the BDI score during the actual test session. By design, the high BDI group had significantly higher BDI-II-NL scores during test (M = 22,1 SD = 8,4) compared to the low BDI group (M = 5.8, SD = 4,2), $t(54)=9.10$, $p<.001$. Age did not differ significantly between groups ($t < 1$). Note that BDI scores during test were not distributed normally (Shapiro-Wilk = .935; p< .005) simply because we invited participants with an extremely high or low BDI score during screening. We therefore used BDI as a dichotomous variable rather than a continuous variable in the analyses.

Measurement

Questionnaire measures. The BDI-II, a 21 item self-report inventory, was used to measure the severity of depressive symptoms (Beck et al., 1996). The Dutch translation of the BDI-II has shown high internal consistency: Chronbach's α of .92 for a patient population and .88 for a healthy control group. Also, the validity index satisfies general psychometric criteria (van der Does, 2002).

IRAP Self-Esteem Measures. On each trial of our self-esteem IRAP, participants were presented with a sample stimulus on the top of a computer screen and a target stimulus in the middle of the screen (see Figure 1). The sample stimulus always referred to the self, the target stimulus was always a positive or negative word. Importantly, the self-related sample stimuli contained relational information. More specifically, in our study we used two almost similar IRAPs, that is, the actual self IRAP (with the two sample stimuli: "I AM", "I AM NOT"), and the ideal self IRAP (with the two sample stimuli: "I WANT TO BE" or "I DON'T WANT TO BE". For the explanation of the task specifics we will focus on the actual self IRAP, however the ideal self IRAP is exactly the same, except for the sample stimuli "I WANT TO BE" and "I DON'T WANT TO BE".

In the actual self IRAP participants would, for instance, see the sample stimulus "I AM" together with the word "HAPPY". Participants were asked to press a "correct" key or a "false" key based on the specific combination of sample and target stimuli. These response assignments were varied between blocks. In the consistent block, participants were asked to press "correct" whenever the sample-target combination expressed self-positivity (i.e., I AM + positive, I AM NOT + negative) and "false" whenever the sample-target combination expressed self-negativity (i.e., I AM + negative, IAM NOT + positive). In the inconsistent block, the correct response was required for sample-target combinations that expressed self-negativity whereas the false response was required for sample-target combinations that

expressed self-positivity. The idea behind the IRAP is that participants will perform better when the required response assignments are in line with how participants typically relate the objects under investigation.

Figure 1 about here

The order of the two IRAP tasks was counterbalanced across participants. The task was implemented using the IRAP software provided by Barnes-Holmes (http://irapresearch.org/downloads-and-training, version 2008). In line with previous IRAP studies (for a review see Drake et al., 2010), participants were required to complete a maximum of four pairs of practice blocks and then two test blocks, with each block containing 24 trials. To rule out order effects, all participants commenced with a block of consistent trials (confirm self-positive and deny self-negative relations) and thereafter completed a block of inconsistent trials. Before starting the task, an instruction-screen was shown which explained these two blocks (i.e., consistent and inconsistent). Further, the key-assignment was explained. As in previous IRAP studies, the function of the keys changed randomly from trial to trial. Hence, on some trials, the left key was used to indicate "correct" and the right key to indicate "false" whereas the reverse was true on other trials. When a response was not in line with the instructions, a red X appeared and participants were asked to press the appropriate key as quickly as possible. In each block, the sample stimuli appeared once with each of the 12 target stimuli (see Table 1).

Table 1 about here

On each trial, all stimuli appeared simultaneously on screen. If the response was in line with the instructions, this response was followed by a blank screen for 400ms after which the next trial was presented. If the response was not in line with instructions, a red X appeared immediately under the target stimulus. To remove the red X and continue to the 400ms intertrial interval, the participant was required to emit the appropriate response. When the participant had completed all 24 IRAP trials, the screen cleared and two types of feedback were presented for that block: the percentage of correct responses and the median response latency. Between each block of trials the following instructions were presented on screen: "Important: during the next phase the previously correct and wrong answers are reversed. This is part of the experiment. Please try to make as few errors as possible – in other words, avoid the red X". Before each test block, the following message also appeared: "This is a test. Go fast; making a few errors is okay." In line with previous IRAP studies (e.g., Barnes-Holmes, Barnes-Holmes, Stewart, & Boles, 2010), the data from participants who failed to achieve at least 80% accuracy or a mean latency under 2500ms during the test blocks were excluded from the analyses. In our study, the data of 16 participants (9 with low BDI scores and 7 with high BDI scores) were ignored because of this reason, thus leading to a final sample of 56 participants.

Procedure

The procedure was identical for both groups. Upon arrival, participants read and signed a consent form and were randomly assigned an identification number to preserve their confidentiality and anonymity. Once the participants were seated, the experimenter stated that it was important to answer quickly and accurately throughout the procedure. Next the IRAP task was started. After the participants finished both IRAP tasks, each participant filled in the BDI. All participants were individually tested.

Results

Data preparation. The raw IRAP data comprise of response latencies, defined as the time in milliseconds from the onset of a trial to the first emission of the appropriate response for that trial. These raw data were transformed using the D-IRAP algorithm (see Barnes-Holmes, et al., 2010), which is derived from the D-algorithm developed by Greenwald, Nosek, and Banaji (2003) for the IAT. Important for our analysis, two compound D-IRAP scores were then calculated, that is, D-IRAP (pos) and D-IRAP (neg). The D-IRAP (pos) is calculated based on all trials with positive targets, and D-IRAP (neg) is calculated based on all trials with negative targets. Finally, a total D-IRAP score was calculated by averaging the D-IRAP (pos) and D-IRAP (neg) scores (see Vahey et al., 2009, for a detailed description of how such scores are calculated). A D-IRAP score reflects the difference in response latency between consistent and inconsistent blocks; therefore a D-IRAP score that is significantly different from zero indicates that there was, in fact, a significant difference between response latencies in consistent versus inconsistent blocks. A higher D-IRAP score indicates a higher (i.e., more positive) level of self-esteem (actual self-esteem on one IRAP and ideal self-esteem on the other IRAP). In the current study, the total D-IRAP score was the crucial dependent variable, but it was deemed important to start the analyses with D-IRAP (pos) and D-IRAP (neg) as a factor, to exclude the possibility that the valance of the words influenced the effects.

Split-Half Reliability. To assess the internal consistency of the IRAP, two split-half reliability scores were calculated, one for Actual Self IRAP and one for the Ideal Self IRAP. In each case, two scores were calculated, one for odd trials and the second for even trials, and these were obtained in the same way as for the overall D-IRAP score, except that the D-algorithm was applied separately to all odd trials and even trials. Interestingly, while the split-half correlations between odd and even scores, applying Spearman-Brown corrections, proved

significant for the Ideal-Self IRAP, $r = .492$, $n = 32$, $p < .001$, they were less so for the Actual-Self IRAP, $r = .221$, $n = 56$, $p < .10$. Given that a shortened version of the IRAP was used we refrain from making any strong conclusions about the difference between Ideal and Actual Self based on internal consistency scores.

Participant-type analyses. The D-IRAP scores for each participant were entered into a 2 x 2 x 2 mixed ANOVA with Group (low versus high BDI) as the between-participants variable and D-IRAP Effect-Type (D-IRAP pos and D-IRAP neg) and Condition (Actual-Self versus Ideal-Self) as the within-participants variables. The results showed a main effect for the D-IRAP Effect-Type, $F(1, 54) = 4.71$, $p=.034$, but not for Condition, $F(1, 54) = .08$, $p=.778$. Most importantly, a highly significant interaction between Group and Condition was observed $F(1, 54) = 15.48$, $p <.001$. Because no significant interaction was found with Effect-Type, we continued all our analyses with the total D-IRAP score.

To test our specific hypothesis on group differences between ideal self-esteem and actual self-esteem, we followed-up the Group X Condition interaction using independent one-tailed t-tests with the total D-IRAP effects. We found a significant group difference for both the Actual-Self-Condition, $t(54) = 3.07$, $p <.01$, $d =.82$, and the Ideal-Self-Condition, $t(54) = 1.68$, $p <.05$, $d =.45$, indicating lower actual self-esteem and higher ideal self-esteem in the dysphoric group relative to the non-dysphoric group.

To test our hypothesis about possible differences between ideal and actual self-esteem within each group, we performed one-tailed paired sample t-tests for the total D-IRAP effects. For the Low BDI group the D-IRAP score for the Self-Condition was significantly higher than the D-IRAP score for the Ideal-Self-Condition, $t(26) = 3.65$, $p <.001$, $d =.72$ (actual self-esteem: $M =.45$, $SD =.39$; ideal self-esteem: $M =.16$, $SD =.41$). For the High BDI group the D-IRAP score for the Self-Condition was significantly lower than the D-IRAP score for the Ideal-Self-Condition, $t(28) = 2.17$, $p =.02$, $d =.54$ (actual self-esteem: $M =.12$, $SD =.41$; ideal self-

esteem: *M* =.35, *SD* =.44) (see Table 2). The results of the current study were thus in accordance with our predictions.

Table 2 about here

Discussion

The present study was designed to explore whether dysphoric and non-dysphoric individuals differ with regard to the valence of their ideal self and/or actual self. Based on the study by De Raedt et al. (2006), who proposed that higher self-esteem as measured with the IAT in depressed individuals could be indicative of associations related to ideal self instead of actual self-esteem, we used the IRAP procedure that allowed us to distinguish between ideal and actual self-esteem. In line with this idea, we found that the dysphoric (high BDI) group scored lower on actual self-esteem and higher on the index of ideal-self-esteem in comparison to the low BDI group. The D-IRAP total scores also showed that low dysphoric individuals have more positive actual self-esteem as compared to ideal self-esteem.

Hence, our results build further on previous research on self-esteem in depression (e.g. De Raedt et al., 2006), by demonstrating that dysphorics have more positive ideal self-esteem, while non-dysphorics have a higher actual self-esteem. The self-esteem IRAPs in this study differentiated between ideal self and actual self, by not simply capturing the association between the concepts “self” and “positive” or “negative”, but by elaborating on the way in which these concepts are related (i.e., I AM versus I WANT TO BE). By using the IRAP (and its use of propositions) we went beyond the results of De Raedt et al. (2006), with results suggesting that the IAT in their study might have measured ideal self-esteem in depressed, and actual self-esteem in non-depressed individuals.

This could explain why De Raedt and co-workers (2006) found similar positive self-esteem for depressed and non-depressed groups using the IAT. There is, however, still the question of why the IAT would measure different aspects of implicit self-esteem in depressed versus non-depressed individuals. A possible explanation is that the IAT does not restrict the way concepts or labels are interpreted, and that this interpretation varies across clinical conditions. More specifically, depressed individuals might conceptualize the IAT labels as "I WANT TO BE GOOD/BAD" whereas non-depressed individuals might interpret them as "I AM GOOD/BAD". The idea that each individual might interpret – or proportionalize – concepts or labels in a different way is crucially important for future research using association tasks such as the IAT.

This study was the first to go beyond the unilateral associative character of the abundance of IAT-research, by differentiating between actual self-esteem and ideal self-esteem through the introduction of labels that specify the way in which concepts are to be related. The results underscore the need to go beyond simple associations and suggest that individual–specific propositions could be co-activated during implicit tasks. Because we showed that implicit measurements of propositions are possible, we argue that these automatically activated propositions should become a point of interest in future experimental and clinical research investigating self-esteem in depression. The use of propositions in implicit measures might be the start of a new avenue for future research, to further unravel how a concept is processed in different populations (e.g., "I HAVE TO BE" + "positive"/"negative").

Further fine-graining the self-esteem concept may have clinical implications. Because implicit measures have been shown to predict distress and psychopathology (e.g. Franck, De Raedt & De Houwer, 2007), these results further clarify the importance of actual versus ideal self-discrepancy theories, which might hold promise to refine therapeutic interventions.

With regard to the modest split-half reliability measures of both IRAPs, a lower internal consistency might be an implication of using a shortened version of the IRAP with only two test blocks. Hence, in future research, more test blocks might be used to address this issue. Furthermore, as stated by Hughes & Barnes-Holmes (in press), future research should continue to benchmark the validity and reliability of the task against well-established alternatives such as the IAT. Thus, more conclusions about reliability could be drawn when future IRAP studies would consistently report these reliability measures.

A limitation to the present research is that we did not use a patient population. However, dysphoric students have been shown to be prone to depression (e.g. Ingram & Siegle, 2009), and can thus be considered as a clinical analogue sample. Nevertheless, our findings can stimulate further research to replicate these findings in different populations (e.g., remitted depressed, MDD, etc.), to further elucidate the role of self-esteem in depression. Secondly, given that 22% of the participants were excluded based on our criterion that they had to reach an accuracy of 80% before starting the actual task, it might be advisable in future studies to lower this threshold to 70%. Note, however, that an accuracy criterion of 80% has been used in most earlier IRAP studies in which healthy undergraduates participated (e.g., Barnes-Holmes et al., 2010).

To summarize, the results of this study suggest that dysphoric individuals, who are prone to depression, have a focus on ideal-self-esteem, and lower actual self-esteem, in comparison to healthy participants. Future research should take into account propositions in implicit measures of self-esteem, incorporating ideal self in the research of self-esteem and depression.

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Table 1. Stimulus response combinations (of the sample stimuli with the 12 self-evaluative words) deemed consistent in the self-esteem IRAP.

Sample1	Positive targets	Sample 2	Negative targets	Sample 1	Negative targets	Sample2	Positive targets
I am/I want to be	Valuable Happy Tender Friendly Hopeful Competent	I am not/I don't want to be	Helpless Guilty Desperate Sad Rejected Failed	I am/I want to be	Helpless Guilty Desperate Sad Rejected Failed	I am not/I don't want to be	Valuable Happy Tender Friendly Hopeful Competent
Response option 1				Response option 2			
Correct				False			

Note. By implication all other stimulus response combinations are deemed inconsistent.

Table 2. Comparison of mean D-scores for both the Actual Self and Ideal Self IRAP between the low and high BDI group.

Group	**Low BDI Group**	**High BDI Group**
Actual Self IRAP	.45 (*SD*=.39)	.12 (*SD*=.41)
Ideal Self IRAP	.16 (*SD*=.41)	.35 (*SD*=.44)

Note: For Low BDI group N=27; for High BDI group N=29.

Figure 1. Examples of the four trial types employed in the actual self-esteem IRAP: one for each combination of the two sample stimuli (“I am” or “ I am not”) with the two types of target stimuli (self-positive or self-negative evaluative words). The ideal self-esteem IRAP was similar except the two samples were “I want to be” versus “I don’t want to be”.