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SELF-SYMBOLS AS IMPLICIT MOTIVATORS

Rob W. Holland, Annemarie M. Wennekers, Gijsbert Bijlstra,
Maaike M. Jongenelen, and Ad van Knippenberg
Radboud University Nijmegen

The present research explored the nonconscious motivational influence of self-symbols. In line with recent findings on the motivational influence of positive affect, we hypothesized that positive affect associated with self-symbols may boost motivation. In Study 1 people drank more of a beverage when the brand name contained name letters. Study 2 emphasized central aspects of motivation, and tested the role of implicit self-esteem. High self-esteem people persisted longer and performed better on a name letter task than low self-esteem people. Study 3 further confirmed these results, testing persistence on an unsolvable puzzle. These findings are explained by the association of self-symbols with positive affect for high self-esteem people. Implications are discussed for the role of self in motivation.

Imagine a person named John, who is thirsty and craving for a drink. Someone gives him a beverage named "Joitoki," and asks him to taste this drink. Would this resemblance between John's name and the brand name of the beverage motivate John to drink more of the beverage? Similarly, consider John working on a research article. Would his motivation to write be boosted by once in a while flashing the letters "JO" on the computer screen?

Self-symbols have been shown to affect all kinds of preferences and choices. For example, people prefer brands of tea that include their own name letters above tea brands that do not include their name letters. More markedly, it has been proposed that self-symbols like name letters or birthday numbers may shape major life decisions. In several archive studies it has been found that choices such as where to live, whom to marry, and what career to pursue can be influenced by name letters (Brendl, Chattopadhyay, Pelham, & Carvallo, 2005; Jones, Pelham,

Rob W. Holland; Annemarie M. Wennekers; Gijsbert Bijlstra; Maaike M. Jongenelen; Ad van Knippenberg, Behavioural Science Institute, Department of Social Psychology, Radboud University Nijmegen.

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Correspondence concerning this article should be addressed to Rob Holland, Behavioral Science Institute, Department of Social Psychology, Radboud University Nijmegen, PO Box 9104, 6500 HE Nijmegen, The Netherlands. E-mail: r.holland@bsi.ru.nl.

Carvallo, & Mirenberg, 2004; Pelham, Mirenberg, & Jones, 2002). For instance, it has been demonstrated that people named Jack are overrepresented in the city of Jacksonville, and that there is an increased likelihood for someone named Dennis to become a dentist.

In the present research we suggest that self-symbols have such an impact on decisions because self-symbols shape an individual's motivation. Recent studies on motivation have provided strong evidence for the crucial role of positive affect in motivation (Custers & Aarts, 2005, 2007; Winkielman, Berridge, & Wilbarger, 2005). If the self is attached to positive affect, then self-symbols may boost motivational processes such as the motivation to drink or the effort and persistence dedicated to a task. Importantly, our focus on the link between the self and positive affect implies that the proposed motivational value of self-symbols depends on the level of implicit self-esteem. Therefore, we propose that self-symbols will only boost motivation for people with positive implicit self-evaluations.

IMPLICIT EGOTISM

Generally speaking, people view themselves in a positive way. Positive self-regards have originally been studied by focusing on people's explicit self-evaluations, but in the past two decades researchers have begun to emphasize people's positive self-associations that reside outside conscious awareness (see Greenwald & Banaji, 1995, for a review). One way in which such positive self-associations can be implicitly revealed is through the evaluation of self-symbols, because these positive associations about the self have been found to spill over to symbols that refer to the self (Jones et al., 2004). This phenomenon is called *implicit egotism* and among its demonstrations are the observations that people prefer their own name letters over other letters of the alphabet compared to people who do not have these letters in their name (Nuttin, 1985), and that people like an object better when they are merely told that they own it (Beggan, 1992). Furthermore, several studies have explored the influence of self-symbols on consumer decision making, for example what brand of tea to choose (Brendl et al., 2005), interpersonal attraction (Jones et al., 2004) and even on decisions about where to live and what to do for a living (Jones et al., 2004; Pelham et al., 2002).

Recent studies began to explore the underlying mechanisms by which such preferences affect decisions. For example, several studies illustrated the implicitness of implicit egotism (Jones et al., 2004; Nelson & Simmons, 2007). Jones et al. (2004) subliminally linked self-related words (I or me) to numbers (e.g., 16). In a subsequent phase of the experiment, evaluations of a female person were found to be more positive when she was wearing a shirt with the number on it that was subliminally linked to the self.

Furthermore, recent studies showed that preferences for self-related objects depend on the level of self-esteem (Gawronski, Bodenhausen, & Becker, 2007; Holland, Smeets, Wennekers, & van Knippenberg, 2009; Nelson & Simmons, 2007). For example, Gawronski and colleagues (2007) showed that implicit egotism effects are moderated by implicit self-esteem. Specifically, they obtained mere ownership effects for high implicit self-esteem individuals but not for low implicit self-esteem individuals. These studies extend past experimental research in the domain of im-

plicit egotism by showing that self-symbols may trigger positive associations only for high self-esteem individuals.

In the present research we focus on self-symbols as sources of motivation. Although some recent studies explored motivational processes in relation to self-symbols (Brendl et al., 2005; Nelson & Simmons, 2007), most previous studies described are confined to an increased liking for objects, people, and places that carry symbols related to the self. However, people named Jack can only be overrepresented in Jacksonville if they have not just an increased liking for that city, but have actually moved there. This would suggest that self-symbols play a motivational role, above the mere liking consequences reported in studies thus far. We think that self-symbols can boost motivation, because they are related to a crucial source of motivation, that is, positive affect.

POSITIVE AFFECT AS IMPLICIT MOTIVATOR

The notion that behavior must have "value" in order to induce motivational activity has been broadly accepted (e.g., Aarts, Gollwitzer, & Hassin, 2004; Strahan, Spencer, & Zanna, 2002; see for an overview Förster, Liberman, & Friedman, 2007). Inspired by earlier work on incentive theory (e.g., Bindra, 1974; Bolles, 1972), various researchers focused on positive affect as a signal that the behavior has value and is worth striving for (e.g., Aarts, Custers, & Marien, 2008; Winkielman et al., 2005). The exact mechanism underlying the effect of positive valence on motivated behavior is not entirely clear, but neuroscientific findings give rise to the idea that the mesolimbic dopamine system (e.g., Berridge, 2001), which is active when an organism engages in states that evoke positive affect or receives cues that refer to these states, plays a role in the process. As outlined by Custers and Aarts (2005, p. 131), research suggests that primed behavioral states associated with positive affect, through their link with the dopamine system, trigger cortical brain structures that encode the incentive value of the state and modulate the effort that will be invested in attaining it (e.g., Berridge, 2003).

Custers and Aarts (2005) showed that linking positive words to neutral behavioral states makes people explicitly want to attain those states and allocate effort in order to accomplish this (see also Aarts et al., 2008). In other studies Custers and Aarts (2007) demonstrated that the strength of the association between a goal (socializing) and positive affect (measured by an automatic evaluation paradigm) predicted motivational effort when the behavioral state was made accessible by priming (see also Ferguson, 2007). Together, these studies suggest that a behavioral goal can be triggered if the representation of the specified behavioral state is associated with positive affect.

The studies described above suggest that positive affect boosts motivation for neutral or mildly positive behavioral states. Other studies suggest that the effects of positive affect on behavior may interact with the positivity of the behavior as well. For example, research by Winkielman et al. (2005) showed that affective cues influenced motivational processes in consumption behavior. Thirsty participants who were subliminally primed with happy faces subsequently poured and drank more of a beverage than participants primed with angry faces. However, these effects were not obtained among non-thirsty participants. Another illustration of the

interactive nature of positive cues and need state on motivation is provided in the research of Förster (2003). He showed that (non-thirsty) individuals drank more of a beverage when they performed an approach movement (arm flexion) compared to an avoidance movement (arm extension) when the drink was tasty (orange juice), but not when participants drank luke-warm water. Thus, positive cues can boost the motivation for desired behavioral states (e.g., drinking tasty juice for non-thirsty individuals, or drinking luke-warm water for very thirsty individuals), but not for undesired ones (e.g., drinking lukewarm water after drinking a gallon of fresh water). In important ways, behavior is a function of the interaction between person and environment (cf. Lewin, 1951).

SELF-SYMBOLS AS IMPLICIT MOTIVATORS

Given the findings that self-symbols are, generally speaking, linked with positive affect, it is hypothesized that self-symbols can also be a source of motivation. As described above, positive affect functions as a reward signal, and, therefore, self-symbols are expected to have incentive capacity for people who have implicit positive self-associations. Importantly, when people lack such positive self-associations, self-symbols are not expected to boost motivation. Although most individuals may hold positive self-associations, people differ greatly in the extent to which their self-associations are positive (e.g., Greenwald & Farnham, 2000). In line with this, research has suggested that implicit self-esteem is formed in early childhood through interactions with significant others, such as parents or caregivers, and people high in implicit self-esteem are likely to have experienced more positive, rewarding interactions with their caregivers than people low in implicit self-esteem (DeHart, Pelham, & Tennen, 2006).

It is hypothesized that given the association between positive affect and the self among high self-esteem individuals, self-symbols can function as a reward signal by means of their association with the self and thereby boost motivation. For low self-esteem people, self-symbols are not expected to have incentive value, because they are not associated with positive affect. Self-symbols might even elicit negative affect in low self-esteem people and lead to a drop in motivation, because motivation has been found to dwindle as a result of associations with negative affect (Aarts, Custers, & Holland, 2007).

Thus far motivational processes in the domain of self-symbols have been studied in two different ways. First, Brendl and colleagues (2005) showed that *preferences* for objects containing self-symbols depend on motivational or need states. Name letters more strongly affected product preferences when the product was linked to a need state (e.g., need to drink, or need to eat) of the participant. To illustrate, their results indicated that a person named Ron would like Roha tea better than Wiha tea when he is thirsty, but not when his thirst has been recently quenched. Such interactive effects of self-symbols and need state on product preferences are fully consistent with the interplay between positive cues and the desirability of the behavioral state on motivational processes discussed above (see Förster, 2003; Winkielman et al., 2005). In the case of Brendl's participants, preferences for a product were boosted by self-symbols when the object was related to a desired behavioral state, but not when it was irrelevant.

A second set of studies that speaks to motivational processes as a function of self-symbols has been conducted by Nelson and Simmons (2007). Across various domains of behavior, they showed that name letters can undermine high performance goals when failure behavior which is normally avoided, is designated by letters included in an individual's name. For example, baseball players whose names begin with the letter K are more likely to strike out than other baseball players, because striking out is indicated by a "K." Furthermore, Nelson and Simmons also showed that students whose names starts with letters associated with poor academic performance (C and D) have lower GPA scores compared to students whose names start with different letters. Another study showed that the latter effect was mainly driven by people with positive evaluations of their initials.

Going beyond the problematic interpretation of name letter effects in archival data (see e.g., Gallucci, 2003; but see Pelham, Carvallo, DeHart, & Jones, 2003, for a response), Nelson and Simmons (2007) also conducted a study in which poor performance behavior was experimentally linked to the participant's first name letter. Specifically, participants were instructed to solve ten anagrams and told that they could win either one of two prizes. If they were able to solve all anagrams, they could win a prize worth more than 100 dollars. In fact, this was impossible, because two of the anagrams were unsolvable. The other prize (being the only prize they could actually win) was worth less than 100 dollars. Interestingly, the names of the prizes were manipulated such that the high prize was either named with the initial of the first name of the participant, the low price was named with the initial of the first name of the participant, or the names of both prices consisted of non-name letters. Results indicated worse performance in the condition that linked the low price to the initial of the participant. Of course, like the baseball players or the students at school in the archival studies, most participants are motivated to perform as well as possible. However, when the lower outcome was associated with name letters, this lower outcome (a strike, low scores, or a low prize) appeared slightly less aversive, as a result of which performance was reduced. In sum, the studies of Nelson and Simmons (2007) demonstrated that, within boundary conditions, name letters can actually *demotivate* people.

In contrast, the question central to the present research is whether self-symbols can implicitly *boost* motivation. As illustrated in our opening example, John may work harder on a task when the letters "JO" are flashed on a computer screen once in a while. Such motivational effects have yet to be demonstrated. In none of their studies Nelson & Simmons (2007) were able to find evidence that self-symbols increased performance. The authors explained such null findings in terms of ceiling effects. However, in their prize experiment the absence of enhanced motivation may also have been due to the inclusion of the two unsolvable anagrams. These anagrams induce a failure experience among participants. As a consequence, any motivational effect of self-symbols may become disrupted because the inability to solve these items precludes participants from winning the high (name letter) prize. Moreover, despite the fact that the studies of Nelson and Simmons (2007) are clearly relevant for motivational processes in name letter studies, they did not include proximal indicators of motivation such as approach behavior, persistence, and effort spent on a task.

THE PRESENT RESEARCH

To test the motivational implications of self-symbols, we conducted a series of studies using different aspects of motivation. In Study 1, we tested the effects of self-symbols on approach motivation. Inspired by studies of Förster (2003) and Winkielman et al. (2005) we chose to investigate approach motivation in the domain of drinking behavior. In our first study we tested whether the perception of self-symbols could facilitate the motivation to drink among thirsty individuals. In Studies 2 and 3, we investigated the influence of self-symbols on a classic indicator of motivation, that is, persistence, measured by the time participants spent on a puzzle task. Study 2 also focused on effort allocation, which is another central indicator of motivation.

Both Studies 2 and 3 included a measure of implicit self-esteem, enabling us to test the proposed moderating role of self-esteem in the investigated process. We predicted that self-symbols could serve as implicit motivators among high self-esteem individuals, but not among low self-esteem individuals.

Name letters were chosen as self-symbols in all three studies, because of their established strong relation to the self. For instance, most implicit egotism findings have been obtained with name letters (e.g., Brendl et al., 2005; Jones et al., 2004; Pelham, Carvallo, & Jones, 2005). Furthermore, the use of name letters allowed us to make the self-cue manipulation an unobtrusive part of the task by using name letters in the name of the drink in the first study and including name letters in the tasks of the last two studies, which both involved solving word puzzles.

STUDY 1

As a first test of the motivational influence of self-symbols we focused on the effect of name letters on the motivation to drink. Participants were made thirsty after which they had to taste a beverage that was either labeled with a name letter brand, or with a non-name letter brand. We hypothesized that participants in the name letter condition would drink more of the beverage than participants in the non-name letter control condition.

METHOD

Participants and Design

Thirty-eight undergraduate students of Radboud University Nijmegen participated in this study. They received €1 for their participation. Participants were randomly allocated to either the name letter condition or the non-name letter condition. One participant failed to follow the instructions correctly and the data of this participant were excluded from the analyses, leaving 37 participants (27 female and 10 male).

Procedure and Materials

Participants were asked to sign in for a study on testing Japanese products. This way, we were able to create brand names containing their name letters or non-name letters and to print these brand names on the labels of the beverages before the participants enrolled in the actual experiment. Appointments were made for later that week and participants were instructed not to eat or drink an hour before the study.

Participants' first task was to taste several salty snacks, in order to make them thirsty and enhance their need to drink, making the beverage relevant. This was done because the studies of Winkielman et al. (2005) showed that the influence of unconscious positive affect on amount of drinking was dependent on relevant motivational state. The name of the snacks (Xoyap) was the same for all participants. Subsequently, participants were asked to taste a beverage. The glass in which the drink was offered had a conspicuous label with the brand name of the beverage printed on it in a Japanese-like font. Participants were instructed to drink as much as they wanted. Importantly, half of the participants received a beverage with a name letter brand name, the other half received a beverage with a non-name letter brand name. To create the name letter brand names we took the first two letters of a participant's name and added it to the word stem "itoki" (e.g., Daan – Daitoki). A yoked design was used (see Brendl et al., 2005), meaning that each participant's brand name in one condition matched the brand name received by a participant in the other condition on a one-to-one basis. The experimenter who served the beverages was blind for the experimental condition.

As a measure of drinking behavior, the glass with the beverage was weighed before and after each experimental session. On average, people received 130 ML of the beverage. The percentage of the beverage each participant drank served as the main dependent variable in this experiment. Moreover, after having tasted the beverage participants were asked to fill out a questionnaire to measure the explicit liking of the beverage, including items with regard to the pleasantness of the taste, smell, and the appearance of the beverage. Participants' intention to buy the beverage was also measured. Participants answered these questions on 7-point Likert scales, using anchors ranging from -3 (e.g., very unpleasant, very unlikely) to 3 (e.g., very pleasant, very likely).

Finally, participants were debriefed, thanked, and dismissed. None of the participants was aware of the hypothesis under investigation.

RESULTS

In order to test our hypothesis concerning name letter influences on motivation to drink, the amount of beverage participants drank was subjected to a × 2 (Condition: name letter versus non-name letter) t-test. Consistent with our hypothesis, participants in the name letter brand condition (M = 57%, SD = 35%) drank significantly more of the beverage than those in the control condition (M = 80%, SD = 30%), $t(36) = 2.14$, $p = .04$, $\eta^2 = .12$.

We also tested whether our name letter manipulation influenced liking for the beverage. This analysis revealed no significant differences on the items, all *F*s < 1. Also, no correlation was observed between beverage intake and the items smell of the drink, $r(37) = .18$, *ns,* and appearance, $r(37) = .23$, *ns*. However, the items taste and intention to buy were correlated with the amount of drinking, $r(37) = .38$, $p = .02$ and $r(37) = .51$, $p < .01$, respectively. When experimental condition and these explicit ratings for taste and intention to buy were simultaneously entered as predictors in a regression analysis, both condition and the explicit ratings significantly predicted the drinking behavior (all $p < .05$).

DISCUSSION

The results of Study 1 provide an initial illustration of the role of self-symbols as implicit motivators. The results show that individuals drank significantly more of a beverage when its brand name started with the first two letters of their own name, compared to individuals who received a beverage with a name composed of non-name letters. Winkielman et al. (2005) showed that subliminally priming people with happy faces increases their motivation to drink. In line with these findings, the present effects of self-symbols on drinking behavior can also be explained by the implicit activation of positive affect. According to our reasoning, the inclusion of self-symbols in the name of the beverage triggered positive affect for most participants, which consequently enhanced their approach motivation, causing them to drink more of the beverage.

We did not obtain an effect of the name letter manipulation on explicit liking for the beverage. At first sight, this seems to conflict with results of Brendl and colleagues (2005), who found that thirsty people showed an enhanced preference for beverages with name letter brands. However, their research specifically focused on these preferences, and they therefore made participants only sip the drink before the explicit measure of liking for the beverage. In other words, participants were still thirsty when they indicated their preference. In contrast, we were primarily interested in the approach motivation as a function of name letter branding and participants were therefore free to drink as much as they wanted. As a result, participants' thirst may have been quenched by the time they evaluated the beverage, leading to a drop in the motivational implications of the beverage (Brendl et al., 2005; Winkielman et al., 2005; c.f. Förster & Strack, 1996; Neumann, Förster, & Strack, 2003). In line with this reasoning, Winkielman et al. (2005) did not obtain effects of priming happy or angry faces on beverage ratings after participants finished drinking as much as they wanted, but they did obtain such priming effects on explicit beverage ratings in another study when participants rated the beverage after drinking only a very small amount of the beverage.

Thus, Study 1 provides first evidence for the proposed motivational processes as a function of self-symbols, illustrated in the domain of approach motivation. In Study 2 we aimed to demonstrate that self-symbols can serve as implicit motivators on other characteristics of motivated behavior, namely, persistence and effort allocation (Custers & Aarts, 2005; Geen, 1995; Heckhausen, 1991). We predicted that a participant's confrontation with self-symbols within a task would boost his or her persistence on this task, as well as the amount of effort allocated to the task.

Furthermore, extending Study 1, Study 2 also focused on the processes that enhance motivation. Self-symbols are expected to motivate behavior, because these symbols trigger positive affect among most individuals. However, although most individuals associate the self with positive affect, individual differences are usually obtained in the level of these positive self-associations (Greenwald & Farnham, 2000). Therefore, we only predict enhanced motivation among individuals who attach positive affect to the self, that is, individuals with high implicit self-esteem, but not among individuals who lack positive self-associations, that is, individuals with low implicit self-esteem. In order to test this proposed moderating role of self-esteem, a measure of implicit self-esteem was included in Study 2.

STUDY 2

Study 2 was designed to test whether name letters can enhance persistence on and effort allocated to a task. Both persistence and effort can be considered classic features of motivational processes. Furthermore, the study aimed to investigate the predicted moderating role of implicit self-esteem in this process.

We employed a "scrambled letter task" in which participants had to create words with a set of six letters. For one half of the participants the set contained name letters, whereas the set was composed of non-name letters for the other half of the participants. Participants were free to determine how long they worked on the task. Two classical measures of motivation were included, that is, persistence and effort (e.g., Heckhausen, 1991; Locke, Shaw, Saari, & Latham, 1981). Time spent on the scrambled letter task was used to measure persistence; the longer participants worked on the task, the higher their persistence. The total number of words produced during the task was used as a measure of allocated effort. It was hypothesized that participants in the name letter condition would spend more time on the task and create more words than participants in the non-name letter condition, but only when they were high in implicit self-esteem.

METHOD

Participants and Design

Forty-five undergraduate students of Radboud University Nijmegen participated in this experiment with a 2 (Condition: name letter versus non-name letter) between-subjects design. Participants received €2 or credit points for taking part in the experiment. Again, a yoked design was used. The data of two participants were excluded, because they did not understand the task. Of the remaining 43 participants, 32 could be yoked successfully. These 32 participants (24 female and 8 male) were included in the final analyses[1].

1. It should be noted that including the participants that were not successfully yoked in the analyses did not influence the pattern of the results reported.

Procedure and Materials

Participants signed up to take part in a one-hour chunk of several experiments. They were brought to a cubicle containing a desk and a desktop PC, and told to follow the instructions presented on the computer screen.

Implicit Self-Esteem. Participants started the experiment with a single target Implicit Association Task (st-IAT; see Wigboldus, Holland, & Van Knippenberg, 2005; Karpinski & Steinman, 2006) that served to measure their implicit self-esteem. The st-IAT is a modification of the original IAT of Greenwald, McGhee, and Schwartz (1998), and it was programmed using Inquisit (version 2.0, Millisecond Software LLC, Seattle). The st-IAT consists of three blocks, of which the first block is a practice block. The practice block contains 20 trials in which a participant has to categorize nouns (e.g., "flower" or "hatred") as being of positive or negative valence, by pressing the "E" or the "I" on the keyboard. The second and third blocks are the test blocks, both containing 40 trials. In the second block, self-related words are included (e.g., "me" and "I") and the task of the participants is to categorize these words as being self-words, under the same key as the positive (or negative) words. In the third block this combination of self-related words with words of positive or negative valence is reversed. People high in implicit self-esteem are expected to react quicker to a combination of self-related words and positive words than to the combination of self-related words and negative words. For people with low implicit self-esteem, an opposite pattern is expected. The order of the combinations in the second and third block was counterbalanced over participants.

Scrambled Letter Task. The st-IAT was followed by some allegedly unrelated tasks of other researchers. After these tasks, a message was presented on the computer screen instructing participants to go to the counter to pick up materials for the next task. The experimenter gave the participant a set of six puzzle pieces, each with an uppercase letter on it. For a participant in the name letter (NL) condition, the first two letters of the forename and the first letter of the surname were included in the set. These letters were complemented by the most frequent letters in the Dutch language that were not present in the forename and the beginning of the surname of the participant. Moreover, every participant received four consonants and two vowels. Examples of letter sets participants received are "JURFMA," "TISGAP," and "NIFTOD." A participant in the non-name letter (NNL) condition, for whom someone else's name letter set did not match the letters of his or her first name or first two letters of the surname, received this same set of letters. Yoked pairs of participants were formed on the spot. First, a few name letter sets were created and as soon as someone walked in who could receive such a set as non-name letter stimuli, a yoked pair was created.

Back in the cubicle, the instruction on the computer screen asked the participant to create words using letters from the set provided to them and to type in the words they created. Once they considered themselves finished with the scrambled letter task, they could press the "stop" button. The computer recorded the time participants spent on the task.

Following the scrambled letter task, participants answered two questions to measure their mood. After finishing the experiment, participants were thanked and paid for their participation.

RESULTS

Implicit Self-Esteem. For analyzing the st-IAT, response latencies faster than 300 milliseconds and slower than 3000 milliseconds were recoded as missing values. Subsequently, latencies were log-transformed and a mean of these log-transformed latencies was computed for the second and the third block. The IAT measure is the mean log-transformed latency of the compatible block subtracted from the mean log-transformed latency of the incompatible block. For sake of clarity, untransformed mean latencies (in milliseconds) are reported in this section. Participants had longer latencies in the incongruent block (self-related and negative words under the same key; $M = 669$, $SD = 98$) than in the congruent block (self-related and positive words under the same key; $M = 618$, $SD = 82$), $t(31) = 3.63$, $p < .01$, indicating that participants on average had positive self-associations.

Performance on the Scrambled Letter Task. The number of words participants created was taken as a measure of the effort they allocated to the scrambled letter task. In measuring participants' performance, it was checked whether the words they created existed in the Dutch language.[2] To investigate the effect of implicit self-esteem and the name letter manipulation on performance, the number of correct words was regressed on Condition (coded as non-name letter = 1, name letter = 2), Implicit Self-Esteem (standardized IAT scores), and the Implicit Self-Esteem X Condition interaction term.[3] These analyses revealed no significant main-effects. However, the Implicit Self-Esteem X Condition interaction term was significantly related to the number of correct words people created, $\beta = .53$, $t(28) = 3.45$, $p < .01$, partial $\eta^2 = .30$.

To explicate the nature of this interaction effect, simple slopes were computed for both the regression of the number of correct words on implicit self-esteem for participants in the name letter condition, and for participants in the non-name letter condition. The results of these analyses are depicted in Figure 1. First, these analyses revealed a significant positive relation between implicit self-esteem and number of correct words in the name letter condition, $\beta = .80$, $t(28) = 3.58$, $p < .01$, demonstrating that participants high in implicit self-esteem created more words with a name letter set than people low in implicit self-esteem. As predicted, no such effect was obtained in the non-name letter condition, $\beta = -.33$, $t(28) = -1.38$, *ns*.

Furthermore, simple slopes were computed to test the effect of condition on number of correct words within the high self-esteem group (one standard deviation above the mean) and the low self-esteem group (one standard deviation below the mean). For high self-esteem participants, a significant difference in number of created words between the name letter and non-name letter condition was obtained, $\beta = .72$, $t(28) = 3.12$, $p < .01$, demonstrating that this group created more words in the name letter condition than in the non-name letter condition. Within the low implicit self-esteem group, a marginally significant reversed difference

2. English words and non-existing words were excluded from the analyses. However, excluding these words did not affect the results reported. The same effects were obtained when using the total number of words participants created as dependent variable.

3. Note that here and in the remaining portion of this article, all variables are standardized before computing the cross-product.

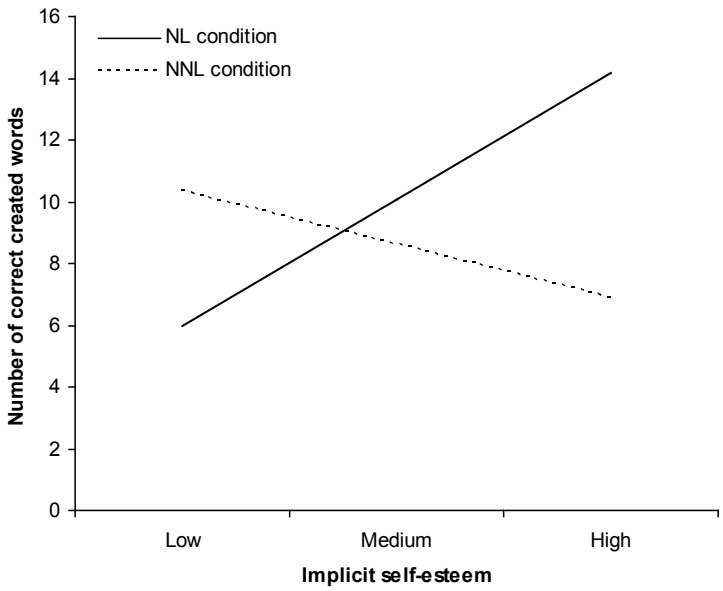

FIGURE 1. Experiment 2: The effect of implicit self-esteem and condition (name letter condition versus non-name letter condition) on number of correct created words.

between the conditions was found, β = -.43, $t(28) = -1.81$, $p = .08$, with participants creating more words with non-name letters than with name letters.

Time Spent on the Scrambled Letter Task. To test our hypothesis concerning persistence effects of self-symbols for people high in implicit self-esteem, time spent on the puzzle task was log-transformed and regressed on Condition (coded as non-name letter condition = 1, name letter condition = 2), Implicit Self-Esteem (standardized IAT scores), and the Implicit Self-Esteem X Condition interaction term. The data of one participant were excluded from this analysis, because this person spent an extreme amount of time on the puzzle task (more than 2.5 standard deviations from the mean). The analysis revealed no significant main effects of Condition and Implicit Self-Esteem, both ts < 1. Importantly, the interaction between Condition and Implicit Self-Esteem approached statistical significance, β = .36, $t(27) = 2.01$, $p = .06$, partial $\eta^2 = .13$. As illustrated in Figure 2, this interaction effect is in the hypothesized direction, with people in the name letter condition spending more time on the task when high in implicit self-esteem compared to people with a low implicit self-esteem. Simple slopes analyses (Aiken & West, 1991) show that this positive trend in the name letter group is marginally significant, β = .47, $t(27) = 1.83$, $p = .08$. No effects of implicit self-esteem were found for participants in the non-name letter condition, β = -.30, $t(27) = -1.05$, *ns*.

Time spent on a task was positively correlated with number of correct solutions $r(31) = .43$, $p = .02$. Interestingly, the Condition X Implicit Self-Esteem interaction on time spent on the task was no longer significant, β = .20, $t(27) = 0.96$, $p = .35$, when the number of correct solutions were partialled out in the regression. On the

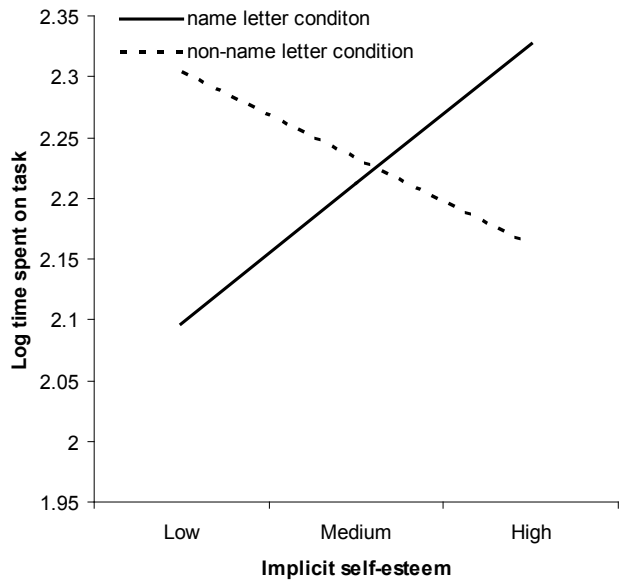

FIGURE 2. Experiment 2: The effect of implicit self-esteem and condition (name letter condition versus non-name letter condition) on log-transformed time spent on the task.

other hand, the interaction effect between Condition and Implicit Self-Esteem on number of correct words was still significant when the time spent on the task was also entered in the regression $\beta = .47$ $t(27) = 2.91$, $p < .01$.

Mood. No main or interaction effects of Condition and Implicit Self- esteem were obtained on the self-reported mood items.

DISCUSSION

Experiment 2 yielded a significant interaction between implicit self-esteem and name letters on the number of words that were created, a measure of effort allocation. People high in implicit self-esteem created more words with name letters compared to people low in implicit self-esteem, and compared to the number of words created by people high in implicit self-esteem in the non-name letter condition. Furthermore, a trend was obtained for people low in implicit self-esteem to create more words in the non-name letter condition than in the name letter condition, suggesting that more negative self-evaluations may even decrease motivation in the context of self-symbols. In addition, a marginally significant interaction effect between name letters and implicit self-esteem was found on persistence, measured by the time participants spent on the puzzle task. The marginally significant trend in the name letter condition was in the hypothesized direction, with people high in implicit self-esteem spending more time creating words with name letters than people low in implicit self-esteem. However, the results of the covariation analyses suggest that participants persist in the task as long as they are suc-

cessful. Thus, this seems to indicate that in this study self-symbols mainly boosted the *effort* spent on the task (and, hence, attendant success) rather than persistence per se. In Study 3, we used a paradigm in which persistence was assessed independent of performance, thus allowing us to investigate persistence in a straightforward manner.

In sum, it can be concluded that the results of the present experiment are in line with the proposition that name letters boost motivation among individuals with positive self-associations. In Study 3, we aimed to replicate and extend Studies 1 and 2 and demonstrate that self-symbols can serve as implicit motivators by focusing on a pure measure of behavioral persistence. In this study we focused on the question whether high self-esteem participants would persist longer on a task that is unsolvable when they are confronted with self-symbols.

STUDY 3

The task of the participants was to solve scrambled words, one of which was in fact unsolvable. For half of the participants, this unsolvable word contained name letters, for the other half of the participants the word was composed of non-name letters. Time spent on the unsolvable word was used as a measure of motivation to persist on the task. It was hypothesized that participants high in self-esteem would persist longer on solving the name letter word than participants low in self-esteem. No effects of self-esteem were expected within the non-name letter control condition.

METHOD

Participants and Design

Fifty-two undergraduate students of Radboud University Nijmegen participated in this experiment with a 2 (Condition: name letter versus non-name letter) between-subjects design. Implicit self-esteem again served as a continuous factor in the design. Participants received €2 or credit points for their participation. One participant failed to provide the experimenter with his/her own name and therefore received the stimuli meant for another participant. Seven participants did not seem to have participated seriously, because they failed to solve one or more of the first three extremely easy anagrams (e.g., "dak" = roof). The data of these eight participants were excluded from the analyses, as well as the data of two other participants, who spent an extreme amount of time on the unsolvable word (more than 2.5 standard deviations above the mean). In sum, the data of 42 participants (34 female and 8 male) were included in the final analyses.

Procedure and Materials

To be able to create the name letter stimuli for the scrambled words task in advance, appointments were made with participants via the Internet. At their arrival in the laboratory, participants were brought to a cubicle containing a desk and a desktop PC, and told to follow the instructions presented on the computer screen.

Implicit Self-Esteem. The same st-IAT as in experiment 2 was used to measure implicit self-esteem. Subsequently, participants engaged in some unrelated tasks of other researchers.

Anagram Task. After these unrelated experiments, participants were told they would participate in a language experiment in which they were supposed to try to solve six word puzzles. They would be presented with scrambled words and their task was to unscramble these words and type in their solution on the computer. The instruction mentioned that some word puzzles would be quite easy, whereas others would be hard to solve. Participants were told that if they did not know the solution, they could go to the next word by pressing the Enter button.

The first four puzzles were the same for all participants, namely, scrambled versions of the Dutch words *dak* (roof), *adres* (address), *stoel* (chair), and *gratis* (free). The sixth word was also solvable and again the same for all participants, namely the Dutch word *school* (school). The fifth word was the unsolvable scrambled word, which contained name letters in one condition and non-name letters in the other condition. The name letter stimulus was composed of the first two letters of a participant's forename and the first letter of the surname, supplemented with three letters with high frequency in the Dutch language. The first two letters of the forename were always the first two letters of the scrambled word; the first letter of the surname was the final letter of the word puzzle. When possible, a name letter stimulus of one participant was used as a non-name letter stimulus for a person in the other condition. However, in some cases a non-name letter stimulus was composed that was not a yoke of a name letter stimulus. It was ensured that the scrambled words were indeed unsolvable by using anagram checkers provided on the Internet (e.g., freeware *Ragmania*). Still, participants were given the impression that the scrambled words could be solved by composing letter combinations with a realistic proportion of consonants and vowels, meaning two or three vowels, and containing letters that could co-occur in the Dutch language.

At the end of the experiment, participants were thanked and paid for their participation.

RESULTS

Implicit Self-Esteem. The st-IAT was analyzed according to the same algorithm as used in the second experiment. Results show that participants had longer latencies (in milliseconds) in the incongruent block (self-related words and negative words on the same key; $M = 627$, $SD = 92$) than in the congruent block (self-related words and positive words on the same key; $M = 580$, $SD = 82$), $t(41) = 5.59$, $p < .01$. This indicates that participants on average had positive implicit self-associations.

Anagram Task. The fourth anagram seemed more difficult than we anticipated.[4] As this anagram puzzle directly preceded the unsolvable target anagram puzzle, making an error (or not) on this anagram can be an important factor, because it might interfere with the hypothesized effects. Several studies have shown that negative affect or failure experiences during goal pursuit may reduce motivation

4. Even after having removed a participant who failed to solve a very easy anagram (i.e., dak, adres, stoel), as many as 38% of the remaining participant failed to solve the anagram directly preceding the critical unsolvable word puzzle.

(e.g., Aarts et al., 2007; Bandura, 1977; Carver, 2004). Therefore, a distinction was made between participants who solved and participants who did not solve the fourth word. This additional factor, labeled "Initial Performance," was included in the regression analyses. Even though this prediction is somewhat post hoc, one may predict that self-symbols only boost motivation among high self-esteem individuals when their initial performance was successful, but not when they failed.

Time spent on the unsolvable word was regressed on Condition (coded as non-name letter = 1, name letter = 2), Initial Performance (coded as errors = 1, no errors = 2), Implicit Self-Esteem (standardized IAT scores), and the resulting two and three-way interactions that were computed after standardizing all variables. This analysis only revealed a significant three-way interaction between Condition, Initial Performance, and Implicit Self-Esteem, $\beta = .40$, $t(34) = 2.49$, $p < .02$, partial $\eta^2 = .15$. To shed more light on the nature of this three-way interaction effect, simple two-way interaction analyses were computed to investigate the role of Initial Performance, revealing the predicted interaction effect between Implicit Self-Esteem and Condition for participants who provided a solution for the fourth word, $\beta = .39$, $t(34) = 2.42$, $p = .02$. No such interaction effect was found for participants who failed to solve the preceding anagram, $\beta = -.58$, $t(34) = -1.64$, *ns*.

Additional simple slopes were computed to compare the effect of implicit self-esteem on time spent on the task for the name letter and non-name letter condition, within the group that made no mistakes at the beginning of the task. These analyses revealed a significant effect of implicit self-esteem on time allocated to the unsolvable word for participants in the name letter condition, $\beta = .54$, $t(34) = 2.42$, $p = .02$, whereas no such effect was obtained for the non-name letter condition, $\beta = -.23$, $t(34) = -1.02$, *ns*. As depicted in Figure 3, the results in the name letter condition were in line with our hypothesis, showing that participants high in implicit self-esteem spent more time solving an unsolvable name letter word than low self-esteem participants (provided that they solved the first words).

DISCUSSION

Experiment 3 demonstrated that name letters influence people's persistence on a task as a function of individual differences in self-esteem. The results show that people high in implicit self-esteem spent more time unscrambling an unsolvable name letter word than people low in implicit self-esteem. These findings are in line with our general reasoning. Self-symbols like name letters are expected to trigger positive affect among individuals with positive self-associations, but not among individuals with negative self-associations. Self-related affect subsequently influences the degree to which the motivation to keep working on the task is boosted.

However, success or failure on the preceding task was found to be important. The expected interaction effect between implicit self-esteem and the name letter manipulation was only found for people who were successful in providing a solution for the fourth word puzzle. Two explanations may be provided for the moderating role of prior performance. One possibility concerns a drop in motivation for individuals who failed to solve the anagram puzzle preceding the target anagram puzzle. Indeed, several studies showed that goal pursuits may be abandoned when the goal is linked to negative affect, for example as a result of a failure experience (e.g., Aarts et al., 2007, Bandura, 1986; Carver, 2004; Martin & Tesser,

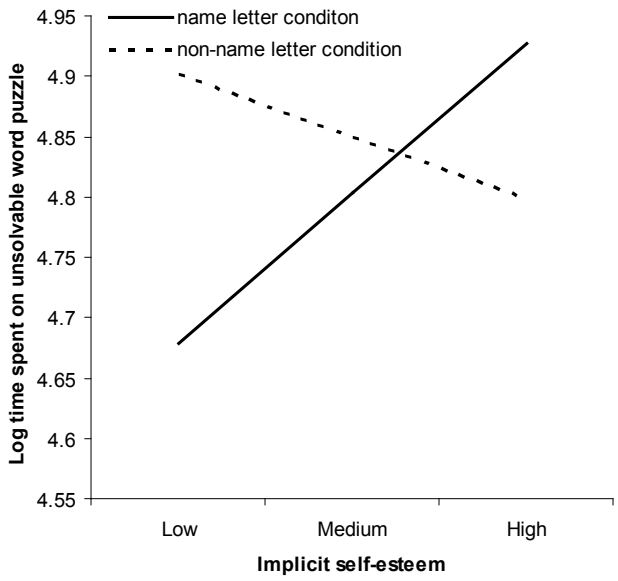

FIGURE 3. Experiment 3: The effect of implicit self-esteem and condition (name letter condition versus non-name letter condition) on log-transformed time spent on the unsolvable word, for participants who solved the fourth word.

1996; Miller & Hom, 1990; Pyszczynski & Greenberg, 1983). Although the theories differ with regard to the exact mechanisms by which failure may reduce motivation, for example, by reducing the desirability of the goal (Aarts et al., 2007) or by changing self-efficacy cognitions (e.g., Bandura, 1986), there is general agreement that failure may modify motivational processes.

A second explanation for the moderation of initial performance concerns temporary alterations in self-esteem. Research by Koole, Smeets, Van Knippenberg, and Dijksterhuis (1999) showed that a failure experience temporarily decreases the positivity of implicit self-associations. In other words, name letters may no longer boost motivation among individuals with positive self-associations, because the positivity of self-associations is temporarily lowered by the failure experience, and could not have been repaired at the time the unsolvable word appeared.

Investigating the exact mechanism by which failure moderates the effects remains open for future research. It is noteworthy that these effects may also explain why Nelson and Simmons (2007) were unable to find enhanced motivator in the name letter condition of their final experiment. In their experiment, all participants experienced failure, because they included unsolvable anagrams. In line with our null-findings for the group who made a mistake, motivational processes may have been disrupted in their study as well. Most important for the present account is that when participants successfully performed the initial phase of the task, our predicted effects of self-symbols in interaction with implicit self-esteem on motivation emerged.

GENERAL DISCUSSION

The present research examined whether self-symbols can serve as implicit motivators of behavior, and how self-esteem influences this process. The current research illustrates that, across three studies and various behavioral domains, name letters can boost motivation. In Study 1, it was found that thirsty individuals drank more of a beverage with a brand containing name letters than one not containing name letters, suggesting that these self-symbols increase the motivation to drink. In Studies 2 and 3, we showed the motivational effects of name letters on effort allocation and persistence on puzzle tasks. In Study 2 name letters increased effort allocation to the task as indicated by the number of words that were created in a puzzle task, as well as persistence, which was measured by the time spent on the task. The results of Study 3 further corroborated persistence effects as a function of name letters. In this study, effects were found on people's persistence to try to solve an unsolvable scrambled word that either did or did not include name letters.

We proposed that self-symbols boost motivation because of the association of the self with positive affect. In order to better understand the nature of this process, we measured the positivity of self-associations as a continuous factor in the design of Studies 2 and 3. In line with our assumptions, self-symbols only increased motivation when individuals hold positive self-associations. Among individuals with negative self-associations, self-symbols had no effect (Study 2) or even seemed to reduce motivation (Study 3). All in all, in accordance with recent approaches on positive affect and motivational processes (Custers & Aarts, 2005; Winkielman et al., 2005), the present research showed that self-symbols facilitate motivational processes among individuals who attach positive affect to the self.

IMPLICIT EGOTISM AND MOTIVATION

The present research has various implications. First, it provides new and important findings for the literature on implicit egotism. Most studies on implicit egotism focused on the implicit biases of name letters, birthday numbers, and ownership on (evaluative) judgments of objects (e.g., Brendl et al., 2005; Gawronski et al., 2007). Results of archive studies investigating the influence of people's name letters on important life decisions fuel the idea that there might be more to self-symbols than influencing judgments and mere liking processes. How could people otherwise actually end up living in a place that matches their name? Some motivational value should be included in self-symbols in order to affect people's behavior to move to a place. Whereas previous studies illustrated the motivational processes that might underlie name letter preferences (Brendl et al., 2005), or showed that self-symbols can sometimes result in lower performance, presumably due to reduced motivation (Nelson & Simmons, 2007), the present studies are the first to show that self-symbols can boost approach motivation and enhance effort and persistence in goal-directed behavior. Thus, our motivational framework sheds more light on how self-symbols influence behavior. Above and beyond their influence on how people evaluate various matters, self-symbols seem to possess the strength to implicitly indicate that a certain behavior is desired and worth striving for, resulting

in motivated behavior, such as increased persistence and effort allocation, in order to attain the desired state.

POSITIVE AFFECT AS IMPLICIT MOTIVATOR IN SELF-PROCESSES

The present findings also have implications beyond the implicit egotism literature. Our findings concerning the role of implicit self-esteem in motivation may provide new insights for research linking the self to motivation. Starting with William James's (1890) chapter about the role of the self in willful action, many scholars have stressed the importance of the self in motivating behavior. Linking an action to the self makes it more likely for that action to occur (e.g., Cross & Markus, 1990; Hull, Slone, Meteyer, & Matthews, 2002). Evidence for this idea has been obtained in the domain of executive functioning (e.g., Muraven, Tice, & Baumeister, 1998), prime-to-behavior effects (e.g., Hull et al., 2002; Wheeler, DeMarree, & Petty 2007), value-behavior relationships (e.g., Verplanken & Holland, 2002), attitude strength (Crano, 1997; Holland, Verplanken, & van Knippenberg, 2002), intrinsic versus extrinsic motivation (e.g., Deci & Ryan, 1985), and involvement in persuasive messages (e.g., Petty & Cacioppo, 1984). For example, research by Verplanken and Holland (2002) in the domain of values showed that the activation of values that are strongly linked to the self have more motivational implications than the activation of values less central to the self.

In sum, the self has generally been considered a source of motivation. However, the nature of this motivational value of the self is not fully understood. The present findings may offer new insights for understanding the role of the self as a source of motivation. We suggest that the level of positive affect associated with the self may be crucial in explaining the obtained motivational effects in self-related behaviors. When the self is activated, the affective implications of the self are also manifested. Specifically, among individuals with high implicit self-esteem, primes that activate the self (e.g., by means of central value priming, or mere self-primes like *I*, *me*, or self-symbol primes) may be expected to trigger positive affect. Through this activation of positive affect, the motivation for ongoing behaviors may be boosted in similar ways as observed in the present research. Future research should more directly examine the role implicit self-esteem might play in explaining the self as a source of motivation.

CONTRIBUTIONS TO THE IMPLICIT MOTIVATION LITERATURE

In addition to the above-mentioned implications of the present research for the implicit egotism literature and broader findings of the self as a source of motivation, the present article may also contribute to the research field of implicit motivation. A question central to this literature is how we can nonconsciously determine whether states are desirable to pursue, and the answer to this question has been found in positive affect. It has been shown that linking neutral behavioral states to positive affect leads to a desire to attain that behavioral state, because the relation with positive affect indicates the desirability of accomplishing these states (Custers & Aarts, 2005). In the present research, it is shown that positive affect, triggered by self-symbols, can also enhance motivation at the time it is actually be-

ing performed. This suggests that the link between a goal-state and positive affect may not be the exclusive trigger for the onset of motivational processes. Surely, if a goal-state is associated with positive affect, it will automatically trigger positive affect upon goal activation. However, incidental sources of positive affect, such as positive affect associated to the self in a self-relevant task, may as well enhance the motivation for an ongoing task.

IMPLICIT VERSUS EXPLICIT SELF-ESTEEM MEASURES

We showed that implicit self-esteem moderates the motivational implications of self-symbols. Our studies did not include an explicit measure of self-esteem. Importantly, none of our participants were aware of the fact that their name letters were part of the name of the beverage or included in the letters for making words. Therefore explicit appreciations of self-symbols seem less relevant for the outcome, and we expected implicit measures to affect outcomes because they predict the kind of associations that spontaneously come to mind when people are confronted with their own name letters. In line with this, Jones et al. (2004) linked explicit self-esteem measures to implicit egotism effects and did not obtain significant results (see also Holland et al., 2009).

CONCLUDING REMARK

To conclude, it has been shown in the present article that name letters can increase several kinds of motivational activity for people high in implicit self-esteem. Thus, if John likes himself, and is thirsty, it is likely that he will drink more of a beverage called *Joitoki.* In addition, when he is performing a task and is doing well on it, chances are that he will persist longer on the task and allocate more effort to it when the message "JO" is repeatedly displayed on the screen.

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