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Self-Esteem Differences, and the Mediating Role of the Working Self-Concept, in Reactions to Positive and Negative Feedback

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This study examined the effects of positive or negative feedback on performance, perceived motivation to perform well, as well as importance of performing well, physiological arousal and attribution. The effects of positive or negative feedback were studied with regard to the participants' basic level of self-esteem as well as the mediating role of the working self-concept. People with high self-esteem (HSE) and people with low self-esteem (LSE) found performance most importance after having received positive and negative feedback, respectively. People with LSE had higher pulse than people with HSE after both types of feedback. People with HSE made more internal attributions when feedback was congruent with their working self-concept (WSC). The importance of WSC for coping with feedback is discussed.

Keywords: Self-esteem, self, feedback, performance, failure, success, congruence, motivation, reactions, individual differences, stress, heart or pulse rate, physiological arousal, cardiovascular reactivity, attribution

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Research focusing on global self-esteem differences in psychological functioning has yielded important findings. High self-esteem (HSE) has generally been found to be related to good attributes such as happiness (Baumeister, 2003) and to be a buffer against anxiety (Greenberg, Solomon, Pyszczynski, Rosenblatt, Burling, Simon & Pinel, 1999; Arndt & Goldenberg, 2002).

Low self-esteem (LSE) has been found to be associated with difficulties such as higher levels of depression (Watson, Suls & Haig, 2002; Tennen & Affleck, 1993), higher levels of anxiety (e.g., Coopersmith, 1967; Baumeister, 1998; Watson et al., 2002) and lower levels of subjective well-being (e.g., Schimmack & Diener, 2003)

Important to happiness and adjustment is how self-image threats are coped with (e.g., Baumeister, 1993). People with LSE have been found to be more vulnerable to self-image threats than are people with HSE (e.g., Baumeister, 1993; Blaine & Crocker, 1993; Brown & Dutton, 1995; Dodgson & Wood, 1998). The present study examined how people with HSE and people with LSE cope with failure feedback as well as with success feedback. Exposing people to failure feedback is one way of inducing a threat to their self-esteem (e.g., Baumeister & Tice, 1985; Brown et al., 1995; Dodgson et al., 1998; see also Baumeister, 1993; Blaine et al., 1993; Arndt et al., 2002). It can be argued that how an individual copes with positive events in life is important to happiness and adjustment as well.

Self-esteem, and Reactions to Failure and Success

People with LSE have been found to differ from people with HSE in the way they cope with failure feedback. People with LSE are more vulnerable to self-image threats, such as failure. The reasons for this are that they believe in this kind of information more easily than people with HSE do (e.g., Schrauger, 1975; Blaine et al., 1993), and that they have fewer strategies with which to defend themselves against negative information (e.g., Steele, Spencer & Lynch, 1993; Baumeister, 1993).

People with HSE, on the other hand, have been found to have several strategies at hand to cope with self-image threats. For instance, after self-image threats, i.e. failure feedback, people with HSE can deny personal responsibility for the failure (Blaine et al., 1993) or discount the evaluator (Baumeister, 1993). Moreover, they seem to be able to think about their strengths (Baumeister & Tice, 1985; Dodgson et al., 1998; Steele, 1988; Joseph, Larrick, Steele and Nisbett, 1992, Steele et al., 1993) and to suppress their weaknesses (Dodgson et al., 1998).

People with HSE are more certain than people with LSE are concerning which attributes accurately describe them and which attributes do not. People with HSE also tend to use more positive than negative attributes when they describe themselves (Kernis, Frankel & Brockner, 1989; Campbell & Lavalley, 1993; Campbell, 1990). Negative feedback, then, is incongruent with the self-image of people with HSE and is therefore more difficult to accept than positive feedback is.

With regard to people with LSE, not only are they more sensitive to and more prone to accepting negative feedback than are people with HSE, they are also less susceptible to believing in and accepting positive feedback (e.g., Schrauger, 1975; Blaine et al., 1993).

According to Baumeister (1998), people with LSE may actually feel unwell if they experience too many positive events. In a recent study, people with LSE showed more negative emotions after a written success manipulation than did people with HSE (Wood, Heimpel, Newby-Clark & Ross, 2005).

It has been suggested that people with LSE have difficulties accepting positive feedback because it is incongruent with their self-image (Schrauger, 1975). Moreover, people are motivated to preserve their self-image (e.g., Swann, 1993). Congruent feedback, or situations, may induce security, while incongruent feedback may induce some kind of imbalance.

Self-esteem and Motivational Orientations

La Ronde and Swann (1993) claimed that we strive for self-verification, in other words that we are motivated to preserve the self-image at hand, and outlined research that supports this theory.

Baumeister (1993), on the other hand, rejected the opinion that people with LSE want to maintain a more negative self-image and that they should not strive toward a more positive self-image. Baumeister (1993) argued that they want to like themselves, want to reject negative criticisms and that they want to present success, but seem cautious about presenting themselves in such a fashion. They tend toward the safe and are more prone to eliminating failure than to presenting themselves in a favorable way (Baumeister et al., 1993; Blaine et al., 1993; Tice, 1993).

People with LSE do not seem to be sure that a positive self-image can be maintained (Brown, 1993) and give the impression that they are mostly motivated toward self-protection (e.g., Baumeister, Tice & Hutton, 1989; Baumeister, 1993). It seems they are focused on avoiding failures and embarrassment rather than on perceiving the

possibilities in life. Results show that individuals with LSE carefully prepare prior to an exam, not in order to succeed, but to avoid failure (Blaine et al., 1993; see also Tice, 1991, 1993). Individuals with HSE prepare in order to succeed and excel (Tice, 1991, 1993). Failure is not an option in their world. If they were to fail, they have several strategies available to withstand the threat of a negative self-image, such as the knowledge that they are successful in other areas (Baumeister et al., 1985).

Some researchers have expressed doubt regarding whether people with LSE really desire a more positive self-esteem. This doubt is based on findings indicating that such individuals tried to achieve a better mood after failure to a much less extent (Heimpel, Wood, Marshall & Brown, 2002) and that they are more prone to accepting negative feedback.

Baumeister et al. (1985) investigated motivational differences between people with high and low self-esteem in an experiment where participants received positive or negative feedback after performing a task. They discovered that people with HSE were most motivated to continue with a task after positive feedback, and that people with LSE were motivated by negative feedback, a result consistent with the interpretation that people with HSE are inclined toward self-enhancement and people with LSE toward self-protection.

Silverman (1964) found a similar result with regard to self-esteem and responsiveness to feedback. Responsiveness to feedback was measured as performance improvement after feedback. People with HSE improved their performance after success feedback, while people with LSE improved their performance after failure feedback.

The Present Study

A previous study (Danielsson, 2008) examined how feedback after a completed assignment affected the quality of performance on a consecutive similar task. The results supported the idea that individuals with positive self-esteem perform relatively better after positive feedback and individuals with negative self-esteem relatively better after negative feedback. The hypothesis that positive and negative feedback create different motivational reactions in individuals with low and high self-esteem was thus supported (Baumeister et al., 1985). According to this hypothesis, persons with LSE would find it important to repair failure, while persons with HSE would use the opportunity to succeed and excel. Danielsson (2008) also examined post-feedback stress reactions in the form of hypervigilant strategies, as suggested by Janis and Mann's decision conflict theory (1977)

and Keinan's (1987) operationalization of stress indicators based on the theory. The results revealed that people with HSE and LSE who received incongruent feedback, i.e., negative and positive feedback, respectively, tend to scan alternatives in the given assignment in a way that, according to Keinan (1987), signifies stress: They tend to give incorrect answers owing to incomplete and hasty scanning of multiple-choice alternatives. Given that earlier research (e.g., Blaine et al., 1993) has revealed that negative feedback does not affect people with HSE negatively, it can be assumed they scanned alternatives quickly and in an uninterested manner owing to their lack of motivation. The notion that people with LSE were affected by stress seems likely, but it is also plausible that these people developed a positive feeling after praise and strived for good results. These possibilities were further examined in the present study.

The main purpose of the present study was to further analyze self-image-related differences in the reaction to feedback. Another, more specific, aim was to examine differences in the motivational effects of feedback. This was achieved by determining whether participants' subjective ideas about how important it was and how motivated they were to perform well on a subsequent task were affected by positive and negative feedback.

Predictions from three different contradictory theories intersect here:

- (a) According to the self-enhancement theory, which is based on various theories (e.g. Horney, 1937; Rogers, 1961 as cited in Baumeister, 1999), people generally strive for a positive self-image (e.g., Epstein, 1973 as cited in Baumeister, 1999). If this were the case, people with HSE and LSE would be equally motivated to perform well after both positive and negative feedback. A higher degree of motivational drive is likely after positive feedback, as the possibility of a positive result is eminently achievable.
- (b) According to self-verification theory (e.g. La Ronde et al., 1993), people behave so as to preserve their self-image. Based on this theory, we would expect a high level of motivation after both positive and negative feedback in people with HSE. A different pattern, lower motivation after both positive and negative feedback, would be expected in people with LSE. Consequently, a main affect of self-esteem can be expected.
- (c) According to Baumeister et al. (1985; 1989), people with HSE can be said to be self-enhancing to a greater extent. For people with HSE, who are eager to achieve an even higher positive self-image and to excel, according to Baumeister et al. (1985), both positive and negative feedback would be stimulating. The opportunity to excel is

meager after negative feedback, and motivation is consequently lower in this condition. If people with LSE are primarily motivated by self-protection, as Baumeister et al. (1985) argued, they ought to be more motivated toward a good result after negative feedback than after positive feedback.

According to Baumeister et al. (1985), people with LSE are less motivated toward good achievement following positive feedback owing to low self-enhancement motivation. At the same time, however, the authors speculated about the possibilities of a more complicated reaction in this condition. Perhaps people with LSE avoid good achievement following positive feedback due to their readiness to believe that success is a product of luck rather than of skill, and perhaps they fear above all that they will not be able to repeat the success. It is also possible that people with LSE wish to perform well after positive feedback, but do not wish to take the risk of trying for fear failure will overshadow their earlier success. Positive feedback, in other words, could put people with LSE in a stressful situation of conflict. To examine this possibility, physiological reactions after feedback and participants' attributions of success and failure were measured in the present study. Physiological reactions to feedback were examined using pulse rate. Two hypotheses were developed:

- (a) Pulse rate after feedback follows the same pattern as the motivation to achieve well on Test 2; conditions that create high motivation also cause a higher pulse rate increase than do conditions that create low motivation.
- (b) The same assumption as in Hypothesis (a), but with the addition that people with LSE present a stress-related increase in pulse rate after positive feedback even if their motivation to perform well is not high in this condition.

The idea that people with LSE would experience stress connected to positive feedback is based on the assumption that these people attribute success to extrinsic factors, such as luck and the degree of difficulty connected with the task, instead of to intrinsic factors, such as their own effort or ability. The present study investigated whether this condition was valid by also studying participants' attributions after positive and negative feedback. Previous research has shown that people with LSE have a tendency to attribute failure, more than success, to intrinsic factors, while people with HSE have a tendency to attribute success, more than failure, to intrinsic factors (e.g., Blaine et al., 1993; see also Kunda, 1999). Based on this, the main hypothesis was that

people with LSE would attribute failure, rather than success, to intrinsic factors and that people with HSE would attribute success, rather than failure, to intrinsic factors.

It is reasonable to assume that if you experience that an outcome is attributable to your own effort and not to extrinsic factors, your motivation to commit to the next task in a systematic way will be increased. In the earlier study by Danielsson (2008), interesting differences between high and low self-esteem appeared as a function of the conditions under which subjects systematically approached Task 2 (the task after feedback). People with HSE, and not people with LSE, behaved systematically if they believed that the outcome of Task 1 was positive and if this coincided with their own appraisal. This result could mean that people with HSE, regardless of feedback, are more inclined to accept feedback if it is congruent with their own activated situational self-image. People with LSE are generally more insecure about their own opinions than are people with HSE (e.g., Campbell, 1990; Baumgardner, 1990; Campbell & Lavalle, 1993; Blaine et al., 1993). If you doubt your own opinions and yourself, insecurity should be higher if feedback is incongruent with your own opinion, which consequently would increase your readiness to accept feedback and attribute the result to intrinsic factors. This would be valid for participants with LSE when feedback is incongruent with their own opinions, particularly after negative feedback. If you are certain about your own opinions, you should be even more confident if feedback is congruent with your opinions, which consequently would increase your readiness to accept feedback and attribute the result to intrinsic factors. This would be valid for participants with HSE when feedback is congruent with their own opinion, particularly after positive feedback.

Method

Design and Procedure

Participants were 52 (50% women) undergraduate psychology students at Lund University. A sample of 68 persons was randomly selected from a course list. The experimental sessions took place at the Department of Psychology during a three-week period. They were invited to participate in a study concerning problem solving, which would include the completion of tests and one scale. The 52 who agreed to participate were randomly assigned to either the success or failure feedback condition (26 subjects in each feedback condition). Gender was equally represented in the feedback conditions. Testing was individual and lasted for about one hour.

Self-esteem measuring. Upon arriving at the laboratory, the participant completed the Tennessee Self-concept Scale (Fitts, 1965). The Total P score measures a person's "overall level of self-esteem". It consists of 90 self-descriptive statements that a person uses to describe his/her image of him/herself: what I am, what I do, how I feel about myself. The scale ranges from 1 (*completely false*) to 5 (*completely true*). The Total P score's reliability is 0.92, based on two measures made during a two-week period among college students (Fitts, 1965).

Pre-manipulation task. The participant performed the pre-manipulation task consisting of 27 items (anagrams); two additional practice items were to be solved beforehand. The participant had 5 minutes to complete the task and was told that he/she would be informed when the time had run out and also when every minute had passed.

Both the pre- and post-manipulation tasks were based on those described by Keinan (1987). Each task consisted of 27 items. For each item there were six alternatives. The correct alternative was to be found among six paper blocks of smaller size (10.5 x 15 cm), which were attached to a piece of hard paper of larger size (23 x 83 cm). The alternatives were numbered from 1 to 6. Each alternative was viewed one at a time, in any order, as many times as the participant chose. The answer choice was written down on a response sheet.

Rating scale. After completing the pre-manipulation task, the participant appraised the degree of task difficulty on a scale from 0 (*difficult*) to 100 (*easy*). This was the operational definition of the working self-concept, *WSC* (Markus & Kunda, 1986; Markus & Nurius, 1986).

Underlying this approach is the assumption that the easier a task is perceived to be, the higher the expected performance outcome, and the more difficult a task is perceived to be, the lower the expected performance outcome. Expecting a good result, rather than a bad result, should mean that the individual's self-image in the situation, that is his/her *WSC*, is more positive than negative, and expecting a bad result rather than a good result should mean that the individual's *WSC* is more negative than it is positive.

Feedback. False positive or negative feedback (e.g., Baumeister et al., 1985) was given according to the following procedure.

Each participant was told that the experimenter had to check the number of correct answers before the participant could continue with the experimental session. While pretending to score, the experimenter used an answer key belonging to an intelligence test, which was held up so that the participant could easily read it.

"You did very well (or rather poorly). Take a look at this chart if you like". There were separate charts for each feedback condition. For the success feedback condition, the chart showed that most of the other students had performed less well by comparison, and for the failure feedback condition, the chart showed that most of the others had performed better. The experimenter said "if you like" to make the manipulation less obvious. "The chart is a statistical description of all the students who have carried out this task earlier. Most of them performed worse (or better) than you did".

The experimenter showed the participant that the other students were located near the bottom (or near the top) of the chart. "You ended up here. As you can see, there are not very many other students who performed as well (or as poorly) as you did."

Post-manipulation task. The participant was informed about performing a second similar task, an analogy task. After completing two practice items, the participant was reminded about the 5-minute time constraint and that he/she would be informed when the time had run out, and when each minute had passed as well. The post-manipulation task consisted of 27 analogies of the form; A is to B as C is to D. D was to be found among the six alternatives.

In a previous study by Danielsson (2008), participants were allowed to complete the task even if time had run out. In the present study, however, the time constraint was enforced, as one purpose was to study performance change after feedback.

Questionnaire. A questionnaire was used to measure each subject's *attributions*, *perceived motivation to perform well* and *perceived importance of performing well* on the task after feedback. The questionnaire was completed after the post-manipulation task to avoid interference with the experimental effects of feedback. It was completed without the participant knowing anything about his or her performance on the post-manipulation task.

Manipulation check and debriefing. Finally, each participant was debriefed, which included the experimenter asking each participant if he/she had any suspicions about the feedback being false. If there were any suspicions, the participant was later excluded from the study. Two participants were excluded for this reason.

Each participant was thanked for participating in the study.

Dependent Variables

Performance quantity. This was the number of correct answers the participant achieved on the post-manipulation task.

Self-report measure. One question tapped participants' perceived motivation ("*How motivated were you to perform well on the second task?*") and another tapped participants' perceived importance ("*How important did you think it was to perform well on the second task?*") regarding performance on the post-manipulation task. The scales ranged from 1 (*not so much*) to 4 (*very much so*).

Physiological arousal. Pulse rate per minute has been ranked as number 2 of 15 indicators of anxiety (Spielberger, 1966 as cited in Persson, 1994). The participant's pulse rate was measured manually immediately before and after the pre-manipulation task as well as before and after the post-manipulation task, that is, four times during the experimental session. Pulse rate 1 and 2 (Pr1 and Pr2), and pulse rate 3 and 4 (Pr3 and Pr4) were measured before and after the pre-manipulation task and the post-manipulation task, respectively.

Internal attribution, such as effort and ability, and *external attribution*, such as luck and task characteristics, in line with Heider (1958) as cited in, Tice, 1991, and Fitch, 1970, were measured by asking each participant to rank the four alternatives according to which best explained his/her performance on the post-manipulation task. "*What do you think best can explain your performance on the task you just completed, that is task number two? Please rank the alternatives from 1 (the best) to 4 (the last) or, if none of the alternatives suits you, please name the one that does*".

Results

Self-esteem scores were dichotomized (Mdn= 348.5), which resulted in a group of people with HSE (M=373.5, SD=17.41) and a group of people with LSE (M=328.2, SD=21.1).

Subjects' appraisals of task difficulty were also subjected to a median split (Mdn=34.0).

This resulted in a group of high WSC (M=58.24, SD=11.06) and a group of low WSC (M=22.67, SD=8.98).

The dependent variables were analyzed in three-factor analysis of variance (ANOVA), with feedback (positive, negative), and self-esteem (high, low), and subjective difficulty appraisals (easy, difficult) as independent variables. An alpha level at .05 was used for all statistical tests.

Perceived motivation to perform well. The ANOVA yielded a significant main effect of feedback, $F(1, 44) = 4.44, p = .041$. No other main or interaction effects were

significant. The participants reported significantly more motivation to perform well if they received positive feedback ($M=3.38$, $SD=0.50$) than if they received negative feedback ($M=3.00$, $SD=0.75$).

Perceived importance of performing well. As expected, the ANOVA revealed a significant interaction effect for feedback and self-esteem, $F(1, 44) = 5.12$, $p = .029$. No other main or interaction effects were significant.

Participants with HSE and participants with LSE found it most important to perform well after positive and negative feedback, respectively. Pairwise comparisons of cell means resulted in a significant, $t(24) = 2.31$, $p = .030$, mean difference with regard to HSE and type of feedback. Participants with HSE found it more important to perform well after positive feedback ($M=2.61$, $SD=0.77$) than after negative feedback ($M=1.92$, $SD=0.76$).

After positive feedback, participants with HSE ($M=2.61$, $SD=0.77$) tended to differ significantly from participants with LSE ($M=2.08$, $SD=0.76$), $t(24) = 1.80$, $p = .085$.

Participants with LSE found it more important to perform well after negative feedback ($M=2.23$) than after positive feedback ($M=2.08$), but the difference was not significant.

Performance after feedback. Contrary to expectations, there were no significant main or interaction effects with regard to performance after feedback between participants with high or low self-esteem.

The performance variables were also analyzed in repeated measures to test whether there were any differences in performance changes between the pre-manipulation task and the post-manipulation task between the self-esteem groups after feedback. No changes were significant.

To further investigate the motivational effect of feedback, additional analyses were performed. The purpose was to discover whether those participants who stated that they were motivated to perform well or thought it was important to perform well actually did perform better. The variable "motivation to perform well" and the variable "perceived importance of performing well" were subjected to a median split resulting in two groups for each variable. (The variable "motivation to perform well" contained a group with high motivation ($M= 4.00$, $SD=0.00$) and a group with low motivation ($M=2.80$, $SD=0.41$). The variable "perceived importance of performing well" contained a group of high importance ($M=3.05$, $SD=0.22$) and a group of low importance ($M=1.69$, $SD=0.47$.) Each of these variables was used as independent or categorical variables in an ANOVA.

There was a significant interaction effect between feedback, self-esteem and "perceived importance of performing well" on performance change, $p = .009$. Participants with HSE improved their performance after positive feedback, if they thought it was important to do so, but not after negative feedback. Participants with LSE, on the other hand, improved their performance after negative feedback, if they thought it was important to do so, but not after positive feedback.

Pairwise comparisons were not significant. However, participants with HSE tended to improve their performance ($M=7.57$, $SD=7.44$) more than did participants with LSE who actually performed worse ($M=-1.38$, $SD=4.91$), when both received positive feedback and thought it was important to perform well, $p = .057$. Moreover, participants with HSE, who thought it was important to perform well, tended to improve their performance after positive feedback ($M=7.57$, $SD=7.44$) and to perform worse after negative feedback ($M=-3.95$, $SD=8.71$), $p = .056$.

There were no significant differences in performance change between the self-esteem groups after positive or negative feedback in the ANOVA with regard to the independent variable "motivation to perform well".

Physiological arousal. Contrary to expectations, there were no significant interaction effects between feedback and self-esteem in the physiological variables, that is changes in heart rate or in individual pulse rate measures. Accordingly, the first hypothesis, that congruent feedback would be related to increased physiological arousal, was not supported.

The second hypothesis, that incongruent feedback would be related to increased physiological arousal in participants with LSE, was also not supported. There was no significant increase in pulse rate in participants with LSE after positive feedback.

However, the main effect of self-esteem on Pr 4, which was measured immediately after the completion of the post-manipulation task, was significant, $F(1, 44) = 7.34$, $p = .018$.

Pr 4 was higher among participants with LSE ($M=81.35$, $SD=11.87$) than among participants with HSE ($M=72.61$, $SD=13.84$).

Participants with LSE tended to have higher initial pulse rate (Pr1) than did participants with HSE, $p = .07$, and also higher Pr3, that is pulse rate immediately after feedback, than did participants with HSE, $p = .08$.

Attribution. The hypothesis that participants with LSE would attribute negative feedback, rather than positive feedback, to internal factors and vice versa, while

participants with HSE would show the opposite pattern was tested. There were no significant results in the ANOVA in this respect, therefore it can be concluded that the hypothesis was not supported.

The mediating role of the working self-concept or WSC (e.g. Markus et al., 1986) on attributions in participants with HSE and participants with LSE after positive and negative was studied as well. The ANOVA revealed a significant interaction effect of feedback, self esteem and WSC, $F(1, 51) = 5.69, p = .021$. No other interaction or main effects were significant. The interaction effect shows that participants with HSE made more internal attributions when feedback, positive feedback as well as negative feedback, was congruent with their WSC.

When participants with HSE had a more negative WSC, they made significantly more internal attributions after negative feedback ($M=0.86, SD=0.38$) than after positive feedback ($M=0.25, SD=0.50$), $t(9) = -2.29, p = .048$.

After positive feedback, participants with HSE tended to make more internal attributions when their WSC was more positive ($M=0.78, SD=0.44$) than when their WSC was more negative ($M=0.25, SD=0.50$), $p = .08$.

No other differences were significant or tended to be significant when the pairwise comparisons were performed.

Discussion

The main ideas presented here were partly derived from an earlier study by the current author (Danielsson, 2008). The purpose was to investigate and elucidate (a) the perceived motivation to perform well as well as the perceived importance of performing well in people with high and low self-esteem after feedback, and their relationships to actual performance, (b) if congruent feedback is associated with increased physiological arousal, (c) if incongruent feedback is associated with increased physiological arousal in people with LSE (d), if people with different levels of self-esteem differ in attributions after positive and negative feedback, and (e) the mediating role of the working self-concept on attributions after positive and negative feedback in people with high and low self-esteem.

Perceived Motivation to Perform Well, and Perceived Importance of Performing Well, in People with High and Low Self-Esteem After Feedback

With regard to participants' *perceived motivation to perform well* on the task after feedback, all participants stated that they were more motivated to perform well after positive feedback than after negative feedback. This result was significant and mainly supports the self-enhancement theory (e.g., Epstein, 1973 as cited in Baumeister, 1999) which proposes that people with HSE as well as people with LSE desire a positive self-image. Many researchers (e.g., Baumeister et al., 1989; Baumeister, 1993; Brown, 1993; Tice, 1991) would agree that even people with LSE want to perform well and to achieve a positive self-image, but that they are less likely to behave in such a fashion. The present findings also partly support the self-verification theory (e.g., La Ronde et al., 1993) and the model of Baumeister et al. (1985; 1989), but only with regard to participants with HSE.

With regard to the *perceived importance of performing well*, a significant pattern emerged showing that participants with HSE found performance most important if they received positive feedback, while people with LSE found performance most important if they received negative feedback. This result supports Baumeister et al.'s (1985; 1989) view that people with HSE are motivated toward self-enhancement and people with LSE toward self-protection. It also partly supports the self-enhancement theory (e.g., Epstein, 1973 as cited in Baumeister, 1999) and the self-verification theory (e.g., La Ronde et al., 1993), but only with regard to participants with HSE (self-enhancement theory) and participants with LSE (self-verification theory) after positive feedback.

In sum, both self-enhancement theory and self-verification theory failed to predict the motivational responses of participants with HSE after negative feedback. Baumeister et al.'s model (1985; 1989) best fit the present results, in that the reactions of all groups were predictable.

No theory was supported by both variables ("motivation to perform well" and "perceived importance of performing well") showing the same pattern. This may be because the participants interpreted the questions differently. After positive feedback, it seems likely that people will feel happy about having performed so well and that this happiness will affect the way in which questions are answered. Thus, answers to the question about motivation to perform may well reflect the positive emotions created by the positive feedback, in participants with HSE as well as in participants with LSE (see Kernis et al., 1987, for a similar interpretation).

When answering the question "perceived importance of performing well", on the other hand, it seems reasonable to assume that different aspects affected participants' appraisals, such as how important it was to perform well with regard to one's self-esteem.

Perceived Motivation to Perform Well, and Perceived Importance of Performing Well, in Relation to Performance in People with High and Low Self-Esteem

Danielsson (2008) found significant performance differences after feedback in people with high and low self-esteem. In the present study, there were no significant differences between participants with high or low self-esteem, not to the number of correct answers or with regard to performance change after feedback. This may be because the design of the present study had been changed. The participants were not allowed to complete the second task (the post-manipulation task), rather it was performed under a time constraint. Therefore, the variations with regard to the number of items solved as well as the number of correct answers were relatively large. To solve this problem, performance differences were analyzed using the number of correct answers relative to the number of items solved. However, this did not change the result.

Interestingly, a similar pattern emerged in the present study as in the previous study (Danielsson, 2008) when performance change was analyzed with regard to perceived importance of performing well after feedback. Participants with LSE improved their performance after negative feedback, but not after positive feedback, when they thought it was important to perform well. Participants with HSE, on the other hand, improved their performance after positive feedback, but not after negative feedback, when they thought it was important to perform well. This result is consistent with that of Danielsson's (2008) study, but implies that the effect of feedback on performance was weaker in the present study and observable only in participants who found performance in the testing situation highly important (that is, actually accepted the feedback).

Interestingly, when the variable "motivation to perform well" instead of the variable "importance of performing well" was analyzed, the pattern was non-significant. This confirms the reasoning above, that is, that the questions may have been interpreted differently, for example one question may tap positive emotional reactions and the other intrinsic motivation.

Physiological Arousal After Feedback in People with HSE and LSE

The hypotheses that differences in performance and in motivation after feedback (e.g. Danielsson, 2008) could be reflected in physiological arousal were tested. Participants with high and low self-esteem were expected to have higher pulse values after congruent feedback than after incongruent feedback. The results showed no such significant pattern. Moreover, it was expected that participants with LSE could show physiological arousal after positive feedback due to stress, but the results did not support this assumption.

In sum, none of the hypotheses regarding increased physiological arousal was supported.

Previous studies relating self-esteem to physiological arousal or stress responses have found that people with LSE, after being exposed to an experimental stressor – e.g., a mental arithmetic task (Hughes, 2003), the Stroop task (Rector & Roger, 1996), or a failure feedback condition manipulated by a difficult task (Pruessner, Hellhammer & Kirschbaum, 1999) – showed more physiological arousal or stress responses than did people with HSE.

The present results did not show any significant differences in stress reactions between participants with HSE and participants with LSE, neither after positive feedback nor after negative feedback.

However, the present study differed from previous studies in several ways. None of the previous studies have investigated the effects of personal positive or negative feedback, *face-to-face*, on differences in physiological arousal responses in people with HSE and LSE.

Moreover, one of the studies investigated level of cortisol in the saliva instead of pulse rate, and in two of the studies the participants were women only.

The present findings showed that participants with LSE, regardless of type of feedback, had a significantly higher pulse rate at the end of the experiment than did participants with HSE. Actually, participants with LSE had a higher pulse rate than did participants with HSE during the entire experimental session, and they also showed an increase in pulse rate within the group, but no other difference was significant. That negative feedback is associated with higher pulse rate in these people has been found in previous studies as well (Pruessner et al., 1999), but that even positive feedback is associated with higher pulse is a new finding. One possible reason is that people with LSE do not like performing after a previous success for fear that they will no be able to

repeat the success. Failing after a success would imply that the initial success was due to luck and that the true reason for the failure is that they are incompetent, this is in line with Baumeister et al.'s reasoning (1985). Fear of failure in performance situations would be present regardless of whether feedback is positive or negative. Future studies should try to specify the mechanisms underlying reactions to positive and negative feedback, preferably by using methods that allow conscious as well as unconscious reactions to be studied.

In the present study, participants with LSE tended to have significantly higher pulse rates than participants with HSE did already at the beginning of the experiment, therefore the difference in the latest pulse could depend on the general difference in anxiety existing between people with LSE and people with HSE (Coopersmith, 1967), rather than on the feedback that they had received. Future research should include two control groups that do not receive feedback, one containing people with LSE and the other containing people with HSE.

This would enable us to elucidate whether it is the type of feedback or the level of anxiety that leads to higher pulse rates in participants with LSE.

Alternatively, the high pulse rate in participants with LSE after positive feedback could also depend on the fact that the feedback caused them to want to perform well. This seems reasonable if we compare the results of the pulse rates with those of perceived motivation to perform well. However, according to previous studies, this could not be the case, because after positive feedback participants with LSE had the least intrinsic motivation (Baumeister et al., 1985), and performed worse (Silverman, 1964; Danielsson, 2008). The absence of a significant result with regard to the interaction effect of feedback and self-esteem on performance in the present study makes it harder to interpret the importance of perceived motivation to perform well and pulse rate on performance after positive feedback in participants with LSE.

However, as it has been previously shown that positive feedback does not seem to cause participants with LSE to be either motivated or interested in performing well, it seems safer to conclude that self-reported motivation and the relatively high pulse rates reflect something other than high motivation, such as positive emotions and anxiety, respectively, than that they actually intended or thought it was important to perform well.

Attribution in HSE and LSE After Positive and Negative Feedback, and in Relation to WSC

In the present study, attribution after feedback in participants with high and low self-esteem was investigated by developing on Baumeister et al.'s (1985) idea that performance after positive feedback in participants with LSE could be associated with stress reactions. The assumption was that stress reactions could depend on success being attributed to luck rather than to ability or skills. The results, however, did not show any significant differences in attribution with regard to self-esteem and feedback. Yet significant differences in attributions did appear when participants' appraised degree of difficulty scores that is, the working self-concept (e.g. Markus et al., 1986), were included in the ANOVA, indicating that basic self-esteem affects how success and failure are attributed in interaction with the working self-concept (e.g., Markus et al., 1986) only.

The present findings concerning attribution differ from previous research in several ways.

First, according to previous studies, people with HSE would engage in most internal attribution after positive feedback and people with LSE would engage in most internal attribution after negative feedback (Schrauger, 1975; Blaine et al., 1993; see also Kunda, 1999). In the present study, no such uniform pattern was seen. *Second*, according to previous research, people with HSE should be less prone to accepting negative feedback (e.g., Schrauger, 1975). The present study shows, however, that people with HSE are largely able to accept negative feedback as well as positive feedback, as long as the feedback is congruent with their working self-concept (e.g. Markus et al., 1986), and do not always accept positive feedback to a great degree. *Third*, people with LSE do not uniformly accept negative feedback. They accepted negative feedback mostly when they had a positive working self-concept. The result also shows that people with LSE are able to attribute positive feedback to intrinsic as well as extrinsic factors, a finding that Blaine et al. (1993) claimed was possible.

According to Blaine et al. (1993), this finding implies that these people are not particularly sure about themselves, which makes positive feedback acceptable sometimes and sometimes not.

The current results reveal that the working self-concept (Markus et al., 1986) is important to how people with HSE, in particular, attribute positive and negative feedback. The results can be viewed as an accurate description of how these people deal with positive and negative situations in real life. Everyone probably has his/her own opinion of

a success or a failure, whether it is attributable to intrinsic or extrinsic factors. According to the present research, people with HSE are more successful than people with LSE are, in this respect. People with HSE believe in their own opinions and accept success or failure in a more realistic as well as self-confident fashion, that is, these situations are accepted to a much larger extent *only* if they are congruent with their own opinion. This finding probably reflects one strength associated with HSE. In the situation, the appraisal seemed important to their decision regarding whether or not further efforts were worth while, an attitude that is valuable in maintaining a positive sense of self and self-integrity. This attitude probably constitutes an important difference between people with HSE and people with LSE, and can increase our understanding of how these people cope differently with success and failure.

Finally, some limitations in the present study ought to be mentioned. The results showing that the working self-concept (e.g., Markus et al., 1986) is important to attributions with regard to level of self-esteem and type of feedback should be replicated in a study in which WSC is experimentally manipulated. This would enable more definite conclusions as to the effects of WSC on attributions.

Future studies should also employ a greater number of participants to improve the reliability of the results, especially with regard to the results in the three-way ANOVAs. Future studies examining stress reactions after personal feedback should also, for methodological reasons, extend the range of physiological variables used to indicate stress responding and not only study pulse rate. This is also important because we know that both the sympathetic and the parasympathetic nervous systems are involved in cardiovascular activity.

The absence of significant results concerning performance differences between people with high and low self-esteem after feedback constitutes an additional difficulty in the present study. One explanation for the absence of significant results is that the feedback was not sufficiently effective. However, this is not regarded as depending on lack of belief in the feedback on the part of participants, because this was controlled for in the experimental design. Rather it may depend on the task they performed prior to feedback. It is reasonable to assume that task performance in a temporary experimental situation, such as the present one, where the participant is guaranteed anonymity, is not enough to create genuine thoughts or emotions induced by positive or negative feedback, as would be created in situations more crucial to the future, such as rejection of a work application. Future studies examining reactions to positive and negative feedback should

be conducted in situations that are more personal, important and crucial to individuals participating in the study.

However, future studies of reactions to feedback would benefit from continuing to study *personal* feedback, because personal feedback, face-to-face, as participants in the present study were exposed to, can be regarded as a naturalistic way of studying responses to both self-image threats and positive information related to the self-image. Personal feedback is something that everyone experiences on occasion. Acquiring knowledge about how everyday positive and negative feedback are coped with may increase our understanding of the tendency for level of self-esteem to be maintained as well as of the differences in well-being between individuals with high and low self-esteem.

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