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## Effects of Positive and Negative Feedback on Performance Quantity and Quality in People with High or Low Global Self-Esteem

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## **Effects of Positive and Negative Feedback on Performance Quantity and Quality in People with High or Low Global Self-Esteem**

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This study examined the effects of positive or negative feedback on performance quantity i.e., number of correct answers, and performance quality i.e., scanning and consideration of alternatives while performing the task, in people with high (HSE) or low (LSE) global self-esteem. The effects of feedback were studied with regard to the participants' basic level of self-esteem as well as the mediating role of the working self-concept (WSC). People with HSE and people with LSE performed best after having received positive and negative feedback, respectively. People with HSE scanned the alternatives more systematically when feedback was congruent with their WSC. The importance of WSC, and self-esteem, for coping with feedback is discussed.

*Keywords:* Self-esteem, self, feedback, performance, failure, success, congruence, motivation, reactions, individual differences, decision, conflict, hypervigilance, hypervigilant strategies.

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Global self-esteem has been found to be an important individual difference variable in psychological functioning (e.g., Baumeister, 1993, 1998). Global self-esteem refers to how a person values the self (e.g., Leary & Baumeister, 2000); it is also treated as a trait reflecting a person's stable level of self-evaluation (e.g., Tesser, 2004; Brown, Dutton & Cook, 2001).

Research on global self-esteem differences in psychological functioning has yielded important findings regarding the difficulties associated with low self-esteem (LSE) and the benefits associated with high self-esteem (HSE). For instance, LSE has been found to be associated with higher levels of depression (Watson, Suls & Haig, 2002; Tennen & Affleck, 1993), higher levels of anxiety (e.g., Coopersmith, 1967; Baumeister, 1998; Greenberg, Solomon, Pyszczynski, Rosenblatt, Burling, Lyon, Simon & Pinel, 1999; Watson et al., 2002) and lower levels of subjective well-being (Schimmack & Diener, 2003).

Important to happiness and adjustment is how a person copes with self-image threats or negative information about the self (Baumeister, 1993). People with LSE have been found to differ from people with HSE in this respect.

#### *Self-esteem and Reactions to Self-image Threats*

Previous research shows that LSE is associated with greater vulnerability to self-image threats than is HSE (e.g., Baumeister, 1993; Blaine & Crocker, 1993; Brown & Dutton, 1995; Dodgson & Wood, 1998). People with HSE have more resources to cope with self-image threats. Actually, they do not expect to fail in the first place, rather they expect good things to happen to them (e.g., Blaine & Crocker, 1993; Baumeister, Tice & Hutton, 1989). If they fail, however, they have several strategies for defending themselves against the threat. For instance, after self-image threats in the form of failure feedback, people with HSE can deny personal responsibility for the failure (Blaine et al., 1993) or discount the evaluator (Blaine et al., 1993). Moreover, they seem to be able to think about their strengths (Baumeister & Tice, 1985; Dodgson & Wood, 1998; Steele, 1988; Joseph, Larrick, Steele & Nisbett, 1992; Steele, Spencer & Lynch, 1993) and to suppress their weaknesses (Dodgson et al., 1998). In contrast, the weaknesses of people with LSE seem to become especially accessible after failure (Dodgson et al., 1998; see also Kernis, Frankel & Brockner, 1989).

#### *Self-esteem and Cognitive and Emotional Reactions to Success and Failure Feedback*

Studies of *cognitive reactions* to feedback offer some explanations for why persons with different levels of self-esteem differ in their reactions to success or failure feedback. In comparison to people with HSE, those with LSE have been found to be more prone to expect, accept, and believe in failure feedback (e.g., Miller & Ross, 1975; Schrauger, 1975; McFarlin & Blascovich, 1981; Swann, Griffin, Predmore, & Gaines, 1987; Blaine et al., 1993; Jussim,

Yen, & Aiello, 1995). This may be due either to the fact that failure is congruent with a negative self-concept (Swann et al., 1987; McFarlin et al., 1981), or to the fact that people with LSE are less sure about who they are, what describes them and what does not (Campbell, 1990; Baumgardner, 1990; Blaine et al., 1993; Campbell & Lavalley, 1993).

Because their self-concept is more positive, people with HSE are more prone to accept success feedback (e.g., Schrauger, 1975; Swann et al., 1987; McFarlin et al., 1981; Blaine et al., 1993; Jussim et al., 1995; Schutz & Tice, 1997). They are more certain about who they are and about what constitutes an accurate description of them and what does not (Campbell, 1990; Baumgardner, 1990; Campbell et al., 1993). These people should expect success (Miller et al., 1975).

With regard to *emotional reactions* to feedback, people with LSE, to the same extent as those with HSE, seem to prefer success feedback to failure feedback and feel better after success feedback than after failure feedback (Tice, 1993). However, some findings show that LSE is associated with more negative emotions after failure feedback than is HSE (Brown et al., 1995; Brown & Marshall, 2001; Dutton & Brown, 1997). In a recent study, people with LSE also showed more negative emotions after a written success manipulation than did people with HSE (Wood, Hempel, Newby-Clark & Ross, 2005).

### *Self-esteem and Differing Motivational Orientations*

According to self-enhancement theory, which is based on various theories (e.g., Horney, 1973; Rogers, 1961 as cited in Baumeister, 1999), people are generally motivated to increase their feelings of personal worth (e.g., Epstein, 1973; Tesser, 1985; Jones, 1973 as cited in Baumeister, 1999). Because people with LSE have less self-esteem than do people with HSE, we would expect, on the basis of self-enhancement theory, that they will compensate for this deficiency by trying to enhance their self-view more than their HSE counterparts would. Baumeister et al. (1989), however, adopted the opposite view by suggesting that self-enhancement may be most characteristic of people who are high in self-esteem. People with LSE doubt that a positive self-image can be maintained (e.g., Brown, 1993; Brown, Collins & Smith, 1988). Because of their doubts about themselves and their vulnerability to negative events, they are prone to developing a careful, cautious self-presentational style and are primarily motivated toward self-protection, that is, toward protecting their self-esteem against failure and embarrassment (e.g., Baumeister et al., 1989; Blaine et al., 1993; Baumeister, 1993; Tice, 1993).

To test their hypotheses regarding differing motivational orientations among people with high and low self-esteem, Baumeister and Tice (1985) designed an experiment to study participants' intrinsic motivation after success or failure feedback on a prior task. Internal

motivation was measured as the time participants voluntarily continued working with the task after having received feedback.

Consistent with the hypothesis that people with LSE are primarily motivated to protect their level of self-esteem, participants with LSE had the highest level of intrinsic motivation to carry on with the task after failure. In contrast, those with HSE had the highest level of intrinsic motivation to do so after success, a finding that is consistent with the view that they are more prone to self-enhancement than to self-protection.

The outcome can also be interpreted to mean that people are more likely to engage in tasks when their performance seems to verify their self-image, or as a combination of this factor and different performance motives in people with LSE and people with HSE (Table 1).

Table 1

*Hypothesized Responses to Positive and Negative Feedback in People with High Self-esteem and Low Self-esteem.*

Level of Self-esteem	Feedback condition	Cognitive reaction	Motivational reaction	Performance
High	Positive	Accept	Self-enhancement	Good
High	Negative	Reject	Low motivation	Poor
Low	Positive	Reject	Low motivation	Poor
Low	Negative	Accept	Self-protection	Good

### *The Present Study*

The aim of the present research was to further test Baumeister et al.'s (1989) model concerning different motivational reactions after positive and negative feedback in people with high and low self-esteem. More specifically, we examined how experimentally manipulated feedback received after performing a task (anagrams) affected the individual's subsequent performance on a similar task (analogies). The study was designed to provide information about the effects on performance quantity, that is, the number of correct answers, as well as on performance quality, that is, *how* the items were solved. The latter was achieved by observing and measuring each participant's scanning strategy when performing the

analogy task. Specifically, the focus was on indications that stress reactions had been present and interfered with the decision process. As suggested by Janis and Mann (1977), if a person is experiencing stress, his or her response will most likely be hypervigilant, that is, he or she will make errors related to non-systematic scanning of the alternatives in the task, make errors without having viewed all the possible alternatives and/or solve the task very rapidly (see Keinan, 1987; Baradell & Klein, 1989).

In line with Baumeister et al.'s model (1985; 1989), it was assumed that persons with high and low self-esteem would be most motivated to perform well if they had received feedback congruent with their self-image, that is, positive feedback for those with HSE and negative feedback for those with LSE. The numbers of correct answers in Test 2 will support this assumption.

Those groups receiving incongruent feedback were studied in more detail. The purpose was to investigate whether their lower levels of performance, as a consequence of incongruent feedback, were related to stress reactions. However, this was expected to hold particularly for people with LSE (see Baumeister, 1985; Wood et al., 2005).

In addition, it was assumed that stress reactions could appear if the individual was highly motivated, and at the same time experienced the task as difficult. Therefore, performance on the second task was also studied with regard to the participants' appraised degree of difficulty of the initial task. Thus, the mediating role of the participants' situational self-image (working self-concept, or *WSC*; Markus & Kunda, 1986; Markus & Nurius, 1986) in relation to motivation and performance after feedback was studied exploratively. With regard to people with LSE, stress reactions were expected to be most frequent if they appraised the task as difficult and had received negative feedback, while stress reactions in people with HSE were expected to be most frequent if they appraised the task as difficult and had received positive feedback.

## **Method**

### *Participants*

Participants were 52 (50% female) undergraduates taking an introductory psychology course at Lund University; they ranged in age from 19 to 31 years ( $M=22.31$ ,  $SD=2.49$ ). They participated in the study as paid volunteers. Sixty-five students were randomly selected from the course list and contacted by phone. 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.

### *Design and Procedure*

Each participant was tested individually for about one hour. The experimenter was blind to the participant's level of self-esteem while running the experiments.

Table 2 provides an overview of the different stages within each of the two experimental conditions.

*The pre-manipulation task.* Upon arriving at the laboratory, the participant was given 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 difficulty of the task on a scale from 0 (*difficult*) to 100 (*easy*). This was the operational definition of the working self-concept, *WSC* (Markus et al., 1986; Markus et al., 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 his/her *WSC* is more negative than positive.

*Feedback.* The 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.

Positive (negative) feedback was given according to the following procedure. "You did very well (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 (better) than you did”.

The experimenter showed them 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 (as poorly) as you did.”

*Post-manipulation task.* The participant was informed that he/she was to perform 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. For this task, as opposed to the pre-manipulation task, the participant was allowed, without knowledge of this, to complete the task, even if the time announced beforehand had in fact run out. For those participants (less than five) who asked about the time, the experimenter said that there was some time left.

The reason for letting all participants complete the task was to simplify comparing them in terms of number of correct answers.

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.

*Self-esteem measurement.* *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).

*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.



Table 2

*Overview of the Experimental Procedure*

Event	Description of each event
Pre-manipulation task	First the participants performed the pre-manipulation task.
Rating scale	Appraisal of the degree of difficulty of the pre-manipulation task was measured individually on a personal scale. This constituted the measurement of the working self-concept, or WSC, (Markus et al., 1986; Markus et al., 1986).
Feedback	Random assignment to positive or negative feedback conditions.
Post-manipulation task	Each participant's scanning and consideration of alternatives on the post-manipulation task were documented.
Self-esteem measurement	The Tennessee Self-Concept Scale (Fitts, 1965) tapped each participant's overall level of self-esteem.
Manipulation check and debriefing	Each participant was carefully debriefed, informed about the experiment, and was asked if he or she had any suspicions about the feedback being false.

*Scoring of the Post-manipulation Task*

When the participant performed the post-manipulation task, the experimenter observed and wrote down the exact order in which he/she scanned and considered the alternatives when searching for the correct answer.

The post-manipulation task was scored in four ways.

1. *Number of Correct Answers (NCA)*. This variable refers to the number of analogies answered correctly.
2. *Premature closure (PC)*. The number of analogies answered incorrectly without having viewed all six alternatives.

3. *Non-systematic scanning (NS)*. The number of times the participant deviated from a fixed order of viewing before an error. The alternatives were numbered from 1 to 6. A deviation from a backward or forward scanning order received a score of 1. For example: 1, 3, 4, 5, 6, 2, 4, 5 resulted in a score of 3, because there are three deviations, between 1 and 3, between 6 and 2 and between 2 and 4. 1, 2, 3, 4, 5, 6, 1, 2, 3, 4, 5, 6, resulted in a score of 0, because the jump between 6 and 1 is not seen as a deviation. Scanning in the order: 1, 2, 3, 4, 5, 6, 5, 4, 3, 2, 1 or 6, 5, 4, 3, 2, 1, 2, 3, 4, 5, 6 also resulted in a score of 0.

4. *Time*. The total time, in minutes, the participant used to complete the task.

*Performance quantity*, measured using point 1 above, and *performance quality*, measured using points 2-4 above, refer to the operational definitions of the dependent variables of hypervigilant strategies according to Keinan (1987), based on the theory of Janis et al., (1977).

## Results

### *Interrelations among Performance Variables*

Pearson correlations indicated that NCA was negatively related to PC and NS,  $r(50) = -.74, p = .000$  and  $r(50) = -.25, p = .038$ , respectively, one-tailed tests, but unrelated to time.

Because it is reasonable to assume that those who scanned the alternatives in the task quickly as well as those who scanned the alternatives in the task slowly may receive a low number of correct answers, the quadratic relationship between time and number of correct answers was analyzed. The relationship was significant at  $p = .026$ . Generally, the faster *or* the slower the participant completed the task, the poorer the performance.

### *Effects of Self-Esteem, WSC, and Nature of Feedback on Performance after Feedback*

The sample was dichotomized ( $Md = 334.50$ ) on self-esteem scores, which yielded a group of HSE persons ( $M = 355.42; SD = 15.34$ ) and a group of LSE persons ( $M = 297.96; SD = 31.45$ ).

The participants' appraised degree of difficulty was also subjected to a median split ( $Md = 32.0$ ), which resulted in a group of persons with a more positive WSC ( $M = 46.24; SD = 11.79$ ) and a group of persons with a more negative WSC ( $M = 20.22; SD = 6.80$ ).

ANOVAs of 2 x (positive, negative feedback) 2 x (high, low self-esteem) 2 (positive, negative WSC) were used to analyze the differences in the dependent variables. An alpha level of .05 was used for all statistical tests.

*NCA.* As expected, the ANOVA yielded a significant interaction effect for feedback and self-esteem,  $F(1, 44) = 5.615, p = .02$ . No other interaction or main effects were significant.

Participants with HSE performed significantly better after positive feedback ( $M = 20.64$ ) than after negative feedback ( $M = 18.42$ ),  $t(19, 26) = 2.12, p = .047$ . Participants with LSE performed better after negative feedback ( $M=19.71$ ) than after positive feedback ( $M = 18.33$ ), but the difference was not significant. After positive feedback, participants with HSE ( $M = 20.64$ ) performed significantly better than did those with LSE ( $M = 18.33$ ),  $t(19, 80) = 2.26, p = .035$ .

After negative feedback, participants with LSE ( $M=19.71$ ) performed better than did those with HSE ( $M = 18.42$ ), but the difference was not significant (Table 3).

To rule out the possibility that the result depended on group differences in performance prior to feedback, an additional analysis was performed. In this analysis, the number of correct answers on the pre-manipulation task was used as a covariate.

The interaction effect between feedback and self-esteem was still significant in this analysis  $F(1, 46) = 4.185, p = .047$ , whereas the covariate effect was non-significant.

*PC.* The ANOVA yielded a nearly significant interaction effect between feedback and self-esteem,  $F(1,44)=3.934, p= .054$ . This pattern was as expected. Participants with LSE tended to have the highest level of PC ( $M=5.50$ ) of all the other groups after having received positive feedback. For participants with LSE after negative feedback, the corresponding result was  $M=4.00$ . Participants with HSE tended to have a higher level of PC after negative ( $M=4.80$ ) feedback than after positive feedback ( $M=3.51$ ). No other main or interaction effects were significant.

*NS.* The ANOVA revealed a significant interaction effect for feedback, self-esteem and WSC on NS,  $F(1, 44) = 4.37, p = .042$ . No other main or interaction effects were significant

It was expected that non-systematic scanning would be relatively frequent among people with LSE who appraised the initial task as more difficult and received negative feedback. As Table 3 shows, the results partly support this assumption. However, non-systematic scanning was most frequent among people with LSE who appraised the task as easier and received positive feedback.

It was also expected that non-systematic scanning would be relatively frequent among participants with HSE who appraised the task as more difficult and received positive feedback. The results did not support this assumption. Non-systematic scanning was more frequent among participants with HSE who appraised the task as easier and received negative feedback.

Interestingly, participants with HSE had the lowest scores for non-systematic scanning when feedback was congruent with their appraised degree of task difficulty, that is, when they had appraised the task as easier and received positive feedback, and when they had appraised the task as more difficult and received negative feedback.

*Time.* The main effect for feedback was significant,  $F(1, 44) = 4.937, p = .031$ . The participants completed the task faster after negative feedback ( $M = 7.76$ ) than after positive feedback ( $M = 8.50$ ).

In addition, the ANOVA revealed a significant interaction effect for feedback, self-esteem and WSC,  $F(1, 44) = 4.372, p = .049$ . No other interaction or main effects were significant.

Participants with LSE completed the task in the shortest time when they had appraised the task as more difficult and received negative feedback. This result supports the hypothesis that these conditions are stressful for people with LSE.

Participants with LSE who appraised the initial task as more difficult completed the post-manipulation task significantly faster after negative feedback ( $M = 7.22$ ) than after positive feedback ( $M = 8.91$ ),  $t(12) = 2.21, p = .047$ .

Moreover, after negative feedback, and when both participants with HSE and participants with LSE had a more negative WSC, those with LSE ( $M = 7.22$ ) completed the task significantly faster than did those with HSE ( $M = 8.39$ ),  $t(9, 89) = 2.35, p = .041$  (Table 3).

Participants with HSE completed the task in the shortest time when they had appraised the initial task as easier and received negative feedback. As mentioned above, under those conditions, these people also had the highest scores for non-systematic scanning. Participants with HSE who appraised the initial task as easier completed the post-manipulation task significantly faster after negative feedback ( $M = 6.55$ ) than after positive feedback ( $M = 8.19$ ),  $t(10, 97) = 2.69, p = .021$ .

Moreover, after negative feedback, participants with HSE completed the task significantly faster if they had a more positive WSC ( $M = 6.55$ ) than if they had a more negative WSC ( $M = 8.39$ ),  $t(8, 52) = -3.77, p = .005$ .

After negative feedback, HSE participants with a positive WSC ( $M = 6.55$ ) completed the task significantly faster than did LSE participants with a positive WSC ( $M = 8.37$ ),  $t(10, 68) = -2.55, p = .028$ .

Table 3

*Means for Number of correct answers, Non-systematic scanning and Time by Feedback, Self-esteem and Working self-concept*

Self-esteem	High			Low			
Working self-concept	Positive	Negative	Total	Positive	Negative	Total	Total
<b>Positive feedback</b>							
Number of correct answers	21.12 (8; 2.36)	20.00 (6; 1.79)	20.64 <i>a</i> (14; 2.13)	18.25 (4; 3.50)	18.37 (8; 2.87)	18.33 <i>b</i> (12; 2.93)	
Non-syst. scanning	1.25 (8; 2.05)	2.33 (6; 1.37)		3.50 (4; 3.11)	2.25 (8; 1.16)		
Time	8.19 <i>a</i> (8; 1.35)	8.33 (6; 1.44)		8.59 (4; 1.69)	8.91 <i>a</i> (8; 1.66)		8.50 <i>a</i> (26; 1.46)
<b>Negative feedback</b>							
Number of correct answers	17.20 (5; 1.30)	19.29 (7; 3.73)	18.42 <i>b</i> (12; 3.06)	20.12 (8; 2.70)	19.17 (6; 2.48)	19.71 (14; 2.55)	
Non-syst. scanning	3.00 (5; 1.58)	1.57 (7; 1.13)		2.00 (8; 2.07)	3.17 (6; 3.54)		
Time	6.55 <i>b</i> (5; 0.84)	8.39 <i>a</i> (7; 0.81)		8.37 <i>ac</i> (8; 1.71)	7.22 <i>bc</i> (6; 0.96)		7.76 <i>b</i> (26; 1.37)

*Note.* n and SD in parentheses. Within each dependent variable, means not sharing common letters (within a row or a column) are significantly different ( $p < .05$  at minimum). Means for Totals are shown with regard to significant effects only.

## Discussion

In the present study, the effects of positive and negative feedback on performance differences in people with high and low self-esteem were investigated. The number of correct answers and *how* the alternatives in the task were solved were studied. The latter was carried out by applying Janis et al., (1977) decision conflict theory on performance after feedback.

In addition, the mediating role of the participant's working concept or WSC (e.g. Markus et al., 1986) in relation to performance after feedback was studied exploratively.

### *The Effect of Self-Esteem and Feedback on the Number of Correct Answers and Hypervigilant Strategy Use*

As expected, the interaction effect between feedback and self-esteem on the number of correct answers, or performance quantity, was significant. This was the main finding in the study. Participants with HSE performed significantly better after positive feedback than after negative feedback, while participants with LSE tended to show the opposite pattern.

This finding can be regarded as reflecting the differing motivational orientations characterizing people with HSE and people with LSE (Baumeister et al., 1989). Participants with HSE seem to react to positive feedback in a self-enhancing manner. Participants with LSE, on the other hand, seem to react to negative feedback in a self-protecting way. They probably want to protect their self-esteem from further failures.

A similar result was found by Silverman (1964) when he studied performance changes after positive and negative feedback in people differing in level of self-esteem. Participants with HSE improved their performance after positive feedback, while participants with LSE improved their performance after negative feedback. In Silverman's (1964) study, participants compared their performance in relation to others' performance on an initial task. The findings in the present study show the same interaction effect when feedback is supplied through direct communication, face-to-face.

In the present study, those groups receiving incongruent feedback were studied with regard to stress reactions, which were expected to be most frequent among participants with LSE. The results showed that participants with LSE as well as those with HSE, but especially participants with LSE, tended to have more PC, or premature closure, after feedback. The presence of PC in participants with LSE may be due to stress reactions, as it has been suggested that they dislike performing after a previous success due to fear of failure

(Baumesiter et al., 1985). With regard to participants with HSE, previous studies have shown that they are able to dismiss negative feedback more easily (e.g., Blaine et al., 1993).

Therefore, it is less likely that PC reflects stress reactions in these people. What is more likely is that they scanned the alternatives in a fast and uninterested manner because they did not care about the performance outcome when the chances of performing well were quite small. The meaning of PC should be investigated in future studies.

#### *The Effect of Self-esteem, WSC and Feedback on Hypervigilant Strategy Use*

In general, the slowest participants as well as the fastest participants had fewer correct answers, compared to those who solved the task at an intermediate speed. This finding suggests that low performances may be associated with differing underlying factors in different individuals. Some have scanned the alternatives slowly and performed poorly, perhaps because the test items were too difficult for them. Others may have wanted to perform well and worked hard to do so, but failed because they worked too quickly to make good decisions. Furthermore, others may have scanned the alternatives very quickly owing to their lack of motivation, which caused them to want to get through the task as quickly as possible.

In the present study, the importance of working self-concept, or WSC, for reactions to feedback in people with high or low self-esteem was studied. In line with the model of Baumeister et al. (1985; 1989), we speculated that participants with HSE would be motivated to perform well after positive feedback and that stress reactions would be present if they also appraised the task as difficult. The results did not support this stress hypothesis. Among participants with HSE, the fastest group contained those who rated the pre-manipulation task as easier and had received negative feedback. These participants scanned the alternatives in a very fast and non-systematic manner, and their number of correct answers was relatively low.

Because people with HSE generally do not expect to fail, the negative feedback must have come as a surprise, especially when they thought the task was relatively easy. This may have been stressful for these individuals. However, the possibility that they reacted by distancing themselves from the task seems likely as well, that is, that they found no meaning in engaging in the task and therefore performed the post-manipulation task in a careless manner.

Interestingly, when scanning the alternatives, participants with HSE were the most systematic when feedback was congruent with their appraised degree of task difficulty, that is, with their working self-concept (e.g., Markus et al., 1986). This was true regardless of

whether feedback was positive or negative. For participants with HSE, who are generally more certain about their own opinions and about themselves (e.g., Campbell et al., 1993), congruence may be crucial to considering the performance outcome, and the task, to be self-relevant, thus to maintaining the motivation necessary to continue working systematically with the task.

In line with the model of Baumeister et al. (1989), it was assumed that participants with LSE would experience stress if they appraised the task as more difficult and received negative feedback. The results partly supported this assumption. Participants with LSE scanned the alternatives fastest in this combination of conditions, and the scores for non-systematic scanning were also relatively high. However, participants with LSE were the least systematic when their chances to excel were good (positive feedback and positive working self-concept) and the most systematic when their chances to repair their failure were good (negative feedback and positive working self-concept), this in contrast to participants with HSE in the same condition.

According to Baumeister et al. (1985; 1989), people do not feel motivated when feedback is incongruent with their level of self-esteem. The present results partly support this assumption. Incongruent feedback was associated with the slowest performances, if the task was appraised as difficult. It is reasonable to assume that lack of motivation together with perceiving the task as difficult will lead to scanning the alternatives slowly.

In conditions where motivation was expected to be low, according to Baumeister et al. (1989), and at the same time the participants thought the task was easy, the highest scores for non-systematic scanning were present. This finding contradicts the assumption that low motivation follows incongruent feedback, unless non-systematic scanning indicates motivational ambivalence ("the task was easy but performance was not important to me") rather than high motivation. The psychological meaning of non-systematic scanning is not clear and should be further investigated in future studies.

The significant main effect on time shows that those who received negative feedback completed the task faster than did those who received positive feedback. One possible explanation is that negative feedback is generally more stressful than positive feedback.

However, when it comes to people with HSE, this explanation does not seem quite adequate, because these people have been found to have several strategies for defending themselves against negative information (e.g., Blaine et al., 1993). Therefore, it is difficult to imagine that these people actually experienced stress. Another explanation is that some



people with HSE performed the task in a careless manner because they did not care about the performance outcome when their chances to excel were minimal (see Baumeister et al., 1985).

In sum, the present study investigated motivational differences, according to Baumeister et al. (1985; 1989), following positive and negative feedback in people with HSE and in people with LSE. The findings show that both groups perform best after congruent feedback, that is, positive feedback for people with HSE and negative feedback for people with LSE.

The findings support Baumeister et al.'s (1985; 1989) model. In the present study, reactions to incongruent feedback were investigated with the expectation that poor performances would be associated with stress reactions, especially in participants with LSE.

Participants with HSE as well as participants with LSE tended to have more premature closure after incongruent feedback than after congruent feedback. However, premature closure was associated with stress reactions only in participants with LSE.

The mediating role of participants' appraisals of the degree of task difficulty in relation to reactions to positive and negative feedback was investigated as well. This was done exploratively. When scanning the alternatives in the task, participants with HSE were most systematic if feedback was congruent with their own opinions about the degree of difficulty.

A systematic scanning strategy could be associated with being interested and careful when searching for the correct answers in the task. This should occur in people who find their performance outcome important. This means that people with HSE seem to be able to accept negative feedback when it is congruent with their appraisal, and to not accept positive feedback when it is incongruent with their appraisal.

The results of the present study increase our understanding of the differences between people with HSE and people with LSE, and of how they cope with feedback.

#### *Limitations of the Present Study*

People always have their own appraisal of a task or a situation. This appraisal, or the self-image in the situation, or the working self-concept (e.g., Markus et al., 1986), could affect how they cope with feedback related to the task or the situation.

In the present study, the mediating effect of the working self-concept was studied exploratively by using the participants' appraisal of the degree of task difficulty.

The results imply that the working self-concept (e.g., Markus et al., 1986) affects how positive and negative information are coped with, but this must be controlled for experimentally in future studies.

Future studies should also employ a larger number of participants in order to increase the reliability of the results, especially with regard to the results in the three-way ANOVAs.

The participants were allowed to complete the post-manipulation task even if their time had run out. This was done to facilitate a comparison of their results. Perhaps some participants, when the five minutes had passed, felt that there was no time limit anymore and therefore became less stressed and less eager to complete the task. However, it is reasonable to assume that these people did not experienced stress even in the beginning of the task.

Others, who needed more than five minutes to complete the task, may have found the task difficult, while others did not care about their performance outcome.

The results with regard to the time the participants needed to complete the task are difficult to interpret, because they may depend upon different psychological phenomena. The same is true with respect to non-systematic scanning. Non-systematic scanning could depend, for example, on stress or a careless scanning manner could depend on low motivation to perform well. Fast scanning could also depend on stress, or that the participant was not interested in performing well and therefore scanned the alternatives in a careless manner.

Assuming that non-systematic scanning is related only to stress, does this mean that people with HSE may experience stress after negative feedback? In that case, do people with LSE experience even more stress after negative feedback when feedback is congruent with their working self-concept, that is, when the chances of failing are greater? Participants with LSE who received positive feedback completed the task relatively slowly, and were also quite non-systematic. Did they scan the alternatives non-systematically because of stress or did they feel less motivation to perform well? These questions need to be answered if we are to understand the psychological mechanisms underlying the interaction effects on time and non-systematic scanning. Future studies of reactions to positive and negative feedback in people with different levels of self-esteem should focus on measuring stress as a physiological reaction, self-reported motivation and attribution in relation to feedback as well as working self-concept.

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