CHAPTER 2

The Relationship between Goal orientation, Social Comparison Responses, Self-efficacy and Performance¹

Abstract

The present study examined whether social comparison responses (identification and contrast in social comparison) mediate the relationship between goal orientation (promotion and prevention) and self-efficacy, and whether the developed self-efficacy may lead to performance. As expected, results showed that promotion-oriented individuals - who are focused on achieving success - had higher self-efficacy than prevention-oriented individuals - who are focused on avoiding failure. In addition, support for mediation was confirmed. Namely, the tendency to contrast oneself with others who were doing better mediated the relationship between prevention goal orientation and self-efficacy, and next, self-efficacy was related to performance.

According to Bandura’s social cognitive theory (1986), self-efficacy is a key factor in achieving success. Self-efficacy is described as “people’s judgment of their capabilities to organize and execute courses of action required to attain designated types of performances” (p. 345). Self-efficacy perceptions influence the goals individuals set themselves: individuals do not set personal goals of which they estimate they cannot reach them, and those high in self-efficacy are relatively more likely to attain the goals they aim for (Bandura, 1977, 1982; Bandura & Schunk, 1981; Brown & Inouye, 1978; Schunk, 1981; Weinberg, Gould & Jackson, 1979). In particular, previous research has shown that individuals high in self-efficacy approach difficult tasks as challenges to be mastered rather than as threats to be avoided, set themselves challenging goals, maintain strong commitment to these goals, and persist in their efforts in the case of a failure. Such individuals quickly recover their sense of efficacy after failures or setbacks and attribute failure to insufficient effort or to deficient knowledge and skills that are acquirable.

In addition, numerous studies have shown the importance of self-efficacy and performance, for instance for work-related performance in both the laboratory and the field (Sadri & Robertson, 1993; Stajkovic & Luthans, 1998); psychosocial functioning of children and adolescents (Holden, Moncher, Schinke, & Barker, 1990); academic achievement and persistence (Multon, Brown, & Lent, 1991); health-related outcomes (Holden, 1991); athletic performance (Gernigon & Delloye, 2003); and perceived collective efficacy in group functioning (Gully, Incalcaterra, Joshi, & Beaubien, 2002).

According to Bandura (1986), self-efficacy is constructed based on information provided by four main sources: mastery experiences (personal performance accomplishments), vicarious experiences (observation of other people’s performance attainments), social persuasion (support or not support one receives from significant others for engaging in particular activities) and physiological and affective states (emotional and physical reactions to personal experiences). In the present research, we focused on social comparison as a particular type of vicarious experience, i.e., a concept that refers to relating one’s own characteristics to those of other similar individuals (e.g., Wood, 1989).

Individuals may engage in upward comparisons with colleagues who are performing in a more competent and adequate way than they do, and they may engage in downward comparisons with colleagues who are performing in a less competent and more inadequate way than they do. For instance, previous research has shown that downward comparisons contribute to an individual’s well-being (Gibbons & Gerrard, 1991) and promote relatively good functioning (Affleck, Tennen, Pfeiffer, & Fifield, 1987; Vrugt, 1994). Expanding social comparison theory, the Identification-Contrast model proposed by Buunk and Ybema (1997) assumes that upward as well as downward comparisons may be interpreted in a positive or negative way, depending on whether one contrasts or identifies oneself with the comparison target. Identification has been defined in various ways, for example as closeness to the target (Tesser, 1988), as forming a bond with the target (e.g., Miller, Turnbull, & McFarland, 1988), or as being similar in personality to the target (Wills, 1991). In the present model, identification refers to viewing the situation...
of the target as a similar potential future for oneself (Buunk & Ybema, 1997; Van der Zee, Buunk, Sanderman, Botke, & Van den Berg, 2000).

Therefore, we assumed that individuals who engage in upward identification, i.e., identification with successful others, will assume that it is possible to reach the position of such others which may raise their self-efficacy and performance. Research on modeling has shown that exposure to the successful attainments of others may increase one’s self-efficacy (Bandura, Reese, & Adams, 1982; Brown & Inouye, 1978; Kazdin, 1979; Schunk, 1986). This is in line with Lockwood and Kunda’s (1997) finding that individuals are motivated and inspired even by targets that perform extremely well – so-called “superstars” - when they believe that they also can attain comparable success. In contrast, those who engage in downward identification will have a lower self-efficacy, i.e., they will identify with unsuccessful others and will assume that the situation of these others represents a possible self for themselves that will also relate to a poorer performance (Buunk, Collins, Taylor, Van Yperen, & Dakof, 1990; Buunk, Ybema, Gibbons, & Ipenburg, 2001). Indeed, observing similar others fail may lower observers’ judgments of their own efficacy and may undermine their efforts (Vrugt & Koenis, 2002; Vrugt, Oort, & Zeeberg, 2002).

Comparing oneself to others from a contrast perspective means that one takes an antagonistic stance, and views the other as a competitor. This process implies that one responds with frustration and resentment when one perceives a successful other (upward contrast). This will be associated with a lower self-efficacy and performance. In general, there is evidence that strong competitive focus will hinder successful performance as individuals focus on the fact that they are not as good as others, rather than on how to improve their own performance (e.g., Van Yperen & Janssen, 2002). According to Collins (1996), upward comparison may be perceived as threatening, and may influence an individual’s self-evaluation unfavourably when the comparing individual feels he or she is clearly inferior to the comparison target. Vice versa, contrasting oneself with an unsuccessful other (downward contrast) may induce feelings of pride and satisfaction. Indeed, feeling superior to those who are doing worse will result in a more favorable evaluation of the actual self, will boost the self-esteem and will induce a positive future self. Thus, downward contrast may be positively related to self-efficacy and...
In line with our reasoning, there is evidence that downward identification and upward contrast are positively related to individuals’ well-being, for example to burnout among teachers (Carmona, Buunk, Peiró, Rodríguez, & Bravo, 2006), and to depression among people with spinal cord injury (Buunk, Zurriaga, & Gonzalez, in press). Therefore, we expected that those individuals who engage in upward identification or downward contrast will have higher self-efficacy and performance (hypothesis 1) and those who engage in downward identification or upward contrast will have lower self-efficacy and performance (hypothesis 2).

Regarding goals, we assumed that the salience of a particular goal orientation (promotion and prevention) will be associated with specific identification and contrast processes in social comparison. According to regulatory focus theory (Higgins, 1997), two kinds of regulatory goals are distinguished: (1) a focus on aspirations and accomplishments (i.e., promotion focus) and (2) a focus on responsibilities and safety (i.e., prevention focus). These two foci are assumed to develop since childhood and may underlie people’s perspectives about what they consider significant in their lives. Individuals with a strong promotion focus are strategically inclined to approach matches to what they consider their ideal self, i.e., the way they want to be, whereas individuals with a strong prevention focus are strategically inclined to avoid mismatches to what they consider their ought self, i.e., they way they should be (Shah, Higgins, & Friedman, 1998). In particular, previous research has demonstrated that promotion-focused individuals are most inspired by positive role models, who highlight strategies for achieving success, and that prevention-focused individuals are most motivated by negative role models, who highlight strategies for avoiding failure (Lockwood, Jordan, & Kunda, 2002). Thus, we expect that individuals with a promotion focus will engage more strongly in upward identification and downward contrast (hypothesis 3). Indeed, such individuals will be directed towards attaining success, and will therefore identify more with others who are doing better, and thus perceive themselves as capable of acting as those others. Given their focus on success, they will also tend to contrast themselves with others who are doing worse, and thus perceive themselves as capable of doing better. Therefore, we expected that individuals with a prevention focus will be directed towards avoiding
failure, in part as a result of identification with others who are doing worse, and of contrast with others who are doing better (hypothesis 4). Indeed, they will experience negative feelings from perceiving oneself as inferior to successful others, and be concerned about becoming like unsuccessful others (cf. Lockwood, Jordan, & Kunda, 2002).

In addition, we expected that individuals characterized by a promotion orientation will have higher self-efficacy perceptions (hypothesis 5), and those characterized by a prevention orientation will have lower self-efficacy (hypothesis 6). That is, a high self-efficacy implies viewing difficult tasks as challenges to be mastered rather than as threats to be avoided, whereas a low self-efficacy implies the lack of confidence that one may attain challenging goals, which will be associated with a tendency to avoid failure rather than seek success. Finally, we expected that social comparison strategies will mediate the relationship between goal orientation and self-efficacy. In particular, we expected that downward identification and upward contrast would mediate the relationship between prevention goal orientation and self-efficacy (hypothesis 7), and upward identification and downward contrast would mediate the relationship between promotion goal orientation and self-efficacy (hypothesis 8). In addition, we expected another two mediation effects. That is, self-efficacy would mediate the relationship between both upward identification and downward contrast, and performance (hypothesis 9), and between both upward contrast and downward identification, and performance (hypothesis 10). Finally, we expected that this self-efficacy will be associated with academic performance (hypothesis 11).

In sum, we expected that different types of goal orientation will lead to specific social comparison responses, and that these specific social comparison responses will lead to self-efficacy, which will lead to performance. The expected relationships for the hypothesized model are shown in Figure 1.
Method

Participants and Procedure
One hundred and twenty Dutch university students (62 men and 58 women) participated in this study. The ages of the participants ranged from 19 to 30 years, and the mean age was 22.23 years ($SD = 2.15$ years). All participants were asked to fill in the questionnaire and were paid five euros for their participation.

Measures

Self-efficacy. Self-efficacy belief in academic success was measured with an adapted version of the self-efficacy subscale included in the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich & De Groot, 1990). Students indicated their capability for performing successfully indicating their level of agreement to nine statements using a 7-point Likert scale. Participants were asked to rate the items in terms of their general success behavior in the studies, such as “I am sure I can do
an excellent job on the class assignments and homework”. Cronbach’s alpha for this scale was .89. In addition, the data were examined using Confirmatory Factor Analysis (CFA) based on the correlation matrix and maximum likelihood estimation (LISREL8, Jöreskog & Sörbom, 1996). Results showed a good fit model for all the items. The χ² goodness of fit statistic was significant (33.64, df = 23, p = 0.07) and the Goodness of Fit Index (GFI) = .94 indicating both that the hypothesized model did fit the data. In addition, other relative goodness-of-fit indices were computed (Bentler, 1990). Results for the Root Mean Square Error of Approximation (RMSEA), the Standardized Root Mean Square of Error (SRMR), the Adjusted Goodness of Fit Index (AGFI), the Normed Fit Index (NFI), the Non-Normed Fit Index (NNFI), and the Comparative Fit Index (CFI) were 0.06, 0.05, 0.88, 0.97, 0.98, and 0.99, respectively indicating a good fit of the model.

Social Comparison Responses. To assess upward and downward comparison responses, students answered an adapted version of the Identification-Contrast Scale (Van der Zee, Buunk, Sanderman, Botke, & Van den Bergh, 2000) that were used to assess retrospectively how individuals respond to comparisons with better-off and worse-off others. These scales, based on the identification-contrast model (Buunk & Ybema, 1997), reflect that feelings and cognitions in response to social comparison are the result of either an identification or a contrast process. The internal consistency and stability of this scale has previously been shown to be high (Van der Zee, et al., 2000; Van der Zee, Buunk, Sanderman, Botke, & Van den Bergt, 1999). In addition, these scales have been used recently in various contexts and have been found to be relevant in theoretically meaningful ways related to variables such as burnout, coping styles, life satisfaction and subjective well-being (Brenninkmeijer, Van Yperen, & Buunk, 2001; Carmona et al., 2006; Frieswijk, Buunk, Steverink, & Slaets, 2004a, 2004b).

This scale contains 12 items grouped in four scales. The reliability for the scales was for downward identification (3 items, α = .75), for upward contrast (3 items, α = .83), for upward identification (3 items, α = .86) and, for downward contrast (3 items, α = .76). The respondents answered on a 5-point scale running from “I strongly disagree” (1) to “I strongly agree” (5). As an item of downward contrast, respondents were for example asked, “When I see students who experience more difficulties than I do, I
am happy that I am doing so well myself”. Downward identification was for example measured by asking the students “When I see students who are doing worse, I experience fear that my future will be similar”. As upward contrast item “When I see students who are doing better than I am, I feel frustrated about my own situation”. In addition, for upward identification “When I see students who are doing better that I am, I realize that it is possible to improve”. Additionally, the data were examined using Confirmatory Factor Analysis (CFA) based on the correlation matrix and maximum likelihood estimation (LISREL8, Jöreskog & Sörbom, 1996). Results showed a good fit model for the four factors. The $\chi^2$ goodness of fit statistic was significant ($53.33, df = 46, p = 0.21$) and the Goodness of Fit Index (GFI) = .93 indicating both that the hypothesized model did fit the data. In addition, other relative goodness-of-fit indices were computed (Bentler, 1990). Results for the Root Mean Square Error of Approximation (RMSEA), the Standardized Root-Mean-Square-of-Error (SRMR), the Adjusted Goodness of Fit Index (AGFI), the Normed Fit Index (NFI), the Non-Normed Fit Index (NNFI), and the Comparative Fit Index (CFI) were 0.04, 0.06, 0.88, 0.90, 0.98, and 0.98, respectively indicating a good fit of the model.

**Goal orientation.** In order to measure promotion and prevention focus, a brief version of the Regulatory Focus Questionnaire was used. The original questionnaire consists of two subscales, promotion $\alpha = .81$, and prevention $\alpha = .75$ (Lockwood, Jordan, & Kunda, 2002). For promotion goals (five items) as “I typically focus on the success I hope to achieve in the future” and concerning prevention goals (five items) as “I frequently think about how I can prevent failures in my life”. For prevention goals, Cronbach’s $\alpha = .59$ and for promotion goals, Cronbach’s $\alpha = .61$. All items were rated on a 7-point scale with endpoints labeled 1 (not at all true of me) and 7 (very true of me). An additional Confirmatory Factor Analysis (CFA) was performed with data from a correlation matrix and with maximum likelihood estimation (LISREL8, Jöreskog & Sörbom, 1996). Results showed a good fit model for the two factors. The $\chi^2$ goodness of fit statistic was significant ($40.81, df = 28, p = 0.06$) and the Goodness of Fit Index (GFI) = .93 indicating both that the hypothesized model did fit the data. In addition, other relative goodness of fit indices were computed (Bentler, 1990). Results for the Root Mean Square Error of Approximation (RMSEA), the Standardized Root Mean Square of Error
(SRMR), the Adjusted Goodness-of-Fit Index (AGFI), the Normed Fit Index (NFI), the Non-Normed Fit Index (NNFI), and the Comparative Fit Index (CFI) were 0.06, 0.08, 0.87, 0.81, 0.87, and 0.92, respectively indicating for most of the indices a good fit of the model.

In addition, an additional Confirmatory Factor Analysis (CFA) was conducted to determine the plausability of the independent factors: self-efficacy, promotion and prevention goal orientation, that may be in fact conceptually related. The CFA did show three independent factors. The $\chi^2$ goodness of fit statistic was nearly non significant (164.62, $df = 132, p = 0.03$) and the Goodness of Fit Index (GFI) was 0.87, indicating that our model did in part fit the data. In addition, other relative goodness of fit indices (Bentler, 1990) were performed. Results for the Root Mean Square Error of Approximation (RMSEA), the Standardized Root Mean Square of Error (SRMR), the Adjusted Goodness of Fit Index (AGFI), the Normed Fit Index (NFI), the Non-Normed Fit Index (NNFI), and the Comparative Fit Index (CFI) were 0.04, 0.07, 0.81, 0.90, 0.96, and 0.97, respectively. The results showed provided in general good support for the independent operationalization of the factors. First, there was not any overlap between the self-efficacy and promotion goal orientation factors, indicating that these two concepts are conceptually independent. Second, although one item had a loading on the self-efficacy as well as on the prevention goal orientation factor, and on the promotion as well as on the prevention goal orientation factor, these loadings were not higher on the non-hypothesized factor than on the hypothesized factor.

Academic performance. The mean grade on the second trimester was used as a measure for academic performance. In the Dutch grading system, grades are given on a 10-point scale with 10 representing the higher grade.

Results

Means, standard deviations, and the univariate relations between goal orientation, social comparison, self-efficacy, and performance are shown in Table 1.
Table 1. *Descriptive Statistics and Intercorrelations between Subscales*

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<td>1. DI</td>
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<td>.06</td>
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<td>-.16</td>
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<td>2. DC</td>
<td>3.86</td>
<td>0.83</td>
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<td>3. UI</td>
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<td>4. UC</td>
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<td>5. PRO</td>
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<td>6. PRE</td>
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<td>7. SEF</td>
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<td>8. AP</td>
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*Note.* DI = downward identification; DC = downward contrast; UP = upward identification; UC = upward comparison; PRO = promotion goals; PRE = prevention goals; SEF = self-efficacy; AP = academic performance. *p < .05. **p < .01.

²The results for Model 2 showed that the $\chi^2$ goodness of fit statistic was significant ($57.3$, $df = 14$, $p = 0.00$) as well as the Goodness of Fit Index (GFI) = 0.89, indicating that the hypothesized model did not fit the data. In addition, we computed other relative goodness-of-fit indices (Bentler, 1990). Results for the Root Mean Square Error of Approximation (RMSEA), the Standardized Root-Mean-Square-of-Error (SRMR), the Adjusted Goodness-of-Fit Index (AGFI), the Normed Fit Index (NFI), the Non-Normed Fit Index (NNFI), and the Comparative Fit Index (CFI) were 0.17, 0.10, 0.71, 0.59, 0.22, and 0.61, respectively. In addition, the results for Model 3 showed that $\chi^2$ goodness of fit statistic was significant ($46.3$, $df = 14$, $p = 0.00$) and the Goodness of Fit Index (GFI) = .90 indicating that the hypothesized model did not fit the data. Moreover, other relative goodness-of-fit indices were computed (Bentler, 1990). Results for the Root Mean Square Error of Approximation (RMSEA), the Standardized Root-Mean-Square-of-Error (SRMR), the Adjusted Goodness-of-Fit Index (AGFI), the Normed Fit Index (NFI), the Non-Normed Fit Index (NNFI), and the Comparative Fit Index (CFI) were 0.14, 0.10, 0.75, 0.65, 0.31, and 0.68, respectively, indicating also a poor fit of the model. Thus, these results suggest that the hypothesized model does fit the data better than the alternative models.
Some correlations are of special interest. The results show that three of the six correlations between the four measures of social comparison are not significant while the remaining three correlations range from $r = -0.21$ to $r = 0.35$. This underscores the relative independence of the social comparison measures. Furthermore, as expected on theoretical grounds, the correlation between self-efficacy and promotion goals was significant and positive ($r = 0.42$), while the correlation with prevention goals was significant and negative ($r = -0.29$). Lastly, promotion goals were hardly related to the social comparison measures while prevention goals were related positively to downward identification ($r = 0.38$) and upward contrast ($r = 0.45$). All these relations are in theoretical meaningful directions.

Next, a structural equation model was estimated using the computer software Linear Structural Relations 8.5 (LISREL8, Jöreskog & Sörbom, 1996) to fit the path model to the data. A maximum likelihood method (MLS) with data from covariance matrix was employed, and the goodness-of-fit of the models was evaluated using absolute and relative indices. The results for the hypothesized model 1 showed that the $\chi^2$ goodness of fit statistic was not significant (14.6, df = 14, $p = 0.41$) and the Goodness of Fit Index (GFI) = 0.97 indicating both that the hypothesized model did fit the data. In addition, we computed other relative goodness-of-fit indices (Bentler, 1990). Results for the Root Mean Square Error of Approximation (RMSEA), the Standardized Root Mean Square of-Error (SRMR), the Adjusted Goodness of Fit Index (AGFI), the Normed Fit Index (NFI), the Non-Normed Fit Index (NNFI), and the Comparative Fit Index (CFI) were 0.06, 0.05, 0.92, 0.90, 0.99, and 0.99, respectively. All the relative fit-indices values indicated a good fit (Hoyle, 1995). Therefore, we conclude that the results provided support for the model. The relationships between these variables are shown in the path model by regression coefficients (Figure 2).

In addition, because causality can not be specified with the former analysis and results, we decided to test two alternative structural equation models. In Model 2, we examined whether self-efficacy did affect the positive or negative social comparison responses (upward identification, downward contrast, upward contrast and downward identification), whether these responses affected promotion and prevention goal orientation, and whether in turn, goal orientations affected performance.
In Model 3, we examined whether self-efficacy did affect promotion and prevention goal orientation, whether these orientations affected the social comparison responses, and finally whether these responses affected performance. The results showed that both the alternative Model 2 and the alternative Model 3 had a poorer fit than the hypothesized Model 1. Next, we tested the potential confounding effect of the social comparison responses on both goal orientation and self-efficacy. The results for this model showed that the $\chi^2$ goodness of fit statistic was non significant ($21.64, df = 3, p = 0.00$) and the Goodness of Fit Index (GFI) = 0.95 indicating that the hypothesized model did not fit the data. In addition, relative goodness of fit indices (Bentler, 1990) were performed. The results for the Root Mean Square Error of Approximation (RMSEA), the Standardized Root-Mean Square of Error (SRMR), the Adjusted Goodness-of-Fit Index (AGFI), the Normed Fit Index (NFI), the Non-Normed Fit Index (NNFI), and the Comparative Fit Index (CFI) were 0.23, 0.07, 0.52, 0.77, -0.77, and 0.75, respectively. The results for the confounding model did not fit the data. Thus, we can assume that our findings are not due to this specific confounding effect.

In Figure 2, the different estimated structural coefficients between the variables according to the hypothesized Model 1 are shown. We expected that the stronger individuals engage in upward identification or downward contrast, the higher their self-efficacy and performance will be (hypothesis 1). However, this hypothesis could not be confirmed. Next, we expected that the stronger individuals engage in downward identification or upward contrast, the lower their self-efficacy and performance will be (hypothesis 2). This hypothesis was partially confirmed. That is the more individuals contrasted themselves with others who were doing better, the lower self-efficacy they perceived and the lower performance they obtained. Next, it was expected that the stronger individuals set promotion goals, the more they will engage in upward identification and downward contrast (hypothesis 3). The first relation was verified: stronger promotion goals were related to upward identification. In addition, it was expected that stronger individuals set prevention goals, the more they will engage in downward identification and upward contrast (hypothesis 4). Both relations were verified. Next, we expected that the stronger individuals set promotion goals, the higher their self-efficacy will be (hypothesis 5) and the stronger individuals set
prevention goals, the lower their self-efficacy will be (hypothesis 6). Both hypotheses were verified.

Regarding mediation analyses, according to Mackinnon, Lockwood, Hoffman, West, and Sheets (2002) we tested our mediation expectations. Specifically, we expected that upward identification and downward contrast would mediate the relationship between promotion goal orientation and self-efficacy (hypothesis 7). However, this hypothesis was not confirmed; and that downward identification and upward contrast would mediate the relationship between prevention goal orientation and self-efficacy (hypothesis 8). As can be seen in Figure 2, this hypothesis was partially confirmed. Upward contrast, but not downward identification, mediated the relationship between prevention goal orientation and self-efficacy. Next, it was expected that self-efficacy would mediate the relationship between both upward identification and downward contrast, and performance (hypothesis 9). However, results did not confirm this hypothesis. Moreover, it was expected that self-efficacy would mediate the relationship between both upward contrast and downward identification, and performance (hypothesis 10). The results confirmed in part our hypothesis. That is, self-efficacy mediated the relationship between upward contrast and academic performance. Lastly, as expected (hypothesis 11), self-efficacy was related to academic performance.

Because of the multiple-mediation nature of our model, as suggested by Mackinnon (2000), and Mackinnon, Lockwood, Hoffman, West, & Sheets (2002) we performed two tests of mediation with products of coefficients. In the first mediation analysis that we tested, the relationship between a prevention goal orientation (a) and self-efficacy (c) was non significant, $c' = -.14 (.08), p > .05$. In addition, the mediated effect was significant, $ab = -.11 (.043), z = -2.51, p < .05$, indicating that upward contrast (b) significantly mediated the relationship between a prevention goal orientation (a) and self-efficacy (c). Next, in the second mediation analysis that we tested, the relationship between upward contrast (a) and performance (c) was non significant, $c' = -.02 (.08), p > .05$. Moreover, the mediated effect was significant, $ab = .15, z = -2.83, p < .01$, indicating that self-efficacy (b) mediated the relationship between upward contrast (a) and performance (c).
Discussion

The purpose of this study was to examine the relationships between goal orientation, social comparison strategies, self-efficacy, and academic performance. We assumed that the way individuals compare themselves with successful and unsuccessful others will be related to their self-efficacy perceptions, and that this process would mediate the relationship between goal orientation (i.e. the focus on promotion of success versus the prevention of failure) and self-efficacy. The results showed that of the four measures of social comparison, only upward contrasting was related to
self-efficacy. That is, the stronger individuals focused on dissimilarities from others who were doing better (upward contrast), the lower their self-efficacy was. This special position of upward contrasting among the social comparison measures was underscored by the correlations: only upward contrast correlated significantly with the other three social comparison measures, with self-efficacy and performance.

Apparently, students who viewed academically successful others as a more threatening competitors for themselves had low self-efficacy. It seems that specifically upward contrasting provides relevant vicarious information for self-efficacy and performance. This finding is in line with previous research that particularly shows that upward contrast is also related to indices of low well-being such as burnout and depression (Carmona et al., 2006; Buunk et al., in press). Especially individuals with a stronger prevention goal orientation engaged in upward contrasting; the more they tried to prevent failures, the stronger they focussed on dissimilarities from others who were doing better and the worse they felt.

Two additional tests for mediation were conducted following procedures described by Baron and Kenny (1986). First, we showed that upward contrast mediated the relationship between prevention goal orientation and self-efficacy. The requirements for this mediation were met. The independent variable predicted the dependent variable ($\beta = -.19$, $p < .05$); the independent variable predicted the mediator ($\beta = .40$, $p < .01$), the mediator predicted the dependent variable ($\beta = -.24$, $p < .05$); and when the mediator was included in the model with the independent variable, the relation between the independent variable and the dependent variable was substantially reduced and non significant ($\beta = -.06$, $p > .05$). Second, we showed that self-efficacy mediated the relationship between upward contrast and performance. The requirements for this mediation were met. The independent variable predicted the dependent variable ($\beta = -.21$, $p < .05$); the independent variable predicted the mediator ($\beta = -.24$, $p < .01$), the mediator predicted the dependent variable ($\beta = .53$, $p < .05$); and when the mediator was included in the model with the independent variable, the relation between the independent variable and the dependent variable was substantially reduced and non significant ($\beta = -.03$, $p > .05$).
Similarly, the more they tried to prevent failures, the stronger they focussed on similarities with others who were doing worse and the worse they felt. This suggests that individuals high in prevention goal orientation are more vulnerable to social comparison information because they process this information in a non-constructive way. In contrast, promotion goal orientation was only weakly related to upward identification; the stronger individuals set themselves promotion goals, the more they benefited from focusing on those who were doing better. In sum, prevention goal orientation was clearly related to non-constructive social comparison processes while promotion goal orientation was only weakly related to constructive social comparison processing.

One significant path in our model stood out: the path from prevention goal orientation, upward contrast, self-efficacy and performance. In a “causal interpretation”, this chain might mean that a stronger focus on preventing failures makes people compare themselves to others in a negative way, which decreases their self-efficacy which, in turn, undermines their performance. However, several limitations deserve attention. First, the size of the sample was too small to include all the items instead of composite scores to test the overall model. Second, the results are based on correlations, therefore we need to be cautious with making causal interpretations. Of course, we did find a better fit for our model than for various alternative models. Nevertheless, unequivocal causal links cannot be assumed on the basis of correlational studies, and it might be relevant to replicate the present in studies using experimental methods. Our results may provide a series of interesting hypotheses to examine in sun studies. It might be relevant to pay attention to what models in this study had and did not have a good fit. Third, since the subject population used in this study was only students, caution should be taken in attempting to generalize the findings to other samples. However, previous research has shown evidence for the relationship between social comparison, goals and self-efficacy in a work context. In particular, among academic staff members perceived self-efficacy and goals have been found to predict scientific productivity (Vrugt & Koenis, 2002). Fourth, the results do not show that the social comparison responses and self-efficacy mediated the relationship between goals and performance. In fact, what our data suggest is a psychological sequence from goals to performance through two mediation effects that may be interpreted as an indirect
mediation effect. In addition, we do not suggest that self-efficacy has a one-directional effect on performance. In fact, previous performance may also influence self-efficacy perceptions. In particular, according to self-efficacy theory (Bandura, 1977), self-efficacy perceptions develop mainly from four sources, (one of those sources is mastery experiences—personal performance accomplishments), and both factors develop in a process of reciprocal influence. That is, the higher in self-efficacy the better performance individuals may have, and vice versa, the better performance the higher self-efficacy individuals may perceive. Finally, the reliability of the goal orientation scales were rather low. However, the Conﬁrmatory Factor Analysis (CFA) showed a good ﬁt of the model for the two goal orientation factors.

To conclude, the present research is the first to explicitly address how goal orientation and identiﬁcation and contrast from social comparison may be related to academic self-efficacy and performance. Thus reﬁning the notion of Bandura (1977), we have shown that vicarious experiences are one of the major factors affecting the development of self-efficacy and the subsequent performance. Although of a correlational nature, the present research may contribute to illuminating how such experiences may, and may not, enhance self-efficacy. The present ﬁndings do not offer unambiguous evidence for the direction of causality between the variables, and future studies are required to address causality. In general though, we have provided some initial evidence for the association between the salient goal orientation individuals have developed during lifetime, the way they compare themselves with others, and how self-conﬁdent they feel for achieving success.