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Psychological need fulfillment as a mediator of the relationship between transformational leadership and positive job attitudes

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Abstract

Purpose – The purpose of this paper is to explore the possible mediating role of need fulfillment in the relationship between transformational leadership and employee job attitudes (job satisfaction and dedication).

Design/methodology/approach – The two samples include both cross-sectional and diary data. The cross-sectional sample (sample 1) consisted of 661 employees from various organizations. In the diary study (sample 2), 65 employees completed a daily questionnaire on five consecutive working days, yielding 325 measurement points in total. The authors analyzed the data using structural equation modeling (Mplus 5) and multilevel analyses (MLwiN 2.20).

Findings – As hypothesized, support for full mediation of the relationship between transformational leadership and positive job attitudes through the fulfillment of psychological needs were found both on a general level and on a daily basis.

Originality/value – The paper is based on a multi study approach and empirically addresses the link between transformational leadership and positive job attitudes, and the role of basic need fulfillment in this relationship on both a general and daily level.

Keywords Transformational leadership, Job satisfaction, Psychological need fulfillment, Work dedication

Paper type Research paper



A fundamental assumption in transformational leadership theory is that transformational leaders enhance followers' effectiveness, confidence, and motivation by meeting their needs (Bass and Riggio, 2006). In line with this assumption, a large amount of existing research shows that transformational leaders influence important employee outcomes like motivation (Hetland and Sandal, 2003), job attitudes (Podsakoff *et al.*, 1996), and well-being (Nielsen *et al.*, 2008). However, in the beginning of this millennium several authors pointed to a lack of knowledge concerning explanatory mechanisms through

which transformational leadership influences followers' job attitudes and performance (Bono and Judge, 2003; Podsakoff *et al.*, 2000; Yukl, 1999). The research following these calls has collectively shown that the effects of transformational leadership are woven and mediated through processes such as efficacy, psychological empowerment, trust, and identification (Walumbwa *et al.*, 2008). Although there has recently been a growing awareness of the importance of the fulfillment of basic psychological needs at the work place (Gagne, 2003; Lynch *et al.*, 2005), as far as we know only one study has specifically examined psychological need fulfillment as a mechanism through transformational leadership leads to favorable outcomes. In this study Kovjanic *et al.* (2012) successfully demonstrated that psychological need fulfillment partially mediates the relationship between transformational leadership and job satisfaction in two different samples.

Moreover, the interaction between a leader and his or her followers is indeed dynamic by nature. A general limitation in the field of organizational and applied social sciences is the wide use of static cross-sectional designs not taking into account the dynamic nature of the variables and their interrelationships (Ployhart and Vandenberg, 2010). Hence, an important contribution to the field would be to complement more static designs in the study of leader-follower relationships and its possible explanatory mechanisms, with designs that capture the possible day-to-day dynamics in these processes. Such designs are often referred to as diary designs, and during the past decade, diary methods are increasingly used in work and organizational research (Ohly *et al.*, 2010). Moreover, compared to cross-sectional or longitudinal designs with time lags of several months and even years, diary methods are useful to capture the short-term dynamics of experiences within and between individuals in the work context (Ohly *et al.*, 2010). Based on this, the aim of the present study is to explore the potential mediating role of psychological need fulfillment in the relationship between transformational leadership and two different positive job attitudes, namely job satisfaction and work dedication, using two complementary research designs. In the first study we used cross-sectional data collected from a large heterogeneous population of Norwegian employees (Study 1) strictly focussing on between person variances. In contrast, the second study represents a diary study (Study 2) which is based on a smaller sample of employees that reports on the study variables for five consecutive working days. This study allows us to analyze both between- and within-person variances across the five working days.

Theoretical background

Transformational leadership implies inspiration to constant change through the following four components: idealized influence, inspirational motivation, intellectual stimulation, and individual consideration (Avolio and Bass, 2004). Idealized influence and inspirational motivation indicate that the leader provides followers with a clear sense of purpose that is energizing; the leader serves as a role model for ethical conduct which builds identification with the leader and his/her articulated vision. Through intellectual stimulation the leader gets followers to question the tried and true ways of solving problems; encourages them to question the methods they use in order to improve upon them. Finally, through individualized consideration the leader focusses on understanding the needs of the followers and works continuously to get them to develop to their full potential.

As transformational leadership through its four components imply inspiring, engaging, mentoring, and empowering employees, we argue in this paper that it should be closely linked to positive employee job attitudes. Accordingly, during the last two

decades, research has consistently shown the superiority of transformational leadership compared to other leadership styles in terms of work unit effectiveness (Lowe *et al.*, 1996). Moreover, transformational leadership is linked to a positive learning climate (Hetland *et al.*, 2011a), positive job attitudes, such as job satisfaction (Podsakoff *et al.*, 1996) and work engagement (Tims *et al.*, 2011), and to other measures of well-being at the work place (Arnold *et al.*, 2007).

The present study focusses on two job attitudes as outcomes of transformational leadership, namely job satisfaction and dedication to work. In general, job attitudes are defined as “how people feel about what they do when they work” (Salancik and Pfeffer, 1977). Hence, job satisfaction and work dedication are both regarded as job attitudes. Still, it can also be argued that job satisfaction and work dedication have different qualities. Locke (1976) defined job satisfaction as a “pleasurable or positive state resulting from appraisal of one’s job or job experiences.” Regarding dedication to work, Schaufeli and Bakker (2010) claim that it is a key component of work engagement, and define dedication as “being strongly involved in one’s work, and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge.” In this respect, job satisfaction represents a more general attitude reflecting the overall evaluation of a job, while dedication represents a more specific attitude towards work tasks and therefore is more likely to fluctuate from day-to-day.

As mentioned above, the link between transformational leadership and job attitudes is well-established. Interestingly, a recent study has shown that such a relationship also exists on a day-to-day level (Tims *et al.*, 2011). The results from this study suggest that there are day-to-day variations in both followers’ experiences of transformational leadership behaviors and levels of work engagement during one working week. Thus, on days where followers experience high levels of transformational leadership behaviors they also report correspondingly high levels of work engagement. A theoretical assumption within transformational leadership theory is that inspirational leaders spark enthusiasm, inspiration, and dedication in followers. Based on the theoretical assumptions as well as the empirical evidence referred to above we hypothesize for Study 1 and Study 2, respectively:

H1a. Transformational leadership is positively linked to followers’ job satisfaction.

H1b. Day-level transformational leadership is positively linked to followers’ day-level work dedication.

The main aim of the present study is to examine if fulfillment of followers’ psychological needs at the work place has a mediating function in the relationship between transformational leadership behaviors and positive job attitudes. Hence, a necessary premise is that the fulfillment of psychological needs is related to positive job attitudes. Along this line, the assumption that fulfillment of followers’ needs is crucial for employee motivation, is indeed in line with self-determination theory (Deci and Ryan, 2000). Within SDT needs are universal necessities that constitute nutrients that are required for proactivity, optimal development, and psychological health of people (Deci and Vansteenkiste, 2004). One basic assumption within this context is that human beings have three inherent psychological needs, namely the needs for: autonomy; competence; and relatedness. The need for autonomy implies that people have a universal urge to be causal agents and to experience volition (deCharms, 1968). The need for competence concerns people’s inherent desire to be effective in dealing with the environment (White, 1959), whereas the need for relatedness or belongingness reflects the universal propensity to interact with, be connected to, and experience caring for other people (Baumeister and Leary, 1995).

According to SDT a person will be more likely to experience task enjoyment, job satisfaction, and psychological adjustment if his or her job satisfies these needs (Ilardi *et al.*, 1993). In line with this, fulfillment of psychological needs at the work place has been positively linked to constructs like job satisfaction (Ilardi *et al.*, 1993), well-being at work (Baard *et al.*, 2004), and the vigor component of work engagement (Van den Broeck *et al.*, 2008). The finding of a relationship between the fulfillment of the needs for autonomy, competence, and relatedness and well-being on a day-to-day basis in a student setting is also in line with the abovementioned assumption (Reis *et al.*, 2000). Accordingly, it is reasonable to expect day-to-day variations in individuals' perceptions of having their psychological needs fulfilled at their work place. It further indicates that fulfillment of psychological needs at work, is likely to be related to different measures of well-being and job attitudes on a day-to-day basis. However, to our knowledge no studies have examined daily fluctuations in the fulfillment of needs and its correlates in the work place on a day-to-day level. Based on the theoretical assumptions above and existing empirical evidence we hypothesize in Study 1 and Study 2, respectively:

- H2a.* Fulfillment of psychological needs at the work place is positively related to job satisfaction.
- H2b.* Day-level fulfillment of psychological needs at the work place is positively linked to followers' day-level work dedication.

As noted, fulfillment of followers' needs is postulated as a central explanatory mechanism in transformational leadership theory. Transformational leadership is postulated to meet followers' needs and as such lead to the extraordinary outcomes compared to other styles of leadership, for instance transactional leadership (Bass and Riggio, 2006). In line with this Hetland *et al.* (2011b) recently showed that transformational leadership indeed is directly related to the fulfillment of psychological needs. In this study they found substantial positive associations between transformational leadership and all of the three dimensions of need fulfillment postulated in SDT theory. As several studies cited earlier in this paper has shown that the fulfillment of psychological needs at work are precursors of positive job attitudes, it is also reasonable to assume that that psychological need fulfillment potentially explains why transformational leaders enhance positive job attitudes among their followers. In line with this, the fulfillment of needs has proven to be an important mediator in key relationships in the organizational setting. For example, Vansteenkiste *et al.* (2007) found considerable evidence for need satisfaction as an explanatory variable in the direct relationship of possessing an extrinsic, relative to an intrinsic work value orientation for outcome variables such as job attitudes and well-being. In another recent study, Van den Broeck *et al.* (2008) successfully demonstrated that need fulfillment partially mediated the relationship between job resources and vigor. Regarding the specific mediating role need fulfillment may have in the relationship between transformational leadership (or comparable leadership styles) and positive work behaviors and attitudes, we have knowledge of only three relevant studies. Using an experimental research design De Cremer and van Knippenberg (2002) found that group belongingness fully mediated the relationship between charismatic leadership and compliance. Expanding on this, using a cross-sectional design in a field setting, Den Hartog *et al.* (2007) found support for partial mediation of the link between charismatic leadership and followers' helping behaviors through the need for belongingness. However, in the latter study, the authors were not able to demonstrate a corresponding partial mediation of the direct relationship between charismatic leadership and followers' compliance. One central argument of the present

paper is that transformational leadership is linked to job attitudes through basic psychological need fulfillment. In support of this, Kovajanic *et al.* (2012) have recently empirically demonstrated that fulfillment of needs have a mediating role in the relationship between transformational leadership and different positive employee outcomes, including job satisfaction, in a study applying both a cross-sectional and a longitudinal sample. The finding of this study is the first to specifically support the fundamental assumption embedded in transformational theory that fulfillment of psychological needs has an important role in the leadership process.

Moreover, to our knowledge no studies yet address the mediating role of need fulfillment in the relationship between transformational leadership and the job attitude work dedication on a daily basis. Thus, we also wish to address this mechanism with focus on daily fluctuations in this paper.

In the two studies presented in the present paper, fulfillment of an overreaching construct of basic psychological needs is used as a potential mediator in the relationship between transformational leadership behaviors and job attitudes in accordance with self-determination theory. Taken together, we predict that transformational leadership will influence followers by meeting their three basic psychological needs, which consequently enhances followers' positive job attitudes. Thus, we hypothesize in Study 1 and Study 2, respectively:

H3a. The positive relationship between transformational leadership and job satisfaction will be mediated by the fulfillment of psychological needs at the work place.

H3b. The positive relationship between day-level transformational leadership and work dedication will be mediated by the day level of fulfillment of psychological needs at the work place.

STUDY 1: Method

Participants

Internet-based questionnaires were administered to 1,300 Norwegian cross-occupational employees. The final sample included 661 employees (response rate of 51 percent) working in several occupations: a major pharmaceutical company ($n = 127$), a regional health sector company ($n = 96$), a national TV station ($n = 172$), two different HR-sector consultancy companies ($n = 80$), and two university faculties ($n = 186$). In total, 301 respondents (46 percent) were female, and the mean age of the participants was 42.6 years. The majority of the respondents was married or living with a partner (67 percent), was living with children (53 percent), and had education at the university level (87 percent). The period of work life tenure ranged from new employees to employees who had tenure longer than 20 years ($\bar{x} = 17.4$, $SD = 9.40$), while the number of years in service in the present company ranged from one to six years ($\bar{x} = 3.0$, $SD = 1.42$).

Measurements

Transformational leadership. Transformational leadership was measured by the Multifactor Leadership Questionnaire (MLQ-form 5X) which consists of five subscales (idealized influence (attributed), idealized influence (behavior), inspirational motivation, intellectual stimulation, and individual consideration). Each of the subscales was measured by four items, following an overall heading referring to the respondents' nearest leader: "The person I am rating: [...]." Example items for the five subscales are,

respectively: "Acts in ways that build my respect," "Talks about his/her most important values and beliefs," "Talks optimistically about the future," "Seeks different perspectives when solving problems," and "Considers me to as having different needs, abilities, and aspirations from others." Respondents were asked to respond on a five-point scale ranging from (1 = not at all, 5 = frequently, if not always). Test of internal consistency revealed satisfactory reliability coefficients for idealized influence (attributed), inspirational motivation, intellectual stimulation and individual consideration (0.80, 0.83, 0.82, and 0.84, respectively), and a lower reliability coefficient for idealized influence (behavior) (0.64). In accordance with earlier research and practice (Hetland *et al.*, 2011a, b), composite scores of the five subscales were used as observed indicators of an overall construct of transformational leadership.

Fulfillment of basic psychological needs. Fulfillment of basic psychological needs was measured with the Basic Needs Satisfaction at Work scale (Deci *et al.*, 2001). The scale consists of 21 items measuring the three needs for autonomy (seven items), competence (six items), and relatedness (eight items). Example items for the three needs, respectively, are: "I feel like I can make a lot of inputs to deciding how my job gets done," "People at work tell me I am good at what I do," and "There are not many people at work that I am close to." In the questionnaire respondents were asked to respond along a seven-point scale ranging from (1 = not at all true, 7 = very true). Prior to analysis seven items had to be recoded due to reverse scoring, and composite scores of autonomy, competence, and relatedness were computed. The composite scores showed acceptable internal consistency ($\alpha = 0.68, 0.67,$ and $0.81,$ respectively). In accordance with earlier suggestions and practice (Van den Broeck *et al.*, 2008) the composite scores were applied as indicators of a higher order dimension of fulfillment of psychological needs. According to SDT, satisfaction of one need goes hand in hand with the satisfaction of the two other needs (Van den Broeck *et al.*, 2008). Consequently, satisfaction of the three psychological needs can theoretically and empirically be regarded as indicators of an overarching psychological need satisfaction construct (Deci *et al.*, 2001; Van den Broeck *et al.*, 2008; Vansteenkiste *et al.*, 2007).

Job satisfaction. Job satisfaction was measured with four items from the original Brayfield and Rothe's index for job satisfaction suggested by Judge *et al.* (2001). Example item is: "I feel fairly satisfied with my present job." The Norwegian translation of the scale has previously shown adequate internal consistency ($\alpha = 0.77$) (Hetland *et al.*, 2008). For descriptive purposes an average score of the four items was calculated. Before computation, one item was recoded due to reverse scoring. Reliability test showed that the reliability of the scale was satisfactory ($\alpha = 0.88$).

All scales were translated from English to Norwegian applying a forward-back translation procedure.

Procedure. Data were collected in a web-based survey that was carried out during Fall 2007/Spring 2008. Before initiating the study, meetings were arranged at which the leaders of invited organizations were informed about the study. Information was given in advance to participants about the aims and objectives of the study (by the CEO's of the organizations by electronic mail). A total of 1,300 invitations were sent, containing information about the survey and informed consent. The employees decided whether, where and when they were willing to answer the questions. The regional Ethics and Research committee approved the study protocol. Respondents were assured anonymity.

Analyses

The relationships between the study constructs were modeled by applying structural equation modeling using the Mplus 6 software. First, a measurement model of the latent study constructs with their respective indicators was estimated. Second, the discriminant validity of the constructs was tested by performing the Harman's single-factor test. Third, estimation of total, direct, and indirect effects was performed in a structural model implying the hypothesized paths between the study variables. Finally, bootstrap estimated confidence interval for the indirect (mediated) path was obtained within the Mplus 6 software. To evaluate the goodness of fit of the models, the following indices were applied: root-mean-square error of approximation (RMSEA); comparative fit index (CFI); and the Tucker-Lewis coefficient (TLI) also known as the Bentler-Bonett non-normed fit index. A value of RMSEA less than 0.05 indicates a good fit, while values as high as 0.08 represent reasonable errors of approximation in the population (Browne and Cudeck, 1993). Originally a CFI over 0.90 was considered to be representative of a well-fitting model (Bentler, 1992); however, a revised cut-off value close to 0.95 has more recently been advised (Bentler and Yuan, 1999). As all questions were administrated as mandatory in the web-based survey, none of the respondents had missing values on any of the study variables.

Results*Descriptive statistics*

Table I shows means, standard deviations, and inter-correlations of the study variables. All correlations between the study variables were significant ($p < 0.001$). As revealed in Table I, the correlations between the five transformational leadership facets and the psychological need fulfilment dimensions were in the range of 0.27-0.38, while the corresponding correlations with job satisfaction were in the range of 0.19-0.38. The correlations between the psychological need fulfilment dimensions and job satisfaction were in the range of 0.48-0.62.

Structural equation models

Prior to calculating the structural model, a measurement model with the three study constructs and their respective indicators was tested. In the model, a latent factor reflecting the five facets-scores of transformational leadership, a second latent factor reflecting the three composite scores of fulfilment of psychological needs, and a third latent factor representing the four observed indicators of job satisfaction were modeled.

Table I.
Mean, standard deviation, and correlations among Study 1 variables

	\bar{x}	SD	1	2	3	4	5	6	7	8
1. Idealized influence (Att.)	3.49	0.82								
2. Idealized influence (Beh.)	3.30	0.71	0.65*							
3. Inspirational motivation	3.61	0.80	0.75*	0.71*						
4. Intellectual stimulation	3.40	0.75	0.76*	0.60*	0.68*					
5. Individual consideration	3.42	0.83	0.78*	0.62*	0.69*	0.81*				
6. Autonomy	5.23	0.80	0.39*	0.30*	0.32*	0.36*	0.41*			
7. Competence	5.58	0.82	0.32*	0.29*	0.30*	0.34*	0.36*	0.63*		
8. Relatedness	5.55	0.84	0.37*	0.29*	0.34*	0.35*	0.38*	0.53*	0.60*	
9. Job satisfaction	2.04	0.86	0.38*	0.27*	0.32*	0.34*	0.38*	0.61*	0.62*	0.48*

Note: * $p < 0.001$

Moreover, the latent variables constituting the study constructs were allowed to co-vary in the model. The measurement model showed a good fit to the data ($\chi^2(51) = 202.10$, CFI = 0.97, TLI = 0.96, RMSEA = 0.067). In order to examine the discriminant validity of the constructs in the model, the measurement model was compared to an alternative model where all the observed indicators loaded on one single latent factor ($\chi^2(54) = 2,107.74$, CFI = 0.62, TLI = 0.53, RMSEA = 0.240, $\Delta\chi^2(3) = 2,107.74$, $p < 0.001$). The deterioration of fit, and the large increase of the χ^2 value support that the factors in the measurement model constitute factors that can be discriminated in the data, and that that our self-reports are less likely to be biased by common method variance (Podsakoff *et al.*, 2003). Furthermore, in the measurement model acceptable factor loadings were found for all the three latent constructs in the model. The factor loadings ranged from 0.67 to 0.91. Finally, significant correlations were obtained between the three latent constructs. Between transformational leadership and job satisfaction, and transformational leadership and need psychological need fulfillment, correlations of 0.43 and 0.52 were found, respectively. A correlation of 0.77 was found between psychological need fulfillment and job satisfaction.

In the next step, structural paths were added to the model, in order to estimate the hypothesized direct and indirect effects. Two structural models were tested. In the first model, only direct paths from transformational leadership to job satisfaction and need fulfillment were modeled. The fit indices indicated acceptable to poor fit ($\chi^2(52) = 478.70$, CFI = 0.92, TLI = 0.90, RMSEA = 0.11). Substantial paths were found from transformational leadership to job satisfaction ($\beta = 0.46$, $p < 0.001$) and to need fulfillment ($\beta = 0.55$, $p < 0.001$). In the second model, the path from need fulfillment to job satisfaction was added. The inclusion of this path resulted in a significant decrease of χ^2 ($\Delta\chi^2(1) = 276.60$, $p < 0.001$), and all fit indices indicated a good fit of the model to the data ($\chi^2(51) = 202.12$, CFI = 0.97, TLI = 0.96, RMSEA = 0.07). As shown in Figure 1, the path from need fulfillment to job satisfaction was strong and significant ($\beta = 0.75$, $p < 0.001$). Moreover, in line with the hypothesized full mediation, the path from transformational leadership to job satisfaction was no longer significant ($\beta = 0.04$, ns), while the path from transformational leadership to need fulfillment remained substantial and significant ($\beta = 0.52$, $p < 0.001$).

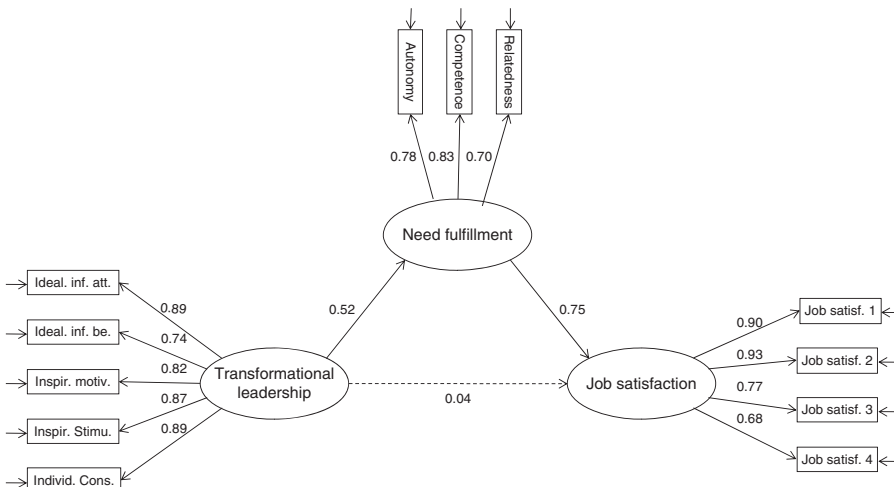


Figure 1.
Parameter estimates
for final structural
model, Study 1

A specific test of the indirect effect from transformational leadership, through need fulfillment, to job satisfaction, supports the significance of this effect ($\beta = 0.39, p < 0.001$). Furthermore, bootstrap estimated confidence intervals confirm the significance of the indirect path (95 percent CI: 0.291-0.490).

STUDY 2: Method

Participants and procedure

The second sample includes 65 employees working in 12 different knowledge organizations in Norway. The number of respondents from each of the 12 organizations varied from one to 11. All the respondents had daily contact with their nearest leader. In the sample, 36 of the respondents (55.4 percent) were female, and the mean age was 43.7 years. Moreover, 64.6 percent of the respondents had education at university level, and mean number of years in work life was 21.9.

The organizations and employees participating in the study were approached and recruited by three research assistants. Our research assistants contacted 12 random organizations in Hordaland County, Norway. All these 12 organizations allowed the research assistants to approach their employees to inform them about the study and ask if they were willing to participate. The diary booklets, instructions about the completion of the diary, and return envelopes, were distributed by postal mail to the employees willing participate. Furthermore, the respondents were allocated a unique number in order to be able to link a general and the daily questionnaires. The numbers were not at any point linked to the name of the respondents in order to assure complete anonymity. In the instructions the respondents were asked to initially complete the general questionnaire, and then to complete a daily questionnaire at the end of the working day (while still being at work) for five consecutive days. To assure that the respondents filled out the daily questionnaires at the instructed point of time, reminders were given by research assistants at the end of the five consecutive working days by e-mail or by phone. All in all, the collection of data were performed within a three-week period. All 65 respondents returned completed questionnaires, making up a response rate of 100 percent, and a total of 325 measurement occasions.

Measurements

General questionnaire. General work dedication. General work dedication was measured with the three-item subscale of the Utrecht Work Engagement Scale (Schaufeli and Bakker, 2010; Schaufeli *et al.*, 2006). An example item is: "I am enthusiastic about my job." The respondents were asked to respond on a seven-point scale ranging from never (0) to always (6). The scale showed adequate reliability ($\alpha = 0.65$).

Diary questionnaire data. In order to assess daily transformational leadership, daily fulfilment of basic needs (autonomy, relatedness, and competence), and daily dedication at work, we adapted existing scales such that they could be answered on a daily basis. In the adaptation, both number of items and wording of the scale items and response categories were adjusted to be appropriate for measuring the study constructs on a day-to-day basis.

Daily transformational leadership. Daily transformational leadership was measured by The Multifactor Leadership Questionnaire (MLQ-form 5X). Of the 25 original items measuring transformational leadership, 11 were applied in the present diary study. The items were chosen on the basis of face validity following a pre-set procedure. Two of

the principal investigators in the project suggested up to ten items from the original version of the MLQ using three criteria: first, all the four sub dimensions of transformational leadership (idealized influence (behavior), inspirational motivation, intellectual stimulation, and individual consideration) should be represented; second, items should be easily semantically transformed into day-level items; and third, items most likely fluctuate across a working day should be prioritized. From this pool of suggested items all four principal investigators in the project agreed on which items should finally be transformed and included in the daily questionnaire. In the questionnaire the statements followed an overall heading: "Today, my leader has [...]" Example item: "Talked enthusiastically about what needs to be accomplished." The respondents were asked to respond on a five-point scale ranging from (1 = strongly disagree, 5 = strongly agree). The scale showed good reliability (α), in the range of 0.91-0.95, across the five work days. Accordingly, in subsequent analyses we used one average score for daily transformational leadership.

Daily fulfillment of basic psychological needs. Daily fulfillment of basic psychological needs was measured by nine items using the Norwegian translation of the Work-related Basic Need Satisfaction Scale (Van den Broeck *et al.*, 2010). Each of the three dimensions (competence, autonomy, and relatedness) was measured by three items from the original scale. Example items for the three dimensions, respectively, are: "Today, I felt competent in my job," "Today, I felt like I could be myself at work," and "Today at work, I have felt like being part of a group" (1 = strongly disagree, 5 = strongly agree). The total Work-related Basic Need Satisfaction scale showed acceptable reliability (α) in the range from 0.62 to 0.75, across the five consecutive work days.

Daily dedication at work. Daily dedication at work was measured by an adjusted version of the three-item subscale of the Utrecht Work Engagement Scale (Schaufeli and Bakker, 2010; Schaufeli *et al.*, 2006). Sample item: "Today, I was enthusiastic about my job" (1 = strongly disagree, 5 = strongly agree). The scale showed good reliability (α) across the five work days in the range from 0.71 to 0.83.

All scales were translated from English to Norwegian applying a forward-back translation procedure.

Analyses

In order to capture the multilevel structure of the data, implying that the five daily measurements (level 1) of the study constructs were nested within individuals (level 2), we applied multilevel analyses by the use of MLwiN 2.20. In the analyses, the level 1 (day level) predictors were centered on the respective person mean, while the level 2 (person level) variable was centered on the grand mean. Formal test of the indirect effect in the model was conducted by estimating confidence intervals using a Monte Carlo method. The calculation was performed using an interactive tool based on the R-console (Preacher and Selig, 2010).

Results

Descriptive statistics

Table II shows means, standard deviations and person-level and day-level correlations among the study variables. As can be seen in Table II, on the person-level trait work dedication correlated significantly with both daily work dedication ($r = 0.52, p < 0.001$), and daily need fulfilment ($r = 0.32, p < 0.05$). Furthermore, a substantial and significant correlation was found between daily need fulfilment and daily work dedication

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($r = 0.65, p < 0.001$). Finally, a significant correlation was found between daily transformational leadership and daily work dedication ($r = 0.36, p < 0.001$), while the person-level correlation between daily transformational leadership and daily need fulfillment was not significant ($r = 0.20, ns$). On the day-level significant correlations were found between daily transformational leadership and both daily work dedication ($r = 0.18, p < 0.001$) and daily need fulfillment ($r = 0.25, p < 0.001$). Moreover, a significant correlation was also found between daily work dedication and daily need fulfillment ($r = 0.51, p < 0.001$) on the day level.

474

Multilevel analyses

In order to examine the hypothesized direct and indirect relationships a set of multilevel analyses was performed (Table III). In the analyses, predictions of daily work dedication were controlled for work dedication style at the personal level in all models. First, in support of *H1b*, the analysis revealed a significant positive relationship between day-to-day level transformational leadership and day-level work dedication ($t = 2.78, p < 0.01$). Second, in line with *H2b*, a significant relationship between daily need fulfillment and daily work dedication was found ($t = 9.27, p < 0.01$). Third, in accordance with the prerequisite conditions for mediation recommended by Baron and Kenny (1986), an additional analysis revealed a significant relationship between transformational leadership and day-level psychological need fulfillment ($t = 4.00, p < 0.01$). Finally, the analysis yielded support for the existence of full mediation of the initial relationship between daily transformational leadership and daily work

Table II.
Mean, standard deviation, and inter-correlations for Study 2 variables

	\bar{x}	SD	1	2	3	4
1. Trait work dedication	5.05	0.77				
2. Daily transform. leadership	2.95	0.57	0.06		0.18**	0.25**
3. Daily work dedication	3.60	0.44	0.52**	0.36**		0.51**
4. Daily need fulfillment	3.68	0.33	0.32**	0.20	0.65*	

Notes: Correlations below the diagonal are person-level correlations ($n = 65$); correlation above the diagonal are day-level correlations ($n = 325$). * $p < 0.05$; ** $p < 0.001$

Table III.
Multilevel estimates for models predicting daily work dedication: day level need fulfillment as mediator ($n = 325$ occasions, $n = 65$ participants); Study 2

Model Variable	Null			1			2			3		
	<i>B</i>	SE	<i>t</i>	<i>B</i>	SE	<i>t</i>	<i>B</i>	SE	<i>t</i>	<i>B</i>	SE	<i>t</i>
Intercept	3.608	0.053	68.08*	3.610	0.049	73.67*	3.608	0.049	73.63*	3.617	0.050	72.34*
Trait work dedication				0.239	0.064	3.73*	0.234	0.064	3.66*	0.242	0.065	3.72*
Daily transform. leadership							0.203	0.073	2.78*	0.058	0.065	0.89
Daily need fulfillment										0.871	0.094	9.27*
$-2 \times \log$			591.498			568.173			540.014			463.323
$\Delta -2 \times \log$						23.33*			28.16*			76.69*
Δdf						1			1			1

Note: * $p < 0.01$

dedication through the daily fulfillment of psychological needs in accordance with *H3b*. As shown in Table III, when daily fulfillment of psychological needs was entered in Model 3, the initial prediction from transformational leadership to work dedication was no longer significant ($t = 0.89$, ns). The total explained variances (R^2) in the final model (Model 3) were 8 percent at the between-subjects level and 30 percent at the within-subjects level.

Prior to formally testing the significance of the indirect path, we examined if the two constituting paths (from transformation leadership to need fulfillment and from need fulfillment to dedication) were non-random by including random effects to the final model (Model 3). However, including these parameters did not significantly improve the fit of the model in terms of values of deviance ($\Delta -2 \times \log$), suggesting that ordinary bootstrap estimation procedures could be applied to test the mediated effects (Kenny *et al.*, 2003). Monte Carlo estimated confidence intervals supported the significance of the indirect (mediating) path (95 percent CI: 0.074-0.234).

Discussion

This paper reports results from two studies; one general cross-sectional study and one five-day diary study. The results support the existence of a positive link between transformational leadership and positive job attitudes. In line with our hypotheses, this positive association was revealed both generally and on a day-to-day basis. Furthermore, we found evidence for a positive link between fulfillment of psychological needs at work and job attitudes, both on a general, and a day-to-day level. Finally, the results from the two studies support the assumption of a full mediation of the positive relationship between transformational leadership and positive job attitudes through the fulfillment of psychological needs at work. Full mediation existed both on a general level, and on a day-to-day basis, strengthening the confirmation of the existence of mediation.

As expected, transformational leadership was associated with positive job attitudes, represented by job satisfaction and work dedication, respectively. The finding concerning the link between transformational leadership and job satisfaction is in line with previous research on inspirational forms of leadership and positive work-related outcomes (Hetland and Sandal, 2003; Nielsen *et al.*, 2008; Podsakoff *et al.*, 1996). Moreover, we also found support for the existence of a positive link between daily experience of transformational leadership behaviors and daily fluctuations in work dedication. This result suggests that on days where employees experience their leader to be transformational, they also feel more dedicated at work. In accordance with this, Tims *et al.* (2011), recently demonstrated a similar association between daily transformational leadership and overall day-level work engagement. All together, these findings suggest that transformational leaders may increase followers' job satisfaction and work dedication by utilizing idealized influence, inspirational motivation, intellectual stimulation, and individual considering leadership behaviors. As noted, the results presented in this paper clearly demonstrate that day-to-day fluctuations in leaders' behavior are influential on followers' day-level work attitudes. Along these lines, employee attitudes have been shown to be highly associated with several work outcomes, including absenteeism (Bakker *et al.*, 2003; Schaufeli *et al.*, 2009) and job performance (Xanthopoulou *et al.*, 2009). Hence, leaders should take into account that also minor variations in their daily leadership performance may be of importance for their followers' dedication at work, and consequently also the performance-related outcomes of having more dedicated followers.

In our second set of hypotheses, we expected a positive link between fulfillment of psychological needs at work and the two types of positive job attitudes. As noted, SDT theory postulates that psychological needs are universal necessities that constitute nutriment that are required for proactivity, optimal development, and psychological health of people (Deci and Vansteenkiste, 2004). Moreover, in a work setting, proponents of the theory would argue that if an individual's job provides these nutriments the person will be more likely to experience greater task enjoyment, general job satisfaction, and psychological adjustment (Ilardi *et al.*, 1993). In line with this, and a string of exciting research (Baard *et al.*, 2004; Ilardi *et al.*, 1993; Van den Broeck *et al.*, 2008), we find a considerable association between the fulfillment of psychological needs at work and job satisfaction in our cross-sectional study. In addition, we also hypothesized that such a relationship should exist on a day-to-day level. According to SDT theory, fulfillment of basic psychological needs constitutes a key factor for autonomous regulation. Moreover, it has been suggested that the concept of autonomy regulation overlaps considerably with existing conceptualizations of state engagement (Meyer and Gagne, 2008). Accordingly, we find that daily fluctuations in employees' fulfillment of psychological needs are substantially related to daily state measures of work dedication during a work week. As mentioned earlier, work dedication is regarded as a key dimension in overall work engagement (Schaufeli and Bakker, 2010). This is one of the first studies revealing this link on a day-to-day basis, and as such demonstrates interesting parallels between the concept of autonomous regulation and work dedication.

Motivation is a central component both in transformational leadership theory and in SDT theory. Surprisingly, to our knowledge, only one study has addressed the complementarities of these two main approaches. In accordance with our finding this study showed that fulfillment of psychological needs fully or partially mediated the link between transformational leadership and several positive work-related outcomes (Kovjanic *et al.*, 2012). Hence, the main aim of the present paper was to examine the potential mediating role of psychological need fulfillment at work within the transformational leadership – job attitudes relationship. In support of our hypotheses, the results proved full mediation of this relationship both in general, and on a day-to-day level. This is, indeed, in line with the theoretically founded assumption that transformational leaders enhance followers' effectiveness, confidence, and motivation by meeting followers' needs (Bass and Riggio, 2006). This also adds to the existing evidence of the mediating role of belongingness in the relationship between charismatic leadership and positive work-related outcomes (De Cremer and van Knippenberg, 2002; Den Hartog *et al.*, 2007). In contrast to the previous findings of a partial mediation of the transformational leadership and job satisfaction relationship through fulfillment of psychological needs (Kovjanic *et al.*, 2012), the results from the present studies demonstrate full mediation through fulfillment of psychological needs in the corresponding relationship between transformational leadership and job attitudes. In the studies presented here, the use of an overreaching construct of need fulfillment may be a possible explanation of the somewhat contrasting results to previous research.

To sum up, several authors has pointed towards the lacking evidence concerning possible mechanisms explaining the positive influences transformational leaders have on followers' job attitudes and job performance (Podsakoff *et al.*, 2000; Yukl, 1999). The results from the present studies do, indeed, suggest that fulfillment of psychological needs at work, as advocated by SDT theory, constitutes one important explanatory mechanism concerning this relationship. Interestingly, our findings indicate that this

mechanism is equally important on a day-to-day level as on a general level. Consequently, it is important for leaders to focus on their followers' psychological needs, not only as an overall strategy, but also in their daily interaction with them.

Methodological considerations

A major advantage of the present paper is that it applies a multi-design approach comprising both a large cross-sectional study as well as a complimentary one-week diary study. The use of such multi-design approach allows for replication of core findings, and makes it possible to generalize results to both a general and a day-to-day level. Furthermore, by applying different measures of job attitudes as outcomes in the two studies, generalizations across different types of job attitudes can be made. Finally, all study constructs applied in the two studies were measured by well-established and validated measurements, and showed adequate reliability in the present studies.

One limitation of the current study is the use of strictly cross-sectional data in the first study reported in this paper, as the causal direction of the mediated relationship cannot to any extent be inferred from these data. Furthermore, parameter estimates in the mediated relationship may be biased when using cross-sectional analysis of longitudinal mediation, even under the ideal conditions of complete mediation (Maxwell and Cole, 2007). However, these potential limitations are minimized in the second study by controlling for baseline general dedication on the first day of keeping the diary. Moreover, the high consistency of the results across the two studies further supports their validity. The use of a single source, namely followers-reports of the study constructs, may be regarded as a second potential limitation in the current studies. This pertains particularly to the measurement of transformational leadership. However, it may, on the other hand, be argued that measuring followers' perceptions of their leader at five occasions across a working week, may resolve in a less biased measurement of leadership behaviors. A third potential limitation is the use of convenience samples, as this may limit the generalizability of the findings. However, the heterogeneity of the samples in terms of education and work sectors may also be regarded as a positive characteristic in terms of external validity. While most of the measurement in the two studies showed good reliability above the criteria of 0.70, three of the measurements in Study 1 showed reliabilities in the range of 0.64-0.68. Thus this may be a potential threat to the validity of the study. Finally, the diary questionnaires were collected by the use of paper and pencil method. Consequently, we cannot be totally confident that the respondents completed the questionnaire exactly at the end of the working day as instructed. In order to limit this possible lack of compliance, research assistants contacted the respondents at the end of each working day in order to remind them to complete the diary.

Conclusion

The findings from this multi-design approach research, reveal convincing and consistent relationships both on a general level and on daily basis. The findings from the studies presented here have implications both for future research and practice. Explanatory mechanisms through which transformational leadership influences followers' job attitudes and performance are still warranted. The research presented in this paper aims to fill this void, by representing two separate studies specifically addressing this issue, and successfully providing evidence for a full mediation of the transformational leadership job attitudes relationship.

It has been demonstrated that transformational leadership behaviors can be learned and developed (Barling *et al.*, 1996). In fact, many leadership development programs aim at increasing these leadership behaviors. Based on this, we encourage further emphasis on the need fulfilling dynamics of transformational leadership behaviors, like inspiring, role modeling, nurturing, and continuously questioning the status quo. One important contribution of the diary study included in this paper is the demonstration of fulfillment of basic psychological needs at work as a key mediating mechanism between transformational leadership behaviors and work dedication also on a day-to-day level. We encourage future research to examine the potential mediating role of daily fluctuations in fulfillment of psychological needs in effect of leadership on other important positive and the negative processes in work place arena.

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