Fostering transformational leadership among young adults: a basic psychological needs approach

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ABSTRACT

Scholars have noted the constructive effects of transformational leadership on groups and organisations. Key predictors of transformational leadership include aspects of personality, self-concept, as well as social context. The purpose of this research was to support and extend past work by exploring the links between a supportive social context, leadership traits, self-efficacy and transformational leadership on a sample of university students (Study 1, \(n = 397\)) and testing the replicability of the findings (Study 2, \(n = 392\)) while controlling for intelligence. Results from both studies supported the hypothesis that the experience of basic psychological need satisfaction plays a moderating role in the relation between a leader’s personality, self-efficacy and transformational leadership. Discussion emphasises keys findings and highlights implications for theory, research and practice.

Leadership capacity building is an issue of great concern for companies and organisations around the world. It is estimated that in 2013 alone, American organisations invested over 15 billion dollars in leadership development (O’Leonard & Krider, 2014). Furthermore, current research also predicts that there will be a shortage of leaders in North America in the next decade due to the retirement of talented and experienced employees from the baby boom generation and the suppression of middle management as a result of downsizing initiatives (Hogan & Benson, 2009; Robie, Brown, & Bly, 2008). These demographic changes, combined with the increasing mobility of workers and a shrinking world market, are predicted to have a negative impact on organisational leadership (Avolio & Vogelgesang, 2011). Therefore, research that examines the factors that foster leadership has become both relevant and important.

Research indicates that the more chances one has to experience leadership roles, the more likely one will develop strong leadership characteristics (Dinh & Lord, 2012). Early adulthood is characterised by numerous opportunities to develop new skills through new experiences in novel settings. As young adults transition to college and university, they often encounter their first chance to realise true leadership roles. Given the right combination of opportunity, personality and environment, university could be the ideal milieu to stimulate leadership awareness and behaviours in young adults. The present article seeks to examine the relationship between individual and social factors associated with transformational leadership. More precisely, it is proposed that the social context may have a significant impact on the relationship between personality traits and self-efficacy on transformational leadership behaviours. These relationships are tested on two samples of young adults.

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Transformational leadership

One of the most researched leadership areas of the last two decades is transformational leadership (Avolio & Yammarino, 2013). The transformational leader is characterised by a desirable set of behaviours that stimulate, inspire, and motivate others, leading to observable changes in the people they work with (Gong, Huang, & Farh, 2009; Hur, van den Berg, & Wilderom, 2011; Braun, Peus, Weisweiler, & Frey, 2012), and organisations (Bass, Avolio, Jung, & Berson, 2003; García-Morales, Jiménez-Barrionuevo, & Gutiérrez-Gutiérrez, 2012).

While initially developed to discuss certain politicians’ governing style (Burns, 1978), the concept of transformational leadership has been expanded by Bass (1985) as part of a full-range leadership theory (also including the transactional and passive-avoidant leadership styles). Bass regarded the different leadership styles as complementary constructs, where a single individual may display transformational and transactional behaviours, as both styles can be required in different situations. However, transformational leadership is believed to give rise to superior performance using strategies that go beyond the exchange of rewards contingent on meeting expectations of the transactional leader (Bass, 1991).

Although other authors have suggested theoretical expansions to complete the leadership portrait (Antonakis & House, 2014; Avolio & Yammarino, 2013; Sanders, Hopkins, & Geroy, 2003), transformational leadership remains the most researched leadership concept (Antonakis & House, 2014).

Both theoretical conceptualisation and empirical testing have produced a large body of research demonstrating the positive effects of transformational leadership on individual and team performance (Wang, Oh, Courtright, & Colbert, 2011), creativity and innovation (Gumusluoglu & Ilsev, 2009; Qu, Janssen, & Shi, 2015), financial outcomes (Barling, Weber, & Kelloway, 1996), job satisfaction (Wang, Chontawan, & Nantsupawat, 2012) and students’ engagement with school (Leithwood & Jantzi, 2000). Transformational leaders help their teams attain greater goals through their use of the following behaviours: fostering trust and cooperation and inspiring others by leading by example (idealised attributes and behaviours); articulating a positive vision for the future (inspirational motivation); energising others to think innovatively about problem-solving (intellectual stimulation); and encouraging personal development and empowerment (individualised consideration). Moreover, experimental testing suggests that transformational leadership practices are malleable and can be taught (Barling et al., 1996; Bass & Riggio, 2006; Dvir, Eden, Avolio, & Shamir, 2002). Although many studies have reported the positive effects of transformational leadership behaviours, researchers have focused only recently on the potential antecedents of transformational leadership development (Avolio, Avey, & Quisenberry, 2010; Day & Antonakis, 2012).

Leadership potential: delving into the antecedents of transformational leadership

For a very long time, it was believed that leaders were born, not made. Key findings from research on personality traits brought to the surface some prominent individuals factors, while more recent approaches to studying leadership suggest that social factors also play a role (Avolio & Vogelgesang, 2011). Antonakis, Day, and Schyns (2012) argue that individual differences have a systematic effect on the development of leadership and that this effect might explain up to 80% of the total variance in some of the studies reported. Furthermore, a recent study comparing identical and fraternal twins reported the unique and overlapping effects of genetic and environmental factors on transformational leadership (Li, Arvey, Zhang, & Song, 2012). As such, Antonakis et al. (2012) proposed that leadership outcomes are a function of distal or anchored predictors (e.g. personality traits and self-concept), and proximal or changing predictors (e.g. reactions of colleagues). The next section will discuss key findings from these two sources.

Individual factors

Early leadership theories compared the predispositions and unique characteristics of leaders compared to those of other individuals (Bird, 1940; House, 1977; Stogdill, 1974). Although trait theories have
been criticised for their lack of flexibility and failure to integrate environmental factors (Zaccaro, 2007), they are making a comeback with the emergence of new and more sophisticated statistical methods that permit, among other things, their integration into more complex models. In fact, a recent special edition of *Leadership Quarterly* was devoted entirely to individual differences in leadership development (Antonakis et al., 2012). Individual characteristics commonly associated with the development of leadership are intelligence, personality, self-concept and emotional intelligence (Zaccaro, 2012), with the latter being more controversial than the others (see Antonakis, Ashkanasy, & Dasborough, 2009, for a discussion on the relevance of emotional intelligence for leadership development). Recent comprehensive reviews of leadership and individual characteristics highlight the importance of traits associated with leaders (Ensari, Riggio, Christian, & Carslaw, 2011; Judge, Piccolo, & Kosalka, 2009).

**Leader personality**

While meta-analyses suggest that the Big Five theory of personality provides a good foundation with which to examine dispositional predictors of leadership (Hogan, Curphy, & Hogan, 1994; Judge, Bono, Ilies, & Gerhardt, 2002), Bligh (2011) believes that research focusing on specific personality factors, as opposed to overall Big Five dimensions, contributes to more dependable findings. Bridging empirical evidence from 73 samples, Judge et al. (2002) reported that the Big Five dimensions of *extraversion*, *conscientiousness* and *openness to experience* have the most robust relationship to leadership in general and specifically to being perceived as leader like. These results have been corroborated by other studies (Cavazotte, Moreno, & Hickmann, 2012; Zopiatis & Constanti, 2012). For transformational leadership, extraversion translates behaviourally into high sociability, but also enables one to speak out when holding a divergent opinion (John, Naumann, & Soto, 2008); conscientiousness is linked to diligence to achieve better job performance by being concerned with accuracy, as well as engaging in collaborative behaviours (John et al., 2008; Marinova, Moon, & Kamdar, 2013); and openness to experience describes the cognitive flexibility necessary to promote intellectual stimulation and innovative thinking (John et al., 2008; Popper & Mayseless, 2013). Furthermore, having a sense that one can lead and be influential is also essential to one's development as a leader.

**Leadership self-efficacy**

The work of Komives, Owen, Longerbeam, Mainella, and Osteen (2005) demonstrates that the individual's sense of efficacy is instrumental in leadership capacity building. The information gathered through group interactions (e.g. self-evaluation of interpersonal success) permits development from self-awareness to self-efficacy, which fosters leadership behaviours (Komives, Longerbeam, Owen, Mainella, & Osteen, 2006). Self-efficacy derives from the work of Bandura (1977) and has been described as one's belief about one's ability to perform in a certain situation. It is an important predictor of behavioural changes as part of a social learning process (social cognitive theory; Bandura, 2011). Murphy and Johnson (2011) described how self-efficacy influences the leadership self-reinforcing cycle. Early experiences feed self-efficacy, increasing the motivation to lead. This in turn regulates behaviours and raises the chance of gaining more leadership experiences. The expectation of others regarding that person's abilities and the role he or she should be playing are likewise reinforced, thus transforming one's leadership efficacy. Moreover, researchers have demonstrated the effect of leadership self-efficacy on leadership outcomes, both theoretically (McCormick, 2001; Murphy, 2002; Popper & Mayseless, 2007) and empirically (Chemers, Watson, & May, 2000; Hoyt, 2013; Matte, 2012). Contrasting results from a recent study examining the links between self-efficacy and transformational leadership suggested a non-significant relation between the two constructs (Mesterova, Prochazka, Vaculik, & Smutny, 2015). This study, however, used general self-efficacy; separated from a specific situation, this approach to the assessment of self-efficacy contradicts the premises of the social cognitive theory (Maddux & Gosselin, 2012). Studies specifically on college students (Dugan & Komives, 2007; Dugan, Komives, & Segar, 2009; Hu, 2011; Propst & Kiesler, 1998) have linked leadership self-efficacy to leadership capacity building, while others have pointed to self-efficacy as a mediating variable between individual characteristics and leadership outcomes among adult employees (Hu, Wang, Liden, & Sun, 2012; Ng, Ang, & Chan, 2008;
Resick, Whitman, Weingarden, & Hiller, 2009), as well as adolescents and young adults (Oliver et al., 2011). Thus, the individual’s sense of efficacy appears to be a key factor in leadership capacity building.

**Social context**

In a similar perspective of integration, Dinh and Lord (2012) suggest an alternative approach to the traditional model of direct causal relationship between individual characteristics and consequences on leadership outcomes. Their model includes the intrapersonal (e.g. self-concept and identity) and interpersonal effects (e.g. environment and specific situation) on leadership outcomes. Thus, leadership behaviours observed at any given time for a given individual will be dependent on personality (stable over time, but dynamic), the specific situation and the activation of different aspects of the individual’s self-concept (Dinh & Lord, 2012). For example, if a person with high levels of extraversion, conscientiousness and openness to experience enters a group where there is no formal leader, assuming no one else in the group has more leadership experience; these personality characteristics in this context may activate this person’s leadership awareness and behaviours. Finally, Dinh and Lord also note the importance of experience for leadership development; the more opportunities people have to develop their skills and assume a leadership identity, the more flexibility they will exhibit when faced with the variety of emerging situations. Moreover, Zaccaro (2012) offers that the environmental influences will moderate the relation between stable individual differences and leadership outcomes, with specific situations affecting leadership capacity building.

Literature suggests that social context may moderate the relation between a leader’s personality traits, aspects of one's self-concept and transformational leadership; in other words, transformational leadership may derive its development from both leader’s traits and the environment. As such, the next section will elaborate on the promising qualities required in social environments to promote transformational leadership.

**Basic need satisfaction and transformational leadership**

Self-determination theory (SDT), a theory of motivation, personality and human development (Deci & Ryan, 2013), states that human beings are constantly seeking to achieve a balance of personal coherence (i.e. engaging in behaviours congruent with their value systems) and self-actualisation (i.e. fulfilling their potential). Thus, individuals have an inherent tendency to engage actively in challenges and integrate these new experiences into their sense of self in order to grow and achieve this balance (Deci & Ryan, 1985; Deci, Ryan, & Guay, 2013).

The theoretical framework of self-determination integrates and reconciles the two views (individual characteristics vs. environmental factors) by defining specific exogenous factors, both proximal (e.g. a teacher’s behaviours) and distal (e.g. cultural norms and values), which will tend to support or slow down a person’s natural development (Deci & Ryan, 2012a). Therefore, building on SDT premises, when people who possess the right traits are placed in a supportive environment, there may be transformational leadership behaviours’ emergence as part of the inherent desire to grow and to find balance.

This dynamic process is explained by the basic psychological needs theory (BPNT). BPNT proposes and observes that individuals are constantly seeking, consciously or not, to fulfil three basic psychological needs: autonomy, competence and relatedness. Autonomy refers to the need to perceive oneself as the source of definition and engagement of behaviours; the need for competence refers to feeling that one has skills and the opportunity to practice these skills in a given environment; and relatedness refers to the desire to belong to a group of individuals and a community (Deci & Ryan, 2012b). These needs are considered innate and universal, and must be met in order for individuals to integrate new experiences optimally and thus develop their potential (Hodgins & Knee, 2002; Kasser, 2002), even though cultural and individual differences are noted in the ways of expressing and attaining need satisfaction (Chen et al., 2015; Chirkov, Ryan, Kim, & Kaplan, 2003; Ryan & Deci, 2012).

Social environments play a crucial role in an individual’s innate tendency towards development by supporting or thwarting an individual’s basic psychological needs (Deci & Ryan, 2013). An environment
that undermines the satisfaction of basic psychological needs will undermine intrinsic motivation (i.e. motivation derived from interests), individual mastery and growth (Chen et al., 2015; Hodgins & Knee, 2002), especially if the need frustration comes from significant figures (Vansteenkiste & Ryan, 2013), like professors. Similarly, DeRue and Wellman (2009) suggest that in organisations where an environment allows for the creation of positive relationships and social support, leadership self-efficacy will be enhanced. In turn, leadership will emerge (e.g. individuals will be more likely to risk-taking on new challenges) and contribute to create a climate that will facilitate the growth of the organisation’s capacity for fostering leadership.

Deci and Ryan (2012b) state that the behaviours of individuals are the product of a specific social context and relatively stable personal characteristics that have developed through their experiences in other social contexts. Efforts have been made to integrate the theories of basic psychological needs and transformational leadership (Bono & Judge, 2003; Eyal & Roth, 2011; Gagné & Deci, 2005). However, at this time, the focus has been to test whether transformational leaders support the basic psychological needs of their subordinates. By extension, BPNT would suggest that an environment supporting these needs fosters long-term personal development (Deci & Ryan, 2012a; Hodgins & Knee, 2002) and even more so, the emergence of transformational leadership manifestations in individuals who are predisposed to it (i.e. people born with high levels of extraversion, conscientiousness and openness to experience). In contrast, research has repeatedly shown how environments that restrict the satisfaction of basic psychological needs (e.g. schools where teachers offer low need satisfaction or actively thwart needs) will decrease intrinsic motivation (Oliver, Markland, Hardy, & Petherick, 2008; Vallerand & Rousseau, 2001; Vansteenkiste & Ryan, 2013). Such an environment could undermine leadership development as well. It is therefore appropriate to further investigate the relation between leadership traits, the level of support for basic psychological needs offered by a given environment and transformational leadership. It is proposed that the environment acts on the emergence of transformational leadership behaviours, both directly and indirectly, through the formation of leadership self-efficacy.

Present research

The present investigation examines young adults in an environment where leadership capacity building is most likely to be influenced, that is their post-secondary institution. The objective of the research was to investigate the effect of basic need supportive environments, personality and self-efficacy on transformational leadership. The review of the literature leads to three main propositions:

H1 Leadership personality traits predict leadership self-efficacy and transformational leadership at university.

H2 Need supportive university environments predict leadership self-efficacy and transformational leadership.

H3 Need supportive university environments modify the relation between leader personality and transformational leadership directly and indirectly through leadership self-efficacy.

In order to investigate these hypotheses, a moderated mediation model was tested on a sample of undergraduate students (Study 1: n = 397). This study was then replicated three months later with a different sample of undergraduate students (Study 2: n = 392) while controlling for the effect of intelligence on transformational leadership.

Study 1

Method

Participants

A total of 397 undergraduate students (270 women, 126 men and 1 person with no gender specified) took part voluntarily in this study ($M_{\text{age}} = 19.86$ years, $SD_{\text{age}} = 3.61$). The participants were mostly full-time students (93.2%) enrolled in different programmes including biomedical sciences (14.4%), psychology (10.3%), health sciences (9.3%), nursing (7.6%) or from 50 other disciplines (58.4%) at the University of Ottawa. More than half of the sample reported English as their first language (54.4%), while a large
portion of the remaining participants reported French (22.9%). In addition, 41.8% indicated having to work part-time (39.3%) or full-time (2.5%) during their school semester. Fourteen participants terminated their contribution to the study before they completed one or more of the scales of the main variables, and their data were eliminated from the analyses (original sample size of 411).

Procedure

Participants were recruited using the School of Psychology’s integrated system of participation in research (ISPR) at the University of Ottawa. They were invited to take part in this cross-sectional study and were assured that their responses would be anonymous and kept confidential. In order to minimise a self-selection bias based on leadership interests, the study was described to potential participants as a study on decision-making processes. Interested participants were given access to an online questionnaire. In exchange for participation, a small compensation was offered (i.e. 1% of their final grade).

Measures

Leadership personality traits

Personality traits associated with transformational leadership were assessed using the extraversion (two-item), conscientiousness (two-item) and openness to experience (two-item) subscales of the 10-Item Personality Inventory (TIPI, Gosling, Rentfrow, & Swann, 2003). Each of the six items was rated using a six-point scale ranging from 1 (Disagree strongly) to 6 (Agree strongly). Split-half Spearman–Brown tests demonstrated good reliability on all scales for this sample: extraversion = .65, conscientiousness = .60, except for openness to experiences = .42. Although two-item scales can present abnormally low internal consistency estimates, this very brief measure of personality has previously shown adequate levels of convergence validity with the NEO PI-R (Big Five) and test–retest reliability (Gosling et al., 2003). Nevertheless, only the overall leader personality traits composite was used, whereas the three personality dimensions were not expected to correlate (α = .52).

Basic psychological need support at university

The 16-item Work-related Basic Need Satisfaction scale (W-BNS, Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010) was adapted to assess basic need satisfaction at university (e.g. ‘I have the feeling that I can even accomplish the most difficult tasks at school’, competence, see Appendix D), using a Likert scale, ranging from 1 (Disagree strongly) to 6 (Agree strongly). Necessary items were reverse scored before responses were averaged; higher scores reflected greater basic need satisfaction. Internal consistency estimates ranged from .72 to .88 across subscales; Cronbach’s alpha for the entire scale was .87.

Leadership effectiveness self-expectancies

Participants’ evaluation of their own effectiveness as a leader was assessed using Singer’s self-efficacy expectancies three-item measure (Singer, 1991). Participants were required to rate each of these items on a six-point Likert scale ranging from 1 (Disagree strongly) to 6 (Agree strongly): ‘If you were in a leadership position, how effective would you be as a leader?’; ‘How well does your own ability fit requirements for leadership position?’ and ‘How easy would it be for you to succeed in a leadership position?’ Answers were averaged to form a leadership self-efficacy index, with a Cronbach’s alpha of .85.

Transformational leadership

The seven-item Global Transformational Leadership scale (GTL; Carless, Wearing, & Mann, 2000) was adapted to assess the participants’ evaluation of their own transformational leadership behaviours (e.g. ‘When I work in a team, I foster trust, involvement and cooperation among team members’). The participants were asked to indicate on a Likert scale ranging from 1 (Disagree strongly) to 6 (Agree strongly) to what extent the behaviours mentioned below are typical of behaviours they have displayed while engaged in team work at university. According to Carless et al. (2000), the validation study of the
GTL has demonstrated adequate factor structure and a high degree of convergent validity with more established and lengthier questionnaires such as the Multifactor Leadership Questionnaire (MLQ; Avolio, Bass, & Jung, 1999) and the Leadership Practices Inventory (LPI; Posner & Kouzes, 1988). Answers were summed to form a transformational leadership score, with a scale reliability index of .90.

**Results**

**Descriptive statistics**

Descriptive statistics and bivariate relations among principal variables are presented in Table 1. Bivariate relations between all constructs were consistent with predictions, with positive relationships found between leadership traits, university’s basic need support and self-efficacy, as well as transformational leadership.

**Main analyses**

The hypothesised moderating role of university’s basic need support (BNS) in the mediation between leadership personality and transformational leadership, directly and indirectly, through self-efficacy, was tested using PROCESS, a SPSS macro, created by Hayes (2013) to test conditional process analysis. The macro relies on the resampling method of bootstrapping, a procedure that provides an estimate of the indirect effect in the population by resampling the data-set k times (5000 iterations in this study) in order to obtain the indirect effect’s sampling distribution and confidence intervals (CIs). An estimate is considered statistically significant if its 90% CI does not include zero.

Testing a moderated mediation model, direct effect on self-efficacy expectancies appeared for leadership personality (\(B = 0.9696, p < .001\)) and for university’s BNS (\(B = 0.6914, p = .004\)). A negative interaction effect of leadership personality and university’s BNS on self-efficacy also emerged with a point estimate of \(-0.1396, 90\% \text{ CI } [-0.2302, -0.0491]\).

Direct effects on transformational leadership emerged for leader personality (\(B = 3.9475, p = .002\), university’s BNS (\(B = 4.1728, p = .003\) and self-efficacy (\(B = 0.8345, p = .005\)). A negative interaction effect between leader personality and university’s BNS on transformational leadership was also found, with a point estimate of \(-0.6018, 90\% \text{ CI } [-1.1347, -0.0690]\). These results are displayed in Table 2. Overall, leader personality and university’s BNS accounted for 25% of the variance in transformational leadership, directly and indirectly through self-efficacy expectancies, \(F(4, 392) = 33.67, p < .001\).

**Study 2**

**Method**

**Participants**

The second sample comprised of 392 undergraduate students (285 women and 107 men) who took part voluntarily in this study during the following school semester (\(M_{\text{age}} = 19.69\) years, \(SD_{\text{age}} = 3.88\)).

**Table 1.** Descriptive statistics for Study 1 and Study 2.

| Construct                      | 1  | 2  | 3  | 4  | 5  |
|-------------------------------|----|----|----|----|----|
| M                             | 4.18| 4.00| 4.47| 34.85| –  |
| SD                            | .70 | .74 | .79 | 4.77 | –  |
| 1. Leader personality         | –  | .41**| .43**| .41**| –  |
| 2. School’s basic need support| .37**| –  | .25**| .39**| –  |
| 3. Leadership self-efficacy   | .51**| .26**| –  | .32**| –  |
| 4. Transformational leadership| .42**| .36**| .32**| –  | –  |
| 5. Intelligence               | .06 | .21**| .02 | .07 | –  |
| M                             | 4.23| 3.99| 4.47| 35.16| 7.01|
| SD                            | .72 | .71 | .80 | 4.40 | 2.09|

Note: Descriptive statistics for Study 1 are presented above the diagonal and those for Study 2 are presented below the diagonal. \(^*p < .001\)
The participants were mostly full-time students (94.9%) enrolled in different programmes including psychology (15%), nursing (14.3%), biomedical science (8.4%), criminology (8.4%) or from other disciplines (53.9% enrolled in 49 diverse programmes) at the University of Ottawa. More than half of the sample reported English as their first language (64%), while a majority of the remaining reported French (16.3%). Moreover, 43.4% of the participants indicated having to work part-time (40.6%) or full-time (2.8%) during their school semester. Similar to Study 1, 10 participants terminated their contribution to the study before they completed one or more of the scales of the main variables and their data were eliminated from the analyses (original sample size of 402).

**Procedure**

Participants were recruited using the same procedure as in Study 1. Students received 1% towards their final grade for their participation. An automated process prevented any ISPR participants who participated in Study 1 from participating in Study 2. Once again, with the exception of the demographics items for which there was less than 2% of missing data, there were no missing data for participants who completed the survey. Additionally, the participants’ intelligence was assessed in order to test incremental validity of the model’s predictors against cognitive abilities. Analytical and cognitive abilities have been described by leadership scholars as critical for understanding novel situations and assessing potential solutions that are complex (Judge, Colbert, & Ilies, 2004; Zaccaro, 2012). In meta-analysis of intelligence and leadership, researchers have observed corrected correlations of .27 (Judge et al. 2004) and intelligence is argued by some scientists to be the most powerful leadership predictor (Antonakis et al., 2009).

**Measures**

The questionnaire for Study 2 was composed of the same scales as the ones used in Study 1. Internal consistency estimates were satisfactory for all scales (University’s BNS, .73–.87 across subscales, .86 for the entire scale; leadership self-efficacy expectancies, .85; and GTL, .87) with the exception of the personality scales for which openness to experiences’ reliability statistic was low (extraversion = .62, conscientiousness = .60 and openness to experiences = .39). However, only the overall leader personality traits composite was used, where the three personality dimensions were not expected to correlate (α = .57).

| Table 2. Direct and interaction effects of the moderated mediation model for Study 1 and Study 2. |
|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| **Study 1** | **Study 2** |
| Product of coefficients | Bootstrapping BC 90% CI | Product of coefficients | Bootstrapping BC 90% CI |
| **Point estimate** | **SE** | **LL** | **UL** | **Point estimate** | **SE** | **LL** | **UL** |
| Leader personality | .9696 | .2150 | .6151 | 1.3241 | 1.3356 | .2653 | .8981 | 1.7730 |
| University’s BNS | .6914 | .2377 | .2995 | 1.0833 | .9901 | .2919 | .5088 | 1.4713 |
| Leader personality | 3.9475 | 1.2875 | 1.8248 | 6.0702 | 2.8614 | 1.5551 | .2973 | 5.4254 |
| University’s BNS | 4.1728 | 1.4027 | 1.8601 | 6.4855 | 2.7791 | 1.6836 | .0031 | 5.5551 |
| Leadership self-efficacy | .8345 | .2945 | .3489 | 1.3201 | .6528 | .2885 | .1770 | 1.1285 |

Notes: BC = bias corrected; CI = confidence interval; LL = lower limit, UL = upper limit and k = 5000. Interaction 1 = the interaction effect of leader personality and university’s BNS on leadership self-efficacy. Interaction 2 = the interaction effect of leader personality and university’s BNS on transformational leadership.
Intelligence
Cognitive abilities were assessed using a single item, the self-reported value of the current grade point averages (GPA) of the participants. Research has previously shown a strong relation (r = .91, p < .01) between the self-reported GPA and the actual average (Frucot & Cook, 1994). Though imperfect, this measure can rapidly rank students relative to the average and has been shown to be highly correlated with measures of cognitive skills, such as IQ (Koenig, Frey, & Detterman, 2008). Participants reported GPAs ranging from 0.0–3.9 (F) to 9.0–10 (A+) on 10 (Mode of 7.0–7.4; B).

Results
Descriptive statistics
Descriptive statistics are displayed in Table 1. Inter-correlations between pairs of constructs were consistent with predictions, with positive relations between leadership personality, BNS and self-efficacy, as well as transformational leadership. On the bivariate level, intelligence did not correlate with transformational leadership. Nevertheless, intelligence was controlled for in subsequent analyses for theoretical reasons (Antonakis et al., 2009; Judge et al. 2004).

Main analyses
Using the same SPSS macro, PROCESS (Hayes, 2013), the original moderated mediation model was tested, this time controlling for the effect of intelligence on transformational leadership. A direct effect on self-efficacy emerged for leader personality (β = 1.3356, p < .001) and for the university's BNS (β = .9901, p < .001). A negative interaction effect of leader personality and university's BNS on self-efficacy expectancies also emerged with a point estimate of −.2058, 90% CI [−.3152, −.0964].

Direct effects on transformational leadership also appeared for leader personality (β = 2.8614, p = .067), university's BNS (β = 2.7791, p = .098) and self-efficacy (β = .6528, p = .024) while controlling for intelligence. However, no interaction effect between leadership personality and the university's BNS on transformational leadership was found, (−.3113, n.s.) and no direct effect emerged between intelligence and transformational leadership (.0082, n.s.). The results for all direct and indirect effects are reported in Table 2. Overall, leader personality and university's BNS accounted for 24% of the variance in transformational leadership, directly and indirectly through self-efficacy expectancies, F(5, 386) = 23.89, p < .001, while controlling for intelligence.

Discussion
Transformational leadership's positive effects on individuals and organisational-level innovation (Gumusluoglu & IIselv, 2009), organisational citizen behaviours (Podsakoff, MacKenzie, Moorman, & Fetter, 1990), team performance (Dvir et al., 2002), organisation performance (Barling et al., 1996) and ethical reasoning (Turner, Barling, Epitropaki, Butcher, & Milner, 2002) are well documented. The world is eager for more men and women who can bring transformational leadership behaviours to their organisations and communities. A moderated mediation model was tested to investigate what makes some individuals more likely to become transformational leaders than others. Individual characteristics associated with transformational leaders were hypothesised to be only one important factor in causing leadership self-efficacy and transformational leadership manifestations in young adults. The degree of support for basic psychological needs offered by the university environment was theorised to play an important role in the development of students' expectations of their own abilities to be a leader, as well as their transformational leadership behaviours. Data obtained from two student samples support these hypothesised relations.

Leader's personality dimensions of extraversion, conscientiousness and openness to experience, and the level of support the university environment offers, were important predictors of students'
self-efficacy evaluation in our samples. Moreover, the negative interactions found in both studies suggest that the effect of leader personality on self-efficacy expectancies becomes less important as the environment offers more basic psychological need support to the students. In other words, the gap in leadership self-efficacy beliefs between students with predispositional leadership qualities and students without becomes smaller when these students are in a need supportive environment.

Results from both studies also suggest that leader personality traits, the university's level of support of the basic psychological needs and self-efficacy expectancies are reliable predictors of transformational leadership. In the first study, the second negative interaction between leader personality and university's BNS on transformational leadership suggests that as the university environment offers more support for the students, the effect of leadership personality on transformational leadership becomes less important. Namely, as the support for autonomy, competence and relatedness increases, everyone gets a chance to grow as a transformational leader to the point that the discrepancies between individuals with and without leadership predispositions become fewer. This second interaction effect did not emerge in the second study. However, personality, university's basic need support and self-efficacy proved to be reliable predictors of transformational leadership, even when controlling for the effect of intelligence.

Not all young adults are born with high levels of extraversion, conscientiousness and openness to new experiences. Just as it may be difficult to develop charisma, the Big Five dimensions are conceptualised as stable over time (Judge, Higgins, Thoresen, & Barrick, 1999). These new results suggest that all young adults could benefit from a supportive university environment, to grow as transformational leaders, no matter what their natural traits may be, and these environments are possible to cultivate (Ryan & Deci, 2000; Vansteenkiste & Ryan, 2013). Given that school is the main occupation for many young adults, and that many opportunities for leadership capacity building could arise in this context, the hope is that the positive self-evaluations and transformational leadership behaviours that these students learn and gain can cross into other domains of their lives (Pawar & Eastman, 1997) and be applied in their families, current and future jobs and communities.

Descriptive statistics and relationships among variables were very similar in both samples, strengthening the validity of the results in the replication study. Surprisingly, however, leadership self-efficacy expectancies' coefficients were not as substantial (the least high coefficients for predictors in both studies) as the literature leads us to believe they could be. These results may suggest that the contributions of such constructs on transformational leadership are not that strong or that their relevance for transformational leadership development could depend on other factors. For example, Isaac, Kaatz, Lee, and Carnes (2012) provide strong evidence for the importance of leadership self-efficacy intervention for women in science, where leadership gender stereotypes are still present.

Similarly, intelligence did not emerge as a predictor for transformational leadership in Study 2, where it was chosen as a controlled variable to test the model's predictors' incremental validity. For that unexpected result, we offer two possible explanations. First, it could be that despite grade point average's (GPA) previous high correlation with other IQ measures (Koenig et al., 2008), it failed in our sample to capture true cognitive abilities that would foster leadership and perhaps captured other embedded characteristics such as conformity and mnemonic abilities, concepts that have little to do with leadership. Second, the participants that composed our sample homogenously had to successfully pass the same admission tests to be part of the fairly elite university population. In that sense, despite the normal distribution of the GPAs in our sample, it is possible the sample did not offer much variety in terms of intelligence to make an impact on leadership outcomes.

A few limitations to the present studies, as well as suggestions for future research, must be noted. First, both samples were composed mostly of female participants at a ratio higher than the university's population statistics (59% undergraduate women; Institutional Research and Planning, 2015). There is no telling whether the results could be replicated this closely in a sample with more male participants, especially considering that meta-analytic research has found gender differences in transformational leadership outcomes (Eagly, Johannesen-Schmidt, & van Engen, 2003; Lord, de Vader, & Alliger, 1986). Future research could investigate the importance of need supportive environments in relationship to gender.
Second, there was a fair amount of variance in the students’ evaluation of their own experience at university. As these participants all attend the same institution, this variance could be a reflection of the different environments provided by the 50+ programmes these students are in, or it could be a reflection of some of the participants’ inability to recognise the degree of support they are truly offered. A replication of these studies comparing samples in diverse environments or using an experimental design could be interesting.

Third, the transformational leadership scores were fairly high in both samples. This could suggest that these students are doing very well in terms of leadership development, but it could also suggest that these students already think quite highly of their leadership behaviours, or a bit of both. Future studies may possibly investigate these relationships using peer-ratings.

Fourth, one of the leader personality dimension measures, openness to experience, presented reliability issues in both our samples. This could relate to the fact that the factors composing the Big Five model are general, a common criticism of personality theory (John et al., 2008). In other words, different facets of openness to experience may correlate differently with transformational leadership. We acknowledge that the internal consistency estimates of the openness to experience scale were abnormally low in our studies, and therefore the findings should be interpreted with caution. While we recognise the strong evidence for content validity of the original scale (Gosling et al., 2003; Rammstedt & John, 2007), it would be worthwhile to use the full scale when the research paradigm allows for it.

Fifth, further examination of the relationship between leadership personality, self-efficacy, social environment and their effect on leadership capacity building would benefit from a longitudinal perspective. While the present research provides a theoretical rational for the hypothesised relationships, the design is non-longitudinal. Longitudinal evidences would contribute to increasing our understanding of the mechanisms by which these factors influence leadership outcomes across time.

Lastly, transformational leadership is an important and widely researched topic (Antonakis & House, 2014). Even in the less-studied subdomain of transformational leadership antecedents, a wide range of different predictors (e.g. attitudes, gender and cultural contexts) have been postulated, argued and empirically supported (Cavazotte et al., 2012; Hu et al., 2012; Nielsen & Cleal, 2011). These results are promising as they contribute to a better understanding of the antecedents of transformational leadership in young adults. Undoubtedly, as reflection progresses in the domain, more research will expand our findings.

Despite limitations, we believe this new line of research and these preliminary results are of interest to the scientific community and post-secondary institutions’ decision-makers. In that sense, we not only join our voices to researchers who call for more research on transformational leadership antecedents (Bommer, Rubin, & Baldwin, 2004; Bono & Judge, 2004; Nielsen & Cleal, 2011; Zhang, Wang, & Pearce, 2014), but especially encourage interested scientists to explore trainable and malleable factors, such as basic need support levels in various environments, similar to the comprehensive work of Oliver et al. (2011) on family environmental antecedents.

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