Authentic leadership, creativity, and innovation : a multilevel perspective.

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Abstract

This study aims to propose and empirically test a multilevel model of cross-level interactions between authentic leadership and innovation at the team level, and perception of support for innovation and creativity at the individual level. We use data from 23 team leaders and 289 team members in a Slovenian manufacturing and processing firm engaged in producing innovative products and customer solutions and conduct a multilevel analysis using hierarchical linear modeling (HLM). The results indicate that whereas perceived team leaders' authentic leadership directly influences team members' individual creativity and team innovation, the impact of self-ascribed team leaders' authentic leadership was not significant. In addition to that, the relationship between team leaders' authenticity and creativity is mediated by perception of support for innovation. Using a multilevel approach, this is the first study to our knowledge to quantitatively examine the relationship between authentic leadership and creativity and innovation. In addition, unlike previous research on related topics that relied solely on one source of information, we examine authentic leadership with empirical data gathered from both team leaders and their employees.

Keywords

Authentic leadership, creativity, innovation, multilevel analysis, perception of support for innovation

Introduction

Creative performance of employees is quite often dependent upon the leadership, which is demonstrated by several conceptualizations and empirical studies (e.g. Scott & Bruce, 1994; Oldham & Cummings, 1996; Oke, Munshi, & Walumbwa, 2009). Although leadership that stimulates innovation has been a subject of research, the mechanisms for its connection with the innovation process, which includes both creativity and implementation of creative ideas (Amabile, 1988), have not been identified in enough detail (Crossan & Apaydin, 2010). A number of research findings have been, however, reported on the relationship between particular leadership styles and creativity in organizations. Yet the evidence for what combination of leadership behaviors is most appropriate for creative groups or teams is lacking (Paulus, 2008). We focus on authentic leadership, a recently emerging research field (e.g. George, 2003; Luthans & Avolio, 2003; Gardner, Avolio, Luthans, May, & Walumbwa, 2005; Walumbwa, Wang, Wang, Schaubroeck, & Avolio, 2010), and the influence it has on creativity and innovation.

Authentic leadership focuses on positive achievements rather than emphasizing flaws (Peterson & Luthans, 2003; Jensen & Luthans, 2006), and promotes employee trust, which results in higher emotional safety and unconventional idea proposition (Avolio, Gardner, Walumbwa, Luthans, & May, 2004). Based on its characteristics, authentic leadership should be suitable for stimulating creativity and innovation. However, more empirical research needs to be conducted in order to better understand the mechanisms by which authentic leaders exert their influence on effective behaviors (Yammarino, Dionne, Schriesheim, & Dansereau, 2008; Walumbwa, Luthans, Avey, & Oke, 2011). This study is, consistent with a recent review by Gardner et al. (2011), the first to our knowledge to theorize about as well as empirically test the relationship authentic leadership has with creativity and innovation.

Additionally, there is very little multilevel research on the determinants of innovation and creativity, including leadership (Crossan & Apaydin, 2010). Both creativity and innovation are complex phenomena, subject to numerous broad contextual and social influences (Agars, Kaufman, & Locke, 2008). Cross-level influences are critical in identifying and understanding group factors that can facilitate or stifle creative behavior in a complex social system (Amabile & Mueller, 2008; Shalley & Zhou, 2008). Published work has tended to take place "in level" (Tierney, 2008), and has been primarily leader-focused and based on individual differences (Yammarino et al., 2008). Yet leaders enhance employees' innovative behaviors and modifying attitudes that are beneficial to innovative activities (Oke et al., 2009). Furthermore, contextual factors might not have the same influence on creativity as on innovation (Agars et al., 2008). Even if creativity and innovation are not the same and are even not stimulated in the same way by the same factors (West, 2002), innovation literature can be informed by creativity research (Runco, 2008). Creativity is the single most important determinant of innovation (Amabile, 1988), however, the two research streams have been too separated in the past (Agars et al., 2008). There have been calls for them to be brought together, even as early as in 1990 (West, 1990), as well as more recently (e.g. Agars et al., 2008). Yet the researchers still mostly avoid addressing the complexity of investigating creativity and innovation together, as the gap caused by the independence of creativity and innovation research streams is just beginning to be addressed (e.g. Baer, 2012).

Even if both creativity and innovation can be practiced at different levels in the organization (see Agars et al., 2008), several authors argue that one of the distinctions between creativity and innovation that we also follow in this study is that creativity should be investigated at the individual level, whereas innovation is a team or organizational level process or outcome (Amabile, 1996; Nijstad & De Dreu, 2002). Group factors and leadership have received the most attention in the literature as two key areas of social influence (Agars et

al., 2008) on creativity and innovation. We focus on leadership and argue that to deepen the understanding of how to stimulate creativity and innovation, it is crucial to use a multilevel approach to be more precise in examining how the contextual effect of authentic leadership relates to creativity at the individual level and innovation at the team level.

The goal of this study is to develop a multilevel model to explain how authentic leadership is related to creativity at the individual level and innovation at the team level. In addition, in line with Gumusluoglu and Ilsev's (2009) proposal, we examine how the cross-level relationship among leadership and creativity could be mediated by perception of support for innovation. We define authentic leadership as a construct consistent of three dimensions (self-awareness, self-regulation, and positive modeling), and empirically assess different effects of both self-ascribed and perceived authentic leadership. This approach is theoretically important because it provides a comprehensive contextual insight in the antecedents of creativity and innovation. Furthermore, it helps to build a case of authentic leadership being suitable for fostering employee creativity and team innovation.

Theoretical background and hypotheses development

Authentic leadership: perceptions and dimensions

Authentic leadership is the root concept and a foundation for any positive forms of leadership (May, Chan, Hodges, & Avolio, 2003; Ilies, Morgeson, & Nahrgang, 2005). Authentic people are in the centre of authentic leadership that can be authentic transformational, transactional, or of any third type (Price, 2003; Shamir & Eilam, 2005). It represents the extent to which managers are aware of and also exhibit a pattern of openness and clarity in their behavior toward others by sharing information, accepting others' inputs, and reveal their own values, motives, emotions, and goals, in a way that enables the followers to assess their behavior (Walumbwa et al., 2010).

Authenticity in leadership describes the managers with great capacity to effectively process information about themselves (their values, beliefs, goals, and feelings), an ability to adjust their behavior in leadership in accordance with their own self, a clear personal identity, and an ability to harmonize their preferences with the demands of society (Chan, Hannah, & Gardner, 2005). To be authentic means to be natural, original, and not a copy (Shamir & Eilam, 2005). It includes possessing personal experiences (values, thoughts, feelings, beliefs) as well as acting in accordance with one's own real self.

Authentic leadership research points out a dilemma whether authentic leaders are genuinely authentic if they perceive themselves to be, or if they are perceived as such by others (e.g. Cooper, Scandura, & Schriesheim, 2005; Harvey, Martinko, & Gardner, 2006; Toor & Ofori, 2008; Ladkin & Taylor, 2010). Even if the answer to this question may be rather difficult to find, researchers should be aware of different perceptions concerning authenticity and employ them in their research.

Many researchers assume that authenticity and consequently authentic leadership do not involve others' perception of a leader, but only an individual's own actions in accordance with an individual's true nature (Shamir & Eilam, 2005; George, Sims, McLean, & Mayer, 2007; George, 2007). Thus, authenticity must be self-ascribed. This assessment of authentic leadership is more about the leader's character (personality). Sparrowe (2005) opposes this and exposes the need to assess a leader's authenticity from multiple sources. Goffee and Jones (2005), and Harvey et al. (2006) also insist that authenticity must be attributed to an individual by others. The leaders cannot asses themselves to be authentic, but can be described as such only by the people in contact with them. Defined as such, authenticity is only perceived by others, thus assessing the leaders' expression of their character through behavior. Therefore, two perspectives exist about perception of authentic leadership. This is

why we measure authentic leadership both from the perspective of team leaders themselves and from the perspective of the leaders' followers - team members.

Since the leader – follower relation is one of the main elements of the authentic leadership construct (Gardner et al., 2005), it is essential to collect information about a leader's authenticity both from leaders as well as from followers. It is necessary to distinguish between own perception of the leaders' characteristics and the perception of the leaders' characteristics by their followers (Cooper et al., 2005). In line with the conceptual model of authentic leadership (Gardner et al., 2005), these characteristics can be grouped in three authentic leadership dimensions; self-awareness, self-regulation, and positive modeling.

Team leaders' authenticity, perception of support for innovation, and creativity

Even if it should be understood and examined as a complex and ambiguous construct (Runco, 2008), creativity is most simply defined as the generation of novel and potentially useful ideas (Amabile, 1983; Shalley, 1991) as understood within a particular social context and can be seen as both an outcome and a process (Shalley & Zhou, 2008). In this article, we mostly treat it as an outcome that is influenced by various factors, but will also delve deeper into the process of creativity when explaining the underlying mechanisms that describe how authentic leadership directly or indirectly through perception of support for innovation could influence creativity.

Much of the past literature looks at how leaders can directly affect their subordinates' creativity through traits and behaviors. Thus, leader behaviors represent an important component of work context. Creativity literature indicates that higher levels of team leader's self-confidence (Barron & Harrington, 1981) and consequent independency (Patterson, 1999), perceived by team members, will result in employees' increased creative behaviors. Authentic leadership may be a particularly suitable style for stimulating creativity through this

mechanism. During the process of self-awareness, authentic leaders observe and analyze their own mental state through introspection. They learn about and accept their fundamental values, feelings, identity, and motives or goals (Avolio & Gardner, 2005). By knowing themselves very well and accepting themselves such as they are, leaders' self-confidence is also built through the process of self-awareness. Such leaders are more independent, which is projected into the followers and has been supported to improve their creative behavior (Patterson, 1999).

The process of personal identification of employees with the leader, called positive modeling, is also affected by the leader's self-awareness (Gardner et al., 2005). This process is unique to authentic leadership compared to other leadership styles. Authentic leaders spread common cognitive behavioral patterns through all members of an organization. During the relational developmental process of positive modeling, authentic leaders build positive psychological capital in the employees (Avolio et al., 2004; Avolio & Gardner, 2005; Gardner et al., 2005). By leading with example and thus demonstrating their true self to the followers, the self-aware authentic leaders increase followers' levels of creativity (Ilies et al., 2005). The leader's development of a high-quality relationship with employees influences them to engage in higher levels of creative performance in the workplace (Tierney, Farmer, & Graen, 1999).

Authentic leaders raise the levels of positive psychological capabilities of their followers. They improve the followers' positive psychological capital; their self-esteem (Luthans & Avolio, 2003), hope (Avolio et al., 2004; Clapp-Smith, Vogelgesang, & Avey, 2009), trust (Ilies et al., 2005; Clapp-Smith et al., 2009), resiliency (Gardner & Schermerhorn, 2004), and optimism (Avolio et al., 2004; Avolio & Gardner, 2005). More hopeful, optimistic and confident employees would be more inclined to try new things more often and not be afraid of a possible failure or rejection. Even more so, they are resilient and overcome obstacles easily. Positive emotions enable flexible and creative thinking (Avolio et al., 2004), which is very

much based on experimentation and potential failure. Therefore, employees that would not be afraid to experiment even when their highly novel ideas might occasionally fail are bound to achieve better creative performance.

Authentic leadership has been conceptualized to be related to intrinsic motivation (Ilies et al., 2005). When guided by the influence of authentic leaders, employees (authentic followers; Gardner et al., 2005) take the initiative for their own development. They do so because in the process of positive modeling and the consequent authentic followership development, they realize that they can achieve more than they previously thought (George et al., 2007). The core of this process is not in transforming the followers to the desires of the leader or towards the liking of the organization, which might be the case with transformational leadership. It is about a more engaged positive development of the follower because or as a result of the leader's role modeling. The followers act towards positive thinking, building self-confidence, and developing hope on their own. Such proactive behaviors of the leaders were demonstrated to stimulate creative behaviors of employees (Seibert, Kraimer, & Crant, 2001). We therefore hypothesize:

Hypotheses 1a&b: Authentic leadership (self-ascribed and perceived) is positively related to individual creativity.

Particular types of leader behaviors are more likely to induce employees' perceptions of leader support that is conducive to their subsequent creativity. These leader behaviors have to do both with emotional support, as well as with more instrumental support forms (Amabile, Schatzel, Moneta, & Kramer, 2004). Instrumental support, for example, is about facilitating employees with tasks, ensuring the employees develop the expertise necessary to perform well, and eliciting the intrinsic motivation for creative work (Amabile et al., 1996). In line

with the more interpersonal support, leaders' demonstrations of empathy and consideration were found to enhance employees' creativity (Oldham & Cummings, 1996; Amabile et al., 2004).

The perception of support for innovation describes the extent to which the employees perceive support of innovation by leadership. Therefore, by the very definition, it should be directly affected by leadership style. We have established that through the process of relational transparency that is part of authentic leaders' self-regulation, the leaders' true self becomes evident to the employees (Gardner et al., 2005). Such openness and full disclosure that is characteristic for authentic relations characterized by high levels of relational transparency enables the employees to better estimate the degree to which the leaders show support for innovation.

Relational transparency (clarity of relations) of authentic leaders includes presentation of an individual's true interior towards others. Authentic leaders demonstrate openness and self-disclosure (Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008). Such behavior over time helps to develop a tighter relationship between the leader and his or her follower. When supervisor-subordinate relationships are tighter, more information is shared and true thoughts and feelings are expressed while minimizing expressions of inappropriate feelings (Kernis, 2003). Through honest and transparent relations with co-workers, internal characteristics of authentic leaders that are supposed to stimulate employees' creativity and innovation can be perceived by others. In such relationships, followers are more likely to be better able to perceive the leaders to be supportive of their novel, different ideas. This is so if leaders not only possess these traits (self-ascribed authentic leadership), but also if they are not concealed from the employees (perceived authentic leadership). In this way, the perception of support for creativity and innovation is established. The way team members perceive the extent to which creativity is encouraged within the team influences a number of creative behaviors.

Team members are not afraid to experiment and suggest novel, unusual ideas. We thus propose a mediating construct on the relationship between both self-ascribed and perceived team leaders' authenticity and creativity:

Hypotheses 2a&b: Perception of support for innovation mediates the relationship between authentic leadership (self-ascribed and perceived) and individual creativity.

Team leaders' authenticity and team innovation

In its broadest sense, innovation represents the creation and implementation of a new idea in a specific social context with the purpose of delivering commercial benefits (Crossan & Apaydin, 2010). Innovation implementation involves changing the status quo, which implies resistance, conflict, and a requirement for sustained effort. Therefore, the effort to innovate must be, in contrast to the effort to be creative, to some extent stimulated externally, thus requiring different incentives or stimulations. This also implies different leader behaviors should stimulate innovation as opposed to those that foster employee creativity. However, we propose that authentic leadership, the root construct of all positive forms of leadership, embodies leadership behaviors suitable to stimulate both creativity and innovation.

Innovation is a nonlinear process that may be in line with the stages of innovation initiation and implementation. Thus, creative thinking of the employees occurs as part of the innovation process. In the research context of this particular study, this takes place at the individual level, with the implementation of novel ideas taking place at the team level. Such setting is also supported by previous research (Amabile, 1996), yet it should not be understood as the only way to practice or examine creativity and innovation, as explained in the introduction. Best creative ideas by the employees are selected and are consequently more likely to be implemented. This, however, takes place through selection and socialization processes (Ford,

1996) where idea champions need some political abilities to 'sell' their ideas to other team members.

West (2002) argues that four groups of factors – task characteristics, group knowledge diversity and skills, external demands, and integrating group processes – determine group innovation. Leadership possesses great role in each one of them, as it is a key contextual influence on group goals, rewards, and resource control (Redmond, Mumford, & Teach, 1993). Authentic leaders empower team members by aligning them around a common purpose and set of values and encouraging them to step up to lead (George et al., 2007). This occurs through time via positive modeling and authentic followership development and is thus uniquely characteristic for this leadership style above and beyond other styles. Authentic leaders with high levels of relational transparency are better able to express that they have faith in their employees and better able to openly show them support by doing so.

Because of open and transparent relations, team members are more likely to be able to perceive leaders as behavioral role models. Authentic leaders that serve as role models, because they exhibit high levels of self-awareness, become to know themselves very well. Such individuals tend to exhibit more self-confidence and are in turn not afraid to take risks, experiment, and try to implement new ideas (Mumford et al., 2002). Creative and innovative leaders that are likely to evolve from authentic leaders with high self-awareness would appreciate, understand, and model creativity and innovation. This would enable and motivate the employees to create and work towards the implementation of creative ideas (Tierney, 2008). They would also act as role models in innovative behavior. In turn, the employees are eager to try to successfully put their own ideas to use, as well.

Balanced processing is an integral part of a leader's self-regulation dimension of authentic leadership. It means comparing with others in a way independent from ego based defense mechanisms (Gardner, Fischer, & Hunt, 2009). It is about objective assessment of all relevant

information before making a decision (Walumbwa et al., 2008). Such authentic leaders with high levels of self-regulation would therefore be more tolerant of ambiguity and open to experience and change, because they would be less likely to be thrown off by potentially risky ideas. These are the characteristics Patterson (1999) stresses as crucial for leadership that stimulates innovative results from the employees. This is why authentic leaders are good at getting team members to build on one another's ideas, as well as at combining ideas from multiple group members and implementing them within as a group outcome:

Hypotheses 3a&b: Team leaders' authentic leadership (self-ascribed and perceived) is positively related to team innovation.

Methods

Sample and Procedures

Empirical data were collected from 23 team leaders and 289 of their followers (employees/direct reports), in a Slovenian manufacturing and processing company employing 445 people, in April 2009. A translation-back translation procedure was used to translate the questionnaire from English to Slovenian and back to English. We use data collection approach proposed by Walumbwa et al. (2010) and gather data from both team leaders and their followers. This enables comparisons of findings and more accurate results. The questionnaires included team and employee identification codes so that the employees were guaranteed anonymity and confidentiality and that data from the supervisors and the employees could be matched and grouped for analysis. The employees were asked to complete the questionnaires individually, without talking to each other. The average response rate per team is 12.56 employees, whereas a number of direct reports per team supervisor that had answered ranges from 4 to 18. If we take into consideration only the 23 teams that

participated (76.6% response rate regarding team responses), it is a 70.70% rate of response of the supervisors' direct reports. We present the demographics of survey respondents in Table 1.

Insert Table 1 about here

The studied company produces highly changing and customer-adaptive products made from composite materials. This work requires divergent thinking, experimentation, and novel idea suggestion in order to come up with the solution best-suited for their customer. In this context, it is the individuals (mostly the engineers or chemical technicians) that generate ideas that are then carried out (implemented) by the team. Thus, the implementation of creative ideas is manifested at the team level, starting with deciding which ideas to implement with a great role of idea champions in this process, until the actual implementation. It is particularly in this final implementation step that the employees conduct the most teamwork, requiring high degree of interdependence between people on the same team. This is why two-level investigation with differentiation among creativity at the individual and innovation at the team level is appropriate, with the leaders interacting with their team members in both stages.

Measures

In order to avoid problems with common method bias, we used following approaches. First, data were collected by two separate questionnaires: one for team members and the other for their team leaders. Second, after the data collection, we conducted two Harman's one-factor tests on data gathered both from the employees and from the leaders to address the common method variance issue. If common method variance was a serious problem in the study, we would expect a single factor to emerge from a factor analysis or one general factor to account for most of the covariance in the independent and dependent variables (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The results of the factor analysis demonstrated that no

general factor was apparent in the unrotated factor structure, with the first factor in employee data accounting for only 27.1% of the variance, whereas the first factor in leader data accounted for 37.3% of the variance.

Third, the items used in our study are part of a large-scale questionnaire; the respondents would therefore likely not have been able to guess the purpose of the study and force their answers to be consistent. Fourth, we reverse-coded some items in the questionnaire. The questionnaires included team and employee identification codes so that data from the leaders and the employees could be matched and grouped for analysis. All respondents were guaranteed confidentiality.

Team leaders' authenticity. Authentic leadership construct is measured with a questionnaire we have developed and adapted from previously used research instruments based on a comprehensive literature review. The measurement instrument we have developed and analyzed via exploratory factor analysis on a different sample, a convenient sample of 2176 employees with direct supervisors from various companies and industries in Slovenia, is similar to the Authentic Leadership Questionnaire (ALQ), validated by Walumbwa et al. (2008), in one mutual dimension (self-awareness). Next dimension, self-regulation, covers their two dimensions, balanced processing and internalized moral perspective. Based on the literature review, positive modeling was added as an integral part of authentic leadership. We test for content and discriminant validity, as well as reliability of measurement variables and constructs. The results indicate all parts of the questionnaire are valid and reliable. Results of the exploratory factor analysis (Appendix A) thus do not confirm the factor structure of ALQ. Based on this evidence and based on practice of previous studies that have found support for combining authentic leadership dimensions into one common core construct (e.g. Walumbwa

et al., 2010), we proceeded to aggregate items of authentic leadership into one latent higher order construct.

A set of 13 items was used for measuring each self-ascribed and perceived authentic leadership. Same items were used both in leader and employee survey, with different wording to concern oneself (in case of the leaders) or someone else (in case of the employees). A 5-point Likert-type scale ranging from 1 = "strongly disagree" to 5 = "strongly agree" was used (this is true for all the measures in this study). Authentic leadership ratings by the subordinates belonging to the same team leader were aggregated at the team level by averaging to get a single score for each team leader.

Mediating, dependent, and control variables. Team innovation construct was measured with a scale developed by Lovelace, Shapiro, and Weingart (2001). The perception of support for innovation construct was measured by 12 items adapted from Scott and Bruce (1994). Follower creativity at the individual level was measured by a research instrument developed by Zhou and George (2001). As identical behaviors may be considered 'innovative' or 'creative' in one organizational context and unsettling or disruptive in another (Agars et al., 2008), perceptual measures were used because they enable the most relevant subjective assessments about domain-specific creativity from the actors involved in the social setting where the innovation process is taking place.

Team innovation was leader-reported, whereas perception of support for innovation and creativity were employee-reported, to get a more objective description of the innovation process by including different perspectives to measure creativity and innovation, respectively. To achieve this, creativity is self-reported, even if some oppose such approach and suggest creativity to be supervisor-assessed (Tierney et al., 1999; Zhou & George, 2001). Yet a large research stream uses self-reported measures when it comes to creativity (e.g. Kaufman, 2006;

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Shalley, Gilson, & Blum, 2009), due to the fact it is easier and more relevant to assess your own creative behaviors than someone else's. Individuals have access to information about certain aspects of their work that no one else has (Amabile & Mueller, 2008). Measures of control variables included followers' age, work tenure, and gender, which were self-reported.

Results

Descriptive statistics, validity and reliability

For validation of the measurement instruments, we applied confirmatory factor analysis (CFA) using LISREL 8.80 software package. Convergent validity and unidimensionality were examined by the loading paths of all items, which are statistically significant if they exceed 0.50. In the iterative process of purifying the scales several items were excluded from the further analysis. In the final version of the model, 48 of 63 items were used to measure five constructs (perception of support for innovation and creativity at the individual level, and self-ascribed and perceived authentic leadership and team innovation at the team level).

Table 2 provides descriptive statistics of all variables analyzed in this study, including the means, standard deviations, and inter-correlations. The inter-item reliability coefficients (Cronbach's alpha) are reported on the diagonal of the correlation matrix.

Insert Table 2 about here

Since we have adapted the ALQ (Walumbwa et al., 2008) to measure authentic leadership dimensions, and changed some items based on literature review (Avolio et al., 2004; Gardner et al., 2005), we tested the questionnaire for reliability. A composite reliability index (CRI) and average variance extracted (AVE) were calculated in order to test the composite (construct) reliability, as suggested by Škerlavaj et al. (2007). The values of CRI as well as AVE are presented in Table 3 for all constructs of the research model. The values exceed the

thresholds (0.50 for AVE and 0.70 for CRI), meaning the measuring instrument proposed is both valid and reliable.

Insert Table 3 about here

Multilevel analysis results

The dataset consisted of two hierarchically nested levels: 289 employees (level-1) nested within 23 teams which all had one team leader (level-2). Each of the 289 employees provided data on their own creativity and perception of support for innovation. These data constituted the lower-level (level-1) unit of analysis in this study. The second-level data included team innovation and authentic leadership scores for each of the 23 team leaders. Data regarding authentic leadership were gathered from two sources: from the leaders (self-ascribed authenticity) and their followers (perceived authenticity).

We used Hierarchical Linear Modeling (HLM 6.0,Raudenbush & Bryk, 2002) to test the following aspects of our multilevel model: 1) the existence of a multilevel structure, 2) the cross-level effect of authentic leadership on individual creativity, and 3) the mediating effects of perception of support for innovation on the relationship between both self-ascribed and perceived authentic leadership and individual creativity.

Testing the existence of a multilevel structure. As suggested by Raudenbush and Bryk (2002), this study first tested the existence of a multilevel structure in the model we proposed. In the intercept-only model with creativity as the dependent variable, the ICC (intraclass correlation) at the team level (level-2) was .080, which indicates a high degree of association on creative behaviors between individuals within the same team. Employees from the same team in our study exhibit similarly creative characteristics within the team. Following Hayes' (2006) recommendation to use multilevel modeling in situations where intraclass correlations

exceed 0.05, the ICC results of the intercept-only model justified our use of a multilevel analysis as an appropriate strategy for analyzing the cross-level effects of authentic leadership on creativity.

To validate the aggregation of individual-level measures of perceived authentic leadership and perceived support for innovation on a group level, we used following approaches. We calculated the intraclass correlations (ICCs) and the within-group agreement (r_{wg}). For perceived authentic leadership (slight skewed shape), the average r_{wg} was 0.72, ranging from 0.50 to 0.93, whereas ICC(1) was 0.16 and ICC(2) was 0.62. For perceived support for innovation (also slight skewed shape), the average r_{wg} was 0.67, with ICC(1) at 0.04 and ICC(2) at 0.49. In light of this evidence, we proceeded to create aggregate measures of perceived authentic leadership, but have decided to treat perceived support for innovation at the individual level.

Testing cross-level mediation. To test our hypotheses, we developed a set of multilevel models based on the theoretical predictions using the incremental improvement procedure demonstrated by Hox (2010). In the construction of these models, all variables were grand-mean centered. The fixed effects with robust standard errors for all models are presented in Table 4. We started with the intercept-only model with *team members' creativity* as the dependent variable (Model 1).

To test the cross-level effects of authentic leadership, we added each self-ascribed and perceived authentic leadership to Model 1, separately (Models 2a and 2b, respectively). To test the hypotheses, we examined the coefficients of corresponding parameters estimated in the models. Perceived authentic leadership has a positive statistically significant effect on individual creativity (Model 2b: $\gamma = .26$, *SE* $= .01$, $p < .01$), confirming Hypothesis 1b, whereas the effect of self-ascribed authentic leadership is not significant (Model 2a: $\gamma = .17$,

SE = .01), controlling for followers' gender, age, and work tenure. Thus, Hypothesis 1a could not be confirmed.

To test the effect of perception of support for innovation at the individual level, we added perception of support for innovation as a level-1 predictor of creativity (Model 3). The results of the analysis showed perception of support for innovation is positively related to team members' creativity (γ = .30, *SE* = .02, *p* < .005). Hypotheses 2a and 2b propose that perception of support for innovation would mediate the relationship between self-ascribed and perceived authentic leadership, and individual creativity. Full mediation would exist if the previously significant relationship between authentic leadership and individual creativity would be reduced to non-significant levels when including mediator variable in the analysis. Partial mediation could be claimed if the relationship between authentic leadership and creativity remained significant but to a lesser degree.

The results in Model 4a indicate that the relationship between self-ascribed authentic leadership and individual creativity has been reduced in size (from γ = .17 to γ = .11 in Model 2a) after including perception of support for innovation as a mediator variable, controlling for followers' gender, age, and work tenure. As this relationship was even previously not significant, partial mediation cannot be claimed. Therefore, we did not find support for Hypothesis 2a.

The results in Model 4b indicate that the relationship between perceived authentic leadership and individual creativity remained significant (γ = .21, *SE* = .01, *p* < .01), controlling for followers' gender, age, and work tenure, but to a lesser degree compared to the effect in Model 2b (γ = .26). Thus, Hypothesis 2b is partially supported. In addition, Sobel's (1982) test was conducted to further examine Hypothesis 2a. The results support this hypothesis for partial mediation (z= 3.34, p<.001).

Insert Table 4 about here

Testing team-level hypotheses. The results of team-level hypotheses are shown in Table 5. Hypotheses 3a and 3b proposed that self-ascribed and perceived team leaders' authentic leadership, respectively, would be positively related to team innovation. The results show self-ascribed authentic leadership is not significantly related with team innovation (Model 1a, $\beta=0.19$), thus not providing support for Hypothesis 3a. On the other hand, perceived authentic leadership has a significantly positive relationship with team innovation (Model 1b, $\beta=0.36$, $p<0.05$), supporting Hypothesis 3b.

Insert Table 5 about here

Discussion and implications

Leaders not only serve as behavioral role models for innovative ideas, they also serve as important actors for enhancing innovative behaviors and modifying attitudes that are beneficial to innovative activities (Oke et al., 2009). As the processes of creativity and innovation occurs within a specific team that is characterized by distinct team leader's traits, individual creativity and team innovation are inevitably influenced by these leadership characteristics. Authentic leadership, recently a very popular construct, is one of the leadership forms that could play a role in fostering employee creativity. This is so because leaders' authentic behaviors relate to employees' higher emotional safety and increased number of proposed unconventional ideas (Avolio et al., 2004). Therefore, examining the cross-level effects of authentic leadership at the team level on creativity and innovation at the individual level is highly relevant.

The goal of this study was to theorize and empirically test a multilevel model of 1) cross-level effects of team leaders' authentic leadership on employee creativity, 2) the mediating effects of perception of support for innovation on the relationship between team leaders'

authentic leadership and individual creativity, and 3) the direct effect of authentic leadership on innovation at the team level. Specifically, we developed two sets of multilevel hypotheses to examine the degree to which both self-ascribed and perceived authentic leadership would influence individual creativity, both directly and through perception of support for innovation. The research model along with the status of the proposed hypotheses is shown in Figure 1.

Insert Figure 1 about here

The major contribution of this study is investigation of a higher-level contextual influence on creativity and innovation. Systematic and comprehensive research on creativity and innovation cannot be conducted without thinking about multiple levels (Woodman, Sawyer, & Griffin, 1993), and the domain of leadership and creativity is multi-level in nature and should be studied as such (Drazin, Glynn, & Kazanjian, 1999). Our research involves a complex multi-level scenario: phenomena of interest involve the leader, who influences an organization's characteristic (climate of support for innovation), which in turn affects both team level characteristic (innovation), as well as individual-level behavior (employee creativity). We showed some difference between affects of self-ascribed and perceived authentic leadership. Self-ascribed team leaders' authentic leadership was not found to influence either individual creativity or team innovation, whereas similar effects were found to be statistically significant for perceived authentic leadership.

For leaders' authenticity to be related with individual creativity and team innovation, it is apparently not sufficient for leaders to assess themselves as very much aware of their goals, emotions, values, and motives. The leaders' self-awareness should be demonstrated to others in a way that followers perceive it as a characteristic that their leader is in possession of. Team leaders' authenticity had no significant effect in our study, until it was clearly presented to others. Apparently, it is authentic behavior that is more likely to lead to positive outcomes,

as opposed to merely authentic character. Leaders should exhibit transparent relations with the employees and demonstrate high moral level, thus inspiring team members to follow their lead (Novicevic, Davis, Dorn, Buckley, & Brown, 2005). This way, team members might be more willing to follow the lead and suggest novel ideas, which are also more likely to be put to successful use by the team. Only then can authentic leaders hope to stimulate creativity and innovation.

Another important finding of this study is related to the mediating effect of perception of support for innovation on the relationship between perceived authentic leadership and individual creativity. It was previously established for leadership as an influence at the team level to have an indirect impact through support, which is expected to enhance creative performance (Madjar et al., 2002). We have indicated authentic leadership can have contextual effects on creativity and innovation, similar to other participative leadership styles. Perception of support for innovation plays a mediating role in stimulating individual creativity from leadership influences; employees, working in an innovation supporting team climate were indicated to exhibit higher levels of creative behaviors. It is evident that it is not only important for the leaders to encourage team members' creativity directly, but also to establish a climate within the team that values experimentation and where occasional flaws are tolerated.

The job of leadership is to move forward the ideas through the somewhat political processes within the organization that are frequently too cumbersome to overcome. Only few studies have examined leader behaviors that find indication of necessary political support and advocacy for employee creativity (Tierney, 2008). The mediating effect of perception of support for innovation helps to reveal that it is an important role of the leaders to provide both resource and political support that can enable and motivate employees to seek innovative actions in the workplace.

In terms of the perception of support for innovation, important notes need to be made. It might be that both the extent to which creativity is necessary or desired in the organization, as well as the employee traits influence the mediating role that we have found. In the studied company, creativity and innovation are well desired and part of work assignments, also stimulated by external incentives (awards). So this might be the reason that the leaders know that innovation is important to the organization and transparently communicate this to employees, making for a stronger mediating effect of perceived support for innovation. The results might be different if the task as such wasn't innovation-oriented. Same logic can be applied in terms of employee creativity. Employees who are already creative as it is, which is most likely the majority of the employees in the studied firm, may perceive the leader as being supportive of innovation, while employees who are not already creative may not see the leader as being supportive of innovation, but still feel that the leader is authentic. Thus, individual traits as well as task-related contextual factors need to be taken into account when interpreting and generalizing the results of our study.

Two possible explanations could be made regarding the fact that we could not find support for the aggregation of perceived support for innovation (in contrast with perceived authentic leadership) at the team level. One, authentic leaders may not be consistently more supportive of creativity. This is also in line with the definition of authentic leadership, which precludes any a priori biases or leadership style-based behavioral traits. Two, it could be the reflection of a work setting that by itself holds creativity and innovation in high regard. In any case, the mediating role of perceived support for innovation did point out that this is an important mechanism through which the supervisors' authentic leadership impacts on employee creativity, even if more in-depth research needs to be conducted to fully grasp these relations.

Our study found support for the fact that not only is leaders' support and guidance vital in promoting innovative efforts at the initial creative stage, as it contributes to effective

interactions among group members, but equally important is their ability to create conditions for the subsequent implementation of innovation (Mumford & Licuanan, 2004). This was supported as perceived authentic leadership was indicated to be positively related to innovation at the team level. Yusuf (2009) agrees and points out that translating creativity into innovation is a function of multiple incentives, with a great role of leadership in this task. The employees' innovative behavior and subsequent team innovative performance is contingent on whether the employees feel the leader provides both intangible and tangible support for team members' innovative ideas (Tierney, 2008).

Theoretical contributions

This study contributes to existing research on authentic leadership, creativity, and innovation in the following aspects. First, we develop a multilevel theoretical model that examines the cross-level effects of authentic leadership on individual creativity and the mediating effects of perception of support for innovation on the relationship between team leaders' authentic leadership and individual creativity. The findings of this study provide further support to the conceptualization of creativity as a context-based phenomenon influenced by multilevel effects of their antecedents, such as leadership (Oke et al., 2009; Crossan & Apaydin, 2010).

Second, we also examine the effect of authentic leadership on team innovation. Our study advances previous research by empirically examining authentic leadership as an important antecedent to creativity and innovation for the first time. We address the call made by Agars et al. (2008) who argue that research should draw a distinction between idea generation and innovation implementation and study the influence of authentic leadership on both outcomes separately, as they are carried out in a specific organizational setting. The results build to the previous research by not only finding support for the direct effects of authentic leadership on team innovation, and for the cross-level effects of authentic leadership on creativity, but also

by capturing the mediating effect of perception of support for innovation with regards to perceived authentic leadership. Our study examines the mechanisms through which leaders enable and facilitate creative and innovative behavior and outcomes. Doing so, we contribute a piece of empirical research to the integration of macro-level innovation research with micro-level creativity work, as well as contribute to authentic leadership literature by investigating its relationship with important outcomes at different levels and thereby expanding its nomological network (Gardner et al., 2011).

Our study that has found empirical support for a positive role of authentic leadership in stimulating desired outcomes in the form of creativity and innovation is somewhat contrasting the proposition of Ford and Harding (2011). They suggest that there is reason for concern regarding the potential detrimental impact of authentic leadership on those subjected to it. This is why we posit a slightly modified model that derives more from its original roots in positive psychology. We acknowledge that it is not possible to find a leader's true self when he or she needs to be a part of the collective of the organization. We attempt to address this notion by positing that only the leaders with high positive psychological capacities are authentic, as well as by incorporating two measurement perspectives in our research model, one directed towards the collective (others-perceptions), and one directed towards self. Our model is therefore potentially *in*authentic, but in a way we feel it contributes to taking authentic leadership theory to a higher level in terms of surpassing the weaknesses of previous models of leadership.

Practical implications

We found support for the fact that perceived authentic leadership has greater impact on individual creativity and on strengthening the positive relationship between creativity and on team innovation than self-ascribed authentic leadership. This is why it is important that the

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leaders emphasize building on authentic relations with the employees so they will perceive the leaders to be more authentic. Through sincere, open and transparent relations and leading by example, the leader's true self can become apparent to the followers. In this way, they would assess the leader as more authentic, which has the potential to result in improved employees' creativity and innovation. This should, in accordance with numerous studies, positively affect team performance and the performance of the organization as a whole (e.g. Johannessen & Olsen, 2009; Liao & Rice, 2010). However, the managers should also be aware of valid points made by Ford and Harding (2011), who point out the fact that the implementation of authentic leadership could lead to destructive dynamics within organizations.

The mediating role of perceived support for innovation supports the notion that team leaders should stimulate a supporting, safe climate to enhance employee creativity. In contrast, authentic leaders that would create a risk-averse and not supportive unsafe climate, such as, for example, those that would engage in close monitoring (Zhou, 2003), are likely to hinder and inhibit creativity. All in all, our study found support for the positive influence of authentic leadership in fostering employee creativity and team innovation, which supports the idea that authentic leadership development should be encouraged in the organizations striving for creativity and innovation. However, the leaders should also exhibit social support and foster a safe climate of support for innovation within their teams.

Conclusion with limitations and future research

The results of this study confirm the viability and importance of including authentic leadership in the theoretical development of creativity and innovation. We use a novel approach; unlike previous research on related topics that relied solely on one source of information, we examined authentic leadership with empirical data gathered from both leaders and followers. This allowed us to compare the findings and empirically examine cross-level

effects of authentic leadership (as perceived both by the leaders and by the followers), demonstrating greater influence of perceived authenticity.

The first limitation is connected to non-inclusion of other contextual and control variables. Although this study did not confirm all the hypothesized cross-level and direct effects of authentic leadership on individual creativity and team innovation, it in no way suggests that such a relationship is independent from other contextual variables at the team and even organizational level. Actually, the high intra-class correlation (ICC) in modeling the effects on creativity implies that the employees tend to exhibit creative behavior in similar fashions within the same team. Team-level variables such as psychological safety within the team could influence the examined relationships and should be subject to future research. Furthermore, as team innovation was assessed by team leaders, future research should include some more objective measures, such as number of patents or introduction of new products. But even with the high ICC, leadership resides in an embedded system within the organization context, and should as such be examined as a broader sphere at multiple levels within the organization (Tierney, 2008), in addition to the influence of the direct supervisor.

Individual traits of the employees, as well as their cognitive skills, should also be taken into account when conducting future research. Employees that are more prepared to take risks, that are proactively seeking opportunities, and work to fulfill their own goals would be more likely to exhibit creative behaviors at work. Thus, risk-aversity, proactive personality, and intrinsic motivation could influence the examined relationships in this study as moderator variables. Yet the actual implementation of creative and innovative behaviors also depends on work-related variables, such as job autonomy or complexity (Amabile, 1983; Shalley, Gilson, & Blum, 2000). In addition to leadership and perceived support of the supervisor, the work design itself should reflect the fact that the employees are operationally empowered and expected to come up with novel ideas. Creativity is affected by the interaction of individual,

group, and organizational factors (Woodman et al., 1993), which is why research should consider multiple interventions at multiple levels in the organization. Furthermore, individual traits, be it within the leaders or their employees, may not be stable over time (Luthans & Avolio, 2009), which is why future research needs to adopt a longitudinal approach (Amabile & Mueller, 2008; Avey, Luthans, & Mhatre, 2008).

We also need to be aware of potential disadvantages and challenges to the connection between authentic leadership and creativity. Mumford et al. (2002) argue that to lead creative efforts within the team, leaders must possess substantial technical and professional expertise and creative skills, as well as the ability to process complex information. Moreover, they must have the motivation to exercise this ability. It is evident that positive psychological states play a great role in leaders being willing to not only proactively stimulate employees' creativity, but also foster innovation within their teams. However, one needs to realize that the feedback, through which the leaders build the perception of support for innovation and influence employees' creativity and innovation, depends on their knowledge and expertise, as well as their status within the organization (Zhou, 2003).

Furthermore, the relation among authentic leadership and employee creativity might not always be as positive and linear as portrayed in our study, but might be better described with a curvilinear relationship. Authentic transparency in one's values and openness in information sharing' does not necessarily mean that an authentic leader will support creativity. For example, if the leader does not value creativity and instead thinks that efficiency is the most important, he or she, according to the definition of authentic leadership, should communicate this value to employees, which would most likely not stimulate creativity. As role-modeling is the main explanatory mechanism, assumptions regarding the leaders' creativity and support for innovation are made that may only be true for a highly innovative work context. Therefore, further in-depth investigation of this relation is required in future research.

The results suggest that besides self-ascribed or perceived authentic leadership examined in this study, there may be other team variables that would contribute to the variation in creativity across different teams and the similarity of such behaviors within the same team. Future research should investigate additional contextual factors (such as other leadership characteristics, team climate, or even organizational culture) to further understand the contextual influences on individual creativity and innovation. Authentic leadership may not have the same effect as it was measured in this study, so it would be necessary to examine if similar results can be expected in all organizational settings, industries, and market conditions. The limitation of this paper is that the empirical data were collected from only one company, with the relationship among authentic leadership and innovation at the team level only based on a sample size of 23 teams and team leaders (even if these are aggregate scores obtained from 289 employees). Given the small sample and relatively small coefficients, we need to be cautious about excessively interpreting the strength of the relationships that we found support for.

Therefore, to enhance the generalizability of our study, future research should be conducted to expand the scope of participating teams on different, diverse companies, companies from other countries and industries to control for effects of external factors. Thus it is imperative to further examine creativity and innovation not only from the perspective of an individual, or even from group perspective at the same level. In addition to that, further research is necessary to examine the contextual influence of authentic leadership on other organizational processes and results besides creativity and innovation. The benefits of authentic leadership need to be fully explored in order to fully embrace it and understand its advantages as well as potential cautions.

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Tables and figures

Table 1. Demographics of Survey Respondents

	Team leaders	Team members
Number of respondents	N=23	N=289
Age		
Up to 25 years	6.8%	7.2%
26-35 years	37.7%	31.1%
36-45 years	34.9%	30.6%
46-55 years	19.9%	24.5%
Over 56 years	00.7%	6.6%
Gender		
Male	64.9%	72.2%
Female	35.1%	28.8%
Work tenure		
Up to 5 years	9.6%	12.3%
6-15 years	37.0%	38.9%
16-25 years	34.9%	28.8%
26-35 years	17.8%	18.6%
Over 36 years	0.7%	1.4%

Table 2. Descriptive Statistics and Correlations for Individual- and Team-Level Variables

	Variable	N	M	SD	1	2	3	4	5	6	7	8
1	Gender (0=M; 1=F)	289	0.35	0.479								
2	Age	289	2.45	0.890	0.07							
3	Work tenure	289	2.63	0.91	0.06	0.07						
4	Perception of support for innovation	289	15.32	5.12	0.01	0.03	-0.02	(0.922)				
5	Team members' creativity	289	28.21	7.98	0.02	-0.01	-0.03	0.30**	(0.762)			
6	Team innovation	23	27.45	1.99	0.02	0.08	0.01	0.41**	0.28**	(0.706)		
7	Self-ascribed authentic leadership	23	64.39	2.44	-0.01	0.04	0.01	0.22**	0.17	0.19	(0.909)	
8	Perceived authentic leadership	23	61.82	3.08	-0.03	0.07	0.02	0.21**	0.26**	0.36**	0.87**	(0.904)

Values in parenteses on the diagonal are inter-item reliability levels (Cronbach's alpha). Significant coefficients are flagged, *p<0.05, **p<0.01

Table 3. Construct reliability

Aggregates of variables	Number of items (final)	CRI	AVE
Self-ascribed team leaders' authentic leadership	15	0.85	0.65
Perceived team leaders' authentic leadership	15	0.86	0.66
Team innovation	7	0.75	0.56
Team members' creativity	7	0.80	0.61
Perception of support for innovation	4	0.78	0.59

Table 4. Multilevel Analysis Results for Creativity as the Dependent variable

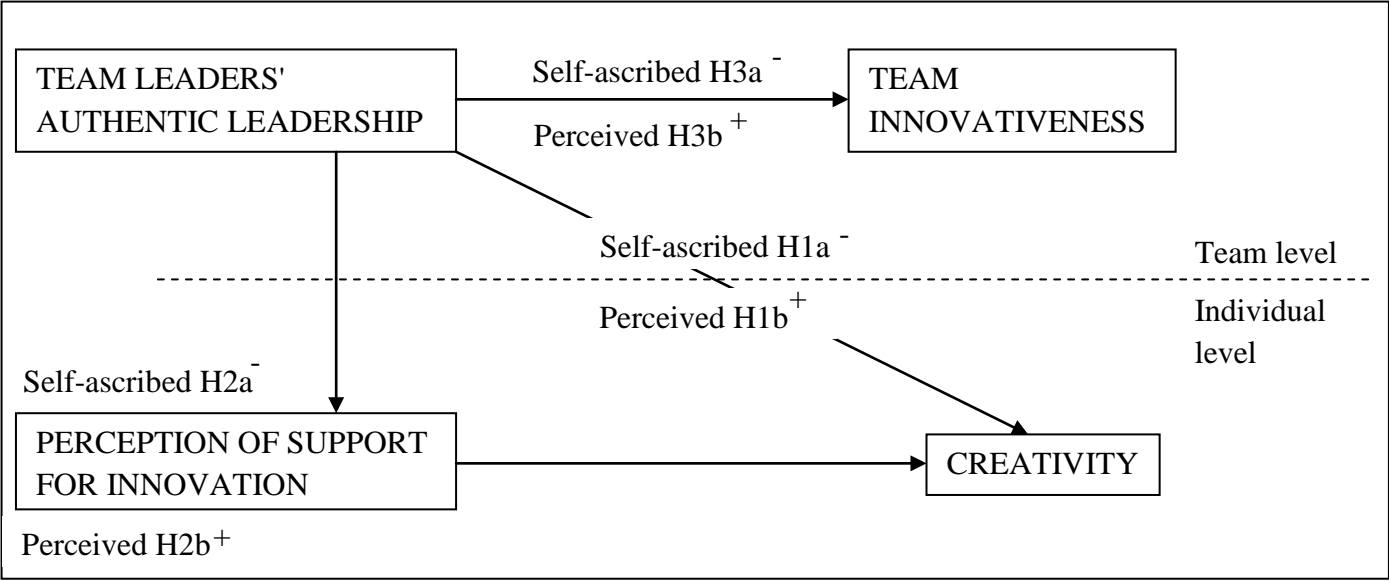|	Model 1	Model 2a	Model 2b	Model 3	Model 4a	Model 4b
Level 1						
	33.580**	33.454**	33.239**	32.343**	32.397**	33.254**
Intercept	(0.08**)	(0.15**)	(0.14**)	(0.13**)	(0.16**)	(0.14**)
Followers' age	0.02	0.04	0.04	0.05	0.06	0.06
Followers' gender	0.05	0.05	0.06	0.06	0.05	0.06
Followers' work tenure	0.01	-0.01	0.01	0.01	-0.01	-0.01
Perception of support for				0.30**	0.28**	0.25*
innovation				(0.02)	(0.02)	(0.01)
Level 2						
Self-ascribed authentic		0.17			0.11	
leadership		(0.01)			(0.01)	
Perceived authentic			0.26*			0.21*
leadership			(0.01)			(0.01)
Within-group residual						
variance	0.22	0.22	0.23	0.15	0.15	0.24
Deviance	1553.36	1565.02	1562.886	1320.33	1351.12	1310.97
n (level 1)	23	23	23	23	23	23
n (level 2)	289	289	289	289	289	289

Entries are estimations of fixed effects with robust standard errors. Estimations of the random variance components are in parentheses. For the intercepts, they represent the between-group variance in creativity. $**p<0.05$, $*p<0.1$.

Table 5. Results of simple regression analysis for team innovation

	Model 1a	Model 1b
Self-ascribed authentic leadership	0.19	
Perceived authentic leadership		0.36**
F		13.651
Df		22
R^2		0.394

**p<0.05, *p<0.1.

Figure 1. The research model along with the status of the proposed hypotheses

Appendix A. Results of exploratory factor analysis for authentic leadership

	Factor 1	Factor 2	Factor 3
Authentic leadership dimensions	Self-awareness	Self-regulation	Positive modeling
Variables	(Varimax-rotated factor loadings)		
AL23	**.745**	.087	.135
AL26	**.718**	.224	.032
AL24	**.673**	.354	.255
AL27	**.666**	.347	.244
AL21	**.638**	.337	.208
AL25	**.622**	.317	.325
AL22	**.620**	.457	.151
AL16	**.554**	.274	.299
AL19	**.543**	.404	.382
AL18	**.532**	.290	.448
AL13	.334	**.814**	.134
AL14	.373	**.776**	-.064
AL15	.381	**.687**	.158
AL11	.237	**.626**	.416
AL12	.098	**.595**	.427
AL20	.165	.158	**.831**
AL17	.297	.137	**.752**
Shares of explained variance (%)	27.121	22.123	13.943
Eigen Value	4.654	3.556	2.444

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Keiser-Mayer_Olkin measure of sampling adequacy: 0.955
Bartlett's Test of Sphericity approx.
Chi-square: 20649.357

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