Establishing the Next Generation at Work: Leader Generativity as a Moderator of the Relationships between Leader Age, Leader-Member Exchange, and Leadership Success

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Abstract

In this study, the authors investigated leader generativity as a moderator of the relationships between leader age, leader-member exchange, and three criteria of leadership success (follower perceptions of leader effectiveness, follower satisfaction with leader, and follower extra effort). Data came from 128 university professors paired to one research assistant for each professor. Results showed positive relationships between leader age and leader generativity, and negative relationships between leader age and follower perceptions of leader effectiveness and follower extra effort. Consistent with expectations based on leadership categorization theory, leader generativity moderated the relationships between leader age and all three criteria of leadership success, such that leaders high in generativity were better able to maintain high levels of leadership success at higher ages than leaders low in generativity. Finally, results of mediated moderation analyses showed that leader-member exchange quality mediated these moderating effects. The findings suggest that, in combination, leader age and the age-related construct of generativity importantly influence leadership processes and outcomes.

Keywords: generativity, age, work, leadership, leadership categorization theory, leadership success, leader-member exchange, mediated moderation
Establishing the Next Generation at Work: Leader Generativity as a Moderator of the Relationships between Leader Age, Leader-Member Exchange, and Leadership Success

The aging of the workforce in many countries has led to an increased interest in the role of age in the work context among developmental as well as organizational scholars (e.g., Bowen, Noack, & Staudinger, in press; Kanfer & Ackerman, 2004; Raymo, Warren, Sweeney, Hauser, & Ho, 2010; Yeung & Fung, 2009; Zacher & Frese, 2009). While most studies examined relationships between age and different forms of employee performance (Ng & Feldman, 2008; Zacher, Heusner, Schmitz, Zwierzanska, & Frese, 2010), the investigation of associations between age and leadership processes and outcomes has been neglected. This is surprising, given that interactions between young, middle-aged, and older supervisors and their subordinates constitute common social experiences for most members of the workforce. Even though an early theoretical article emphasized the importance of taking a life span approach to leadership (Avolio & Gibbons, 1988), hardly any studies exist in the developmental psychology literature that investigated leadership (for an exception, see Vecchio, 1993). Similarly, only a few leadership studies exist in the organizational psychology literature that examined age as a substantial (i.e., not as a control) variable (Zacher, Rosing, & Frese, in press).

We suppose, however, that combinations of age and age-related developmental tasks such as generativity (McAdams, de St. Aubin, & Logan, 1993; Peterson & Duncan, 2007; Ryff & Heincke, 1983) may importantly influence leadership processes and outcomes. Specifically, we assume that leadership success declines with increasing age unless leaders accomplish these developmental tasks (e.g., unless they become more generative with age). Thus, further research on age and leadership is needed to identify factors that may help maintain leadership success at higher ages.
The goal of this study is to investigate the interplay between leaders’ age and generativity in predicting three important criteria of leadership success—follower perceptions of leader effectiveness, follower satisfaction with leader, and follower extra effort (Bass, 1985; Bass & Avolio, 1994). We suggest that leader age and leadership success may not be related per se, which would be similar to the relationship between age and employee performance (Ng & Feldman, 2008; Warr, 2001). However, the relationships between leader age and different criteria of leadership success may be affected by a moderator, such that leaders with a high level of the moderator variable are better able to maintain leadership success at higher ages than leaders with a low level of the moderator variable.

The focus of this study is on leader generativity as a moderator of the relationship between leader age and leadership success. Based on generativity theory (Erikson, 1950; McAdams & de St. Aubin, 1992, 1998), we define leader generativity as leaders’ behaviors and actions aimed at establishing and guiding members of the younger generation, while focusing less on their own gains, careers, and accomplishments. Consistent with previous generativity research, we propose in the following that older leaders in general show higher levels of generativity than younger leaders. In addition, we suggest that leader generativity is more important for maintaining leadership success at higher than at lower ages because followers hold the normative expectation that older leaders should act in generative ways, whereas generativity is not expected from younger leaders.

Finally, we argue that the interactive effects of leader age with leader generativity on criteria of leadership success are mediated by follower perceptions of the quality of the leader-member exchange (LMX) relationship, which has been identified as an important leadership process variable (Gerstner & Day, 1997; Graen & Uhl-Bien, 1995).
Leader Age and Leader Generativity

Over the past decades, generativity has become a well-established construct and is considered to be an important research topic in the adult development literature (e.g., Kessler & Staudinger, 2007; Kotre, 1984; McAdams & de St. Aubin, 1992; McAdams, et al., 1993; Mor-Barak, 1995; Peterson & Duncan, 2007; Peterson & Klohnen, 1995; Peterson & Stewart, 1996). Erik Erikson (1950) was the first to describe the psychosocial conflict between generativity (i.e., establishing and guiding members of future generations) and stagnation (i.e., caring only for oneself) as the seventh out of eight stages in his seminal theory of life span development. Since then, numerous theoretical and empirical studies have extended the nomological network of generativity and provided support for its central role in adult development (for overviews, see de St. Aubin, McAdams, & Kim, 2004; McAdams & de St. Aubin, 1998).

We assume that older as compared to younger leaders show more generative behavior at work which contributes to the establishment and success of younger followers. At the same time, older leaders should invest less time and effort into building their own careers and success than younger leaders. Two related lines of theorizing provide support for our assumption. First, in their generativity theory based on Erikson (1950), McAdams and de St. Aubin (1992) suggested that individuals’ “need to be needed” and their desire for “symbolic immortality” become stronger with increasing age. These mostly subconscious motivations combine with age-related “cultural demands” (cf. Neugarten, Moore, & Lowe, 1965) to fuel a growing conscious concern for the next generation during midlife. Generative concern, in turn, may translate into a variety of behavioral expressions of generativity such as establishing and guiding younger individuals, taking over leadership roles, improving the community, and creating a personal legacy (Grant & Wade-Benzoni, 2009; Kotre, 1999; Zacher, et al., in press). Empirical findings generally
supported the assumption that generative concerns and behaviors increase from young to middle adulthood (Keyes & Ryff, 1998; McAdams, et al., 1993; Sheldon & Kasser, 2001; Stewart & Vandewater, 1998).

Second, socioemotional selectivity theory (Carstensen, 1995) suggests that age-related decreases in perceived remaining life time lead to a prioritization of emotionally meaningful and generative life goals. Research showed that decreases in future time perspective indeed resulted in a preference of generativity goals (Lang & Carstensen, 2002). In contrast, the importance of goals related to personal autonomy and self-enhancement diminishes with increasing age. Thus, older leaders’ motivation to lead is likely to be different from the motivation of younger leaders. Younger leaders want to move up the career ladder and accomplish things at work. In contrast, older leaders should perceive the remaining time in their occupational future to be more limited (Zacher & Frese, 2009), and age-related mortality cues may trigger reflections on impending death more often among older leaders (Grant & Wade-Benzoni, 2009). According to socioemotional selectivity theory, these perceptions should in turn facilitate generative behaviors among older leaders. Based on these theoretical perspectives, we propose our first hypothesis.

**Hypothesis 1:** Leader age is positively related to leader generativity.

**Leader Generativity as a Moderator of the Relationship between Leader Age and Leadership Success**

Leadership researchers often make use of follower perceptions to measure leadership success; in fact, follower ratings can be considered good measures of leadership success, because—compared to peer or supervisor ratings—they represent direct assessments of one’s leader (Hogan, Curphy, & Hogan, 1994; Judge, Bono, Ilies, & Gerhardt, 2002; Kaiser, Hogan, & Craig, 2008). In this study, we employ three follower-rated criteria of leadership success used in
many previous leadership studies (e.g., Bycio, Hackett, & Allen, 1995; Judge & Piccolo, 2004; Lowe, Kroeck, & Sivasubramaniam, 1996; Sosik & Megerian, 1999): follower perceptions of leader effectiveness, follower satisfaction with leader, and follower extra effort. Similar to the relationship between age and employee performance (Ng & Feldman, 2008), we do not assume that the relationship between leader age and these three criteria of leadership success is generally positive or negative—in other words, we do not expect a universal decline or increase in leadership success with increasing age.

Consistent with this assumption, the few existing studies on leader age and leadership success have generally found only small and non-significant relationships. For example, Vecchio (1993) showed that leader age and follower satisfaction with leader were not significantly related. More recently, Barbuto, Fritz, Markin, and Marx (2007) found no significant relationships between leader age and follower satisfaction with leader and follower extra effort, but a small and positive relationship between leader age and follower perceptions of leader effectiveness. Finally, Vecchio and Anderson (2009) reported a small and non-significant relationship between leader age and follower perceptions of leader effectiveness.

We propose in this study that leader generativity has a moderating influence on the relationship between leader age and leadership success. More specifically, we suggest that leaders high in generativity are better able to maintain high levels of leadership success at higher ages than leaders low in generativity. In contrast, leader generativity should be less relevant for younger leaders in terms of their leadership success. We base our assumptions on leadership categorization theory proposed by Lord and his colleagues (Brown & Lord, 2001; Lord, 1977, 1985; Lord, Foti, & De Vader, 1984; Lord & Maher, 1993). Leadership categorization theory suggests that followers’ expectations and cognitive prototypes of ideal leaders play an important
role in encoding, representing, and shaping perceptions of their leaders’ attributes, behaviors, and leadership success.

According to the theory, the expectations and cognitive knowledge structures of followers constitute implicit leadership theories (ILTs; cf. Epitropaki & Martin, 2005). Followers develop ILTs during the process of organizational socialization and through past experiences with leaders, and use them as a foundation for interpreting and responding to leaders’ attributes and behavior (Epitropaki & Martin, 2005). As a result, leaders are categorized as successful or unsuccessful based on followers’ perceptions of the match between leaders’ attributes and behavior and the attributes and behavior of previously existing leader categories and prototypes according to followers’ ILTs. Any inconsistencies that are determined when followers match their ILTs with actual leaders will affect followers’ general impression of their leaders as well as their attitudinal and behavioral responses to leader behavior (Epitropaki & Martin, 2005).

Empirical studies have supported the importance of ILTs for followers’ perceptions of and responses to leader behavior. For instance, Lord et al. (1984) showed that the identification of prototypical attributes in an actual leader had a strong influence on followers’ ratings of the leader’s behavior. In summary, leadership categorization theory assumes that the closer the match between followers’ perceptions of the attributes and behaviors of an actual leader to the follower’s ILTs of a successful leader, the more positive followers’ attitudinal and behavioral responses (i.e., satisfaction with the leader and follower extra effort) and the higher followers’ ratings of leader effectiveness will be.

We assume that followers hold differential ILTs about ideal older and ideal younger leaders’ attributes and behavior. Specifically, we suggest that followers expect older leaders to be high in generativity, whereas younger leaders are not (yet) expected to engage in generative
behaviors. Our assumption is supported by suggestions of generativity researchers that generativity is a normative, age-graded developmental task which is socially expected of older individuals (Erikson, Erikson, & Kivnick, 1989; Havighurst, 1948; McAdams & de St. Aubin, 1992; Neugarten, et al., 1965). Specific generative behaviors may include the transmission of older leaders’ accumulated work-related knowledge and experience to followers (Mor-Barak, 1995) and putting subordinates’ interests and success before the leader’s own career interests (Greenleaf, 1977).

Based on leadership categorization theory, we expect that followers respond to and rate older leaders with high generativity more favorably than older leaders with low generativity because they represent a closer match with followers’ ILTs about older leaders. The closer this match, the more likely followers show high levels of effort and provide better leadership ratings. Thus, older leaders who show a high degree of generativity should receive more favorable ratings than older leaders who do not. In contrast, for younger leaders, it should not make a difference whether they show high or low levels of generativity because generativity is not necessarily a part of followers’ ILTs about younger leaders. In other words, generativity is not an important developmental task at younger ages that followers expect from their leaders.

In summary, we propose that leader generativity helps leaders maintain high levels of follower-rated leadership success at higher ages because followers expect older leaders to be generative. If these expectations are fulfilled (i.e., if older leaders behave consistent with followers’ ILTs about older leaders by showing high levels of generativity), followers will perceive the older leaders to be more effective, will be more satisfied with their leaders, and they will also show more extra effort at work in order to reciprocate the leaders’ positive behaviors.
Hypothesis 2: Leader generativity moderates the relationship between leader age and leadership success, such that leaders high in generativity are better able to maintain high levels of leadership success at higher ages than leaders low in generativity.

The Mediating Role of Leader-Member Exchange

Leader-member exchange (LMX) theory represents an important contemporary approach to organizational leadership (Avolio, Walumbwa, & Weber, 2009; Gerstner & Day, 1997; Graen & Uhl-Bien, 1995; Liden, Sparrowe, & Wayne, 1997). LMX theory originally developed from the Vertical Dyad Linkage Model, which was proposed as an alternative to research on average leadership style (Dansereau, Graen, & Haga, 1975). The central premises of LMX theory are that leaders develop unique exchange relationships with each of their followers, and that the development and maintenance of high-quality exchange relationships lead to leadership success. High-quality exchange relationships between leaders and followers are characterized by a high degree of mutual liking, trust, respect, obligation, and reciprocal influence (Graen & Uhl-Bien, 1995). In these high-quality exchange relationships, leaders influence and support their followers beyond what is generally expected and specified in formal job descriptions, and followers engage in more autonomous and responsible activities. In contrast, low-quality exchange relationships are limited to exchanges as described in the employment contract; that is, leaders provide these followers only with what they need to perform, and followers only do their prescribed job. Meta-analyses showed that high-quality LMX relationships have positive effects on criteria of leadership success, such as follower satisfaction with leader, follower performance, and follower organizational citizenship behavior (Gerstner & Day, 1997; Ilies, Nahrgang, & Morgeson, 2007).

LMX theory does not describe the specific leader behaviors that promote high-quality exchange relationships. We suggest that older leaders’ generativity may represent an important
social resource in the LMX process that is expected and highly valued by followers. When older leaders show high levels of generativity, followers perceive the LMX relationship with their leader to be of a higher quality and, subsequently, show more effort at work, are more satisfied with the leader, and rate the leader higher in terms of leader effectiveness. This assumption is consistent with Uhl-Bien (2006), who suggested that the perceived quality of LMX relationships between leaders and followers depends to a large extent on prior expectations regarding the social exchange relationship. Similarly, Lord and Maher (1993) suggested that followers compare their actual leaders’ behavior with their ILTs in order to form an impression of the quality of the LMX relationship. The importance of followers’ ILTs for LMX was recently demonstrated in a study by Epitropaki and Martin (2005), who found that the closer the match between followers’ ILTs to the perceptions of their actual leaders, the better the quality of follower perceptions of LMX. In summary, we propose that LMX relationship quality mediates the interactive effect of leader age with leader generativity on leadership success.

Hypothesis 3: Leader-member exchange mediates the moderating effect of leader generativity on the relationship between leader age and leadership success.

Setting of the Present Study

We examined our hypotheses in a sample of leaders at German universities (i.e., associate and full professors) because they are in a particularly good position to establish and guide members of the next generation (i.e., their research assistants). In the German university system, each professor is responsible for a work group which in most cases includes one or more research assistants. Such a work group is usually part of a larger department headed by a dean. According to the most recent data of the German Federal Bureau of Statistics, the average age of becoming a professor in Germany in 2007 was 41 years, the average age of professors in
Germany in 2007 was 51.2 years, and 16.2% of professors were female and 83.8% were male (Statistisches Bundesamt, 2008). Individuals working towards obtaining a doctoral degree are most frequently employed by the university as research assistants for up to five years and are not considered students as in other countries such as the United States. These research assistants are members of the *Mittelbau* (subprofessorial middle-rank academics) and are dependent on the established senior professors for guidance and support (Pritchard, 2006). The German terms *Doktorvater* (“doctoral father”) and *Doktormutter* (“doctoral mother”) are used to describe the close working relationship between a research assistant and the professor and suggests that the relationship is characterized by dependency of the assistant on the professor for his or her support. The average age of research assistants in Germany in 2007 was 32.8 years and 37.2% of these assistants were female and 62.8% were male (Statistisches Bundesamt, 2008).

**Method**

**Participants and Procedure**

The data used in this study came from 128 university professors from 12 German universities and one research assistant of each of these professors. We obtained leadership ratings from only one research assistant of each professor, because virtually every professor in Germany has one research assistant but not necessarily more. Twenty-two (17.2%) of the professors in the sample were female and 101 (78.9%) were male (five professors [3.9%] did not report their gender). Their age distribution ranged from 30 to 70 years, and the average age was 50.06 years (*SD* = 7.98; two professors [1.6%] did not report their age). Fifty-one (39.8%) of the research assistants were female and 72 (56.3%) were male (five assistants [3.9%] did not indicate their gender). The age distribution ranged from 21 to 55 years, and the average age was 32.35 years (*SD* = 6.14; five assistant [3.9%] did not report their age). These demographics were
remarkably similar to those of the overall populations of university professors and research assistants in Germany in 2007 (see previous section).

As a first step of data collection for this study, we contacted 2029 professors from all academic disciplines represented at 12 large German universities and asked whether they and one of their research assistants would be willing to participate in a study on leadership. Subsequently, we sent a questionnaire package to those 314 professors who indicated their general interest in participating (15.5% response rate). In the cover letter, professors were asked to answer the first questionnaire themselves and to give the second questionnaire to an assistant. Professors and assistants directly and independently mailed their questionnaires back to us in prepaid envelopes. One-hundred twenty-eight questionnaire sets (i.e., questionnaires from a professor and a corresponding assistant) were returned for a response rate of 40.8 percent (6.3% response rate overall). We imputed missing data using the SPSS/PASW routine for expectation-maximization estimation, which is recommended over listwise or pairwise deletion (Schafer & Graham, 2002). The number of missing values ranged between zero and five (3.9%) in the study variables.

Measures

**Leader generativity.** We assessed leader generativity by research assistants’ ratings of university professors using three items developed for this study. The items were “My supervisor devotes more energy to building up the next generation of scientists than to getting ahead him-/herself,” “My supervisor is more strongly concerned with establishing successful successors in his/her field than with working on his/her own success,” and “My supervisor uses more time for rearing young academics than for making progress in his/her own career.” The items were
answered on 5-point scales ranging from 1 (does not apply at all) to 5 (applies completely). Cronbach’s $\alpha$ of this scale was .93.

**Leader-member exchange.** We measured LMX using research assistants’ ratings on the 12-item LMX scale developed and validated by Liden and Maslyn (1998). Two example items are “I respect my supervisor’s knowledge of and competence on his/her job” and “My supervisor would come to my defense if I were ‘attacked’ by others.” The items were answered on 5-point scales ranging from 1 (does not apply at all) to 5 (applies completely). As suggested by Liden and Maslyn (1998), we averaged the ratings across the 12 items to derive a global measure of LMX. Cronbach’s $\alpha$ of the scale was .87.

**Leadership success.** We measured three criteria of leadership success using research assistants’ ratings on all of the nine leadership success items from the Multifactor Leadership Questionnaire (Form 5X-Short, Avolio & Bass, 1995). The items make up three reliable and well-validated scales that are often used in leadership research (e.g., Bycio, et al., 1995; Judge & Piccolo, 2004; Lowe, et al., 1996; Sosik & Megerian, 1999). Specifically, *follower perceptions of leader effectiveness* were measured using four items (e.g., “Is effective in meeting organizational requirements,” $\alpha = .77$). *Follower satisfaction with leader* was measured using two items (e.g., “Works with me in a satisfactory way,” $\alpha = .76$). Finally, *follower extra effort* was measured using three items (e.g., “Gets me to do more than I expected to do,” $\alpha = .92$). The items were answered on a 5-point scale ranging from 1 (not at all) to 5 (frequently, if not always) (note that the MLQ in original uses a scale from 0 to 4).

To test whether the three criteria are distinct dimensions of leadership success, we compared the results of two confirmatory factor analyses. In the first model, the three sets of items were specified to load on three separate factors, which were allowed to covary. In the
second model, all items were specified to load on one factor. The first model had a good, $\chi^2(24, N = 128) = 46.05, p < .01$, comparative fit index (CFI) = .97, root mean square error of approximation (RMSEA) = .09. The second model did not fit the data well, $\chi^2(27, N = 128) = 184.51, p < .01$, CFI = .75, RMSEA = .21. A comparison of the models showed that the three-factor model fit the data significantly better than the 1-factor model, $\Delta\chi^2(3, N = 128) = 138.46, p < .01$. These analyses suggested that the three criteria represent distinct dimensions of leadership success, and therefore we decided to analyze the hypothesized effects on each of these criteria separately instead of combining them into an overall score. This is consistent with the leadership literature, which suggests to keep these criteria separate (Judge & Piccolo, 2004).

**Demographic and control variables.** Professors and research assistants reported their gender ($0 = \text{female}, 1 = \text{male}$), age, and organizational tenure. For age, we used ten 5-year-intervals ranging from 1 (21-25 years) to 10 (66-70 years) to comply with universities’ demands for protection of data privacy. No participant indicated that he or she was younger than 21 years or older than 70 years. For descriptive purposes, the responses were later recoded by using the midpoint of each age interval (e.g., 23 for “21-25 years”). This recoding did not change the results in any way. Similarly, for organizational tenure, we used ten 5-year-intervals ranging from “5 years or less” to “46-50 years.”

We controlled for research assistants’ organizational tenure in the analyses because it is a proxy of the length of the working relationship with the professor, which may influence followers’ ratings of LMX and leadership success (Schyns, Paul, Mohr, & Blank, 2005). We controlled for professors’ gender because research suggests that male leaders tend to be more successful in roles that are traditionally defined in masculine terms (Eagly, Karau, & Makhijani, 1995). Despite efforts to increase the percentage of women in academia, the vast majority of
university professors in Germany is still male. Due to universities’ demands for anonymity, we were not able to assess scientific discipline in the questionnaires. Instead, we controlled for team size (i.e., the total number of employees as reported by professors) as a proxy for scientific discipline.

Team size can be used as a proxy for scientific discipline as shown by an analysis of publicly available data on the average team sizes of all 55 different academic subdisciplines clustered in nine broader academic disciplines represented at German universities—language and cultural sciences; sport sciences; law, business and social sciences; mathematics and natural sciences; medicine and health sciences; agriculture, forestry and nutrition sciences; engineering sciences; and arts (Autorengruppe Bildungsberichterstattung, 2008). The results of our discriminant analysis showed that team size significantly predicted classification of subdisciplines into the nine broader academic disciplines (Wilk’s $\lambda = .34$, $\chi^2[df = 8, N = 55] = 53.66, p < .001$), with team size explaining 66% of the variance in the discriminant scores. Finally, we also considered it important to control for team size because research showed that team size may have a negative effect on LMX (Schyns, et al., 2005).

Results

The descriptive statistics and intercorrelations of the study variables are shown in Table 1. Age was positively related to leader generativity ($r = .38, p < .01$), supporting Hypothesis 1. In addition, Table 1 shows that age was negatively related to follower perceptions of leader effectiveness ($r = -.18, p < .05$) and follower extra effort ($r = -.19, p < .05$), but not significantly related to LMX and follower satisfaction with leader. Additional analyses showed that there were no curvilinear effects of leader age on leader generativity, LMX, follower perceptions of leader effectiveness, follower satisfaction with leader, and follower extra effort (i.e., the squared age
term did not significantly predict these variables beyond the first-order effects of age. Leader gender was also not significantly related to any of the study variables. Leader generativity was positively related to LMX ($r = .28, p < .01$), follower perceptions of leader effectiveness ($r = .19, p < .05$), follower satisfaction with leader ($r = .23, p < .01$), and follower extra effort ($r = .21, p < .05$). Finally, LMX was positively related to all three criteria of leadership success ($rs$ between .54 and .61, $p < .01$).

According to Hypothesis 2, leader generativity moderates the relationship between leader age and leadership success, such that leaders high in generativity are better able to maintain high levels of leadership success at higher ages than leaders low in generativity. The results of three hierarchical moderated regression analyses with mean-centered predictor variables (Aiken & West, 1991) used to test Hypothesis 2 are displayed in Table 2. We entered the control variables (leader gender, team size, follower tenure) in the first step, leader age and leader generativity in the second step, and the interaction between leader age and leader generativity in the third step. As shown in Table 2, the interaction of leader age with leader generativity significantly predicted follower perceptions of leader effectiveness ($\beta = .25, \Delta R^2 = .06, p < .01$), follower satisfaction with leader ($\beta = .25, \Delta R^2 = .06, p < .01$), and follower extra effort ($\beta = .20, \Delta R^2 = .04, p < .05$).

We utilized simple slope analysis (Aiken & West, 1991) to test whether the significant interaction effects were also consistent with the hypothesized pattern. We regressed the leadership success criteria on leader age at high (i.e., one standard deviation above the mean) and low (i.e., one standard deviation below the mean) values of leader generativity. The relationship between leader age and follower perceptions of leader effectiveness was weak and non-significant for leaders high in generativity ($B = -.01, SE = .01, \beta = -.09, t = -.74, p = .46$), and negative and significant for leaders low in generativity ($B = -.05, SE = .01, \beta = -.55, t = -4.66$, $p < .01$).
The interaction effect between leader age and leader generativity predicting follower perceptions of leader effectiveness is graphically depicted in Figure 1. The relationship between leader age and follower satisfaction with leader was also weak and non-significant for leaders high in generativity ($B = .003$, $SE = .01$, $\beta = .03$, $t = .26$, $p = .79$), and negative and significant for leaders low in generativity ($B = -.04$, $SE = .01$, $\beta = -.42$, $t = -3.45$, $p < .01$). Finally, the relationship between leader age and follower extra effort was weak and non-significant for leaders high in generativity ($B = -.02$, $SE = .01$, $\beta = -.13$, $t = -1.11$, $p = .27$), and negative and significant for leaders low in generativity ($B = -.06$, $SE = .01$, $\beta = -.51$, $t = -4.22$, $p < .01$). The plots of the interactive effects of leader age with leader generativity on follower satisfaction with leader and follower extra effort were very similar to the one depicted in Figure 1.

We also conducted three separate regression analyses in which we additionally controlled for the squared effects of leader age and leader generativity. This is important in order to test whether the interaction effects are significant due to the linear relationships between the predictor and the moderator variables (Cortina, 1993; Edwards, 2009). The results showed that the squared effects of leader age and leader generativity did not significantly predict any of the leadership success criteria, and controlling for the squared effects in the regression analyses also did not change the significance of the interaction effects. Together, these results provide support for Hypothesis 2: Leaders high in generativity are better able to maintain high levels of leadership success at higher ages, whereas leadership success of leaders low in generativity declines at higher ages.

According to Hypothesis 3, leader generativity moderates the relationship between leader age and LMX, and LMX is in turn positively related to the three criteria of leadership success.
Thus, Hypothesis 3 is a mediated moderation hypothesis, according to which the interaction between two variables affects a mediator, which is subsequently associated with the dependent variables (Baron & Kenny, 1986; Muller, Judd, & Yzerbyt, 2005). We followed the procedures described by Morgan-Lopez and MacKinnon (2006) to test for mediated moderation and to obtain estimates of the indirect (mediated moderation) effects. Specifically, we first regressed the mediator variable (LMX) on the control variables (leader gender, team size, and follower tenure), the independent and moderator variables (leader age and leader generativity), and on the interaction between the independent variable and the moderator variable (see Table 3). Second, we regressed the dependent variables (follower perceptions of leader effectiveness, follower satisfaction with leader, and follower extra effort) on the control, independent, and moderator variables, on the interaction between the independent variable and the moderator variable, as well as on the mediator variable (see Table 2). The latter analysis is the same as the test of Hypothesis 2 plus the inclusion of the mediator variable LMX in an additional step 4.

Table 3 shows that the interaction between leader age and leader generativity significantly predicted LMX ($\beta = .22$, $\Delta R^2 = .05$, $p < .05$). Table 2 shows that LMX significantly predicted follower perceptions of leader effectiveness ($\beta = .49$, $\Delta R^2 = .20$, $p < .01$), follower satisfaction with leader ($\beta = .56$, $\Delta R^2 = .26$, $p < .01$), and follower extra effort ($\beta = .45$, $\Delta R^2 = .18$, $p < .01$). In addition, the significant effects of the interaction between leader age and leader generativity on follower satisfaction with leader and follower extra effort became smaller and non-significant when LMX was entered in the fourth step into the regression analyses (see Table 2, Step 3: $\beta$s = .13 and .11, respectively, $ns$). Thus, the interactive effects of leader age with leader generativity on follower satisfaction with leader and follower extra effort were fully mediated by LMX. The interaction effect between leader age and leader generativity on follower
perceptions of leader effectiveness decreased, but remained significant after controlling for LMX (see Table 2, Step 3: $\beta = .15, p < .05$). Thus, LMX partially mediated the interactive effect of leader age with leader generativity on follower perceptions of leader effectiveness.

The estimate of an indirect (mediated moderation) effect is computed as the product of the effect of the interaction term on the mediator and the effect of the mediator on the respective dependent variable (Morgan-Lopez & MacKinnon, 2006). We computed 95% confidence intervals derived from bias-corrected bootstrap estimates (Preacher, Rucker, & Hayes, 2007; Shrout & Bolger, 2002) to test whether an indirect effect is statistically significant. The indirect effects are considered significant when the 95% confidence interval does not include zero.

The results of the bootstrap analyses showed that all of the indirect effects of the interaction of leader age with generativity via LMX on the three criteria of leadership success were significant (for follower perceptions of leader effectiveness, indirect effect = .006, $SE = .003$, lower 95% confidence interval [CI] = .001, upper 95% CI = .012; for follower satisfaction with leader, indirect effect = .008, $SE = .004$, lower 95% CI = .001, upper 95% CI = .015; for follower extra effort, indirect effect = .008, $SE = .004$, lower 95% CI = .001, upper 95% CI = .016). Altogether, these results provide support for Hypothesis 3: LMX mediates the moderating effect of leader generativity on the relationship between leader age and leadership success.

Discussion

The aging of the workforce necessitates that developmental and organizational scholars arrive at a better understanding of the role of age in the work context. Thus, the goal of this study was to contribute to the literature on age and leadership by investigating the interplay between leader age and leader generativity in predicting leader-member exchange (LMX) quality and, subsequently, three important criteria of leadership success. Our results showed that leader age
was positively related to leader generativity. Consistent with generativity theory (McAdams & de St. Aubin, 1992), socioemotional selectivity theory (Carstensen, 1995), and previous empirical research on generativity development (Keyes & Ryff, 1998; McAdams, et al., 1993), older compared to younger leaders invested more time and effort into establishing and guiding members of younger generations than into their own gains, careers, and accomplishments.

We further expected that leader generativity moderates the relationship between leader age and leadership success, such that older leaders with high generativity are better able to maintain high levels of leadership success than older leaders with low generativity. We based this hypothesis on leadership categorization theory (Lord et al., 1984), which suggests that followers’ expectations and cognitive prototypes of ideal leaders play an important role in shaping followers’ attitudinal and behavioral responses to their leaders. Based on life span theory and research (Erikson, et al., 1989; Havighurst, 1948; McAdams & de St. Aubin, 1992; Neugarten, et al., 1965), we proposed that generativity is an age-graded developmental task that is socially expected from older but not necessarily from younger leaders. In line with our hypothesis, we found these interactive effects of leader age with leader generativity on leadership success: followers’ perceptions of leader effectiveness, follower satisfaction with leader, and follower extra effort were higher for older leaders with high generativity than for older leaders with low generativity. Follower ratings of younger leaders’ leadership success were not influenced by younger leaders’ level of generativity.

Furthermore, we expected that LMX mediates the interactive effects of leader age with leader generativity on all three criteria of leadership success. This hypothesis is also consistent with leadership categorization theory and research (Epitropaki & Martin, 2005; Lord & Maher, 1993), which suggest that the closer the match between followers’ expectations and their
perceptions of their actual leaders, the better the quality of follower perceptions of LMX. We expected that LMX, in turn, influences leadership success. In line with our hypothesis, we found that followers perceive LMX quality of older leaders with high generativity to be high, and, subsequently, perceive these leaders to be more effective, are more satisfied with these leaders, and put more effort into their work. Older leaders with low generativity seem to have negative effects on followers’ perceptions of LMX quality, which in turn leads to reduced follower perceptions of leadership success. Younger leaders received the same positive follower ratings of LMX quality and subsequent leadership success independent of their level of generativity.

Overall, our findings extend the aging and developmental literature by investigating the interplay between age, the age-related developmental task of generativity, and an important as well as common social phenomenon for many young, middle-aged, and older people in the workforce, leadership. Our findings also expand current perspectives on leadership in the organizational psychology literature by taking a developmental perspective on leadership processes and outcomes.

Limitations and Future Research

This study has a number of limitations. First, our cross-sectional design does not allow definite inferences regarding intraindividual changes across the life span, as the age-related differences found may also be attributable to differences between birth cohorts (Smola & Sutton, 2002). In addition, our study design does not allow conclusions about the causal mechanisms connecting leader age, leader generativity, LMX, and leadership success. For example, it is not only possible that followers match their ILTs with their perceptions of their actual leaders to form impressions of LMX quality, but also that LMX quality potentially affects how close followers perceive the match between their leaders and their ILTs to be (Epitropaki & Martin,
2005). Thus, future research needs to employ longitudinal and cohort-sequential designs to better disentangle aging and cohort effects on leadership processes and outcomes and to draw definite causal conclusions. Future research should also investigate followers’ ILTs with regard to age more directly. For example, it would be interesting to examine which specific generative behaviors followers expect from older leaders (e.g., emotional or career-related support, Kram, 1983) and what is expected from younger leaders.

Second, limitations of our study with regard to control variables need to be noted. For example, due to reasons of anonymity, we were not able to control for academic discipline and had to use team size as a proxy. Future studies need to include additional control variables and might also investigate whether the interplay of leader age and leader generativity predicts leadership success above and beyond established predictors of leadership such as intelligence (Judge, Colbert, & Ilies, 2004), personality (Judge, et al., 2002), and leadership styles such as transactional and transformational leadership behaviors (Judge & Piccolo, 2004).

Third, the overall response rate in our study was low, raising potential concerns about the generalizability of our findings. However, the demographics of the study participants were quite similar to the overall populations of university professors and research assistants in Germany. It may also be criticized that we focused on German university professors as leaders. We chose our present sample because professors are generally in a good position to be generative; that is, they have the opportunity to work with younger followers and it is an important part of their job to establish and guide members of the younger generation. Future studies could investigate whether our findings generalize to other leader populations (e.g., business leaders), in which supporting the younger generation is not necessarily expected as a substantial part of the job. In addition, it would be interesting to examine whether our model can be replicated in cultures that expect or
value leader generativity more than it is the case in Germany and other Western cultures. For example, it may be that the interactive effects of leader age with leader generativity on LMX and leadership success found in this study would be even stronger in cultures that value older members of the workforce or society in general more strongly, emphasize long-term over short-term gains, and put a strong precedent on tradition and intergenerational exchange (e.g., many East Asian cultures). 6

Fourth, it may be possible that we did not find an effect of leader generativity on leadership success among younger leaders not because generativity is not expected from them by their followers, but rather because of the relatively small number of younger leaders in our sample (only 11% were younger than 40 years) as well as due to potential problems with range restriction in generativity scores among younger leaders. With regard to the latter issue, we did not find any indications of a violation of the homoscedasticity assumption by an inspection of the scatterplots as well as by controlling for the squared effects of age and generativity in our linear regression analyses. However, we recommend that future studies sample equal numbers of participants from a broad range of different age groups.

Finally, it may be that our procedure of asking university professors to select the research assistant who provided the ratings has biased our findings because professors may have chosen the assistants they have worked with for the longest time or that they liked best. It may also be possible that followers who worked with the professor for a longer time have more accurate perceptions of leader generativity and leadership success than those with a shorter working relationship. Even though we controlled for follower tenure and examined the unique LMX relationships between professors and followers as a mediator variable, future studies should obtain leadership ratings from all followers in a given group or select followers randomly.
Practical Implications and Conclusion

From a practical perspective, our research on leader age and leader generativity suggests an important means through which older leaders may contribute to follower satisfaction, motivation, and performance. In the context of demographic changes occurring at the workplace, facilitating generativity in organizations may also be an important human resource practice to retain and motivate older leaders (Calo, 2005; Gunderman, 2003). That is, by promoting leader generativity, organizations might make better use of their older leaders strengths as well as existing intergenerational potential while building up the next generation at work (Kessler & Staudinger, 2007).

In conclusion, our study extends current theoretical perspectives on the role of age in the work context by showing that the relationships between leader age and three important criteria of leadership success were moderated by leader generativity. Consistent with leadership categorization theory (Lord, et al., 1984), leaders high in generativity were better able to maintain high levels of leadership success at higher ages than leaders low in generativity. In addition, we found that the quality of the dyadic leader-member exchange (LMX) relationship is an important mediating mechanism that explains why older leaders high in generativity were more successful than older leaders low in generativity. Overall, our findings suggest that engaging in generativity is particularly important for older leaders in the work context, as it helps them to maintain high-quality relationships with their followers and high levels of leadership success with increasing age.
References


Footnotes

1 The sample used in this study does not overlap with the sample used in Zacher et al. (in press).

2 The average ages for professors and research assistants described in this section represent only approximations of the actual average ages as they are based on the arithmetic means of the midpoints of ten 5-year age intervals (e.g., “31-35 years”). Further details are given below.

3 We additionally assessed leader generativity by self-report of university professors using an equivalent set of three items (“I devote more energy to building up the next generation of scientists than to getting ahead myself,” “I am more strongly concerned with establishing successful successors in my field than with working on my own success,” and “I use more time for rearing young academics than for making progress in my own career”; $M = 3.29, SD = .95$, Cronbach’s $\alpha = .89$). Professors’ ratings of leader generativity correlated positively and moderately with leader age ($r = .41, p < .01$) and with research assistants’ ratings of leader generativity ($r = .38, p < .01$). In addition, the pattern of results of separate moderation and mediated moderation analyses using professors’ ratings of leader generativity was very similar to the pattern of results of the analyses using research assistants’ ratings of leader generativity which are reported in Tables 2 and 3.

4 In order to gather further support for the convergent and discriminant validity of our leader generativity measure, we examined the correlations between professors’ and research assistants’ ratings of leader generativity and ratings of several personality characteristics provided by the
professors. Support for the construct validity of our generativity scale came from a positive correlation \( r = .20, p < .05 \) between professors’ ratings of leader generativity and their generative concerns as assessed by the Loyola Generativity Scale (LGS, McAdams & de St. Aubin, 1992). The LGS is widely used in generativity research (McAdams & de St. Aubin, 1998), but some authors have questioned its construct validity (Clark & Arnold, 2008; Keyes & Ryff, 1998) or—as in the current study—developed shorter and more homogeneous scales to measure generative concern (Kessler & Staudinger, 2007). The correlation between assistants’ ratings of leader generativity and professors’ generative concerns assessed by the LGS was small and non-significant \( r = .10, ns \). Consistent with generativity theory (Ackerman, Zuroff, & Moskowitz, 2000; McAdams & de St. Aubin, 1992; Peterson & Stewart, 1993), we expected leader generativity to be positively related to both communal and agentic personality characteristics. The results showed that both professors’ and assistants’ ratings of leader generativity were unrelated to narcissism \( r = .06 \) and \( r = .09 \), respectively, \( ns \) as assessed by the German short form of the Narcissistic Personality Inventory (Schütz, Marcus, & Sellin, 2004).

Professors’ and assistants’ ratings of leader generativity were positively related to altruistic life goals \( r = .31, p < .01 \) and \( r = .22, p < .05 \), respectively) but unrelated to power life goals \( r = -.08 \) and \( r = -.09 \), respectively, \( ns \) as assessed by a German life goals scale (Pöhlmann & Brunstein, 1997). Finally, professors’ ratings of leader generativity were positively related to agreeableness \( r = .23, p < .05 \), whereas assistants’ ratings of leader generativity were not significantly related to agreeableness \( r = .13, ns \). Professors’ and assistants’ ratings of leader generativity were also not significantly related to extraversion \( r = -.03 \) and \( r = -.09 \), respectively, \( ns \), emotional stability \( r = .10 \) and \( r = .07 \), respectively, \( ns \), conscientiousness \( r = -.05 \) and \( r = -.11 \), respectively, \( ns \) and openness to
experience ($r = .11$ and $r = .01$, respectively, $ns$) as assessed by a German short form of the Big Five Inventory (Rammstedt & John, 2007). Overall, these findings suggest that our measure of leader generativity reflects more the communal part of the generativity construct. It is possible that the agentic part of the generativity construct relates more to leaders’ concerns about symbolic immortality and leaving a legacy (Kotre, 1999; McAdams & de St. Aubin, 1992; Zacher, et al., in press), which is not explicitly covered by our leader generativity measure. Instead, our measure seems to reflect leaders’ altruistic concerns and behaviors related to establishing and guiding the younger generation.

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6 We thank an anonymous reviewer for this suggestion.
Figure 1

Leader Generativity as a Moderator of the Relationship between Leader Age and Follower Perceptions of Leader Effectiveness
Table 1

**Means (M), Standard Deviations (SD), and Intercorrelations of Study Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Leader age</td>
<td>50.07</td>
<td>7.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Leader gender (0 = female, 1 = male)</td>
<td>1.82</td>
<td>.38</td>
<td>.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Leader generativity</td>
<td>2.96</td>
<td>.98</td>
<td>.38**</td>
<td>.09</td>
<td>(.93)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Leader-member exchange</td>
<td>4.11</td>
<td>.52</td>
<td>-.02</td>
<td>.07</td>
<td>.28**</td>
<td>(.87)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Follower perceptions of leader effectiveness</td>
<td>4.13</td>
<td>.66</td>
<td>-.18*</td>
<td>.15</td>
<td>.19*</td>
<td>.56**</td>
<td>(.77)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Follower satisfaction with leader</td>
<td>4.00</td>
<td>.70</td>
<td>-.07</td>
<td>-.03</td>
<td>.23**</td>
<td>.61**</td>
<td>.66**</td>
<td>(.76)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Follower extra effort</td>
<td>3.74</td>
<td>.94</td>
<td>-.19*</td>
<td>.12</td>
<td>.21*</td>
<td>.54**</td>
<td>.51**</td>
<td>.48**</td>
<td>(.92)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Team size (number of employees)</td>
<td>4.30</td>
<td>8.11</td>
<td>.06</td>
<td>.09</td>
<td>.12</td>
<td>.05</td>
<td>-.04</td>
<td>-.02</td>
<td>.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Follower tenure</td>
<td>5.15</td>
<td>3.64</td>
<td>.21*</td>
<td>-.07</td>
<td>.12</td>
<td>-.02</td>
<td>.01</td>
<td>.02</td>
<td>-.10</td>
<td>.13</td>
<td></td>
</tr>
</tbody>
</table>

*Note. N = 128. Reliability estimates (α) are shown in parentheses along the diagonal.

* p < .05. ** p < .01.
Table 2

Results of Mediated Moderation Analyses

<table>
<thead>
<tr>
<th>Variable</th>
<th>DV: Follower perceptions of leader effectiveness</th>
<th>DV: Follower satisfaction with leader</th>
<th>DV: Follower extra effort</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
<td>Step 2</td>
<td>Step 3</td>
</tr>
<tr>
<td>Step 1: Controls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leader gender</td>
<td>.15</td>
<td>.16</td>
<td>.16</td>
</tr>
<tr>
<td>Team size</td>
<td>-.06</td>
<td>-.08</td>
<td>-.09</td>
</tr>
<tr>
<td>Follower tenure</td>
<td>.02</td>
<td>.05</td>
<td>.06</td>
</tr>
<tr>
<td>Step 2: Main effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leader age</td>
<td>-.31**</td>
<td>-.32**</td>
<td>-.25**</td>
</tr>
<tr>
<td>Leader generativity</td>
<td>.30**</td>
<td>.33**</td>
<td>.15</td>
</tr>
<tr>
<td>Step 3: Interaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leader age x Leader generativity</td>
<td></td>
<td>.25**</td>
<td>.15*</td>
</tr>
<tr>
<td>Step 4: Mediator</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leader-member exchange</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. $N = 128$. DV = dependent variable. Standardized regression coefficients ($\beta$) are reported.

* $p < .05$. ** $p < .01$. 
Table 3  

Results of Moderation Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: Controls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leader gender</td>
<td>.06</td>
<td>.04</td>
<td>.04</td>
</tr>
<tr>
<td>Team size</td>
<td>.05</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>Follower tenure</td>
<td>-.04</td>
<td>-.04</td>
<td>-.04</td>
</tr>
<tr>
<td>Step 2: Main effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leader age</td>
<td>-.14</td>
<td>-.15</td>
<td></td>
</tr>
<tr>
<td>Leader generativity</td>
<td>.33**</td>
<td>.36**</td>
<td></td>
</tr>
<tr>
<td>Step 3: Interaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leader age x Leader generativity</td>
<td></td>
<td></td>
<td>.22*</td>
</tr>
<tr>
<td>Δ$R^2$</td>
<td>.09**</td>
<td>.05*</td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>.01</td>
<td>.10*</td>
<td>.15**</td>
</tr>
</tbody>
</table>

Note. N = 128. DV = dependent variable. Standardized regression coefficients ($\beta$) are reported.  
* $p < .05$. ** $p < .01$. 