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A Longitudinal Study of the Relationships Among Self-Monitoring, Authentic Leadership, and Perceptions of Leadership

Brian Tate

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There is little research examining variability in leadership outcomes over time as a function of individual differences. The present study investigates how the extent to which individuals are perceived as leaders varies over time, with self-monitoring and authentic leadership as predictors. Hierarchical linear modeling analyses found that change in the extent to which individuals were perceived to be leaders by others varied across individuals, but this variability was not due to individuals' self-monitoring, authentic leadership, or declining interrater reliability. It was also found that individuals' overestimation of themselves as leaders increased over time. Finally, an initial measure of authentic leadership was developed.

Keywords: *leadership; perception; self-monitoring; authentic leadership; longitudinal studies; individual differences*

A general criticism of organizational behavior research is that it features a lack of longitudinal designs (Huber & Van de Ven, 1995). Reliance on cross-sectional data is especially at odds with the goals of leadership research, as many theories that include time as a factor have not been fully tested (Ployhart, Holtz, & Bliese, 2002; Yukl, 2002). Although recent longitudinal studies have investigated such important issues as transformational leadership (e.g., Keller, 2006) and implicit leadership theories (ILTs; e.g., Epitropaki & Martin, 2005), there remains little understanding of trait-based predictors of change in leadership outcomes over time (Ployhart et al., 2002). The present study contributes to leadership research by examining individual difference predictors, self-monitoring and authentic leadership, of change in how individuals are perceived as leaders over time.

In examining the proposed relationships, the present study both converges with and diverges from general trends in longitudinal leadership research. Longitudinal leadership studies have generally involved time spans of a few months (Yukl, 2002) and have used military samples (e.g., Atwater, Dionne, Avolio, Camobreco, & Lau, 1999; Bradley, Nicol, Charbonneau, & Meyer, 2002; Chemers, Watson, & May, 2000; Smither, London, & Richmond, 2005). Also, many existing studies do not use repeated measurements of the same variable over time; instead,

they involve the measurement of predictors at Time 1 and different types of outcomes (e.g., leadership style vs. leader effectiveness ratings) at later times (e.g., De Hoogh, Den Hartog, & Koopman, 2005; Keller, 2006; Smither et al., 2005). The present study's greatest contribution to leadership research in general is that it will use repeated measurement of the same variable, leadership perceptions, to model change in an important outcome variable in leadership research, using a random coefficients modeling (RCM) approach.

Perceptions of Leadership

Examining the nature of perceptions of individuals as leaders, as an outcome, is important for theoretical and practical reasons. According to Cronshaw and Lord (1987), research on leadership perceptions can inform broader research into the nature of social perceptions. Also, because perceptions of leadership are involved in the development of influence and status relationships at work (Cronshaw & Lord, 1987), research on leadership perceptions can enhance an understanding of who is likely to be conferred with influence and status over others at work.

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That the length of time over which individuals are afforded with leadership status may change according to individual differences has implications for selection and team composition. For selection, organizations would likely want to select or promote individuals into leadership positions who are likely to be perceived as leaders by others over time. Although those individuals may not be significantly regarded as leaders initially, their selection or promotion to leadership status should pay dividends over time. Knowing which individual differences predict change in leadership perceptions would allow organizations to know who should be placed into leadership positions. For team composition, it may be that individuals should be placed in teams according to how long teams are expected to be in tact. To have a greater proportion of individuals who share in group leadership roles, which has been found to positively predict team performance (Ensley, Hmieleski, & Pearce, 2006), it may be that individuals of certain personality characteristics should be placed into shorter-term teams, whereas others should be placed into longer-term teams.

Personality and Leadership Evaluations

The present study contends that the extent to which individuals are perceived as leaders by others, within newly formed groups, is not stable over time and that individual differences can predict the extent to which they change. Previous research shows personality variables to significantly predict the extent to which individuals are perceived as leaders (for a review, see Avolio, Sosik, Jung, & Berson, 2003). In now classic studies, Kenny and Zaccaro (1983) found that 49% to 82% of the total variance in how individuals were perceived as leaders was explained by stable characteristics of those individuals, defined as variance across situations due to rater effects. Using a similar strategy, Zaccaro, Foti, and Kenny (1991) found individual differences to account for 59% of variability in how individuals were rated as leaders, which included how strongly individuals were considered as leaders and others' preferences for having individuals as leaders in the future. A meta-analysis by Lord, DeVader, and Alliger (1986) found significant positive effect sizes among intelligence, dominance, and masculinity and leadership perceptions. More recently, a meta-analysis by Judge, Bono, Ilies, and Gerhardt (2002) found significant effect sizes between all Big 5 traits, except agreeableness, and leadership perceptions. This line of research shows personality to predict how individuals are perceived as leaders.

A limitation of these previous studies, however, is that they have used mainly cross-sectional designs. This is an important limitation because studies by Lim, Ployhart, and colleagues (Lim & Ployhart, 2004; Ployhart, Lim, & Chan, 2001) suggest that personality has different relationships with leader evaluations over different periods of time. For example, in two studies, the researchers found that agreeableness and openness predicted leader effectiveness ratings after an assessment center but not ratings made after 3 months of participants' military service. The studies suggest that, similarly to job performance (e.g., Ployhart & Hakel, 1998), evaluations of individuals as leaders may vary over time and that individual differences may predict this variability. However, because the studies did not model change in repeated measurements of the same outcome variable, the suggestions from the studies require further, direct testing. The present study will do so using individual differences that should be particularly relevant in examining differences in how individuals are perceived as leaders across time, self-monitoring, and authentic leadership. Existing research and theory suggests that self-monitoring and authentic leadership are especially likely to have dynamic relationships with leadership outcomes over time.

Self-Monitoring

Self-monitoring (Snyder, 1974) reflects individual differences in the propensity to engage in certain forms of impression management (Gangestad & Snyder, 2000). Individuals high in self-monitoring use impression management to construct public images that are aligned with others' behavioral expectations to appear socially appropriate and garner favorable outcomes (Gangestad & Snyder, 2000). Individuals low in self-monitoring attempt to project images that accurately reflect their internal beliefs, emotions, and attitudes. Self-monitoring has implications for a wide range of work behaviors, such as job performance, satisfaction, and commitment (Day, Schleicher, Unckless, & Hiller, 2002).

Self-Monitoring and Leadership

Cross-sectional research has found self-monitoring to positively predict the extent to which individuals are perceived as leaders (Day et al., 2002; Zaccaro et al., 1991). Because of the use of impression management by individuals high in self-monitoring (Gangestad & Snyder, 2000), there is potential for change in the relationship between self-monitoring and perceptions

of leadership over time. To understand how self-monitoring relates to leadership in real contexts in which groups exist for more than the time span of one activity, it is necessary to examine the relationship over time.

Whereas no previous studies have addressed the question of how self-monitoring relates to leader outcomes over time, a series of “theoretical letters” exchanged between Arthur G. Bedeian and David V. Day (2004), published in *Leadership Quarterly*, offered conflicting viewpoints. Whereas Day argued that individuals high in self-monitoring, through their greater behavioral flexibility, are more likely to meet others’ expectations and be perceived as leaders initially and over time, Bedeian argued that individuals high in self-monitoring would eventually be viewed as inconsistent and untrustworthy because of their behavioral variability. Those low in self-monitoring, through their behavioral consistency, should engender trust and commitment.

Research on managerial behavior and subordinate trust supports Bedeian’s argument. Reviews by Whitener, Brodt, Korsgaard, and Werner (1998) and Simons (2002) discussed behavioral consistency and integrity, with the latter defined as the consistency between espoused and enacted values, as important antecedents of trust in leaders. Based on previous research on self-monitoring and on trust, Simons argued that perceived behavioral integrity should be lower among managers higher in self-monitoring because the variability in their behaviors across situations should lead others to believe that their behaviors do not correspond to what they think and feel. The lack of perceived behavioral integrity and consistency should then make others less likely to trust in managers high in self-monitoring. Dirks and Ferrin (2002) showed that individuals, especially those without a formal leadership position, who are not trusted as leaders by others are also unlikely to be perceived as leaders. Furthermore, perceived inconsistencies in others’ behaviors are likely to be salient when making ratings of others’ on leadership criteria because individuals tend to expect behavioral integrity and consistency from leaders (Simons, 2002). Based on this prior research, the present study will adopt Bedeian and Day’s (2004) viewpoint that although individuals high in self-monitoring are likely to be perceived as leaders initially, over time, others will notice inconsistencies in those individuals’ behaviors, attitudes, and opinions. Consequently, individuals high in self-monitoring should be less likely to be perceived as leaders over time than individuals low in self-monitoring (see Figure 1 for a model of the predicted results).

Hypothesis 1: Individuals high in self-monitoring will be more likely than those low in self-monitoring to be perceived as leaders early in a group’s tenure.

Hypothesis 2: Individuals high in self-monitoring will be less likely than those low in self-monitoring to be perceived as leaders later in a group’s tenure.

Authentic Leadership

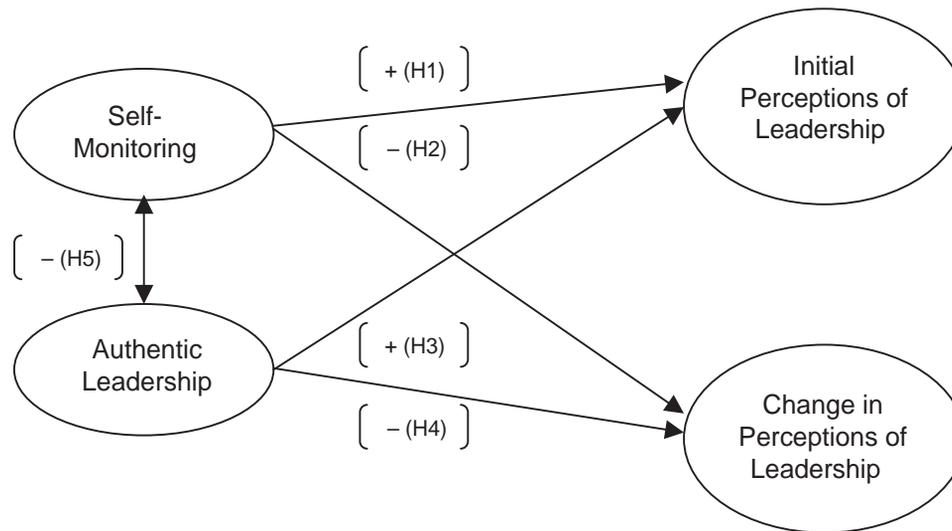
Additional theoretical support for proposing that individuals low in self-monitoring are more likely to be perceived as leaders over time than those high in self-monitoring comes from literature on authentic leadership. Based mainly on case studies of leaders such as Jack Welch (e.g., George, 2003), researchers have identified a form of leadership concerned with developing positive leader-follower relationships (May, Chan, Hodges, & Avolio, 2003), high moral standards, and integrity (Avolio, Gardner, Walumbwa, Luthans, & May, 2004). By actively involving and developing followers, authentic leaders should increase follower job commitment, performance (Gardner & Schermerhorn, 2004), and trust in leadership (Avolio et al., 2004). Similarly to self-monitoring, individuals low in authentic leadership may be more likely to be perceived as leaders initially because they should be more likely to use self-promoting impression management tactics but less likely to be perceived as leaders over time than those high in authentic leadership. Over time, the behavioral integrity and attempts to develop positive long-term relationships characterized by mutual trust of individuals high in authentic leadership should make them more likely to be perceived as leaders.

Hypothesis 3: Individuals high in authentic leadership will be less likely than those low in authentic leadership to be perceived as leaders early in a group’s tenure.

Hypothesis 4: Individuals high in authentic leadership will be more likely than those low in authentic leadership to be perceived as leaders later in a group’s tenure.

Individuals low in self-monitoring seem to be more likely to be authentic leaders than those high in self-monitoring. Behaving in accordance with personal beliefs and values is characteristic of authentic leaders (May et al., 2003) and individuals low in self-monitoring (Gangestad & Snyder, 2000). Research also shows individuals low in self-monitoring to have greater organizational commitment (Day et al., 2002; Kilduff & Day, 1994) and preference for establishing intimate relationships than those high in self-monitoring

Figure 1
Proposed Model



(Snyder & Simpson, 1984), which are also characteristic of authentic leaders (May et al., 2003).

Hypothesis 5: Self-monitoring will negatively relate to authentic leadership.

Method

Participants

Data was collected from 115 undergraduate students taking an upper-level leadership course who were randomly assigned into 29 groups of three to four members. A total of 69 participants (39 males, 30 females) completed all measures and were included in primary analyses.

Measures

Self-monitoring. To assess self-monitoring, Snyder and Gangestad's (1986) revised version of the Self-Monitoring scale was used. Snyder and Gangestad reported a reliability of .70 for the overall scale; Day et al.'s (2002) meta-analysis found a reliability of .73. The scale consists of 18 true-false items, such as "In a group of people I am rarely the center of attention." The measure was scored on a scale from 0 to 18, with higher scores representing higher degrees of self-monitoring. In the present study, the scale was found to have a reliability of .66.

Authentic leadership. Because no measure existed at the time of the study, one was created for the study. Based on George's (2003) five dimensions of authentic leadership, "Demonstrating Self-Discipline," "Leading with Heart," "Establishing Enduring Relationships," "Practicing Solid Values," and "Passion for Purpose," and the behaviors that compose those dimensions, 18 items were generated, with responses on 5-point Likert-type scales. Responses to the items were self-reported.

An exploratory factor analysis using principal axis extraction and promax rotation was performed on responses to the items. Exploratory factor analysis was chosen over confirmatory factor analysis because although items were written with George's (2003) dimensions in mind, there was no prior research on authentic leadership to guide specification of a confirmatory factor analysis model (Conway & Huffcutt, 2003). Three factors emerged with eigenvalues greater than 1, accounting for 34.47%, 12.09%, and 7.92% of variance in scores respectively (please refer to Table 1). One of the 18 items, "I tend to get very emotional when under stress," was eliminated because of low loadings on each factor. Factor 1 includes 9 items concerning being pleasant in social interactions, demonstrating behavioral consistency, and acting in accordance with one's ethical standards. The factor was named, "Self-Discipline and Ethical Standards," and was found to have a reliability of .84. The 4 items loading highest on Factor 2, named,

Table 1
Item-Loading Matrix for Authentic Leadership Measure

Item	Self-Discipline and Ethical Standards	Establishing Positive Relationships	Passion for Purpose
I act in ways that reflect my core values, even when it is difficult to do so.	.716	.303	.532
I am genuinely interested in other people and their ideas even if they are different from my own.	.703	.424	.629
Having positive interactions with group members is a priority to me.	.697	.451	.515
I value completing assignments to the best of my ability over taking advantage of possible loopholes.	.663	.479	.609
I would not put my academic integrity in question.	.650	.341	.470
I consider myself to have high ethical standards.	.617	.377	.469
I try to treat people in a consistently positive manner even if I am upset.	.579	.046	.304
My behavior is pretty consistent from day to day.	.467	.130	.185
I usually show a great deal of self-discipline.	.439	.197	.390
I build relationships with others at school or work.	.315	.855	.377
I take the time to get to know the people around me at school or work.	.263	.793	.282
I like to establish close personal connections with the people around me.	.272	.722	.251
I develop a positive rapport with my teammates.	.431	.653	.345
I am passionate about what I do.	.497	.260	.816
I have a sense of purpose in life.	.591	.375	.787
I am highly motivated to excel in everything I do.	.395	.296	.686
I am a compassionate person.	.497	.392	.537
I tend to get very emotional when under stress. ^a	.007	-.146	-.069

Note: Numbers in bold represent the factor (column) on which the item is loading highest.

a. Dropped from further analyses.

“Establishing Positive Relationships,” concerned establishing positive relationships with others and had a reliability of .84. The 4 items included in Factor 3 concerned a sense of motivation, passion, and energy for one’s activities and was named, “Passion for Purpose,” with a reliability of .78. Overall reliability of the 17-item measure was .89.

Perceptions of leadership. Participants were asked to rate themselves and their group members on a 5-point Likert-type scale on three items: “This person contributed to the leadership of the group,” “This person acted as an effective group leader,” and “I would consider this person to be our group leader.” Higher scores represented greater perceptions of leadership. Ratings provided by each participants’ group members were mean-aggregated, providing both self- and other-rated perceptions of leadership scores for each participant. Reliability of the measure was .94.

Group Tasks

Participants completed three written group assignments during one semester. The first assignment was to write a paper on “connected leadership,” the second was to propose an activity that would allow the

group to enact that definition, and the third was to carry out the proposed activity and write a summary paper. The assignments were spaced by 3 to 4 weeks. Groups were given feedback on each assignment prior to the due date for the next assignment. To successfully complete the projects, group members had to meet outside of class and work interdependently.

Procedure

Participants completed all measures online. They were administered the self-monitoring and authentic leadership measures before being randomly assigned into groups. Participants completed the perceptions of leadership measure after each assignment had been turned in and before feedback was given. Participants completed the Time 1 perceptions measure at 9 weeks into the semester, the Time 2 measure at 12 weeks into the semester, and the Time 3 measure at 15 weeks into the semester.

Analyses

To test Hypotheses 1, 3, and 5, correlational analysis was used. For Hypotheses 2 and 4 and additional testing of Hypotheses 1 and 3, HLM (hierarchical linear

modeling) was used to analyze the data. HLM analysis was chosen over traditional regression analysis because, as a result of the use of repeated measures, there were likely to be correlated errors across measurement times and because the study intended to assess different trends in scores across participants rather than applying the same trend to all participants. Standard regression analysis is inadequate for such a design (Day, Sin, & Chen, 2004). HLM analysis was chosen over structural equation modeling because HLM does not require nonmissing data (Day et al., 2004). The analyses used in the present study followed the RCM model-building steps outlined by Bliese and Ployhart (2002).

Level 1 and 2 Predictors

A two-level HLM analysis was used. At Level 1, time was used as a predictor of perceptions of the within-subject variable predicted to vary across time, perceptions of leadership. The slope and intercept parameters of the equation for perceptions of leadership were analyzed to determine whether there was evidence for random effects. Evidence of random effects indicates significant interindividual variability in the parameters and is required before testing between-participants variables as Level 2 predictors. At Level 2, separate equations are created for the intercept and slope parameters of the Level 1 equation. Given evidence for random effects in the Level 1 parameters, the between-person variables of self-monitoring and authentic leadership are used as predictors of those parameters.

Results

Correlational Analysis

Failing to support Hypotheses 1, 3, and 5, Table 2 shows nonsignificant relationships between self-monitoring and initial other-rated perceptions of leadership ($r = .13, p > .05$), between authentic leadership and initial others' ratings ($r = .05, p > .05$), and a negative though nonsignificant correlation between self-monitoring and authentic leadership ($r = -.12, p > .05$). In addition, neither self-monitoring nor authentic leadership significantly correlated with initial self-rated perceptions of leadership. Regarding relationships among leadership perceptions across times, Table 2 shows that other-rated perceptions of leadership were positively related at all measurement times. However, self-rated perceptions of leadership at T1 did not significantly relate to self-rated perceptions of leadership

at T3 ($r = -.01, p > .05$). Descriptive statistics show self-rated perceptions of leadership to increase over time, and the difference between self-ratings at T1 ($M = 11.83, SD = 2.53$) and T3 ($M = 12.42, SD = 2.20$) was greater than the difference among those times for other-rated perceptions of leadership ($M = 10.12, SD = 2.92$ at T1; $M = 10.30, SD = 3.31$ at T3), indicating that self-rated perceptions of leadership show greater change over time than other-rated perceptions of leadership.

Tests of Hypotheses Using HLM

Self-Rated Perceptions of Leadership

Determining the Level 1 equation. As recommended by Bliese and Ployhart (2002), the baseline model, which provides a basis for comparing models of increasing complexity, was the simplest model that included only fixed effects. Models are compared using chi-square difference tests of deviance statistics associated with competing models. Deviance statistics represent the amount of unexplained variance in an outcome variable. For the present study, the baseline models included time as having a fixed effect on the separate criteria of self- and other-rated perceptions of leadership, as the values associated with time, 1, 2, or 3, were the same for all participants. The Level 1 equation can be expressed as

$$\text{Self-rated perceptions of leadership}_{ij} = B_{0j} + B_{1j}\text{Time} + r_{ij}$$

In the preceding equation, B_{0j} represents the intercept, B_{1j} represents the estimated slope coefficient, and r_{ij} represents an error term. A similar equation will be associated with other-rated perceptions of leadership.

Within the baseline model, Table 3 shows both a significant intercept ($t = 28.08, p < .01$) and slope parameter ($t = 3.02, p < .01$) for self-rated perceptions of leadership. The positive slope coefficient of 0.45 indicates that the extent to which participants perceived themselves as leaders increased over time. Table 3 also shows significant interindividual variability in the intercept parameter, $\chi^2(67) = 120.83, p < .01$, indicating significant variability across participants in how they initially rated themselves as leaders. Of greater importance to the present study is the test for interindividual variability in the slope parameter because it represents change in ratings over time. Evidence was not found for significant interindividual variability in the slope parameter, as there was not a

Table 2
Means, Standard Deviations, and Bivariate Correlations Among Study Variables

Study Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. SPL (T1)	11.83	2.53	—											
2. SPL (T2)	12.12	2.44	.25**	—										
3. SPL (T3)	12.42	2.20	-.01	.62***	—									
4. OPL (T1)	10.12	2.92	-.13	-.24*	-.24	—								
5. OPL (T2)	10.50	3.07	-.12	-.17	-.04	.63***	—							
6. OPL (T3)	10.30	3.31	.02	-.15	-.09	.57***	.71***	—						
7. Self-monitoring	11.43	3.13	.11	-.07	-.02	.13	.24**	.12	(.66)					
8. Authentic leadership	69.61	8.70	-.09	.02	.06	.05	.10	.26**	-.12	(.89)				
9. Self-discipline and ethical standards ^a	36.38	5.15	-.09	.07	.19	.02	.07	.19	-.22*	.92***	(.84)			
10. Establishing positive relationships ^a	16.47	2.64	-.06	.01	-.04	.05	.07	.24**	-.02	.65***	.38***	(.84)		
11. Passion for purpose ^b	16.81	2.76	-.03	-.08	-.14	.08	.12	.19	.06	.80***	.60***	.35***	(.78)	
12. Gender ^b	0.43	0.50	.17	.13	.03	-.05	-.05	-.17	.06	.02	.02	-.08	.00	—

Note: *N* = 69 to 107. SPL = self-rated perceptions of leadership; OPL = other-rated perceptions of leadership.

a. Factors included in the authentic leadership measure.

b. Coded as 0 = male, 1 = female.

p* < .10. *p* < .05. ****p* < .01.

Table 3
Hierarchical Linear Modeling Level 1 Analysis: Model for Self-Rated Perceptions of Leadership

Effect	Coefficient	SE	df	t
Fixed Effect				
Initial perceptions of leadership (B_{00})	11.20	0.40	185	28.08***
Trend in perceptions over time (B_{10})	0.45	0.15	185	3.02***
Random Effect	Variance Component	SD	χ^2	Deviance
Initial perceptions of leadership (r_{0i})	4.96	2.23	120.83***	802.60 (2)
Trend in perceptions over time (r_{1i})	0.54	0.29	76.21	801.71 (4) ^a
Level 1	1.45	2.11		

Note: Reported coefficients and variance components based on sequential model steps (Bliese & Ployhart, 2002; Day, Sin, & Chen, 2004). Deviance = $-2 \log$ likelihood value.

a. Comparison with model with random effects for intercept and fixed effects for slope.

*** $p < .01$.

significant change in the amount of variance in self-ratings explained after adding a random error term to the equation for the slope parameter, $\Delta\chi^2(2) = 0.89$, $p > .10$. Thus, it must be inferred that the positive slope generalizes to all participants equally well, providing no support for Hypothesis 2.

Building the Level 2 (interindividual) model.

Because evidence was found for significant between-person variability in initial self-rated perceptions of leadership, the next step in the analysis was to determine if self-monitoring and/or authentic leadership could explain this variability. At Level 2, the intercept parameter was used as an outcome of self-monitoring and authentic leadership. The model can be represented as

Level 1 (Intraindividual):

$$\text{Self-rated perceptions of leadership}_{ij} = B_{0j} + B_{1j}\text{Time} + r_{ij}$$

Level 2 (Interindividual):

$$B_{0j} = y_{00} + y_{01}(\text{self-monitoring}) + y_{02}(\text{authentic leadership}) + u_{0j}$$

$$B_{1j} = y_{10}$$

In the preceding Level 2 equations, B_{0j} represents the intercept parameter. The equation attempting to predict that parameter includes a fixed effect, y_{00} , participants' self-monitoring and authentic leadership scores, and an error term, u_{0j} . B_{1j} represents the slope parameter, and the equation for that parameter includes only a fixed effect. To assess the extent to which Level 2 predictors explain variance in Level 1

parameters, t-values associated with each predictor are examined (Bliese & Ployhart, 2002). Table 4 shows that neither self-monitoring ($t = 0.32$, $p > .05$) nor authentic leadership ($t = 1.56$, $p > .05$) are significant predictors of the intercept parameter. Thus, although there is significant variability across participants in their initial self-ratings, neither self-monitoring nor authentic leadership significantly explain this variability, failing to support Hypothesis 2.

Other-Rated Perceptions of Leadership

Determining the Level 1 equation. Table 5 shows that, contrary to self-rated perceptions of leadership, other-rated perceptions of leadership did not significantly increase or decrease over time ($t = -0.13$, $p > .05$). Also contrary to self-rated leadership perceptions, the best fitting model for the data included random effects for both the intercept, $\chi^2(68) = 142.73$, $p < .01$, and slope parameters at Level 1, $\Delta\chi^2(2) = 12.23$, $p < .01$, indicating significant interindividual variability in both initial other-rated perceptions of leadership and, more importantly, the rate of change in ratings over time.

To evaluate the possibility that interindividual variability in the slope parameter may have been because of change in the interrater reliability of the other-rated perceptions of leadership measure over time, interrater reliability (r_{wg}) was calculated for each group at each time using James, Demaree, and Wolf's (1984, 1993) formula. Across groups, r_{wg} for other-rated perceptions of leadership was greater than .70 across times and did not significantly differ at any time, as shown through ANOVA analysis. Thus, the

Table 4
Hierarchical Linear Modeling Level 2 Analysis:
Model for Self-Rated Perceptions of Leadership

Fixed Effect	Initial Status		
	β_{0j}	SE β	<i>t</i>
Intercept 2	8.13	2.27	3.58***
Self-monitoring	0.03	0.08	0.32
Authentic leadership	0.04	0.03	1.56

*** $p < .01$.

variability in other-rated perceptions of leadership over time cannot be attributed to change in interrater reliability of other-rated perceptions.

It was thought that a quadratic trend in other-rated perceptions of leadership, with an inflection at Time 2, may better explain the data than a linear trend. This is because the mean of other-ratings was highest at T2 and there was a significant relationship between self-monitoring and other-ratings only at T2. To test the possibility of a quadratic trend in other-rated perceptions of leadership, a quadratic term, made by squaring the term for time, was added to the Level 1 equation.

Adding the quadratic term to the Level 1 equation did not significantly improve the fit of the model over an equation with only a linear term, $\Delta\chi^2(1) = 2.66, p > .05$. Moreover, comparison of *t*-values associated with linear ($t = 0.62, p > .10$) and quadratic terms ($t = -0.70, p > .10$), added to the same baseline Level 1 equation, as recommended by Bliese and Ployhart (2002), showed that neither term significantly explained the trend of the data. In this case, the more parsimonious

linear trend was retained for future analyses. After the most appropriate Level 1 equation had been specified, the next step was to determine if participants' self-monitoring or authentic leadership scores could explain the variability across participants in both initial other-ratings and change in other-ratings over time.

Building the Level 2 (interindividual) model. The model including the Level 2 predictors can be represented as

Level 1 (Intraindividual):

$$\text{Other-perceptions of leadership}_{ij} = B_{0j} - B_{1j}\text{Time} + r_{ij}$$

Level 2 (Interindividual):

$$B_{0j} = y_{00} + y_{01}(\text{self-monitoring}) + y_{02}(\text{authentic leadership}) + u_0$$

$$B_{1j} = y_{10} + y_{11}(\text{self-monitoring}) + y_{12}(\text{authentic leadership}) + u_1$$

Neither self-monitoring nor authentic leadership were found to significantly predict interindividual variability in either the intercept ($t = 1.06, p > .05$, for self-monitoring; $t = -0.35, p > .05$, for authentic leadership) or slope ($t = 0.52, p > .05$, for self-monitoring; $t = 1.89, p > .05$, for authentic leadership) parameters at Level 1 (Table 6). Authentic leadership was, however, a marginally significant predictor ($p = .06$) of interindividual variability in the slope parameter. Thus, contrary to Hypotheses 2 and 4, over time, self-monitoring and authentic leadership did not predict the extent to which individuals were perceived as leaders.

Because the primary analyses did not support the present study's hypotheses, a supplemental analysis

Table 5
Hierarchical Linear Modeling Level 1 Analysis: Model for Other-Rated Perceptions of Leadership

Effect	Coefficient	SE	<i>df</i>	<i>t</i>
Fixed Effect				
Initial perceptions of leadership (B_{00})	10.83	0.41	199	26.58***
Trend in perceptions over time (B_{10})	-0.02	0.18	199	-0.13
Random Effect	Variance Component	SD	χ^2	Deviance
Initial perceptions of leadership (r_{0i})	5.34	2.31	142.73***	896.64 (2)
Trend in perceptions over time (r_{1i})	1.02	1.01	145.61***	884.42 (4)***
Level 1 error (e_{1i})	1.89	1.38		

Note: Reported coefficients and variance components based on sequential model steps (Bliese & Ployhart, 2002; Day, Sin, & Chen, 2004). Deviance = $-2 \log$ likelihood value.

a. Comparison with model with random effects for intercept and fixed effects for slope.

*** $p < .01$.

Table 6
Hierarchical Linear Modeling Level 2 Analysis: Model for Other-Rated Perceptions of Leadership

Fixed Effect	Initial Status			Performance Trend		
	β_{0j}	SE β	<i>t</i>	β_{1j}	SE β	<i>t</i>
Intercept 2	10.45	2.32	4.49***	-3.04	1.55	-1.96
Self-monitoring	0.12	0.11	1.06	0.03	0.05	0.52
Authentic leadership	-0.01	0.03	-0.35	0.04	0.02	1.89*

* $p < .10$. *** $p < .01$.

Table 7
Hierarchical Linear Modeling Level 2 Analysis: Model for Other-Rated Perceptions of Leadership (Using Gender as a Predictor)

Fixed Effect	Initial Status			Performance Trend		
	β_{0j}	SE β	<i>t</i>	β_{1j}	SE β	<i>t</i>
Intercept 2	10.79	0.43	24.91*	0.09	0.19	0.46
Gender	0.29	0.80	0.36	-0.35	0.36	-0.97

* $p < .01$.

using gender as a Level 2 predictor was performed. Previous research has shown differential ratings of leadership based on ratees' gender (for a meta-analysis, see Eagley, Karau, & Makhijani, 1995). A separate Level 2 model was developed with only the gender variable included. Including different categories of predictors (e.g., personality vs. demographic variables), especially when no prior predictions have been made about the relationships between those variables and how they will function as Level 2 predictors, could lead to misspecification of Level 2 equations and misleading results (Bryk & Raudenbush, 1992). Table 7 shows that gender was not a significant predictor of the intercept ($t = 0.36$, $p > .05$) or slope ($t = -0.97$, $p > .05$) parameters.

Supplemental Analysis

A supplemental analysis was conducted to examine participants' over-estimation of perceptions of leadership as an outcome of self-monitoring and authentic leadership. A difference score was calculated for 79 participants by subtracting each participant's other-rated perceptions of leadership from their self-rated perceptions of leadership, with higher difference scores representing greater overestimation. HLM analysis showed a significant slope coefficient ($t = 2.12$, $p = .04$), indicating that overestimation increased over time. Significant interindividual

variability in the Level 1 intercept parameter was found, $\chi^2(63) = 152.97$, $p < .01$, but not in the slope parameter, $\Delta\chi^2(2) = 3.87$, $p > .10$. Neither self-monitoring ($t = -1.53$, $p > .05$) nor authentic leadership ($t = -0.75$, $p > .05$) significantly predicted variability in the intercept parameter. Regression analysis, however, including self-monitoring and authentic leadership, showed authentic leadership to significantly predict overestimation of leadership, averaged across measurement times ($\beta = -.32$, $p = .04$). Those higher in authentic leadership were less likely to overestimate their ratings of themselves as leaders. Thus, in general, individuals higher in authentic leadership may have perceptions of themselves as leaders that are more realistic, relative to how they are perceived by others, than those lower in authentic leadership, but this may only occur with aggregating perceptions over time and not when making comparisons of perceptions overestimation among specific times.

Discussion

The present study contributes to leadership research, especially research on ILTs, in several ways. First, results of the present study suggest that time may play a role in ILT-related phenomena. Research on ILTs argues that individuals hold mental representations

of traits that are desirable in leaders (Lord & Emrich, 2001; Lord & Maher, 1991). Epitropaki and Martin (2005) found individuals' ILTs to be consistent during a span of one year. By showing significant variability across individuals in how they are perceived as leaders over time, results of the present study may suggest that the extent to which individuals match the traits that others associate with leadership may vary over time. Although the traits that individual raters associate with leadership may be stable over time, the extent to which individual ratees are perceived to match those traits may vary over time.

Second, results of the present study suggest that task characteristics in addition to time may effect how individuals are perceived as leaders. Research on small groups shows that characteristics of the tasks that groups perform can affect their performance and patterns of interaction (Hackman & Morris, 1975; Kelly & McGrath, 1985; McGrath, 1997; Straus, 1999; Weed, Mitchell, & Moffitt, 1976). Several researchers have proposed classification schemes for group tasks (e.g., Hackman, 1968; Steiner, 1972), the most popular of which is McGrath's (1984) scheme (Straus, 1999). Using McGrath's classifications, the first task of the present study, defining "connected leadership," may qualify as a creativity task, which is cognitive in nature and requires group member collaboration. The second, proposing an activity to enact that definition may qualify as a planning task as group members had to plan a task for the future that would entail coordinating schedules, availabilities, and preferences. The final task involved greater physical coordination among group members as they had to work together on their proposed task. Although each task involved a written paper as a deliverable, each task was also somewhat different. It is possible that individuals of certain traits may have been perceived as leaders for one or two of the tasks but not all. Because, with the exception of Epitropaki and Martin (2005), which found the relationship between the difference between implicit leadership traits and explicit (observed) traits of leaders and leader-member exchange not to differ based on subordinate job demands, little research has examined how context factors into ILT and leadership perceptions phenomena. This explanation for the results of the present study suggests that future research should study the role of task type in relationships involving traits and perceptions of leadership.

Results showing individuals' overestimation of their perceptions of themselves as leaders to increase over time contribute to research on self-other leadership

evaluation discrepancies, leader self-awareness, and leadership feedback. The present study shows that the discrepancies between self- and other-provided ratings of leadership found in cross-sectional research (e.g., Alimo-Metcalfe, 1998; Baril, Ayman, & Palmiter, 1994; Bass & Yammarino, 1991; Carless & Roberts-Thompson, 2001; Harris & Schaubroeck, 1988; Ostroff, Atwater, & Feinberg, 2004) increase over time. At no time in the present study did the extent to which individuals perceive themselves as leaders either positively or negatively relate to the extent to which other group members perceived them as leaders. HLM analysis showed that whereas individuals' perceptions of others as leaders did not significantly change over time, individuals' perceptions of themselves as leaders increased over time, and this finding was consistent across individuals.

Fourth, the findings involving self- and other-ratings also have implications for the role of feedback in leadership research and leader self-awareness. Regarding feedback, results of the present study highlight differences between the feedback available in leadership research using student samples versus applied samples. In the present study, students may have received informal feedback from others, in the form of comments from others, for example, but not formal feedback targeted at individuals' performance as leaders. Because any feedback that individuals may have received was less salient than formal feedback, consistent with findings by Ehrlinger and Dunning (2003), individuals may have only acknowledged information consistent with their positive perceptions of themselves as leaders. Furthermore, when recalling information from which to base their self-ratings, individuals may have been more likely to recall self-view consistent information than inconsistent, negative information. This tendency may have been coupled with the tendency of individuals to perceive their skill in a given domain, such as group leader, to be greater than what it actually is as they spend more time involved in that domain (Ashford, 1989; Ostroff et al., 2004).

This explanation of the results emphasizes the differences between leadership research using student samples and applied samples by arguing that students receive different types of feedback at different frequencies and attend to feedback differently than workers. For future leadership research, this means that researchers may want to choose group tasks that inherently provide feedback to participants or may want to provide evaluations to participants to more closely replicate conditions that would be found in applied

samples. Results of the present study support the argument that without the provision of formal, or at least somewhat salient, feedback, self-awareness is not likely to develop over time (Atwater & Yammarino, 1992; Bass & Avolio, 1990).

The present study also has implications for future research on individual differences and leadership. Though neither self-monitoring nor authentic leadership predicted the variability in how individuals were perceived as leaders, future research should examine other potential traits that could predict the variability. Possible predictors include conscientiousness and emotional stability. Ployhart, Lim, and colleagues found both conscientiousness and emotional stability to predict typical performance ratings of leaders, taken after participants had been in leadership positions for an extended period of time (Lim & Ployhart, 2004; Ployhart et al., 2001). In the present study, as assignments became more time- and work-intensive, those high in conscientiousness may have taken on greater responsibility for group work, and, therefore, may have been more likely to be perceived as leaders later in groups' tenure, rather than earlier. Similarly, individuals high in emotional stability may have been able to remain calm and affectively consistent over the course of the semester, even later in the semester when others may not have been as stable because of increased workload and time pressure.

Sixth, the development of a measure of authentic leadership could be a first step toward the further development of an authentic leadership measure. Although a formal scale development process was not employed, the measure's items were developed using a deductive approach (Hinkin, 1998), through a content analysis of George's (2003) authentic leadership dimensions. Thus, there was rationale for the items included in the measure. Regarding the psychometric properties of the measure, it was found to include three reliable subscales that shared moderate-strength correlations. The authentic leadership measure showed adequate reliability as well. Although scores on the measure did not significantly relate to self-monitoring scores as predicted, the nonsignificant relationship was in the predicted negative direction. Also, authentic leadership was found to be a marginally significant predictor of variability in other-rated perceptions of leadership over time. Thus, although strong evidence was not found for the construct or predictive validity of the authentic leadership measure in the present study, the results may be promising for the future refinement of the measure. Future research using a more stringent scale development procedure is necessary to test the legitimacy of authentic leadership as a leadership style.

Finally, the most important contribution of the present study is the application of a sophisticated statistical analysis method to an area of leadership theory where research is lacking (Ployhart et al., 2002). Ployhart et al. (2002) stated that a reason for an overall lack of longitudinal leadership research may be that researchers are unaware of how to use analytical methods such as RCM that make modeling longitudinal change easier and more accurate than can be done with traditional analytic methods. The present study joins recent studies, such as Day et al. (2004), that have used RCM to test previous assumptions and arguments, such as those of Bedeian and Day (2004). By applying RCM to actual data, the present study serves as an illustration of Bliese and Ployhart's (2002) prescriptive guidelines for using RCM and hopefully makes RCM more accessible to researchers investigating similar topics in the future. The present study should also encourage more research in the area of attempting to model change in leadership outcomes over time. Such research is the next step in leadership research and is necessary for the progression of leadership theory (Ployhart et al., 2002).

Limitations and Conclusion

The main limitations of the study are tied to the sample. The small sample size may have limited the likelihood of finding significant results. Also, the extent to which findings based on leadership in student groups over 3 months generalizes to leadership in organizational groups and teams may be questionable. It is likely that organizational groups would be together for a longer period of time and work on tasks that require greater interaction among group members than the groups included in the present study. Organizational groups are also likely to have both formal and informal leaders, rather than only the informal leaders that would have been found in groups in the present study, which is likely to effect how individuals are perceived as leaders.

Despite these limitations, the present study comes closer to representing organizational groups than studies using cross-sectional designs by involving groups whose members had variable levels of familiarity before group formation and that remained intact during a multiple-month period to complete various projects. In so doing, the present study's results concerning the nature of change and variability in how individuals are perceived as leaders by others and themselves over time has implications for leadership research and practice. The present study will hopefully

stimulate more research investigating the role of time in leadership phenomena, especially given the availability of statistical techniques such as RCM.

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