

**IN THE EYE OF THE BEHOLDER: LEADER ERROR ORIENTATION,  
EMPLOYEE PERCEPTION OF LEADER, AND EMPLOYEE WORK-RELATED  
OUTCOMES**

**Nicoletta G. Dimitrova**

**University of Greenwich**

**Business School**

**Old Royal Naval College, Park Road**

**London SE10 9LS**

**United Kingdom**

**Tel: (+44) 2083317725**

***e-mail: [n.dimitrova@greenwich.ac.uk](mailto:n.dimitrova@greenwich.ac.uk)***

**Edwin A. J. van Hooft**

**University of Amsterdam**

**Faculty of Social and Behavioural Sciences**

**Programme group Work and Organizational Psychology**

**Postbus 15919**

**1001 NK Amsterdam**

**The Netherlands**

**Tel: (+31) 205256863**

***e-mail: [e.a.j.vanhooft@uva.nl](mailto:e.a.j.vanhooft@uva.nl)***

*Author Note*

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### **Abstract**

Organizations, and the leaders within them, have been slow in adopting error management, an orientation that accepts error occurrence and focuses on correction and learning from errors. Image concerns are a potential barrier, specifically concerns about how a leader will be perceived by employees when adopting an error management orientation. In both an experimental study (Study 1; 73 student and non-student participants) and a field study (Study 2; 454 employees and 95 leaders) we explored the relationship between leaders' perceived error orientation and employees' perceptions of the warmth and competence of those leaders. Moreover, in Study 2 we extend our findings by testing the indirect effects of leader error orientation via perceived leader warmth and competence on indicators of employees' work-related outcomes (i.e., job satisfaction, turnover intention, work engagement, and employee job performance). Our findings provide the first evidence to suggest that leaders should not be reluctant to apply error management in their practice as it offers benefits both for employees' perception of leaders and for employees' work-related outcomes. To inspire future research, based on previous theorizing and our findings, we propose an integrative theoretical model of the interindividual effects of leader error orientation on employee perceived leader warmth, competence, and work-related outcomes at both the individual and team levels.

*Keywords:* error management, error avoidance, leader perception, warmth, competence, job satisfaction, turnover intentions, work engagement, job performance, work outcomes

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Errors are generally perceived as negative events by employees and organizations, and those made by leaders are no exception. Errors may cause reputational damage (Follmer, Neely, Jones, & Hunter, 2019) and evidence suggests that leaders who commit task errors may be perceived negatively by their employees (i.e., as incompetent; Thoroughgood, Sawyer, & Hunter, 2012). Perceptions of leader task incompetence influence how subordinates interact with their leaders (e.g., employees who perceive a leader as incompetent exhibit higher resistance to the leader; Darioly & Mast, 2011). It is therefore not surprising that leaders may prefer to be seen as error avoidant, that is, avoid making errors due to their potential incurred personal and organizational costs. Concerns with these costs may make leaders tough on employees who make errors. By being tough on errors and those who make them, the leader may be attempting to avoid being perceived as a “weak” or incompetent leader.

In contrast to being error avoidant, leader’s error management - an approach which accepts error occurrence and focuses on correction and learning from errors - may be perceived as potentially detrimental by the leader and employees. The employees of leaders who show error management may see such a leader as lacking performance orientation and strength by allowing sloppy and low-quality work. Scholars have mentioned image concerns as one of the powerful barriers that hamper the adoption of error management (Cannon & Edmondson, 2005; Van Dyck et al., 2005; Zhao & Olivera, 2006). Leaders and managers in organizations worry about how they would be perceived if they followed the principles of error management (e.g., they fear that their acceptance of making and learning from errors is interpreted as incompetence because it could indicate that they do not know how to get their employees to do the right things). Moreover, leaders may be concerned about the implications

of employees' negative leader perceptions for employee work-related attitudes and behaviors (e.g., that negative perceptions would negatively affect various employee work-related outcomes such as work engagement, job satisfaction, turnover intention, and job performance).

As pointed out by Reason (1990), errors are ubiquitous thus predicting and eradicating all of them is impossible. Even more so, in a VUCA world (volatile, uncertain, complex, ambiguous; Bennett & Lemoine, 2014), leaders are likely to commit more errors as they make decisions more frequently and faster. Leaders, therefore, face an interesting paradox: they fear errors - because of their negative implications - but at the same time are more likely to make them. This necessitates the demand for leaders to develop constructive ways of dealing with errors. As errors cannot be fully eradicated, it is worth investigating whether leaders' fear of being perceived as an error management leader is truly warranted.

Researchers and practitioners alike (e.g., Edmondson, 2011; Farson & Keyes, 2002) have been recommending that organizations and leaders, in addition to avoiding errors, should adopt an error management orientation. However, due to aversion toward error making (Frese & Keith, 2015; Hofmann & Frese, 2011; Van Dyck et al., 2005), both organizations and leaders may be reluctant in actively endorsing error management, as avoiding errors altogether may be seen as more desirable than having to resolve errors once they have occurred. To date, there is a substantial gap in our understanding due to a lack of empirical investigation and theorizing of error orientation's interindividual effects, leaving open the question of how leaders' error orientation affects employees' perception of leaders and those employees' work-related outcomes.

By investigating this question, we plan to provide novel scientific knowledge in at least three important ways. First, we want to go beyond the intrapersonal, intrateam, and intraorganizational effects of error orientation and explore new grounds by investigating

errororientation as an interpersonal phenomenon. Understanding the interpersonal effects of errors and error orientation is extremely relevant for theory generation as well as for practice, as focusing solely on what happens with and within an individual, a team, or an organization does not provide us with the whole picture. Errors and the error orientation adopted by a person affect not only that individual, but also those around them (Goodman, Wood, & Chen, 2011; Hofmann & Frese, 2011; Lei, Naveh, & Novikov, 2016; Reason, 1990). Our research sets the first steps in investigating the relationship between leaders' error orientation and employees' perception of that leader and employee work-related outcomes, helping us to understand whether leaders' image concerns about adopting an error management orientation are warranted.

Second, our investigation aims to contribute to the error orientation literature by generating new theorizing to explain the interpersonal effects of error orientation. The common theoretical framework which grounds error orientation research is action theory (see Frese & Zapf, 1994), which predicts individual effects of error orientation on cognition, self-regulation, and performance (at different levels). Yet, action theory does not extend to the potential interpersonal effects of error orientation, which necessitates the development of theorizing that can account for such interpersonal effects.

Third, we contribute to the literature on social cognition and impression formation (e.g., Abele & Wojciszke, 2014; Cuddy, Fiske, & Glick, 2008; Fiske, Cuddy, Glick, & Xu, 2002; Cuddy, Glick, & Beninger, 2011). Most research on the antecedents of the fundamental dimensions of social perception - warmth and competence - has focused on nonverbal behaviors (e.g., posture, smiling) or on characteristics such as gender, age, and race and how these affect the choice of a candidate for a position (Cuddy et al., 2011). Despite numerous studies showing the importance of leaders' perceptions for leaders' (e.g., Todorov, Mandisoza, Goren, & Hall, 2005) and employees' outcomes (e.g., Capozza, Bobbio, Di

Bernardo, Falvo, & Pagani, 2017; Falvo, Capozza, Di Bernardo, & Manganelli, 2016), scant empirical research has focused on any predictors of warmth and competence that go beyond the effects of stable (e.g., gender, race, facial characteristics) or difficult to adapt aspects (e.g., nonverbal behavior). In our study, we explore leader error orientation as a potential predictor of employees' perceptions of their leaders' warmth and competence.

### **Error Management and Error Avoidance**

The literature on error orientation distinguishes between error avoidance and error management orientations (Frese & Zapf, 1994; Hofmann & Frese, 2011; Keith & Frese, 2008). Error avoidance focuses primarily on averting the negative consequences of errors by preventing their occurrence. Whilst logical and intuitive this orientation is limited as it focuses on removing errors but not on containing them after they have already occurred.

Error management, in contrast, attempts to maximize the positive consequences of errors (e.g., learning, system improvement) rather than eliminating error occurrence per se (Frese & Zapf, 1994; Hofmann & Frese, 2011; Van Dyck, Baer, Frese, & Sonnentag, 2005). Applying an error management orientation does not, however, involve blind acceptance of willful violations, incompetence, or laziness. Rather, error management recognizes errors as "honest mistakes" - an inevitable part of life. Error management creates openness about errors, which may facilitate error detection prior to error escalation (Hofmann & Frese, 2011).

Existing research on error management focuses on the intrapersonal effects of error orientation on various individual-level outcomes. For example, error orientation has been found to have important affective, attitudinal, cognitive, and behavioral consequences. Compared to individuals with an error avoidance orientation, individuals with an error management orientation, or individuals receiving error management training, generally display higher motivation (Wood, Kakebeeke, Debowski, & Frese, 2000), lower frustration, and negative affect (Chillarege, Nordstrom, & Williams, 2003), more explorative behaviors

(Dorman & Frese, 1994), stronger emotion control and increased meta-cognition (Keith & Frese, 2005), stronger task-focus (Dimitrova, Van Dyck, Van Hooft, & Groenewegen, 2015), greater individual innovativeness (Fischer, Frese, Mertins, & Hardt-Gawron, 2018), and better performance (Bell & Kozlowski, 2008; Chillarege et al., 2003; Frese, 1991; Hofmann & Mark, 2006; Keith & Frese, 2005; 2008). Some studies examined error management at the team level, showing positive links to psychological safety and error reporting, as well as to higher patient and employee job satisfaction in hospitals (Edmondson, 1996; 2011; Hofmann & Mark, 2006). Finally, at the organizational level, error management culture has been associated with increased organizational performance and survivability (Van Dyck et al., 2005) and with greater organizational innovativeness (Fischer et al., 2018). Overall, empirical evidence shows that error management is beneficial for individuals, teams, and organizations (for a review see Frese & Keith, 2015 and Keith & Frese, 2008). Despite this, as mentioned earlier, organizations and leaders are often concerned about actively applying error management orientation in their dealings with employees. This creates an interesting paradox: although error management appears to be beneficial, leaders are unlikely to adopt it.

When it comes to leaders and errors the existing literature has so far theorized about the antecedents of leader errors (Hunter, Tate, Dzieweczynsky, & Bedell-Avers, 2011), investigated the interplay between error types and work conditions on leader performance, (Eubanks & Mumford, 2010) and looked at how leaders' task or relationship errors affect their perceived competence (Thoroughgood et al., 2012). But such studies are limited in that they assume that leaders handle errors in the same way. We argue that it is not only the occurrence of leader errors but how such errors are managed that affects employees. This is in line with organizational scholars' proposed role of leaders as "meaning managers" or "climate engineers", as well as with research and theorizing showing that leaders influence their team's

perceptions and psychological climate through their behavior (e.g., by how they deal with errors; Edmondson, 2004; Dragoni, 2005).

### **The Fundamental Dimensions of Social Perception**

People spontaneously generate impressions of others. Independent streams of research in social and personality psychology, anthropology, management, and organization science have consistently identified two fundamental dimensions that dominate our judgments of traits, people, teams, and cultures (for in-depth reviews of the literature see Abele & Wojciszke, 2007; 2014; Cuddy et al., 2008; Judd, James-Hawkins, Yzerbyt, & Kashima, 2005). Although called differently among separate research traditions (e.g., warmth and competence, communion and agency, morality and competence, consideration and initiating structure, femininity and masculinity, intellectual good-bad and social good-bad; for a review see Abele & Wojciszke, 2014), these two fundamental aspects of person perception have proven extremely useful in explaining how we judge others. The two core dimensions have been shown to account for more than 80% of the variance in our impressions of others (Abele & Wojciszke, 2007; Wojciszke, Bazinska, & Jaworski, 1998). Accordingly, because we were interested in fundamental perceptions we decided to focus on these two broad dimensions instead of on other more specific perceptions that the two fundamental dimensions are likely to subsume (e.g., leader integrity, leader conscientiousness, justice perceptions).

In this paper, we will use the terms *warmth* and *competence*<sup>1</sup> to refer to the two fundamental dimensions, in line with prior work by Fiske (see Cuddy et al., 2008 for a review) and Judd et al. (2005). Warmth includes judgments about how friendly, good-natured, and tolerant one is perceived, whereas competence focuses on whether someone is capable,

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<sup>1</sup> We chose “warmth” and “competence” as the names by which to call the two fundamental dimensions in our paper because of their intuitive appeal. Abele and Wojciszke (2014), however, make a very good case for using the terms “communion” and “agency” (p. 204-205). For a comprehensive overview and clarification of communion and agency we highly recommend reading their excellent article, which integrates the considerable amount of research on the two fundamental dimensions of social perception.



skillful, and intelligent. A person's perceived warmth informs us about their intent towards us (whether a person is a friend or a foe). Perceptions of warmth are vital for the maintenance of relationships and social functioning. Competence tells us to what degree the other is capable of enacting their intent and is focused on task-functioning and goal achievement (Abele & Wojciszke, 2014; Cuddy et al., 2008). Conceptually, the fundamental dimensions can reflect both real behavior and the social cognitions (perceptions of behavior) people form (Abele & Wojciszke, 2014). Consequently, warmth and competence can be seen as ascribed traits, but can also change over time depending on interactions with the person (e.g., a person can increase in ascribed competence by showing competent behaviors or by learning new skills, but can also decrease in ascribed warmth by showing behaviors that challenge perceptions of being well intentioned).

An important question is whether leaders should care if their employees perceive them as warm and competent. Classic research shows that traits of warmth are rated as more important for impression formation than competence traits (e.g., Asch, 1946). However, perceptions of leader competence, rather than warmth, predict the outcomes of elections (Todorov et al., 2005). In the leadership literature, both consideration and initiating structure (which are concepts akin to warmth and competence) have been found to positively relate to leader and employee outcomes, such as employees' satisfaction with one's leader and one's job, as well as to team performance (DeRue, Nahrgang, Wellman, & Humphrey, 2011; Judge, Piccolo, & Ilies, 2004). In addition, recent research has shown that leaders' warmth and competence perceptions by employees have implications for various employee outcomes. Perceiving one's supervisor as warm is positively linked to organizational commitment (Falvo et al., 2016). Employees perceiving their leaders as warm and competent exhibited less burnout, weaker turnover intentions, and more frequent prosocial behaviors (Capozza et al., 2017). In short, there is a wealth of evidence demonstrating the importance of employee

perceptions of leader warmth and competence for both employee and organizational outcomes. What is missing in the aforementioned research, however, is an explanation (or an investigation) of the precursors of perceptions of leader warmth and competence. In particular, whether leader error orientation may, through perceptions of their leader's warmth and competence, link to work-related outcomes for employees.

### **CURRENT RESEARCH**

To investigate how leaders' error orientation is linked to employees' perception of leaders' warmth and competence, and employees' work-related outcomes, we conducted two studies. As a first step in investigating the phenomenon in Study 1, we conducted a controlled laboratory experiment in which participants received instructions from a fictitious leader, consistent with either an error management or an error avoidance orientation. Participants' perceptions of the leader's warmth and competence were then measured. Our rationale for starting with an experiment was to examine whether leader error orientation has the potential to influence employees' perceptions of the leader. The design rules out potential third variable influences such as leader personality and goal orientation. Study 2 is a correlational field study that tests the ecological validity and replicability of the Study 1 findings with actual managers. Additionally, in Study 2, we extend Study 1 by testing the indirect effects of leader error orientation via perceived leader warmth and competence on indicators of employees' organizational well-being/leadership effectiveness (i.e., job satisfaction, turnover intention, work engagement) and employee job performance.

### **STUDY 1**

#### **Method**

***Participants and design.*** Participants were recruited by distributing flyers in the canteen of a large Dutch university. The final sample, excluding two participants, consisted of 73 participants (32 men and 41 women;  $M_{age} = 26.98$ ,  $SD = 8.62$ ). One man and one woman

(both in the error avoidance group) were removed, one for not reading the leader's instructions and one for not finishing the 15-minute practice task. In total, 41 students and 32 non-students joined the study. As remuneration, participants had a one in five chance to win money prizes varying from €10 (approximately \$10) to €50 (approximately \$50). The experiment had a three-group between-participants design (error orientation of the leader: error management vs. error avoidance vs. control). The between-group distribution was as follows: error management (11 men; 14 women), error avoidance (9 men, 14 women), and control (12 men and 13 women).

*Procedure and measures.* As a cover story, we informed participants that they would be randomly assigned to communicate with an online leader who would guide them through the task either through an interactive chat with video, interactive chat without video, or one-way chat instructions. In reality, all participants received one-way chat instructions. The instructions explained that the study dealt with online leadership and that participants would be working on a task for which they would receive help from a leader in a chat window (for a similar procedure see Inesi, Gruenfeld, & Galinsky, 2012). The task was a simulation called TrainDispatcher 2.0 (Signal Computer Consultants, 1997). After reading the introductory task instructions, participants watched a screen recording of the fictitious leader showing them how to successfully guide a train from its entry point to its destination. The total duration of the video was a little over a minute.

After seeing the video, participants returned to the chatbox where they received instructions from the fictitious leader varying by the group to which they were randomly assigned: error management, error avoidance, or control. The error management and error avoidance manipulations were based on theory and manipulations used in previous studies (Dimitrova et al., 2015; Keith & Frese, 2005). Both error management and error avoidance were framed positively as orientations that improve performance when used. Specifically, in

line with the definition of error management, participants in the error management group read that the leader followed the motto "To err is human" and considered learning from errors important. The leader encouraged participants to think about how to minimize the negative impact of errors that occurred and learn from them in order not to repeat them in the future.

Participants in the error avoidance group, in contrast, read instructions consistent with the principles of error avoidance stating that the leader followed the motto "Better safe than sorry" and considered avoiding errors important. The leader encouraged participants to think about how they could minimize the occurrence of errors, detect situations that could lead to errors, and use their knowledge to prevent the occurrence of similar situations in the future.

In the control group participants received a neutral text discussing the Dutch train system (e.g., how it is among the busiest train networks in the world, what percentage of people travel by train daily for work) of similar length to the experimental groups. After the manipulation, participants had 15 minutes to practice a filler train task. Next, participants received the measures of interest.

***Leaders' perceived warmth and competence.*** Drawing on the literature on person and group perception (for a review see Abele & Wojcizke, 2014 and Cuddy et al., 2008), leaders' perceived warmth and competence were measured with 6 items. Respondents were asked how "warm", "good-natured", and "likable" (warmth;  $\alpha = .87$ ), "competent", "skilled", and "efficacious" (competence;  $\alpha = .79$ ) they considered their leader.

***Manipulation checks and controls.*** As a manipulation check, we used the learning from errors and error strain subscales from the Error Orientation Questionnaire by Rybowskiak, Garst, Frese, and Batinic (1999). These scales correspond with error management and error avoidance strategies, respectively, and have been used successfully as manipulation checks in research on error orientation (Keith & Frese, 2005). The 'learning from errors' scale consists of four items made more context-specific by changing the wording to add "during the task"

(e.g., “The errors I made during the task helped me improve my work” instead of “My errors help me improve my work”). The error strain scale, which included 5 items, was adapted to our context in a similar way as the learning from errors scale; for example, “I felt stressed when I made an error during the task”. The Cronbach’s alphas for the scales were .90 and .73, respectively.

We assessed participants’ experience with gaming (“How often do you play computer games?”), experience with simulations similar to the one used in the current study (“I consider myself experienced in similar tasks”), task difficulty (“I found the task difficult”), and perceived performance on the task (“I think I have performed well on the task”) as control variables. Manipulation credibility was measured with four self-developed items: “During the study, I did not doubt whether there was really a leader”, “The chat was believable”, “I believed that someone was chatting with me during the study”, and “I believed that during the study there was a leader” ( $\alpha = .76$ ). The answer scales varied from 1 (*not at all*) to 5 (*extremely*). We also asked participants for their age, sex, and study status (student or non-student).

## Results

***Manipulation checks and controls.*** An ANOVA, with condition as the independent variable and the learning from error subscale as the dependent variable, revealed a significant effect,  $F(2, 70) = 5.91, p = .004, \eta^2_p = 0.15$ . Three post-hoc non-orthogonal contrasts indicated that the error management manipulation was successful because: a) error management instructions resulted in greater perceived importance of learning from error than error avoidance instructions,  $F(1, 70) = 11.49, p = .001, \eta^2_p = 0.14$ , b) error management instructions resulted in greater perceived importance of learning from error than control instructions,  $F(1, 70) = 4.69, p = .034, \eta^2_p = 0.06$ , and c) error avoidance and control instructions did not differ,  $F(1, 70) = 1.61, p = .209, \eta^2_p = 0.02$ .

An ANOVA, with condition as the independent variable and the error strain subscale as the dependent variable, indicated that condition had a significant effect on error strain,  $F(2, 70) = 8.92, p < .001, \eta^2_p = 0.20$ . Three post-hoc non-orthogonal contrasts indicated that the error avoidance manipulation was successful because: a) error avoidance instructions resulted in greater perceived error strain than error management instructions,  $F(1, 70) = 17.52, p < .001, \eta^2_p = 0.20$ , b) error avoidance instructions resulted in greater perceived error strain than control instructions,  $F(1, 70) = 7.04, p = .010, \eta^2_p = 0.09$ , and c) error management and control instructions did not differ on error strain,  $F(1, 70) = 2.45, p = .122, \eta^2_p = 0.03$ .

Separate ANOVAs revealed no significant differences between conditions on gaming experience, experience with similar simulations, task difficulty, perceived performance, and perceived manipulation credibility (all  $F_s < 2.07, p_s > .134$ ). The results suggest that the effects we find on our dependent variables are unlikely to be explained by differences between our groups on the control variables.

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***Leader error orientation and perception.*** An ANOVA, with leader error orientation as the independent variable and perceived leader warmth as the dependent variable, showed a significant effect,  $F(2, 70) = 24.14, p < .001, \eta^2_p = 0.41$ . Two post-hoc non-orthogonal contrasts showed that a) leaders providing error management instructions were perceived as warmer than leaders providing control instructions,  $F(1, 70) = 6.27, p = .015, \eta^2_p = 0.08$ , and b) leaders who provided error avoidance instructions were perceived as less warm than leaders using control instructions,  $F(1, 70) = 18.60, p < .001, \eta^2_p = 0.22$ .

An ANOVA, with error orientation as the independent variable and perceived leader competence as the dependent variable, showed no significant main effect,  $F(2, 70) = 2.00, p$

= .143,  $\eta^2_p = 0.05$ . This finding suggests that there was no overall significant difference on perceived competence depending on leaders' error orientation<sup>2</sup>.

### Study 1 Discussion

Study 1 provided causal evidence that a leader's error management orientation positively affects the perception of that leader's warmth. Specifically, leaders with an error management orientation were perceived as warmer than error-neutral leaders, and leaders with an error avoidance orientation were perceived as less warm than error-neutral leaders. No effects of leader error orientation were found on perceived leader competence. Our findings suggest that, in contrast to what leaders may fear, adopting an error management orientation did not result in lower perceptions of leader competence and increased perceptions of leader warmth.

Although we tried to mimic leader-employee interactions, laboratory research has its limitations. For one, in real life the interdependence between leaders and employees is usually stronger than anything we could create in fully controlled conditions. Additionally, in Study 1 participants were aware that they would never have to work with the leader again. In real organizations, employees are aware that they may work with the same leader over an extended period, which is likely to influence their perceptions and behaviors. If one's outcomes are dependent on that leader, the leader's competence is of greater importance to the self (Abele & Wojciszke, 2007). Finally, for conceptual clarity in our experiment, we focused on extreme categories – pure error avoidance and pure error management. Actual leaders, however, may exhibit degrees of both error avoidance and error management. Consequently, to address these limitations we conducted a field survey study with employees in real organizations.

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<sup>2</sup> A post-hoc non-orthogonal contrast suggested that there is a trend to rate the error management leader ( $M=3.63$ ,  $SD=0.93$ ) as more competent than the control leader ( $M= 3.16$ ,  $SD = 0.77$ ),  $F(1, 70) = 3.42$ ,  $p = .069$ ,  $\eta^2_p = 0.05$ .

## STUDY 2

Our goal in Study 2 was to explore whether the findings of our experimental study would also occur in a field setting. With this study, we extend our Study 1 findings in three ways. First, unlike the simulated leaders who either had a pure error management orientation or a pure error avoidance orientation, in Study 2 we measure the error management and error avoidance orientations of actual leaders (managers) on continuous scales as rated by their employees. Existing work shows that error avoidance and error management are orthogonal constructs (e.g., Van Dyck et al., 2005), that is, a leader can exhibit both, while they remain uncorrelated, thus measuring both can result in more reliable conclusions. Second, the field setting with actual leaders and their employees allowed us to examine whether perceived leader error orientation relates to employees' outcomes such as job satisfaction, turnover intention, work engagement, and job performance and whether leader perceptions may explain this relationship. Third, because actual leaders may interact with their employees both at the individual level (i.e., dyadically) and at the team level, an important question is whether leader error orientation unfolds at the dyadic, team level, or both. At the dyadic level, in line with LMX theory (e.g., Graen & Uhl-Bien, 1995), one may argue that leaders behave differently towards different employees, which implies that we may expect variability between employees in perceptions of their leader error orientation, leader warmth, and leader competence. At the team level, leaders may be showing average levels of their error orientation, warmth, and competence, uncovering their underlying error orientation, warmth, and competence systems, resulting in shared perceptions of the leader among employees (e.g., Zohar & Luria, 2004). As both dyadic and team-level effects are theoretically possible, we collected data from employees within and between



teams to be able to examine at which level error orientation links to perceptions of warmth and competence and employee outcomes.

### Method

**Participants and procedure.** We collected data from 454 employees (269 women and 185 men;  $M_{age} = 37.43$ ,  $SD_{age} = 11.67$ ) from 95 teams and 88 different organizations in Belgium. Student assistants approached managers, asking them to distribute a pen and paper questionnaire to a minimum of three to five of their subordinates.

The main sectors represented in the sample included healthcare (16.7%), retail, (15.6%), education (7.5%), social and youth care (7.5%), logistics and transport (6.6%), civil service (6.6%), construction (4.4%), hospitality (4.2%) and others (IT, accountancy, recruitment, marketing, non-profit, etc., 30.9%). The sample consisted of both full-time (68.6%) and part-time employees (30.8%). The average work experience of the employees in the current position at the current organization was 7.64 years ( $SD = 8.14$ ). The average time that employees had worked with their current leader was 4.95 years ( $SD = 5.26$ ). The average work experience of the leaders in their current organization was 8.68 years ( $SD = 7.72$ ). The average team size was 15.70 members ( $SD = 22.49$ ). The sample was evenly distributed among small and medium organizations of up to 100 employees (50.4%) and large organizations (49.6%).

**Measures.** All responses were given on 7-point Likert scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Employees' rated their leaders' error orientation on seven items based on earlier error orientation measures (Rybowiak et al., 1998, Van Dyck et al., 2005). Four items measured perceived leader error management ( $\alpha = .93$ ) and three items perceived leader error avoidance ( $\alpha = .75$ )<sup>3</sup>.

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<sup>3</sup> The error management items were: "My manager tells us to evaluate errors so that we can learn from them", "My manager tells us that if you learn from errors, it is far less likely to make the same errors in the future", "My

Employees' perceptions of leader warmth were measured with the three items used in Study 1: "warm", "friendly", and "good-natured" ( $\alpha = .87$ ). Perceived leader competence was measured with the three items measuring perceived competence in Study 1: "skilled", "efficient", and "efficacious" ( $\alpha = .95$ ).

Employees' job satisfaction was measured with the three-item scale by Edwards and Rothbard (1999). The items included were "All in all, the job I have is great", "In general, I am satisfied with my job", and "My job is very enjoyable" ( $\alpha = .92$ ).

Employees' turnover intentions were measured with three items from the exit scale by Rusbult, Farrell, Rogers, and Mainous III (1988). A sample item is "I am seriously considering quitting my job" ( $\alpha = .85$ ).

Employees' work engagement was measured with the short nine-item Utrecht Work Engagement Scale (UWES-9; Schaufeli, Bakker, & Salanova, 2006). Sample items included: "At my work, I feel bursting with energy", "I am enthusiastic about my job", and "I am immersed in my work". Recent work suggests that a single general work engagement factor, rather than the originally suggested three separate dimensions of vigor, dedication, and absorption (Schaufelli et al., 2006; Schaufelli, 2013), is a better and more parsimonious representation of work engagement (De Bruin & Henn, 2013; Fong & Ho, 2015). Accordingly, we averaged all 9 items calculating a general work engagement score ( $\alpha = .91$ ).

Employee job performance was measured by asking the employee's manager about the individual's in-role performance using four items from Williams and Anderson (1991). The specific items were: "This employee adequately completes assigned duties", "This employee meets formal requirements of the job", "This employee maintains high-quality standards at

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manager tells us that you can only grow if you learn from errors", and "My managers tell us to evaluate projects in order to learn from the errors made". The error avoidance items were: "My manager encourages us to avoid all error", "My manager expects us to tolerate no error", and "My manager expects us to see every error, no matter how small, as something potentially negative".

work”, and “This employee increases the pace of work if necessary to meet a deadline” ( $\alpha = .84$ ).

### Results

Table 2 presents the means, standard deviations, and correlations among the variables.

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Because employees were nested within teams with the same leader, observations were not completely independent and so we used multilevel modeling (see Hox, 2010) to analyze the data. We conducted multilevel path analyses to model the relationships at both the individual/dyad level (Level 1) and the team level (Level 2). This way we were able to simultaneously test a) individual/dyad-level relationships, in that different employees may have different dyadic experiences with a leader which may result in different perceptions of that leader’s error orientation, warmth, and competence, and b) team-level relationships as team members may have shared perceptions of the leader.

We conducted all multilevel path analyses in Mplus 7.11 with maximum likelihood estimation with robust standard errors (MLR), and with leader as the assigned nesting variable. Intraclass correlations were .109 ( $p = .03$ ) for perceived leader error management, .180 ( $p < .001$ ) for perceived leader error avoidance, .285 ( $p < .001$ ) for perceived warmth, .255 ( $p < .001$ ) for perceived competence, .046 ( $p = .32$ ) for job satisfaction, .072 ( $p = .07$ ) for turnover intention, .112 ( $p = .05$ ) for work engagement, and .146 ( $p = .002$ ) for job performance. The intraclass correlations reflect the proportion of variance at the team level (i.e., Level 2 variance / [Level 1 variance + Level 2 variance]), and are the Mplus analog to ICC(1) (cf. Gavin & Hofmann, 2002), thus indicating the extent to which the assessed construct is shared among team members (Kozlowski, 2012). Our intraclass correlations

suggest that when studying leader error management and avoidance, as well as perceived leader warmth and competence, it is important to not only focus on individual employee perceptions but also take team-level effects into account. The intraclass correlations further suggest that, respectively, 89.1% and 82.1% of the variance in perceived leader error management and avoidance is at the individual level, whilst 71.5% and 74.5% of the variance respectively in perceived leader warmth and competence is at the individual level. These values suggest that perceptions of leader error management and avoidance are somewhat more idiosyncratic (or varying across team members) than perceptions of leader warmth and competence, which are more fundamental person perceptions. However, across all variables, the intraclass correlations suggest that, although the team level is important to take into account, most of the variance is at the individual/dyadic (leader-employee) level.

We first tested the relationship between leader error orientation and employee perceptions of the leader (i.e., perceived warmth and competence). As displayed in Table 3 and Figure 1, multilevel analysis including leader error management and leader error avoidance simultaneously as predictors with perceived leader warmth and competence as outcomes, showed that at the individual/dyadic level (Level 1) error management of the leader was significantly and positively related to both perceived warmth of the leader,  $B = 0.369$ ,  $p < .001$ , 95% CI [0.297, 0.442], and perceived competence of the leader,  $B = 0.358$ ,  $p < .001$ , 95% CI [0.262, 0.455]. Leader error avoidance was neither related to perceived warmth of the leader,  $B = -0.047$ ,  $p = .119$ , 95% CI [-0.106, 0.012], nor to perceived competence of the leader,  $B = -0.055$ ,  $p = .104$ , 95% CI [-0.120, 0.011]. These findings indicate that employees who perceive their leader as showing more of an error management orientation also perceived their leader as warmer and more competent compared to employees who perceived their leader as showing less of an error management orientation, while leader error avoidance did not relate to perceived leader warmth and competence at the individual level.

At the team level (Level 2), the findings as displayed in Table 3 and Figure 1 indicate that error management of the leader significantly and positively related to the perceived competence of the leader,  $B = 1.079$ ,  $p < .01$ , 95% CI [0.293, 1.865], but not to the perceived warmth of the leader,  $B = 0.583$ ,  $p = .113$ , 95% CI [-0.139, 1.304]. Leaders' error avoidance related significantly and negatively both to perceived competence of the leader,  $B = -0.399$ ,  $p < .05$ , 95% CI [-0.715, -0.083], and to perceived warmth of the leader,  $B = -0.498$ ,  $p < .01$ , 95% CI [-0.825, -0.171]. These findings indicate that the team perception of leaders' error management positively relates to the team perception of leaders' competence, but not to the team's perception of leaders' warmth. Comparison between the individual/dyad level and the team level suggests that leader error management links to employees' perceived leader warmth only at the individual level, but to employees' perceived leader competence at both levels. Leader error avoidance only links to perceived leader warmth and competence at the team level, with leaders high on error avoidance being perceived as less warm and less competent compared to leaders scoring low on error avoidance orientation.

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Insert Table 3 and Figure 1 about here  
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Our findings indicate that leader error approach matters for employees' perception of a leader, but this opens the question of whether it also has any consequences that go beyond mere perception. To investigate this question, we looked into the indirect relationships of error management and avoidance through perceived warmth and competence to the outcome variables job satisfaction, turnover intention, work engagement, and job performance.

We conducted a separate multilevel path analysis for each of the outcome variables (see Table 4 and Figure 2) and estimated the indirect effects. For job satisfaction the results at Level 1 indicate a significant positive indirect effect of error management through warmth,

*estimate* = 0.088, 95% CI [0.038, 0.139], and competence, *estimate* = 0.089, 95% CI [0.034, 0.144], to job satisfaction. The remaining direct effect of error management to job satisfaction was not significant,  $B = 0.078$ ,  $p = .131$ , 95% CI [-0.023, 0.180], suggesting full mediation. The indirect effects of error avoidance to job satisfaction at Level 1 were not significant. None of the Level 2 indirect effects were significant.

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Insert Table 4 and Figure 2a about here  
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For turnover intention, the results at Level 1 indicate a significant negative indirect effect of error management through warmth, *estimate* = -0.075, 95% CI [-0.143, -0.006] to turnover intention. The remaining direct effect of error management to turnover intention was not significant,  $B = -0.042$ ,  $p = .588$ , 95% CI [-0.193, 0.110], suggesting full mediation. The indirect effects of error management via competence, and those of error avoidance to turnover intention at Level 1 were not significant. None of the Level 2 indirect effects were significant.

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Insert Figure 2b about here  
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For work engagement the results at Level 1 indicate a significant positive indirect effect of error management through warmth, *estimate* = 0.066, 95% CI [0.016, 0.115], and competence, *estimate* = 0.057, 95% CI [0.012, 0.103], to work engagement. The remaining direct effect of error management to work engagement was not significant,  $B = 0.070$ ,  $p = .127$ , 95% CI [-0.020, 0.159], suggesting full mediation. The indirect effects of error avoidance to work engagement at Level 1 were not significant. None of the Level 2 indirect effects were significant.

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Insert Figure 2c about here  
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For job performance the results at Level 1 indicate a significant positive indirect effect of error management through warmth,  $estimate = 0.048$ , 95% CI [0.003, 0.093] to job performance. The remaining direct effect of error management to job performance was not significant,  $B = -0.060$ ,  $p = .233$ , 95% CI [-0.159, 0.039], suggesting full mediation. The indirect effects of error management via competence, and those of error avoidance to performance at Level 1 were not significant. None of the Level 2 indirect effects were significant.

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Insert Figure 2d about here  
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## GENERAL DISCUSSION

We aimed to better understand how leaders' error orientation links to employees' perceptions of their leaders' warmth and competence and employees' work-related outcomes. Our findings show that leaders with an error management orientation are perceived as warmer (Study 1; Study 2 dyadic level), and leaders with an error avoidance orientation as less warm (Study 1; Study 2 team level). In Study 1, we did not find an effect of leader error orientation on perceptions of competence. However, Study 2, which used actual leaders and employees, provided evidence that leaders seen as exhibiting more of an error management orientation were also perceived as more competent at both the dyadic and the team level. Leaders exhibiting more of an error avoidance orientation were perceived as less competent, but only at the team level. Finally, in Study 2 we found that the positive outcomes of leader error management orientation go beyond employees' perception alone (at the individual/dyadic

level). Both warmth and competence fully mediated the positive relationship between employees' perceived leader error management orientation and employees' job satisfaction and work engagement. Leaders' warmth perception fully mediated the relationship between leaders' error management orientation and employee turnover intention and job performance. Overall, our results show that being perceived as a leader with an error management orientation links to various benefits to both leader image and employee outcomes. Leader error avoidance, in contrast, either lacks these benefits or is detrimental to them.

The current findings go against the intuition that leaders will be perceived as less competent if they show error management orientation and that they will be perceived as more competent and effective if they show error avoidance orientation. Leaders' error management did not signal weakness to employees. On the contrary, employees saw their leader's error management orientation as a signal of both warmth and competence. Moreover, error management orientation was indirectly linked with greater job satisfaction, lower employee turnover intentions, higher work engagement, and better leader-rated employee performance, while error avoidance orientation was not. Our results add to previous research by showing that leader error orientation has implications for employees not only in terms of how they perceive their leader but also in terms of their work-related outcomes.

### **Implications for Theory and Practice**

The present studies add to the error orientation literature in multiple ways. The existing literature mostly focuses on the effects of leader errors on other's perceptions of the leader (Thoroughgood et al., 2013) but not on how a leader *deals* with errors and how that then affects employees' perceptions of the leader and work-related outcomes. Rodriguez and Griffin (2009) in their theoretical paper made initial steps in highlighting the value of error orientation for leadership research. Additionally, Dragoni (2005) theorized that leader error avoidance may have implications for employees' state goal orientation emergence. Research



on the potential relationship between leaders' error orientation, employees' perceptions of the leader, and employee outcomes, however, is lacking. We take prior work further by making the first empirical steps in understanding how leaders' error orientation relates to employees' perceptions and outcomes. Based on the results of the present studies and their implications, we create an integrative theoretical model that clarifies how leader error handling influences employee leader perception and how that, in turn, influences work-related outcomes at both the individual and team levels (see Figure 3). According to our model, the behaviors that leaders engage in affect employees' perceptions of leaders' error orientation at both the individual/dyadic and team level. In turn, employees' perceptions (both at the individual/dyadic and the team level) can affect work-related outcomes. Additionally, we theorize the presence of potential moderators impacting the relationship between perceived leader error orientation and employee leader perception.

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Insert Figure 3 about here  
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Importantly, we address leaders' image concerns about having an error management orientation. There is a clear interest in the benefits of applying error management in organizations (e.g., Frese & Keith, 2015; Van Dyck et al., 2005). Nonetheless, research exploring the potential perceptual effects of leader error orientation has been missing. Lei, Naveh, and Novikov (2016), in their integrative review of the literature on errors in organizations, included hiding errors, open communication about errors, help in dealing with errors, and blaming as interpersonal processes. However, those only focus on the interindividual elements of error orientation itself and not on the interindividual effects error orientation has on leader perception by employees or on employee work outcomes. The current research is the first to explicitly recognize the need to explore the interindividual

effects of error orientation and to investigate whether leaders' predilection for error avoidance and skepticism about applying error management, due to image concerns, are justified. Our results show that leaders adopting error management should not be worried about how their employees would see them or how error management impacts their employees' wellbeing or performance. If anything, error management leaders are perceived favorably, generating positive work-related outcomes for their employees.

Specifically, we have demonstrated that the relationship between leader error management and warmth perceptions is positive and robust at the individual/dyadic level, independently of whether there were few or many interactions between leaders and employees (effect found in both studies). Warmth perceptions are regarded as primary in the social cognition literature, with people being faster at judging warmth compared to competence (e.g., Cuddy et al., 2008). The findings for competence perceptions differed between our two studies. The null findings on the link between error management and perceived competence in Study 1 and the positive findings in Study 2 (at both the dyadic and team level) may suggest that competence perceptions of the leader by employees require time and multiple interactions to develop, as such temporal influences should be considered.

Prior theorizing from the social cognition literature suggests that sensitivity to warmth or competence information is context-dependent. According to Wojciszke (2005: 65), "...when the target's competence contributes to the perceivers' well-being as much as their own abilities do, as in the case of competence of 'my lawyer' or 'my boss'" the impact of competence judgments increases. In the organizational context, therefore, competence appears to be important when people's outcomes are interlinked, which is the case in most efficiency-oriented organizations. In other words, the more dependent one's outcome is on others, be that a leader, a teammate, or a group representative, the more consequential their competence is to one's well-being.

We speculate that the finding that leaders' error orientation and perceived competence were related in Study 2, but not in Study 1, may be due to the long-term interactions between leaders and employees, as well as the employees' interlinked outcomes, both of which were missing in Study 1. Over time, employees may become more aware of the competence of leaders with an error management orientation. Note that the social cognition and impression formation literature predict that competence is judged very fast, although slower than warmth. Our results, however, suggest that in the absence of visual cues (e.g., a picture of the leader), competence judgments may take longer to form and may require multiple interactions. People are judged as competent when they show observable abilities, skills, and good performance (Cuddy et al., 2008; Fiske et al., 2002). According to earlier related work, error avoidance by leaders harms employees' learning and performance (e.g., Edmondson, 1996; Van Dyck et al., 2005), which over time is likely to signal that a leader is incapable (e.g., not efficient and efficacious) of achieving organizational goals. We thus suggest that finding effects of leader error orientation on competence is time-dependent. That is, the effect of leader error orientation on perceived leader competence can be observed over a longer time frame but not when employees have had little opportunity to fully interact with a leader. Warmth perceptions, in contrast, likely are more immediate, which is in line with the empirical evidence according to which, compared to competence perceptions, warmth perceptions are made more quickly and are judged as more important (e.g., Abele & Wojciszke, 2007; Wojciszke et al., 1998). Accordingly, in our proposed theoretical model we have included temporal influences as a moderator of the relationship between perceived leader error orientation and employee perceived leader competence (see Figure 3).

Organizations are often proud of their zero-error policies (Hofmann & Frese, 2011) and invest a considerable amount of time, money, and training in avoiding the occurrence of errors. Keeping that in mind, it was interesting to see that leader error avoidance orientation

negatively affected perceived leader warmth in Study 1, and negatively related to perceived leader warmth and competence at the team level in Study 2. Error avoidance has been theoretically linked to some negative responses such as punishment of errors, blaming the parties responsible, and fear of losing face (e.g., Van Dyck et al., 2005). It is possible that leaders with an error avoidance orientation show themselves as strict, intolerant, and defensive - characteristics which may explain the negative findings for leaders' perceived warmth (Study 2 team level). Additionally, employees likely expect that a leader who wants to work flawlessly will apply the same strict non-compromising criteria to them as well, which results in a fear of being blamed and punished for errors, compromising the leaders' position as having good intent (Edmondson, 1996; 1999; Van Dyck et al., 2005). In our theoretical model, we have added paths between leader error avoidance and warmth at the individual/dyadic level and between leader error avoidance and perceived leader warmth and competence at the team level (see Figure 3).

Contrary to some previous research indicating that error avoidance results in worse performance by individuals (e.g., Dimitrova et al., 2017) and teams (e.g., Fruhen & Keith, 2014; error aversion culture was linked to a higher number of accidents), we found no significant indirect relationships between leader error avoidant orientation and employees' performance. Maybe it is not that leaders' error avoidance harms employee outcomes - it does not seem to affect them. But it does seem that leaders' error management is beneficial for employee outcomes. Such a lack of a relationship between error avoidance and organizational outcomes aligns with Van Dyck et al. (2005) who similarly did not find any relationship between organizational error aversion culture and organizational outcomes (firm goal achievement and firm survivability) but did find a positive relationship between organizational error management culture and organizational outcomes. These differences may be linked to how performance is measured, but signal that further exploration is needed to

establish how error orientation measured at different levels affects various types of work-related outcomes (including performance). In our theoretical model, we address this difference in individual and team level outcomes by proposing the existence of individual/dyadic and team level work outcomes, although in the research we have only tested individual employee work-related outcomes.

Our research adds to the social cognition literature by providing novel knowledge about leader error orientation as an antecedent of warmth and competence perceptions. There is rich literature (e.g., Todorov et al., 2005; Todorov, Said, & Verosky, 2011) examining facial characteristics and their effect on warmth (a.k.a. trustworthiness) and competence (a.k.a. dominance). Additionally, the research in social cognition and group stereotyping (for a review see Abele & Wojciszke, 2014 and Cuddy et al., 2008) has focused mostly on indirect interactions (reading a description of a stereotyped group or of a person) or on facial perception from pictures. Our experimental study differs from previous research in that participants made inferences about a leader based on direct information. We thus add to the literature on warmth and competence by looking at direct (Study 1) and realistic interaction-based (Study 2) formation of judgments based on leader error orientation. Unlike some earlier factors suggested to affect warmth and competence perceptions (e.g., non-verbal behavior), error orientation is more under the conscious control of leaders. It may, therefore, be possible to train leaders in effective error management skills to reap the benefits of improved leader perception and potentially employees' work-related outcomes.

The development and testing of leader error management training will be a valuable addition to the general error management training that has already been empirically tested (for a review see Frese & Keith, 2015 and Keith & Frese, 2008). It is worth considering, based on the findings of Study 2, that leader training would likely have disparate effects at the individual and team levels. Specifically, team-level perceived leader error management

orientation was positively linked to team-level employees' perceptions of leader competence, whereas individual/dyadic perceived leader error management orientation was positively linked to both employees' perceptions of leader warmth and competence. Interestingly, when comparing the findings on error avoidance at the individual/dyadic and team level, we see that perceived leader error avoidance relates to reduced warmth and competence perceptions at the team level only. A possible explanation may relate to negativity bias, suggesting that negative information and events are more potent, have higher salience, command more attention, and are more contagious (e.g., Rozin & Royzman, 2001). Assuming that leader error avoidance behaviors are interpreted as negative information by team members, these likely are noticed, remembered, and shared to a greater extent among team members, such that these have greater consequences, especially at the shared team level. In our theoretical model, we address these disparate effects by showing relationships between individual/dyadic level perceived leader error management and employee perceived leader warmth and competence, but no individual/dyadic level relationship between leader error avoidance and employee perceived leader competence (see Figure 3).

Our Study 2 findings suggest that leader error management mostly links to perceptions and outcomes at the individual level. A likely explanation is that outcomes such as job satisfaction, turnover intentions, work engagement, and job performance are inherently individual-level employee outcomes. Future research is needed to examine the extent to which leader error management, through its effects on warmth and competence perceptions, may also link to inherently team-level outcomes. Although in our research we only find links to employee work-related outcomes at the individual level, in our theoretical model we also propose links to team-level work-related outcomes. Because perceptions of leader warmth and competence are somewhat shared within a team, these likely affect how teams interact and the team-level work-related processes and outcomes (e.g., psychological safety, team learning,

information sharing, collaboration, goal sharing, etc.). Team-level outcomes are therefore included in our proposed theoretical model (see Figure 3, marked with dashed lines), although they remain to be tested. Moreover, based on existing findings showing links between individual and team level work-related outcomes (e.g., Chen, 2005; Chen, Kirkman, Kanfer, Allen, & Rosen, 2007) in our theoretical model we propose a cross-level relationship between individual and team level work-related outcomes. Specifically, we posit that team-level error orientation can have top-down effects on individual-level outcomes through team-level work-related outcomes. For example, if an error management leader has created psychological safety, information sharing, and collaboration in their team, this positively affects individual employees' work engagement, job satisfaction, and performance. Moreover, individual/dyadic perceived leader error orientation can affect individual work-related outcomes, which in turn can have bottom-up effects on team-level processes such as collaboration and information sharing and team-level outcomes (see Figure 3).

Our studies build on the work by Cuddy and colleagues (2011) who theorized that warmth and competence can be useful to measure and manage (i.e., impression management) within the organizational context. However, when building their theorizing Cuddy et al. (2011) focused primarily on the perception of employees' warmth and competence (e.g., do employees' warmth and competence determine which employees get promoted) and ignored employees' perceptions of leaders. In our research and theoretical model, we amend this omission. Additionally, finding relationships between perceived leader warmth and competence and employee work-related outcomes aligns with the stereotype content model predictions (e.g., Fiske et al., 2002; Cuddy et al., 2008). Specifically, the stereotype content model theorizes that being perceived as warm and competent links to emotional (i.e., admiration) and behavioral (passive and active facilitation) outcomes. Cuddy et al. (2008: 112) provide evidence that admiration motivates contact, cooperation, positive approach

behaviors akin to active facilitation (i.e., actively acting for) and passive facilitation (passively acting with). Adapting stereotype content model theorizing to leaders' perceptions, we propose that when employees perceive their leaders as high on warmth and competence compared to low on the two dimensions, the employees experience more cooperative and positive interpersonal interactions with their leader making working together more satisfying, engaging, and productive. Such reasoning aligns very well with our individual/dyadic work-related outcomes and with the predicted but not tested team-level work-related outcomes.

Although error management and error avoidance may be understood as opposing concepts, in Study 2 we found no significant relationship between leader error management and error avoidance orientation (see Table 2). This finding suggests that the two are separate constructs, rather than parts of the same continuum. Note that this aligns with the original findings by Rybowskiak et al. (1998), who similarly did not find a correlation between the learning from error and error strain subscales. Furthermore, supplementary analyses of our Study 2 data revealed no interaction between perceived leader error avoidance and perceived leader error management. This aligns with experimental research utilizing a 2 (error prevention: yes vs. no)  $\times$  2 (error management: yes vs. no) factorial design that showed that error prevention (akin to error avoidance) and error management did not interact and had unique outcomes on cognition, emotion, and performance (Dimitrova et al., 2017).

Accordingly, our integrative theoretical model does not predict that leader error avoidance and leader error management interact in affecting leader perceptions and work-related outcomes.

Finally, action theory (Frese & Zapf, 1994), which is the main theoretical framework used in the literature to explain how error orientation affects one's cognition, learning, and performance, cannot explain the interindividual effects of error orientation that we found. Whereas action theory has focused on the action, the social aspects potentially affecting that action can benefit from further elaboration. We make initial steps in connecting error research



with the dual perspective model of social cognition (Abele & Wojciszke, 2014) and the stereotype content model (Cuddy et al., 2008). Grounded by our findings and their implications, we have now proposed a new theoretical integrative model of the interindividual effects of leader error orientation on employee perceived leader warmth, competence, and work-related outcomes at both the individual and team levels. We hope that the empirical groundwork and theoretical model we have developed will inspire further empirical research testing how leader error orientation affects employees. Such new research can assist us in clarifying how both leaders and employees can be happy and productive at work while successfully facing the challenges that come with errors.

### **Limitations and Future Research**

Although the reported findings extend the literature in multiple ways, several limitations must be acknowledged. To limit the effects of other factors that could potentially affect our findings (e.g., leader appearance), we used an artificial leader-employee set-up in Study 1. Future research could apply a more realistic experimental setting by using actors. Alternatively, future research could test an error management training intervention in a field setting to further investigate causality.

In Study 1 participants only got to read texts sent by the leader, thus no real interactions took place. In the questionnaire study, we focused on measurements at a specific point in time, but not on their development over time. It will be worth investigating how multiple interactions between leaders and employees shape the perceptions of warmth and competence and the role error orientation plays during this process of impression (re)formation. Based on the differences in findings between Study 1 and Study 2, it will be interesting to test if warmth perceptions are more stable than competence perceptions over multiple leader-follower interactions. Future research could investigate the dynamics of leader

perceptions over time as a function of leader-employee interactions in a longitudinal field study or by conducting multi-interaction leader-employee experiments.

Study 2 focused on employee perceptions of their leader and individual employee outcomes. Future research is needed to examine to what extent such employee perceptions of their leader's error orientation differ from the leader's self-perceptions, and how (dis)agreement in self-perceptions versus employee perceptions affect leader and employee outcomes. Furthermore, the relatively high individual-level variance in leader perceptions suggests that leaders may adopt a different error orientation depending on the specific employee's attitude or performance.

Our research shows that perceived leader error orientation may have interindividual effects on employees: Employees who perceive their leader as showing more, rather than less, error management also performed better as judged by the leader. Additionally, our measure of performance was focused on the competence aspects of performance leaving social aspects (e.g., works well with others to reach team goals) unmeasured. Future research using broader (e.g., measuring both competence and social aspects) and more objective performance outcomes, compared to the ones presently measured, is needed. It can verify whether leader error management makes employees perform better both at the individual and team levels, or whether our findings merely indicate that leaders high on error management rate their employees as performing better. Nonetheless, our findings converge with previous research that has consistently shown that error management instructions are linked to improved individual performance (e.g., Bell & Kozlowski, 2008; Dimitrova et al., 2015; Keith & Frese, 2008). Further, it remains yet to be tested in future research whether leaders show more error management as compared to less when dealing with high-performing employees, which then makes the employees perceive the leader in a favorable light as the leader is warmer towards

them. Yet, from our experimental study, we could see that leaders exhibiting error management were already judged as warmer by participants.

In our research, we addressed employees' perception of a leader as a potential barrier to the implementation of error management by leaders. Yet, leaders' potential concerns about how they are perceived by their boss or peers may also be barriers. Our results were instrumental in developing a theoretical model that can explain the relationships between leader error orientation and follower effects, but the perceptions of the leaders' peers and superiors were seen as extraneous to our model. It is possible that leaders may intuitively be aware that their employees can benefit from error management but be afraid that their boss or peers may see them as weak if they applied this approach. Future research can build on our work and extend our theoretical model by looking into the perceptions of leaders' superiors and peers towards leaders exhibiting varying degrees of error management and error avoidance thus developing a 360-degree view of the interindividual effects of leader error orientation on employee, peer, and superior perceptions and work-related outcomes.

**TABLE 1**  
**Means, Standard Deviations, and Correlations in Study 1**

Variables	Error avoidance		Error neutral (Control instructions)		Error management		1	2	3	4	5	6	7	8	9
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>									
<i>Control variables:</i>															
1. Age	26.83	7.81	26.56	9.19	27.52	9.07	-								
2. Sex	0.61	0.50	0.52	0.51	0.56	0.51	-.21	-							
3. Student status	0.57	0.51	0.60	0.50	0.52	0.51	-.59***	.28*	-						
4. Gaming experience	2.22	1.04	2.24	1.01	2.08	0.95	-.25*	.02	.22	-					
5. Experience with similar simulations	2.00	.95	2.36	1.28	1.92	1.15	-.06	.03	.20	.46***	-				
6. Experienced task difficulty	4.22	1.28	3.48	1.23	3.88	1.27	.02	-.11	-.04	-.31**	-.49***	-			
7. Perceived practice performance	2.13	1.36	2.84	1.38	2.56	1.33	.04	-.03	-.15	.27*	.49***	-.66***	-		
8. Manipulation credibility	3.02	1.31	3.34	0.80	3.26	1.05	-.16	.06	.19	.07	-.08	.31**	-.24*	-	
<i>Dependent variables:</i>															
9. Perceived leader warmth	1.99	1.09	3.09	0.64	3.71	0.82	.05	.01	.04	.04	.13	-.13	.26*	.05	-
10. Perceived leader competence	3.57	0.98	3.16	0.77	3.63	0.93	-.09	-.10	-.12	.09	.17	.02	.16	.03	.16

*Note.*  $N = 73$ . Sex: 0 = man, 1 = woman. Student status: 0 = non-student, 1 = student. All tests are two-tailed.

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

**TABLE 2**  
**Means, Standard Deviations, and Correlations of Variables in Study 2**

Variables	<i>M</i>	<i>SD</i>	$\alpha$	1	2	3	4	5	6	7
1. Leader error management orientation	5.16	1.15	.93	-						
2. Leader error avoidance orientation	3.46	1.44	.75	-.01	-					
3. Perceived leader warmth	5.30	1.02	.87	.42***	-.17**	-				
4. Perceived leader competence	5.88	1.02	.95	.48***	-.13**	.54***	-			
5. Employee job satisfaction	5.57	1.04	.92	.29***	-.02	.32**	.36***	-		
6. Employee turnover intention	1.99	1.23	.85	-.14**	.09	-.24***	-.26***	-.52***	-	
7. Employee work engagement	5.22	0.89	.91	.24***	-.01	.28***	.26***	.76***	-.41***	-
8. Employee job performance (evaluated by leader)	5.48	1.03	.84	-.05	-.10*	.12*	.06	.07	-.05	.09

*Note.*  $N = 454$ . All tests are two-tailed.

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

TABLE 3

**Study 2 Multilevel Path Analysis Results for Leaders' Error Orientation Predicting  
Perceptions of Leaders' Warmth and Competence**

	Perceived leader warmth		Perceived leader competence	
	Estimate	SE	Estimate	SE
<i>Individual level (Level 1)</i>				
Leader error management	0.369***	0.037	0.358***	0.049
Leader error avoidance	-0.047	0.030	-0.055	0.034
Residual variance	0.566***	0.048	0.606***	0.064
<i>Team level (Level 2)</i>				
Leader error management	0.583	0.368	1.079**	0.401
Leader error avoidance	-0.498**	0.267	-0.399*	0.161
Intercept	4.012*	1.774	1.689	1.809
Residual variance	0.190**	0.060	0.096	0.061
Loglikelihood	-2588.492			
AIC	5208.99			

*Note.*  $N_{\text{Level 1}} = 454$ .  $N_{\text{Level 2}} = 95$ . The estimates for the predictor variables are unstandardized coefficients ( $B$ ). The multilevel path model also included the interrelation between perceived leader warmth and perceived leader competence at both Level 1 ( $B = 0.261$ \*\*\*,  $SE = 0.039$ ) and Level 2 ( $B = 0.020$ ,  $SE = 0.047$ ).

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

**TABLE 4**

**Study 2 Multilevel Path Analysis Results for Leaders' Error Orientation Predicting the Outcome Variables via Perceptions of Leaders' Warmth and Competence**

<b>Model A</b>	<b>Perceived leader warmth</b>		<b>Perceived leader competence</b>		<b>Job satisfaction</b>	
	<b>Estimate</b>	<b>SE</b>	<b>Estimate</b>	<b>SE</b>	<b>Estimate</b>	<b>SE</b>
<i>Individual level (Level 1)</i>						
Leader error management	0.369***	0.037	0.358***	0.049	0.078	0.052
Leader error avoidance	-0.047	0.030	-0.055	0.034	0.045	0.038
Perceived leader warmth					0.239**	0.069
Perceived leader competence					0.248**	0.075
Residual variance	0.566***	0.048	0.606***	0.064	0.849***	0.088
<i>Team level (Level 2)</i>						
Leader error management	0.577	0.367	1.073**	0.400	0.545	0.639
Leader error avoidance	-0.490**	0.166	-0.391*	0.160	-0.249	0.269
Perceived leader warmth					-0.086	0.182
Perceived leader competence					-0.082	0.396
Intercept	4.017*	1.774	1.696	1.808	4.544**	1.369
Residual variance	0.191**	0.060	0.098	0.060	0.022	0.044
Loglikelihood	-3205.578					
AIC	6465.157					
<b>Model B</b>	<b>Perceived leader warmth</b>		<b>Perceived leader competence</b>		<b>Turnover intentions</b>	
	<b>Estimate</b>	<b>SE</b>	<b>Estimate</b>	<b>SE</b>	<b>Estimate</b>	<b>SE</b>
<i>Individual level (Level 1)</i>						
Leader error management	0.369***	0.037	0.358***	0.049	-0.042	0.077
Leader error avoidance	-0.047	0.030	-0.055	0.034	0.062	0.048
Perceived leader warmth					-0.203*	0.090
Perceived leader competence					-0.194	0.121
Residual variance	0.566***	0.048	0.606***	0.064	1.273***	0.151

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<i>Team level (Level 2)</i>						
Leader error management	0.577	0.359	1.063**	0.390	1.257	1.065
Leader error avoidance	-0.497**	0.166	-0.396*	0.160	-0.459	0.492
Perceived leader warmth					-0.153	0.316
Perceived leader competence					-0.901	0.777
Intercept	4.026*	1.738	1.756	1.765	3.194	2.354
Residual variance	0.654**	0.205	0.371	0.288	0.137	1.034
Loglikelihood	-3300.177					
AIC	6654.355					

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<b>Model C</b>	<b>Perceived leader warmth</b>		<b>Perceived leader competence</b>		<b>Employee work engagement</b>	
	<b>Estimate</b>	<b>SE</b>	<b>Estimate</b>	<b>SE</b>	<b>Estimate</b>	<b>SE</b>
<i>Individual level (Level 1)</i>						
Leader error management	0.369***	0.037	0.358***	0.049	0.070	0.046
Leader error avoidance	-0.047	0.030	-0.055	0.034	0.038	0.030
Perceived leader warmth					0.177**	0.068
Perceived leader competence					0.160*	0.067
Residual variance	0.566***	0.048	0.606***	0.064	0.609***	0.057
<i>Team level (Level 2)</i>						
Leader error management	0.579	0.368	1.075**	0.402	0.426	0.654
Leader error avoidance	-0.492**	0.166	-0.392*	0.161	-0.219	0.263
Perceived leader warmth					0.009	0.163
Perceived leader competence					-0.222	0.397
Intercept	4.009*	1.777	1.683	1.814	5.035***	1.332
Residual variance	0.191**	0.060	0.097	0.060	0.076	0.047
Loglikelihood	-3145.759					
AIC	6345.518					

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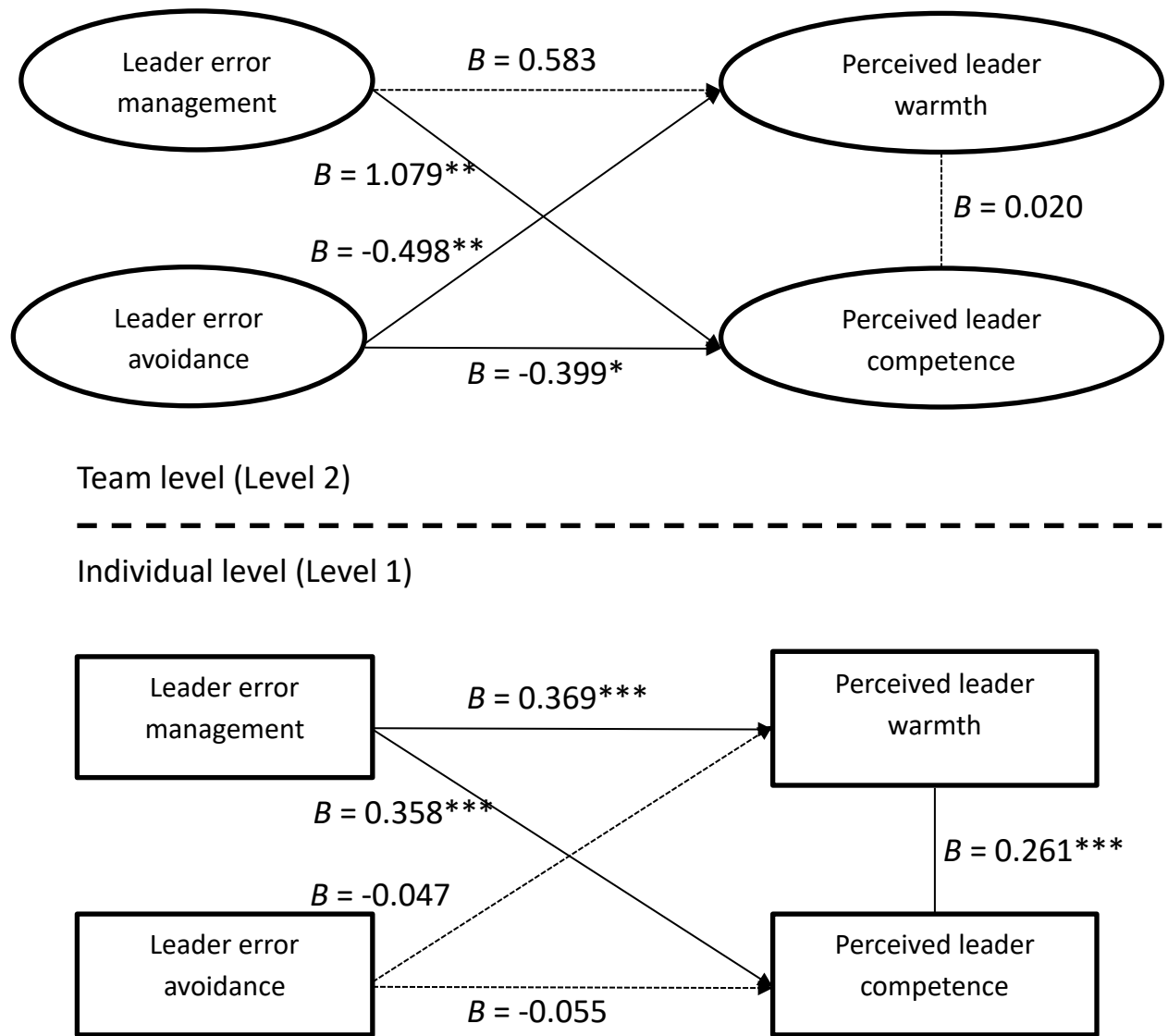
Model D	Perceived leader warmth		Perceived leader competence		Employee job performance	
	Estimate	SE	Estimate	SE	Estimate	SE
<i>Individual level (Level 1)</i>						
Leader error management	0.369***	0.037	0.359***	0.049	-0.060	0.051
Leader error avoidance	-0.047	0.030	-0.055	0.034	-0.063	0.032
Perceived leader warmth					0.131*	0.061
Perceived leader competence					0.042	0.066
Residual variance	0.566***	0.048	0.606***	0.064	0.757***	0.078
<i>Team level (Level 2)</i>						
Leader error management	0.581	0.363	1.064**	0.398	-1.119	0.869
Leader error avoidance	-0.498**	0.166	-0.394*	0.161	0.348	0.374
Perceived leader warmth					0.221	0.273
Perceived leader competence					0.472	0.567
Intercept	4.019*	1.755	1.749	1.796	6.107***	1.747
Residual variance	0.190**	0.060	0.098	0.059	0.067	0.069
Loglikelihood	-3195.882					
AIC	6445.765					

Note.  $N_{\text{Level 1}} = 454$ .  $N_{\text{Level 2}} = 95$ . The estimates for the predictor variables are unstandardized coefficients ( $B$ ). The multilevel path model also included the interrelation between perceived leader warmth and perceived leader competence at both Level 1 ( $B = 0.261***$ ,  $SE = 0.039$  in all four models) and Level 2 (Model A:  $B = 0.022$ ,  $SE = 0.046$ ; Model B:  $B = 0.155$ ,  $SE = 0.297$ ; Model C:  $B = 0.022$ ,  $SE = 0.046$ ; Model D:  $B = 0.021$ ,  $SE = 0.046$ ).

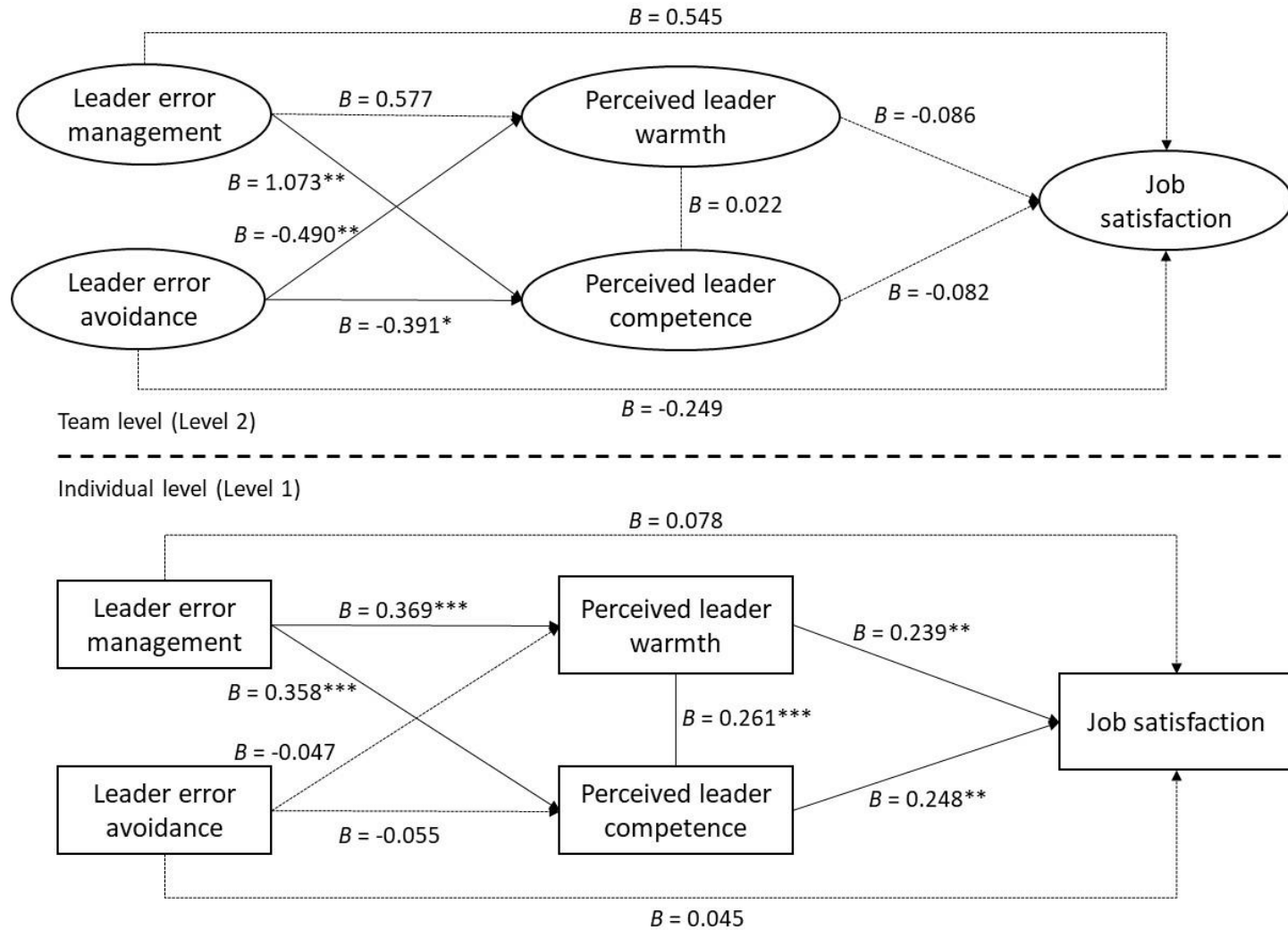
\*  $p < .05$

\*\*  $p < .01$

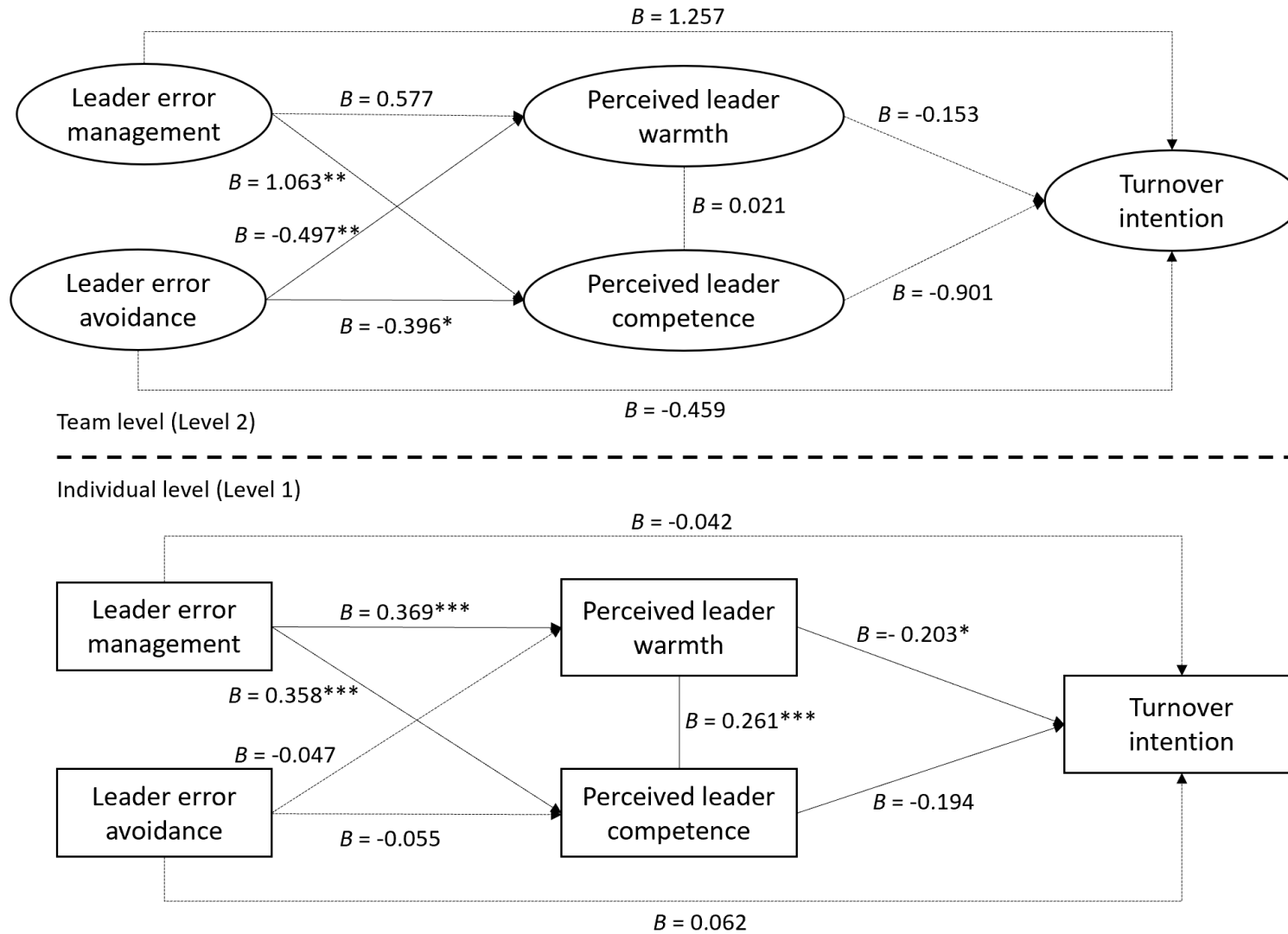
\*\*\*  $p < .001$ .



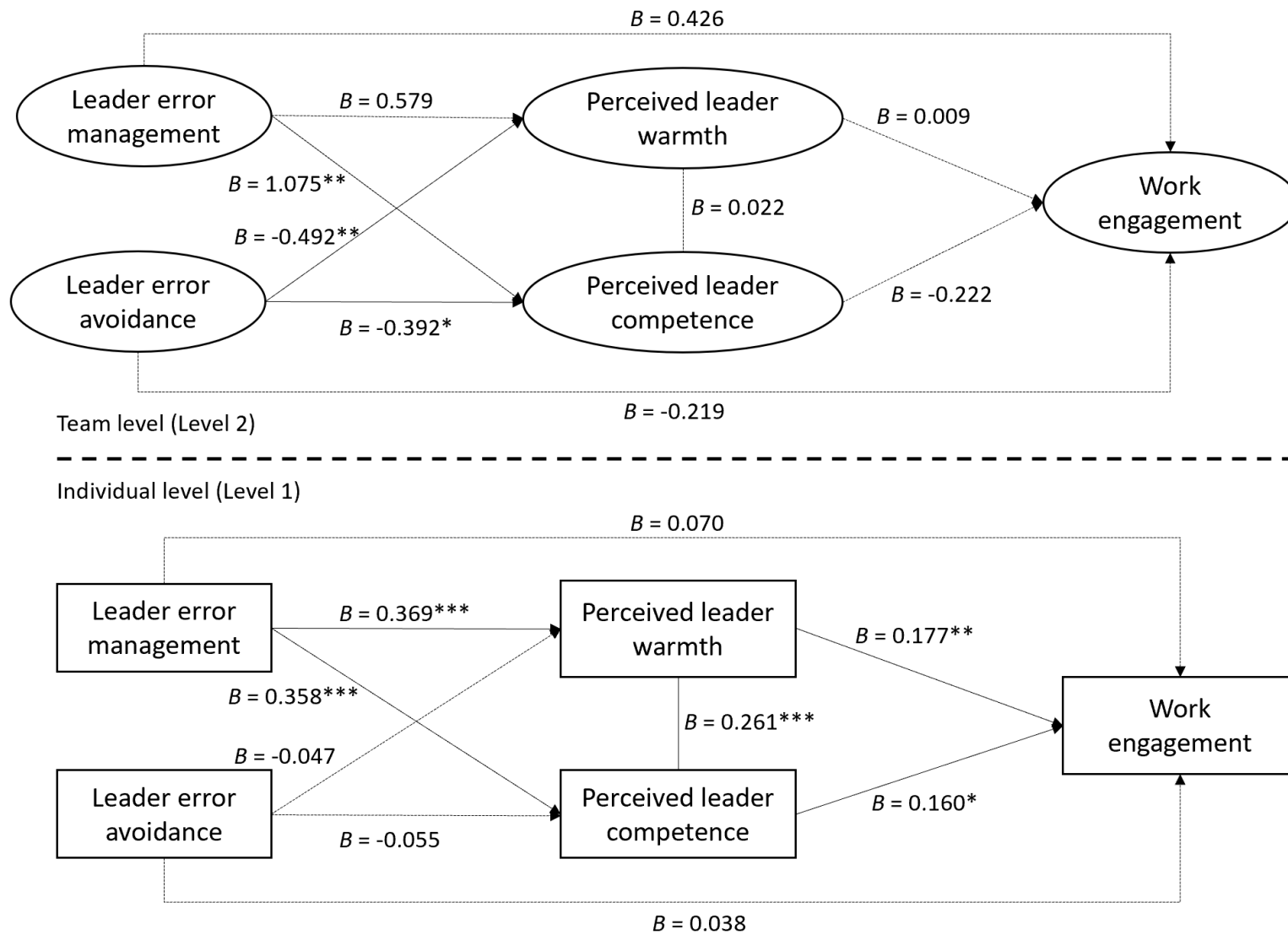
**Figure 1.** Study 2 multilevel path analysis results for leaders' error orientation (error management and error avoidance) predicting employees' perceptions of leaders' warmth and competence. Non-significant relationships are marked with a dashed line. *B* = unstandardized path coefficient. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$



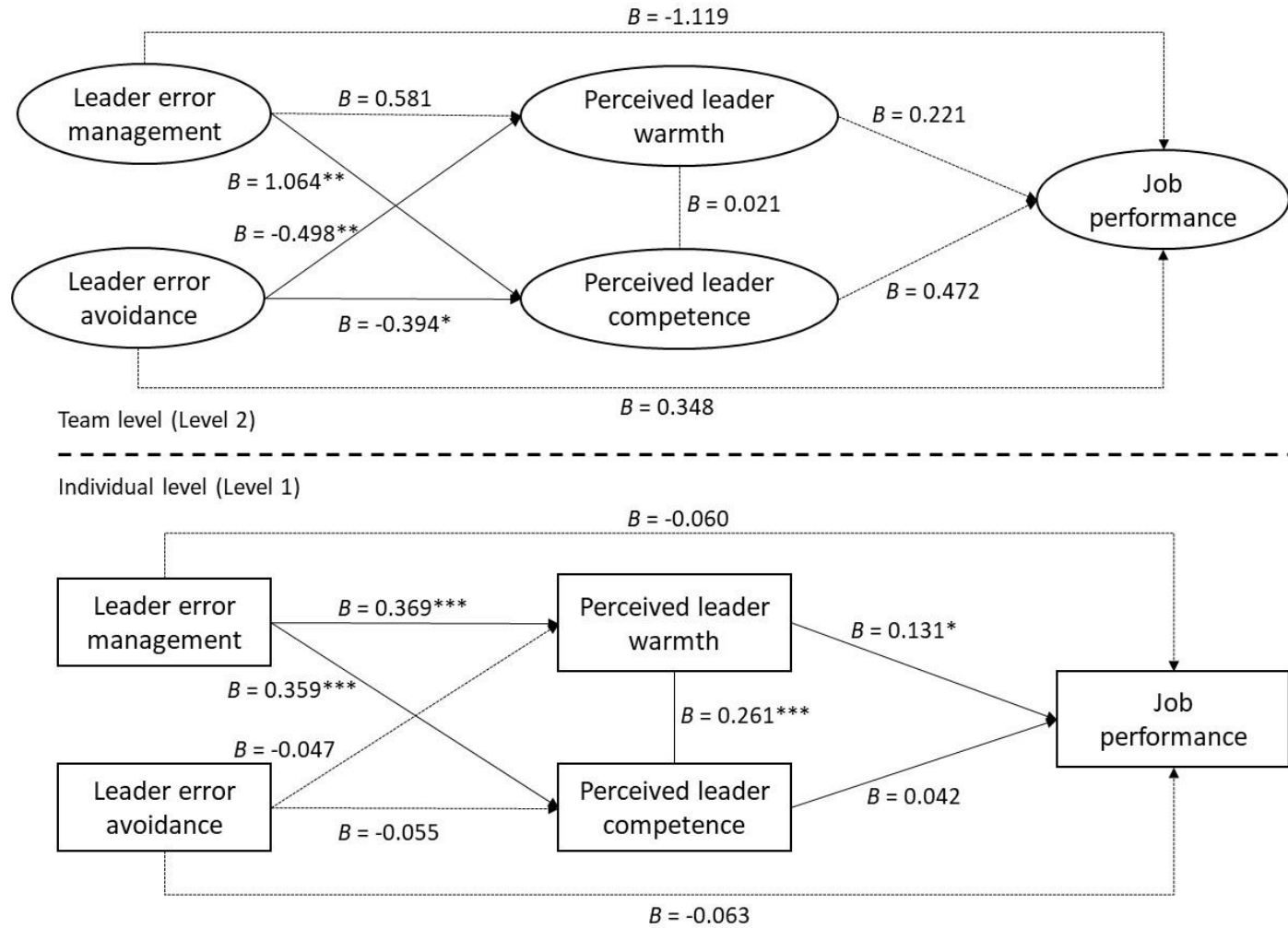
**Figure 2a.** Study 2 multilevel path analysis results predicting employee job satisfaction.  $B$  = unstandardized path coefficient. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$



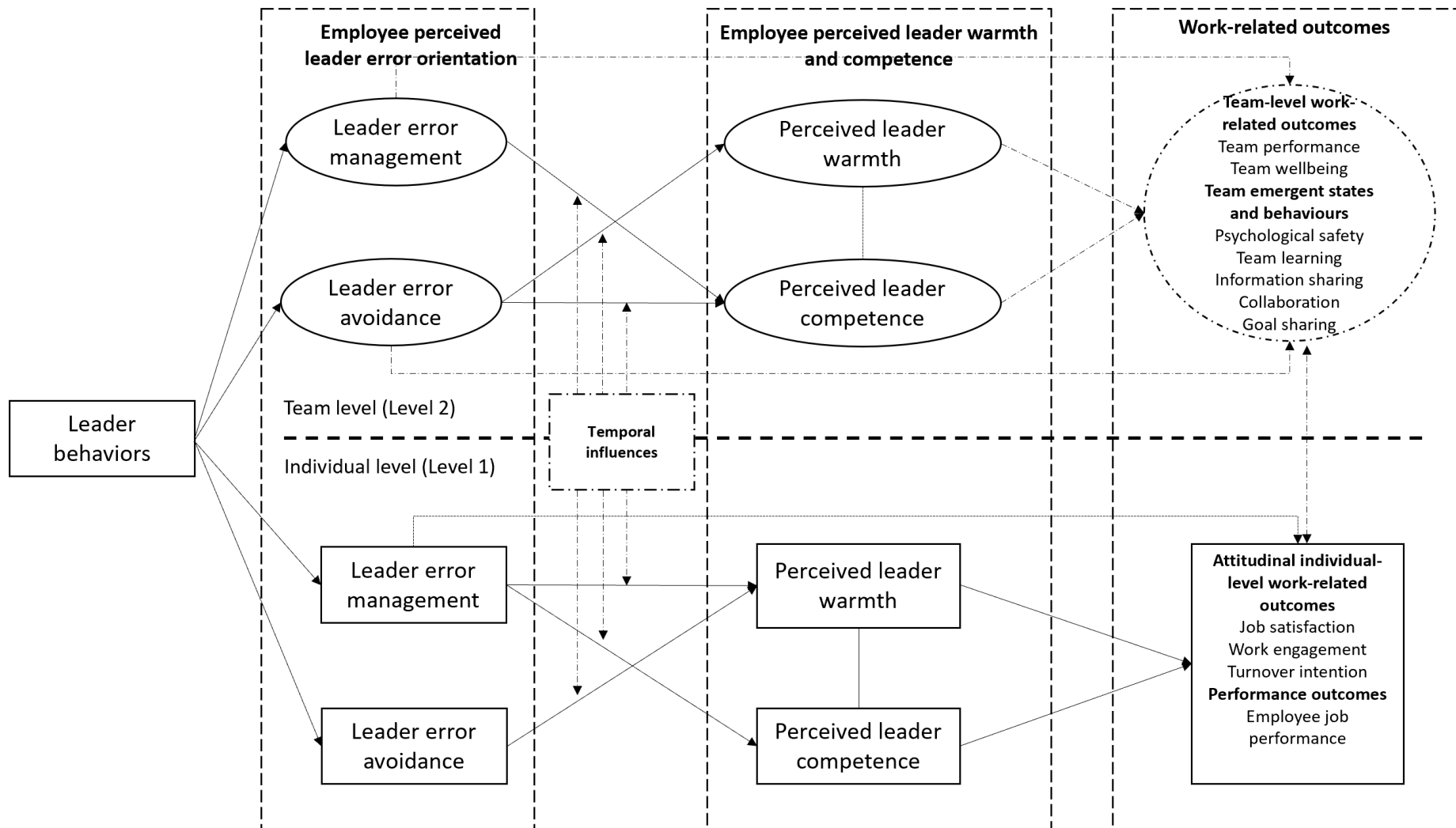
**Figure 2b.** Study 2 multilevel path analysis results predicting employee turnover intention.  $B$  = unstandardized path coefficient. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$



**Figure 2c.** Study 2 multilevel path analysis results predicting employee work engagement.  $B$  = unstandardized path coefficient. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$



**Figure 2d.** Study 2 multilevel path analysis results predicting employee job performance (as evaluated by the manager).  $B$  = unstandardized path coefficient. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$



**Figure 3.** Proposed integrative theoretical model of the interindividual effects of leader error orientation on employee perceived leader warmth, competence and work-related outcomes at both the individual and team levels. Variables and relationships not presently measured in our research that we propose should be investigated in future research are marked by a dashed line.

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**Nicoletta G. Dimitrova** is senior lecturer at the University of Greenwich, Business School, London, The United Kingdom. Her research interests include error handling in organisations, resilience, leadership and learning agility. Her work has appeared in *Applied Psychology: An International Review*, *Journal of Vocational Behavior*, and *Journal of Business Venturing*.

**Edwin A. J. Van Hooft** is professor of work and organizational psychology at University of Amsterdam, the Netherlands. His research interests include motivation and self-regulation in individuals and groups (e.g., job search behavior, achievement goals, boredom, procrastination). His work has appeared in *Journal of Applied Psychology* and *Personnel Psychology*.