IS LEADER–MEMBER EXCHANGE DIFFERENTIATION BENEFICIAL OR DETRIMENTAL FOR GROUP EFFECTIVENESS? A META-ANALYTIC INVESTIGATION AND THEORETICAL INTEGRATION

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Despite the burgeoning number of studies that have examined leader–member exchange (LMX) differentiation, definitive conclusions regarding its effects remain scarce. We propose a theoretical framework for studying LMX differentiation through an equity–equality perspective derived from allocation preferences theory, allowing us to elucidate both the beneficial and detrimental influences LMX differentiation can have on workgroups. In a meta-analytic investigation including 4,114 workgroups and 21,745 individuals, we found that LMX differentiation was detrimental to collective harmony and solidarity, as indicated by a consistent negative relationship with emergent states and group processes. A theoretical integration of our predictions within an input–mediator–outcome model of group effectiveness revealed a more complex pattern of relationships with group performance. By simultaneously considering the proximal and distal nature of group outcomes, we found that emergent states and group processes not only mediated the negative indirect relationship, but also suppressed the positive direct relationship between LMX differentiation and group performance. These findings demonstrate the utility of an equity–equality framework for understanding LMX differentiation in workgroups and imply that there are tradeoffs associated with differentiation that must be considered when predicting group effectiveness criteria.

Leader–member exchange (LMX) remains one of the most prominent and useful approaches for advancing our scientific and practical understanding of how workplace phenomena are influenced by leader–follower relationships. Originally developed as a dyadic theory of leadership (Dansereau, Graen, & Haga, 1975; Graen & Scandura, 1987), the distinguishing feature of LMX research is its focus on the *relationships* between leaders and each of their followers (Bauer & Erdogan, 2015; House & Aditya, 1997), as opposed to the general traits or behaviors of leaders (Barling, Christie, & Hoption, 2011; Graen &

Uhl-Bien, 1995). To date, several quantitative reviews have consistently shown that the relationship quality between a leader and subordinate is associated with beneficial outcomes for employees and their organizations, such as job attitudes, interpersonal behaviors, and performance (Dulebohn, Bommer, Liden, Brouer, & Ferris, 2012; Gerstner & Day, 1997; Ilies, Nahrgang, & Morgeson, 2007; Martin, Guillaume, Thomas, Lee, & Epitropaki, 2016). Moreover, these relationships have been found to generalize across cultural contexts, albeit at varying strengths (Rockstuhl, Dulebohn, Ang, & Shore, 2012).

Although the benefits of high-quality LMX relationships are seemingly without question, a fundamental assertion of LMX theory is that effective leaders cannot establish high-quality exchanges with *all* of their subordinates (Dansereau et al., 1975; Liden & Graen, 1980). Leaders are limited in the

resources afforded to them by their organization as well as the individual resources available at their disposal (Graen & Uhl-Bien, 1995; Kinicki & Vecchio, 1994; Liden, Sparrowe, & Wayne, 1997). Therefore, leaders develop differentiated relationships with subordinates, ranging from low-quality transactional relationships with most employees to high-quality socio-emotional relationships with a few "trusted assistants" (Dienesch & Liden, 1986; Liden & Maslyn, 1998). As such, variability in LMX quality is a natural byproduct of establishing high-quality relationships with some but not all members of a workgroup. Indeed, Liden and Graen's (1980) study on the generalizability of the LMX model showed that more than 90% of workgroups included members from multiple exchange groups (we note the literature at the time split LMX relations into in-groups and out-groups; for similar results, see also Graen & Cashman, 1975), suggesting that differentiation is more of a norm than an exception in workgroups (Dansereau et al., 1975).

Despite the fact that differentiation is a fundamental assumption of LMX research, the conceptual underpinnings of LMX theory do not speak directly to the implications of these differences for workgroup effectiveness. Instead, LMX research has traditionally focused on the process of differentiation (i.e., role making, role taking, and role routinization) within workgroups (Graen, 1976; Graen & Scandura, 1987) or the dyadic exchanges that a leader has with an individual in a workgroup (Bernerth, Armenakis, Feild, Giles, & Walker, 2007; Liden et al., 1997). Specifically, in their original approach to LMX, Graen and Cashman (1975: 150) explicitly stated that "the appropriate level of analysis is not the work group ... but the vertical dyad." While a focus on the leader–follower dyad has undoubtedly advanced LMX research (Graen & Uhl-Bien, 1995), this perspective has been criticized for its neglect of the broader workplace environment. Indeed, it is well recognized that the context in which workplace relationships exist in can have important implications for individuals, groups, and organizations (Grant & Parker, 2009; Katz & Kahn, 1978). Moreover, LMX scholars have acknowledged that leader–member relationships do not exist in a vacuum (e.g., Liden et al., 1997) and that differences in LMX quality are salient to other coworkers (Duchon, Green, & Taber, 1986; Tse, Lam, Lawrence, & Huang, 2013). This has led to an emerging vein of research that has focused on understanding the conditions through which differences in LMX quality can be beneficial or detrimental for individuals and their workgroups

(Anand, Vidyarthi, & Park, 2015). The most common perspective that has emerged from studies of this phenomenon is that of *leader–member exchange differentiation* (LMX differentiation), defined as the variability in the quality of LMX relationships between members of the same workgroup (Erdogan & Bauer, 2010; Liden, Erdogan, Wayne, & Sparrowe, 2006).

In contrast to the seemingly ubiquitous benefits of high-quality LMX for individual-level outcomes, definitive conclusions regarding the influence of LMX differentiation remain scarce. For example, recent reviews of the LMX differentiation literature have explicitly stated that "findings on the effects of LMX differentiation have been mixed at best" (Anand et al., 2015: 288) and "[LMX differentiation] is understudied and conclusive findings are hard to come by" (Erdogan & Bauer, 2015: 418). We believe that one of the critical reasons why consensus has been difficult to achieve in this emerging literature is the near-exclusive approach of studying moderators that qualify the effects of LMX differentiation (Anand et al., 2015), such as task interdependence (e.g., Liden et al., 2006) and national culture (e.g., Sui, Wang, Kirkman, & Li, 2016). For example, in a widely recognized study on LMX differentiation, Liden et al. (2006: 739) concluded that, "At the group level, our results suggested that the relationship between LMX differentiation and group performance could be best understood by considering moderators." While considering moderators has certainly been informative for LMX differentiation research, this approach has two critical limitations that preclude researchers from addressing the inconclusive evidence currently present in the literature. Specifically, existing perspectives typically (a) make an implicit assumption that how LMX differentiation is related to individual-level outcomes (e.g., commitment, helping) will influence group-level outcomes (e.g., group commitment, team–member exchange) in a similar manner (for a rare exception, see Li & Liao, 2014), and (b) approach differentiation as either positive or negative for individuals and workgroups. Despite the number of boundary conditions that have been uncovered in prior research, we currently have little theory at the group level that succinctly addresses how LMX differentiation can have positive and negative relationships with group outcomes.

Therefore, the purpose of the present study is to establish a parsimonious framework that can (a) account for both the beneficial *and* detrimental influences of LMX differentiation at the group level (in

contrast to most previous work that has almost exclusively focused on the moderators of the beneficial *or* detrimental effects) and (b) integrate our predictions within existing research on group effectiveness. In doing so, we contribute to theory and research on LMX differentiation in several ways. First, drawing upon the seminal theory on resource allocations (allocation preferences theory [Leventhal, 1976a, 1976b; Leventhal, Karuza, & Fry, 1980]) and the dominant conceptual model of group effectiveness (the input–mediator–outcome (IMO) model [Arrow, McGrath, & Berdahl, 2000; Marks, Mathieu, & Zaccaro, 2001; Mathieu, Maynard, Rapp, & Gilson, 2008]), we posit that the literature can achieve a clearer understanding of LMX differentiation at the group level by distinguishing between proximal (i.e., emergent states and group processes) and distal (i.e., performance) group outcomes. We argue that LMX differentiation influences these outcomes in opposing ways, shaped by equity and equality concerns as described by allocation preferences theory. Second, we propose a theoretical integration of these arguments with the IMO model of group effectiveness. This provides researchers with a conceptually grounded framework that elucidates how LMX differentiation simultaneously influences proximal and distal group outcomes. Third, we empirically test our predictions by synthesizing the accumulated research on LMX differentiation using meta-analytic techniques, allowing us to obtain a population estimate of the relationships between LMX differentiation and group outcomes, while overcoming the idiosyncrasies across individual studies. Finally, because allocation preferences theory also speaks directly to how typical moderators from the LMX differentiation literature (e.g., task interdependence, cultural collectivism) influence preferences for equity and equality in resource allocations, we extend our investigation to consider these theoretically grounded moderators and explore additional study-level differences that may serve as boundary conditions to our theorizing. Through these contributions, we seek to establish the foundation toward more generalizable conclusions regarding the influence of LMX differentiation in workgroups.

EXTANT PERSPECTIVES ON LMX DIFFERENTIATION

To date, several theoretical perspectives have been useful for understanding the influence of LMX differentiation, such as role theory (e.g., Liden et al.,

2006), social exchange theory (e.g., Liao, Liu, & Loi, 2010), social comparison theory (e.g., Henderson, Wayne, Shore, Bommer, & Tetrick, 2008), and relative deprivation theory (e.g., Anand et al., 2015; Erdogan & Bauer, 2010). However, these perspectives share at least two critical issues that have limited their ability to address the inconsistent findings present in the LMX differentiation literature.

First, when considering prior theoretical approaches in aggregate, some studies have taken a generally positive perspective (e.g., role and social exchange theories) while others have taken a generally negative perspective (e.g., social comparison and relative deprivation theories) on LMX differentiation. This has led scholars to note the disparity between the theoretical underpinnings of LMX research that argue for the necessity of differentiation and the empirical evidence that has shown the detrimental effects of differentiation on individual and group outcomes. For example, Li and Liao (2014: 863) summarized this disparity by concluding, "Our findings reveal the paradoxical nature of LMX phenomena: while LMX quality at the individual level . . . drives role engagement and job performance, LMX differentiation can hurt team performance." Additionally, scholars have cautioned against viewing differentiation as unilaterally good or bad for workgroups (Anand et al., 2015). Instead, we suggest that LMX differentiation research should embrace this paradox by viewing the potential benefits and detriments as tradeoffs that have to be simultaneously considered, a perspective that has yet to be taken in prior studies.

Second, most of the theoretical approaches scholars have taken fail to speak to differentiation at the group level. Rather, they shed light on how individuals perceive and respond to differentiation, assuming that the same effects will translate to the group level. This is problematic, however, because theoretical relationships and constructs are not necessarily isomorphic across levels of analysis (Chan, 1998; House, Rousseau, & Thomas-Hunt, 1995; Klein & Kozlowski, 2000). A notable exception to the reliance on individual-level perspectives was the recent investigation by Li and Liao (2014), in which the authors found evidence that differentiation was negatively related to group performance (via team coordination). Although their study was a notable first step toward advancing research on LMX differentiation in workgroups, we go beyond their pioneering study by unpacking the negative and positive pathways by which LMX differentiation influences group outcomes and by considering

additional relationships (including coordination) that LMX differentiation has at the group level.

In light of these issues, we argue that research on LMX differentiation can be advanced by building upon a group-level theory that can parsimoniously explain the beneficial (aligned with LMX theory and research) and detrimental (as shown in past studies) influences of LMX differentiation in workgroups.

ALLOCATION PREFERENCES THEORY: AN EQUITY–EQUALITY FRAMEWORK FOR UNDERSTANDING LMX DIFFERENTIATION IN WORKGROUPS

Allocation preferences theory (Leventhal, 1976a, 1976b; Leventhal et al., 1980) provides an ideal theoretical lens through which to understand LMX differentiation at the group level, for two critical reasons. First, the theoretical underpinnings of LMX research (based on role theory) explicitly consider a leader's resource allocations in terms of relational exchange quality with subordinates (Dansereau et al., 1975; Graen, 1976; Liden & Graen, 1980). Second, aligned with our main research question, Leventhal's seminal work advances arguments regarding a collective's attitudinal and behavioral responses to differences in resource allocations (Leventhal, 1976b; Leventhal et al., 1980). Allocation preferences theory is built upon the premise that a leader's resource allocations can have both beneficial and detrimental effects on a social system (e.g., workgroups) as well as the individuals within the social system (e.g., group members) (Leventhal, 1976a, 1976b; Leventhal et al., 1980). The theory elucidates how different allocation strategies are more useful for achieving particular outcomes, such as maximizing collective performance and productivity or preserving group harmony and solidarity (Leventhal, 1976b; Leventhal et al., 1980).

Accordingly, allocation preferences theory (Leventhal, 1976a, 1976b; Leventhal et al., 1980) articulates two core principles that drive a leader's decisions: equity and equality (Cropanzano & Schminke, 2001; Deutsch, 2006; Leventhal et al., 1980). The *equity* principle suggests that resources and rewards should be assigned according to the input-to-outcome ratios of individual group members (Adams, 1963, 1965), whereas the *equality* principle suggests that resources and rewards should be evenly shared by the workgroup, regardless of individual efforts (Deutsch, 1975, 1985). In any particular situation, these principles may be in conflict with each other (Deutsch, 2006) and the implications

of these allocation strategies are often more complicated than leaders realize (Cropanzano & Greenberg, 1997). Indeed, theory and research suggest that each principle (equity or equality) can be more useful for achieving collective goals under particular circumstances (Deutsch, 1985; Wang, Law, Hackett, Wang, & Chen, 2005).

Specifically, allocating resources based upon an *equity* principle is more desirable for achieving group performance, because resources are disproportionally provided to more capable members thereby motivating greater productivity in the workgroup (Deutsch, 1985; Leventhal, 1976b). In the words of Leventhal et al. (1980: 177), "Giving more reward and resources to better performers facilitates group productivity." Allocating resources based upon an *equality* principle is more desirable for achieving unity or agreement in feelings and actions between group members (Deutsch, 2006; Leventhal et al., 1980). This is especially effective for minimizing feelings of jealousy and mutual antagonism, thereby fostering group harmony and solidarity, which is important for teamwork (Deutsch, 1985; Leventhal, 1976b). In the words of Leventhal et al. (1980: 179), equality allocation principles are "preferred when there is concern about preserving harmony among group members." Thus, the principles of equity and equality derived from allocation preferences theory offer rationale for the beneficial and detrimental influences of LMX differentiation for workgroups. We build upon these arguments to develop a unifying theoretical framework that provides explicit predictions addressing the mixed findings lamented in recent reviews of this literature (e.g., Anand et al., 2015; Erdogan & Bauer, 2015).

An Equity Perspective of LMX Differentiation in Workgroups

The decision to allocate scarce resources based on an equity principle is driven by a fundamental assumption of fairness: those who can contribute more toward achieving collective goals should be entitled to greater benefits and rewards (e.g., LMX-related resources) because of their efforts (Deutsch, 1975; Kabanoff, 1991). According to allocation preferences theory (Leventhal, 1976a, 1976b; Leventhal et al., 1980), allocating resources according to an equity principle directly impacts group performance by (a) ensuring that workgroup members who are most useful to the system get the resources they need to be successful, (b) incentivizing high performers to remain in the organization, and (c) reinforcing high

performers to help sustain their effort. Thus, leaders who seek to promote outcomes such as performance and productivity should selectively allocate the resources at their disposal *equitably* within their workgroup, thereby differentiating the quality of their LMX relationships between members.

The benefits of allocating resources based on an equity principle also mirror the core tenant of LMX research that argues effective leaders should selectively differentiate their exchange quality with subordinates to use their available resources most efficiently (Liden & Graen, 1980). In turn, subordinates who are most capable and can contribute more toward accomplishing collective objectives are provided the resources to do so (Graen & Scandura, 1987; Graen & Uhl-Bien, 1995). By recognizing differences in each group member's potential to contribute, effective leaders are able to achieve greater group performance by rewarding their higher performers accordingly (Littlepage, Schmidt, Whisler, & Frost, 1995). From this perspective, differential treatment based on an equity principle is instrumental for collective performance (Dansereau et al., 1975), because a leader allocates more resources to subordinates who can do more with what they are given (Dansereau, Cashman, & Graen, 1973). In sum, the above theorizing suggests that, by allocating LMX-related resources according to an equity principle, LMX differentiation will be beneficial for group performance.

Aligned with these arguments based on allocation preferences and LMX theories, past studies have suggested that it is beneficial to invest resources into group members who are more critical to accomplishing collective objectives (i.e., core team members), thereby leading to improved group performance (Humphrey, Morgeson, & Mannor, 2009). Early studies on allocation decisions have also shown that, at the individual level, employees tend to prefer an equity norm when performance and productivity are emphasized (e.g., Meindl, 1989). In addition, at the group level, evidence suggests that the recognition of which members are more capable for a particular task is beneficial for performance (e.g., Littlepage et al., 1995; Moreland, Argote, & Krishnan, 1998). Moreover, research has demonstrated that, when a performance-driven (i.e., economically oriented) culture exists in a workgroup, members are more reliant on an equity principle, relative to an equality principle, for resource allocations (Mannix, Neale, & Northcraft, 1995). Therefore, based on an equity principle of resource allocations and aligned with the underlying premise

of LMX theory and research that suggests leaders can enhance group performance through differentiation, we predict:

Hypothesis 1. LMX differentiation is positively related to group performance.

An Equality Perspective of LMX Differentiation in Workgroups

In contrast to an equity perspective, the decision to allocate resources based on an equality principle is driven by the assumption that each individual is of equal value to the workgroup. Thereby, equality in resource allocations optimizes mutual self-esteem—a necessary condition for group harmony and solidarity (Deutsch, 1975; Kabanoff, 1991; Leventhal, 1976b). Although the primary purpose of workgroups in organizations is to perform work tasks (Ilgen, 1999), the effectiveness of group-based work structures often hinges upon the interpersonal environment in which tasks are accomplished (Mathieu, Hollenbeck, van Knippenberg, & Ilgen, 2017). According to allocation preferences theory (Leventhal, 1976a, 1976b; Leventhal et al., 1980), assigning resources according to an equality principle can facilitate group effectiveness by (a) fostering positive feelings, because no member receives less than others; (b) emphasizing a common fate for all members; and (c) preventing conflict among members. Specifically, group harmony and solidarity are reflected by unity or agreement of feelings and actions among group members, which have been referred to by groups and teams researchers as "emergent states," defined as the cognitive, motivational, and affective states among group members, and "group processes," defined as the interactions between group members that enable task accomplishment (Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Marks et al., 2001; Mathieu et al., 2008). Consequently, leaders who seek to maintain group harmony and solidarity will seek to allocate resources equally, thus minimizing differences in LMX quality between group members.

The above arguments for allocating resources based on an equality principle also parallel theory and research on "collective fairness" (defined as "the shared perceptions of team members about how the team as a whole is treated"; Roberson & Colquitt, 2005: 596). Particularly in the context of workgroups, where the achievement of collective goals depends on the interdependent contributions of its members, the contributions of each individual become difficult

to clearly identify. As such, equality in resource allocations can promote a sense of collective fairness (Anand et al., 2015; Martin, Thomas, Legood, & Russo, 2018), and past research has shown that, when groups perceive higher levels of fairness, members tend to engage in more mutually beneficial behaviors (e.g., coordination, team–member exchange) that allow the group to accomplish tasks more effectively (Colquitt & Jackson, 2006; Colquitt, Noe, & Jackson, 2002; Roberson, 2006; Whitman, Caleo, Carpenter, Horner, & Bernerth, 2012). From this perspective, the key role of a leader is to foster a harmonious interpersonal environment such that members are motivated to work together to accomplish collective goals. As noted by Deutsch (1975: 146):

> Allocation according to the principle of equity tends to be disruptive of social relations because it undermines the bases for mutual respect and self-respect necessary for enjoyment of such relations. It does this by signifying that the different participants in the relationship do not have the same value.

Thus, a leader who differentiates their LMX relationships can instill a sense of *inequality* that is disruptive to group processes and hinders the solidarity of emergent states due to dissatisfaction and antagonism (Cropanzano & Schminke, 2001; Deutsch, 1975; Kabanoff, 1991).

Past studies on resource allocations and LMX provide support for these arguments. Beginning with evidence from research on equity and equality, early studies have demonstrated that adherence to equality principles in resource allocations is preferred when group harmony and solidarity are prioritized (Meindl, 1989) and when repeated interactions are expected in the future (Shapiro, 1975). In addition, at the group level, research has shown that equality norms are more important for individuals who perform tasks in group-based structures (Colquitt & Jackson, 2006), suggesting that adherence to an equality principle is important for maintaining harmony and solidarity in the workgroup. Indeed, failing to adhere to an equality principle can trigger perceptions of unfair treatment as a result of differences in exchange quality observed by group members (Liden et al., 1997; Scandura, 1999). Turning to evidence from LMX research, prior studies have demonstrated that differences in LMX quality can introduce relational boundaries that undermine effective coordination and increase group conflict (Hooper & Martin, 2008; Li & Liao, 2014; Sherony & Green, 2002). This can disrupt unity or agreement of

feelings (i.e., emergent states) and actions (i.e., group processes) within collectives, thereby damaging, for example, intragroup trust (de Jong, Dirks, & Gillespie, 2016; Liu, Hernandez, & Wang, 2014). Taken together, prior research on allocation preferences and LMX support our theorizing that differentiation is detrimental to collective feelings (i.e., emergent states) and actions (i.e., group processes) by violating equality principles.

Hypothesis 2a. LMX differentiation is negatively related to emergent states.

Hypothesis 2b. LMX differentiation is negatively related to group processes.

INTEGRATING AN EQUITY–EQUALITY PERSPECTIVE OF LMX DIFFERENTIATION WITHIN AN IMO FRAMEWORK OF GROUP EFFECTIVENESS

The survival of a social system (e.g., workgroups) hinges on its ability to effectively accomplish tasks that contribute to the broader goals of the organization (Leventhal, 1976b). However, the relationship between LMX differentiation and group-level outcomes is more complex than what existing studies on this topic have accounted for. As we have discussed above, allocation preferences theory (Leventhal, 1976a, 1976b, 1980) delineates why differentiation can be beneficial for achieving group performance and productivity (more distal group outcomes), but may also be detrimental for group processes and emergent states (more proximal group outcomes). Importantly, these arguments parallel the seemingly paradoxical relationships LMX differentiation can have in workgroups, as evident across individual studies (e.g., Li & Liao, 2014) and in reviews of the existing literature (e.g., Anand et al., 2015; Erdogan & Bauer, 2015; Martin et al., 2018).

Although there is considerable variability in the range of outcomes (e.g., proximal vs. distal, emergent states vs. group processes vs. performance) that have been considered by group researchers (Mathieu et al., 2008), it is important to recognize that, first and foremost, workgroups in organizations exist to *perform tasks* (Kozlowski & Ilgen, 2006). To understand how groups perform tasks effectively, group researchers have predominantly leveraged the popular and useful IMO framework (Arrow et al., 2000; Ilgen et al., 2005; Mathieu et al., 2008; McGrath, 1964). The core assertion of the IMO model is that the relationship between inputs (e.g., resource allocations, task structure, individual competencies)

and outcomes (i.e., performance, productivity) are transmitted through mediating mechanisms. Emergent states (e.g., collective attitudes) and group processes (e.g., member interactions) represent proximal mediating factors that are more salient and readily observable to group members. From this perspective, a leader's allocation decisions (i.e., LMX differentiation) can be viewed as an input that influences group performance through emergent states and group processes (Day, Gronn, & Salas, 2004).

By integrating our predictions derived from allocation preferences theory within the IMO model of group effectiveness, we can (a) establish the importance of emergent states and group processes as mediating mechanisms to performance, (b) empirically test our equity and equality predictions simultaneously, and (c) decompose the total effects of LMX differentiation on performance into direct and indirect components. This serves as an important step for extending LMX research beyond the individual and dyadic perspectives through an integration with extant research on workgroups and teams. Formally stated, we predict that:

Hypothesis 3a. Emergent states will mediate the negative relationship between LMX differentiation and group performance.

Hypothesis 3b. Group processes will mediate the negative relationship between LMX differentiation and group performance.

MODERATORS OF THE RELATIONSHIPS BETWEEN LMX DIFFERENTIATION AND GROUP OUTCOMES

On the basis of allocation preferences theory and prior research, we extend our investigation to consider important moderators that may serve as boundary conditions to our theorizing. This also serves to bridge our arguments back to extant research on LMX differentiation, which has predominantly focused on moderating factors. We explicitly consider two theoretically derived moderators from allocation preferences theory and past research (task interdependence and cultural collectivism), which may serve to strengthen or weaken the influence of LMX differentiation in workgroups.

Task Interdependence

An expansive body of theoretical and empirical research suggests that task interdependence, which refers to the extent that an individual's work activities are reliant on the contributions of others

(Morgeson & Humphrey, 2006; Pearce & Gregersen, 1991), influences whether an equity or an equality principle should be used in resource allocations (e.g., Chen, Meindl, & Hui, 1998; Rosenbaum et al., 1980). In general, as interdependence increases, agreement of feeling (i.e., emergent states) and unity in action (i.e., group processes) become increasingly important to accomplishing collective objectives (Leventhal, 1976b; Rutte & Messick, 1995). Under these conditions, differences in LMX quality are more salient because group members interact more frequently (Duchon et al., 1986; Tse et al., 2013) and equality principles are more preferable, given that equality is the dominant allocation principle used to maintain group harmony and solidarity (Deutsch, 1975; Kabanoff, 1991; Leventhal, 1976b). Thus, the detrimental influence of differentiation on emergent states and group processes (Hypothesis 2) will be particularly deleterious in more interdependent contexts. Indeed, several scholars have suggested that groups can only maximize their effectiveness when resources are allocated via an equality principle, and that it becomes increasingly difficult to apply an equity principle as task interdependence increases (Barber & Simmering, 2002; Shea & Guzzo, 1987).

In contrast, as interdependence decreases, a greater weight is placed on the contributions of each individual in the group because members are less reliant on others to accomplish their tasks (Sniezek & May 1990). Considering that equity is the dominant allocation principle used to maximize performance and productivity (Deutsch, 1975; Kabanoff, 1991), we expect that equity in resource allocations will be more beneficial in less interdependent contexts. Indeed, a lack of interdependence has typically been associated with a preference for equity-based allocation principles (for reviews, see Dornstein, 1991; Greenberg & Cohen, 1982). As such, since differentiation is aligned with adherence to the equity principle that is core to promoting performance and productivity (Hypothesis 1), LMX differentiation is likely to be particularly beneficial when task interdependence is lower.

Empirical studies on equity and equality principles provide support for these arguments. For example, Miller and Hamblin (1963) showed that differentially rewarding team members (in accordance with the equity principle) harmed performance in highly task-interdependent contexts. Rosenbaum et al. (1980) demonstrated that, when task interdependence was high, equal rewards (in

accordance with the equality principle) enhanced cooperative behaviors, whereas proportional rewards (in accordance with the equity principle) disrupted cooperative behaviors. Colquitt (2004) showed that differences in procedural control levels within teams were more harmful for performance when task interdependence was high (vs. low). Finally, Meindl (1989) demonstrated that high task interdependence elicited a preference for an equality principle regardless of whether social harmony or productivity was the ultimate goal. Thus, aligned with past research on resource allocations, we hypothesize that LMX differentiation will be more detrimental to (a) emergent states and (b) group processes when groups are higher on task interdependence because it violates principles of equality, whereas differentiation will be more beneficial to (c) performance when groups are lower on task interdependence because it adheres to principles of equity.

Hypothesis 4a. Task interdependence will moderate the negative relationship between LMX differentiation and emergent states, such that the relationship will be accentuated (more negative) when task interdependence is higher.

Hypothesis 4b. Task interdependence will moderate the negative relationship between LMX differentiation and group processes, such that the relationship will be accentuated (more negative) when task interdependence is higher.

Hypothesis 4c. Task interdependence will moderate the positive relationship between LMX differentiation and group performance, such that the relationship will be accentuated (more positive) when task interdependence is lower.

Cultural Collectivism

In addition to task interdependence, a number of studies have highlighted the critical role that "cultural collectivism," which refers to the extent that collective accomplishments are the basis for individual identities (Hofstede, 2001; Triandis, 2004), can have on influencing individual attitudes and behaviors as a response to resource allocations (e.g., Shao, Rupp, Skarlicki, & Jones, 2013). Furthermore, collectivism has also been suggested as an important boundary condition for the effects of LMX differentiation in groups (Anand et al., 2015), although not empirically examined to date. In applying our allocation preferences theory perspective, we argue that cultural collectivism will serve as an important moderator that qualifies the relationship between LMX differentiation and group outcomes.

Specifically, in cultures where collectivism is high, maintaining harmony and solidarity is an especially valued feature in workgroups (Triandis, 1989). The extent that members exhibit unity or agreement in feelings or actions is particularly salient in more collectivistic cultures because such cultures prioritize mutual gains over individual successes (Erdogan & Liden, 2006; Shao et al., 2013). Considering the emphasis on harmony and solidarity in workgroups higher on collectivism, we expect that equality principles are likely to be preferred (Singelis, Triandis, Bhawuk, & Gelfand, 1995), thereby making the violations of equality associated with LMX differentiation particularly detrimental. In contrast, in more individualistic contexts, where members may be more concerned with instrumental outcomes based on their own efforts and contributions to the workgroup (Shao et al., 2013), group harmony and solidarity is emphasized less and individual performance and productivity are prioritized. Therefore, the importance of productivity in more individualistic contexts suggests that equity principles are more likely to be preferred (Deutsch, 1975; Kabanoff, 1991), making adherence to equity associated with LMX differentiation particularly beneficial.

Prior research on preferences for equality and equity across cultures supports the above arguments. For example, several scholars have shown that individuals in the United States and Europe (more individualistic cultures) have a greater preference for equity, whereas individuals in East Asia (more collectivistic cultures) tend to prefer equality in allocations (e.g., Kim, Park, & Suzuki, 1990; Leung & Bond, 1982, 1984; Leung & Iwawaki, 1988). In addition, research has shown that the benefits of high-quality LMX relationships for individuals are more prevalent in individualistic cultures, relative to collectivistic cultures, leading to increased productivity and performance (Rockstuhl et al., 2012). This suggests that, when individual contributions can be adequately distinguished within the workgroup, which is typical as contributions toward collective outcomes are often unequal (Aguinis & O'Boyle, 2014; Park & Shin, 2015), equity resource allocations are likely to be more effective in less collectivistic cultures because the advantages of differentiation are strengthened for those members who can contribute more to the workgroup. Taken together, research on resource allocations suggests that cultural

collectivism may serve as an important boundary condition to the relationship between LMX differentiation and group outcomes, such that LMX differentiation will be more detrimental to (a) emergent states and (b) group processes when cultural collectivism is higher, and LMX differentiation will be more beneficial for (c) group performance when cultural collectivism is lower. Thus:

Hypothesis 5a. Cultural collectivism will moderate the negative relationship between LMX differentiation and emergent states, such that the relationship will be accentuated (more negative) when cultural collectivism is higher.

Hypothesis 5b. Cultural collectivism will moderate the negative relationship between LMX differentiation and group processes, such that the relationship will be accentuated (more negative) when cultural collectivism is higher.

Hypothesis 5c. Cultural collectivism will moderate the positive relationship between LMX differentiation and group performance, such that the relationship will be accentuated (more positive) when cultural collectivism is lower.

METHODS

Literature Search

To identify group-level studies relevant for our meta-analysis, we conducted a literature search using Web of Science (Institute for Scientific Information), PsychINFO (American Psychological Association), and Google Scholar using alternative combinations of similar keywords such as "leader–member exchange variability," "leader–member exchange differentiation," "LMX differentiation," "LMXD," and "differential leader member exchange." Reference lists of major review articles on LMX differentiation (e.g., Anand et al., 2015; Henderson, Liden, Glibkowski, & Chaudhry, 2009) were searched for unidentified published articles. Following this, we used several additional methods to identify unpublished studies relevant for inclusion in our study. First, we identified theses and dissertations using the ProQuest Dissertation database. Second, we searched the online databases for the Academy of Management Best Paper Proceedings for the years 2005 to 2014 and available conference papers from the Academy of Management and the Society for Industrial and Organizational Psychology annual conferences. Finally, we solicited unpublished manuscripts from the Organizational Behavior and Human Resource listservs of

the Academy of Management. This search process was intended to be as inclusive as possible of empirical papers relevant for our study. After determining a study was relevant, we conducted backward-and-forward reference searches for each article, using our search terms to identify additional studies that may be relevant.

Inclusion and Exclusion Criteria

Our search process yielded 56 articles that were potentially relevant for inclusion in our study. We established five exclusion rules for deciding which articles from our search pool would be coded. First, we excluded articles that were not empirical. Second, we excluded articles that did not include a relationship between LMX differentiation and a group-level outcome. Third, we excluded studies that confounded individual- and group-level correlations, as including these studies could have lead to erroneous conclusions about the true relationships between our constructs of interest (Ostroff, 1993; Ostroff & Harrison, 1999). Fourth, given our focus on the relationships between LMX differentiation and group-level outcomes, we excluded articles that only reported individual-level measures of differentiation (e.g., perceptions of LMX variability; Hooper & Martin, 2008). Fifth, we excluded articles that did not report a zero-order correlation or enough information to allow for computing an effect size. These exclusions resulted in a final set of 41 independent samples taken from 39 studies, and included 4,114 workgroups made up of 21,745 individuals (see Appendix B).

Coding Procedures

The authors jointly developed a coding scheme and initially coded five articles together to ensure coding accuracy. Initial agreement was high, ranging from 95% to 100% for all variables coded. All remaining discrepancies were resolved through a joint discussion among all authors. In coding LMX differentiation, the most frequent operationalization was the variance or standard deviation of group member LMX quality (e.g., Erdogan & Bauer, 2010; Liden et al., 2006). Notably, two studies operationalized LMX differentiation using measures of interrater agreement (e.g., r_{WG}) for member reports of LMX in their respective workgroups. However, this is an unsuitable measure of *differentiation* because agreement indices capture the extent that group members *agree* on a focal construct—in this case, their LMX quality. We reversed the sign of these effect sizes in

order to represent a *lack of agreement* in LMX quality between group members.

To categorize the relationships from each primary study, we relied upon conceptually grounded distinctions from extant research on groups and teams to inform the development of our coding scheme, which distinguishes between performance, emergent states, and group processes (Ilgen et al., 2005; Marks et al., 2001; Mathieu et al., 2017). Based on these distinctions, we examined the construct definitions and individual items from each primary study. We categorized outcomes including collective attitudes, commitment, efficacy, and justice climate as *emergent states*, given that each of these constructs represent affective, cognitive, or motivational states that emerge as a function of group inputs (Ilgen et al., 2005; Mathieu et al., 2008). In contrast, *group processes* refer to the interactions that occur between group members within the task environment and include conflict, coordination, extra-role behaviors, and team–member exchange (Cohen & Bailey, 1997; Kozlowski & Ilgen, 2006). Although the differences between emergent states and group processes are subtle (Marks et al., 2001; Mathieu et al., 2017), the key distinguishing factor is that the former represent collective perceptions of group members whereas the latter represent the activities that members engage in to accomplish tasks.[1] Finally, we categorized outcomes that assessed the effectiveness of group actions as *group performance*, including

subjective performance, objective performance, and creative performance. Thus, each of these broader categories exhibit similar underlying themes and are aligned with prior group-level meta-analytic studies using similar distinctions in their coding schemes (e.g., DeChurch & Mesmer-Magnus, 2010; de Wit, Greer, & Jehn, 2012; LePine, Piccolo, Jackson, Mathieu, & Saul, 2008).

To code for task interdependence, we searched the sample descriptions of each study and found that most of them lacked sufficient information on the nature of group tasks to assess interdependence directly. As an alternative method for coding interdependence, we followed a procedure similar to that described in Chiaburu and Harrison (2008) and used a validated external data source to supplement our meta-analytic database. First, we identified the occupation that workgroups were drawn from in each sample. We then used the U.S. Department of Labor's Occupational Informational Network (O*NET), an extensive database offering job information rooted in an established theoretical structure (Mumford & Peterson, 1999), to create an index capturing interdependence using variables that describe the nature of work activities and the work context. This included six variables from the O*NET database: "communicating with supervisors, peers, or subordinates," "coordinating the work and activities of others," "establishing and maintaining interpersonal relationships," "interpreting the meaning of information from others," "provide consultation and advice to others," and "getting information from all relevant sources." A principle factor analysis supported our a priori, single-factor structure (with 87.23% of the variance explained by the task interdependence factor).

Based on the country each sample was drawn from, we assigned a value to each study from Hofstede's online database to code for cultural collectivism (Hofstede, 2001). Additionally, we coded for the other cultural differences (e.g., power distance) that are particularly relevant to LMX phenomena (Anand et al., 2015; Rockstuhl et al., 2012). Samples that contained workgroups from multiple countries were coded as "mixed" and were excluded from these analyses. Finally, we coded additional study-level differences that, although not formally grounded in the theoretical perspective we take, may serve as important boundary conditions that qualify the effects of LMX differentiation in workgroups. These included (a) workgroup LMX quality, (b) workgroup size, and (c) measurement of LMX differentiation.

Meta-Analytic Procedures

We followed Hunter and Schmidt's (2004) procedures for conducting psychometric meta-analysis

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[1] We acknowledge that there have been differences in how group effectiveness criteria are categorized under the rubric of emergent states and processes. We relied upon the established distinctions that have shown considerable consistency over the past two decades of group research (e.g., Ilgen et al., 2005; Marks et al., 2001; Mathieu et al., 2008, 2017) and coded each variable based upon the construct definition and individual items from each primary study (if available). For example, in line with the definition of an emergent state, group commitment captures "the attachment to, identification with, and involvement in the team" (Le Blanc & Gonzalez-Roma, 2012: 535) and the measurement items reflect member *perceptions*. In contrast, aligned with the definition of a group process, team–member exchange captures an individual's "exchange relationship to the peer group as a team" (Seers, Petty, & Cashman, 1995: 21) and the measurement items directly reference member *behaviors* toward the workgroup. We also note that Mathieu and colleagues' (2008: 421, 424–425) review on team effectiveness provided exemplars of variables under the rubric of emergent states and processes that served as a useful guide for our own work.

to obtain an estimate of the population correlations for this study. We used random-effects meta-analysis because it allows for the possibility that parameters vary across studies and for the estimation of variability between studies. We report the number of samples (k) and the total number of workgroups and individuals (N) in each primary study. Our results include a sample-size weighted estimate (r), a 90% confidence interval (CI) around the uncorrected point estimate (Whitener, 1990) to assess statistical significance (Hunter & Schmidt, 2004), and the true population estimate corrected for measurement error (ρ). To correct for measurement error in LMX differentiation, we used the reported reliability coefficient for the LMX measure used in each study, given that differentiation represents a dispersion construct opposed to a direct consensus construct (Chan, 1998). Emergent states and group processes reflect direct consensus constructs, which require agreement from multiple sources (e.g., group members) before aggregating into a group-level variable. Therefore, we used the within-group agreement index r_{WG} as an indicator of the group-level reliability (James, Demaree, & Wolf, 1993; LeBreton & Senter, 2008). When no reliability information was provided for a primary study, we used the average values from studies that did report data for that particular category of group outcome. For workgroup size and objective measures of group performance (e.g., sales), we imputed a value of 1.00 because these metrics are not subject to unreliability.

To ensure that effect sizes were independent, when a sample reported multiple operationally distinct variables that were categorized as similar group-level outcomes (i.e., performance, emergent states, group processes), we combined them into a single correlation using the formula for composites (Hunter & Schmidt, 2004). This method of aggregation does not distort meta-analytic estimates and is a more construct valid approach than other methods of aggregation when assessing operationally distinct variables at a higher level of conceptualization (Hunter & Schmidt, 2004; Lipsey & Wilson, 1993; Viswesvaran & Ones, 1995). Finally, to address the potential for publication bias toward significant findings (i.e., the file drawer effect; Rosenthal, 1979), we computed the *fail-safe N* for statistically significant meta-analytic correlations to estimate the number of past or future studies with null findings that would be needed to reduce the estimate to a value less than .05 (Hunter & Schmidt, 2004; Lipsey & Wilson, 2001; Orwin, 1983).

Meta-Analytic Path Modeling

To test our predictions within the IMO model of group effectiveness (Hypothesis 3), we created a correlation matrix using data from our results and supplemented these with meta-analytic correlations from prior studies[2] (Viswesvaran & Ones, 1995). Because workgroups operate across a wide range of contexts and under various conditions, we included several group characteristics as controls (task interdependence, workgroup LMX quality, and group size), allowing us to first examine the incremental relationships between LMX differentiation and group outcomes. We note that our results hold with or without these workgroup characteristics in the model. Consistent with past research, we used the harmonic mean sample size from the correlation matrix as the sample size for our analysis (Viswesvaran & Ones, 1995).

We first tested a direct effects model, including paths to group outcomes from both LMX differentiation and workgroup characteristics. This allowed for an assessment of the incremental contributions of LMX differentiation—after accounting for differences in task interdependence, workgroup LMX quality, and group size—and served as a robustness check for Hypotheses 1 and 2. Next, we tested Hypothesis 3 within an IMO framework by specifying (a) paths between LMX differentiation and group mediating mechanisms (emergent states and processes) to assess the α paths in the mediation model, and (b) paths between mediating mechanisms and performance to assess the β paths in the model. We gauged the significance of the indirect relationship of LMX differentiation on group performance when the direct relationship was also modeled (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002), as omitting the direct relationship when alternative

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[2] All three authors independently searched for potential group-level meta-analyses that could be used to supplement the results of the current study. For the relationship between emergent states and performance, we found five studies that provided population estimates for variables we categorized as emergent states (e.g., trust, justice climate, efficacy). The average estimate from these studies was .37, with a range of .30 to .44. However, Schmidt and Oh (2013) noted several limitations of averaging effect sizes across first-order meta-analyses. Thus, we chose to use the most conservative estimate to represent this relationship (i.e., $\rho = .30$ from de Jong et al., 2016). Courtright, Thurgood, Stewart, and Pierotti (2015) provided the estimates for relationships between task interdependence and group outcomes, and LePine et al. (2008) provided the relationship between group processes and performance.

conceptual linkages exist beyond the included mediating mechanisms (in our case, the equity arguments forwarded in Hypothesis 1) results in a mis-specified model that can yield incorrect estimates for the second stage of a mediation model (James & Brett, 1984; Kenny, 2008).

Moderator Analyses

To detect cases where moderator variables may be present, we reported the percentage of variance attributable to artifacts (V_{art}) and the 80% credibility interval (CV). As a rule of thumb, moderators are likely present if study artifacts fail to account for 75% of the variance in meta-analytic correlations (Hunter & Schmidt, 2004) or when the credibility interval is wide or includes zero (Whitener, 1990). To test for differences in our meta-analytic estimates for continuous moderators (task interdependence, cultural collectivism), we performed weighted least squares (WLS) regression analyses (Steel & Kammeyer-Mueller, 2002) and weighted each effect size by the inverse of its sample size (Hunter & Schmidt, 2004). This assumes that larger sample sizes offer more precise estimates of a relationship than studies with smaller sample sizes, and thus are given larger weight in the analyses (Hunter & Schmidt, 2004; Lipsey & Wilson, 2001).

RESULTS

Meta-Analytic Results

Table 1 presents the meta-analytic results for the relationships between LMX differentiation and group outcomes. The estimated true-score relationships showed (a) the relationship between LMX differentiation and group performance was not significant ($k = 24$, $\rho = -.01$, 90% CI [$-.06$, $.03$]), (b) a significant negative relationship between LMX differentiation and emergent states ($k = 21$, $\rho = -.32$, 90% CI [$-.32$, $-.17$]), and (c) a significant negative relationship between LMX differentiation and group processes ($k = 18$, $\rho = -.35$, 90% CI [$-.38$, $-.21$]). These results did not support Hypothesis 1, which predicted a positive relationship between LMX differentiation and group performance, but did support Hypothesis 2, which predicted negative relationships between LMX differentiation and both emergent states (Hypothesis 2a) and group processes (Hypothesis 2b).

To supplement our primary analyses, we also report meta-analytic estimates for subgroups of operationally distinct variables when there were enough studies to do so, allowing us to assess if there were significant differences in our meta-analytic

relationships based on our categorization of group outcomes.[3] In general, these results provide support for our conceptual categorizations of workgroup outcomes, as indicated by each subgroup's confidence intervals overlapping with (a) the confidence interval of the higher-order construct (i.e., performance, emergent states, group processes) and (b) among each subgroup within the same category (e.g., coordination and team–member exchange). The only exception were the two studies that used objective indicators of performance, which revealed a significant positive relationship with LMX differentiation ($k = 2$, $\rho = .06$, 90% CI [$.05$, $.07$]). However, these findings were based on only two studies, the *fail-safe N* necessary to reduce this relationship to below a .05 level was less than 1, and our results remain consistent even when these two studies were removed from our analyses. Overall, we interpreted these results as support for our theoretical groupings of operationally distinct variables across individual studies.

Finally, although not formally hypothesized, we also report meta-analytic estimates for the relationships between LMX differentiation and workgroup characteristics (see Appendix A). Our results revealed that LMX differentiation had (a) a significant negative relationship with task interdependence ($k = 7$, $\rho = -.16$, 90% CI [$-.20$, $-.07$]), (b) a significant negative relationship with workgroup LMX quality ($k = 36$, $\rho = -.18$, 90% CI

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[3] We note that organizational justice can be further distinguished between distributive, procedural, and interactional dimensions. Because equity and equality are both allocation principles, our theorizing would suggest that the relationship between LMX differentiation and distributive justice climate should be positive when equity is the salient allocation principle and negative when equality is the salient allocation principle. As such, our theorizing would suggest a null relationship with distributive justice climate that has substantial variance (depending upon whether equity or equality is salient). A further subgrouping of justice climate showed a null net effect ($\rho = .01$, CI [$-.20$, 18]) between LMX differentiation and distributive justice climate. Moreover, variance attributable to artifacts was 35.1% and the credibility interval was wide and included 0, suggesting the relationship is contingent on other factors (e.g., whether equity or equality is salient). The estimates between LMX differentiation and both procedural and interactional justice climate were consistently negative. Because the focus of our study was to understand the broad pattern of relationships between LMX differentiation and group outcomes, we chose to aggregate justice dimensions into a composite score to represent overall perceptions of fairness in the workgroup. Meta-analytic results for the justice climate subgroup are further strengthened (i.e., more negative) without the inclusion of distributive justice climate in our subgroup.

TABLE 1
Meta-Analytic Results for LMX Differentiation, Group Outcomes, and Workgroup Characteristics

Criteria	k	n	r	90% CI	ρ	V_{art}	80% CV	Fail-safe N
Group Performance (Hypothesis 1)	24	2,991 (15,243)	−.01	−.06, .03	−.01	42.7	−.17, .14	
Objective performance	2	910 (3,394)	.06	.05, .07	.06	100.0	.06, .06	1
Subjective performance	19	1,776 (9,567)	−.04	−.10, .01	−.05	49.0	−.20, .11	
Creative performance	5	369 (2,702)	−.06	−.21, .08	−.07	41.5	−.28, .14	
Emergent States (Hypothesis 2a)	21	2,749 (13,385)	−.24	−.32, −.17	−.32	16.5	−.62, −.03	156
Attitudes	8	1,672 (7,267)	−.23	−.31, −.15	−.35	17.4	−.60, −.10	64
Commitment	4	550 (2,727)	−.30	−.51, −.10	−.32	11.4	−.64, .01	30
Collective efficacy	3	234 (1,298)	−.14	−.18, −.09	−.16	100.0	−.16, −.16	13
Justice climate	9	707 (4,103)	−.41	−.56, −.25	−.44	12.6	−.82, −.07	88
Group Processes (Hypothesis 2b)	18	2,049 (10,965)	−.30	−.38, −.21	−.35	16.6	−.66, −.04	144
Conflict	8	606 (3,035)	.27	.20, .36	.31	70.1	.21, .41	57
Coordination	8	1,503 (7,430)	−.28	−.40, −.15	−.30	10.4	−.58, −.01	56
Extra-role behaviors	6	294 (2,249)	−.27	−.39, −.16	−.30	65.0	−.44, −.16	42
Team–member exchange	5	422 (2,087)	−.25	−.38, −.13	−.28	37.9	−.46, −.09	32
Workgroup Characteristics								
Task interdependence	7	556 (3,469)	−.14	−.20, −.07	−.16	100.0	−.16, −.16	30
Workgroup LMX quality	36	2,763 (15,461)	−.16	−.22, −.10	−.18	25.3	−.46, .10	163
Group size	32	3,352 (17,228)	.05	.02, .08	.05	100.0	.05, .05	2

Notes: k = number of independent effect sizes; n = total number of groups from studies (number of individuals within these groups in parentheses); r = sample-size weighted mean uncorrected correlation; CI = confidence interval around uncorrected correlations; ρ = estimated true-score correlation, corrected for measurement error; V_{art} = percentage of variance in corrected correlations attributable to study artifacts; CV = credibility interval around corrected correlations; *Fail-safe n* = number of past or future studies with null findings needed to reduce ρ to .05.

[−.22, −.10]), and (c) a significant positive relationship with workgroup size ($k = 32$, ρ = .05, 90% CI [.02, .08]). These findings suggest that it is necessary to control for these characteristics to eliminate them as possible alternative explanations when assessing the incremental variance LMX differentiation can explain in our group outcomes.

Path Modeling Results

Table 2 presents the correlation matrix derived from our meta-analytic results (shown in Table 1 and Appendix A) and supplemented with population estimates from prior studies.

Prior to testing the relationships between LMX differentiation and group outcomes in an IMO framework, we first tested a preliminary model that included direct paths from LMX differentiation and all workgroup characteristics to performance, emergent states, and group processes (all group outcomes were allowed to covary; see Figure 1). This provided a robustness test for the meta-analytic results presented in Table 1 by assessing the incremental predictive validity of LMX differentiation after accounting for differences in workgroup characteristics. The results, presented in Figure 1, support our meta-analytic findings, showing that, when including workgroup characteristics as alternative explanations, (a) LMX differentiation did not account for incremental

variance in group performance (β = .05, $p = .08$) and (b) LMX differentiation accounted for incremental variance in both emergent states (β = −.22, $p < .01$) and group processes (β = −.26, $p < .01$).

Figure 2 presents the formal test of Hypothesis 3 using an IMO framework, decomposing the indirect relationship (via emergent states and group processes) and direct relationship of LMX differentiation on group performance. We controlled for workgroup characteristics that exhibited significant relationships from our preliminary model (not shown in Figure 2).

Our results show that LMX differentiation had a significant indirect relationship[4] with group

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[4] We used the traditional approach of assessing the significance of indirect effects via the Sobel (1982) test, which has been criticized as an underpowered method for detecting indirect effects and for its distributional assumptions. Following the suggestions of a helpful reviewer, we assessed the robustness of our results using contemporary simulation techniques that relax the distributional assumption of the Sobel test, and assessed the significance of our indirect effects using Hayes and Scharkow's (2013) Monte Carlo method for assessing mediation. These results were consistent across both methods; thus, given that the Sobel test is less likely to result in Type I errors than simulation methods (Koopman, Howe, Hollenbeck, & Sin, 2015), we report only our primary results in the manuscript.

TABLE 2
Meta-Analytic Correlation Matrix

Variable	1	2	3	4	5	6
1. LMX differentiation	—					
2. Performance	$\rho = -.01$ (k = 24, n = 2,991, [−.06, .03])	—				
3. Emergent states	$\rho = -.32$ (k = 21, n = 2,749, [−.32, −.17])	$\rho = .30$[a] (k = 100, n = 6,748, [.24, .36])	—			
4. Group processes	$\rho = -.35$ (k = 18, n = 2,049, [−.38, −.21])	$\rho = .31$[b] (k = 40, n = 3,125, [.24, .37])	$\rho = .57$[d] (k = 6, n = 494, [.32, .59])	—		
5. Task interdependence	$\rho = -.16$ (k = 7, n = 556, [−.20, −.07])	$\rho = .13$[c] (k = 63, n = 4,671, [.07, .19])	$\rho = .30$[c] (k = 36, n = 2,262, [.22, .39])	$\rho = .44$[c] (k = 41, n = 2,851, [.36, .52])	—	
6. Workgroup LMX quality	$\rho = -.18$ (k = 36, n = 2,736, [−.22, −.10])	$\rho = .28$[d] (k = 22, n = 1,732, [.18, .31])	$\rho = .51$[d] (k = 17, n = 1,435, [.34, .52])	$\rho = .33$[d] (k = 19, n = 1,257, [.19, .34])	$\rho = .24$[d] (k = 7, n = 586, [.09, .31])	—
7. Group size	$\rho = .05$ (k = 32, n = 3,352, [.02, .08])	$\rho = .14$[d] (k = 18, n = 2,266, [−.01, .26])	$\rho = -.01$[d] (k = 18, n = 2,357, [−.05, .04])	$\rho = -.02$[d] (k = 17, n = 2,108, [−.06, .02])	$\rho = -.07$[d] (k = 6, n = 535, [−.14, .03])	$\rho = -.09$[d] (k = 29, n = 2,354, [−.14, −.02])

Notes: Each cell in the matrix contains a meta-analyzed correlation from the current study or from prior meta-analyses. ρ = estimated true-score correlation from the current study or from prior meta-analyses. ρ = estimated true-score correlation; k = number of independent effect sizes; n = total number of groups from primary studies. Confidence intervals shown in brackets.
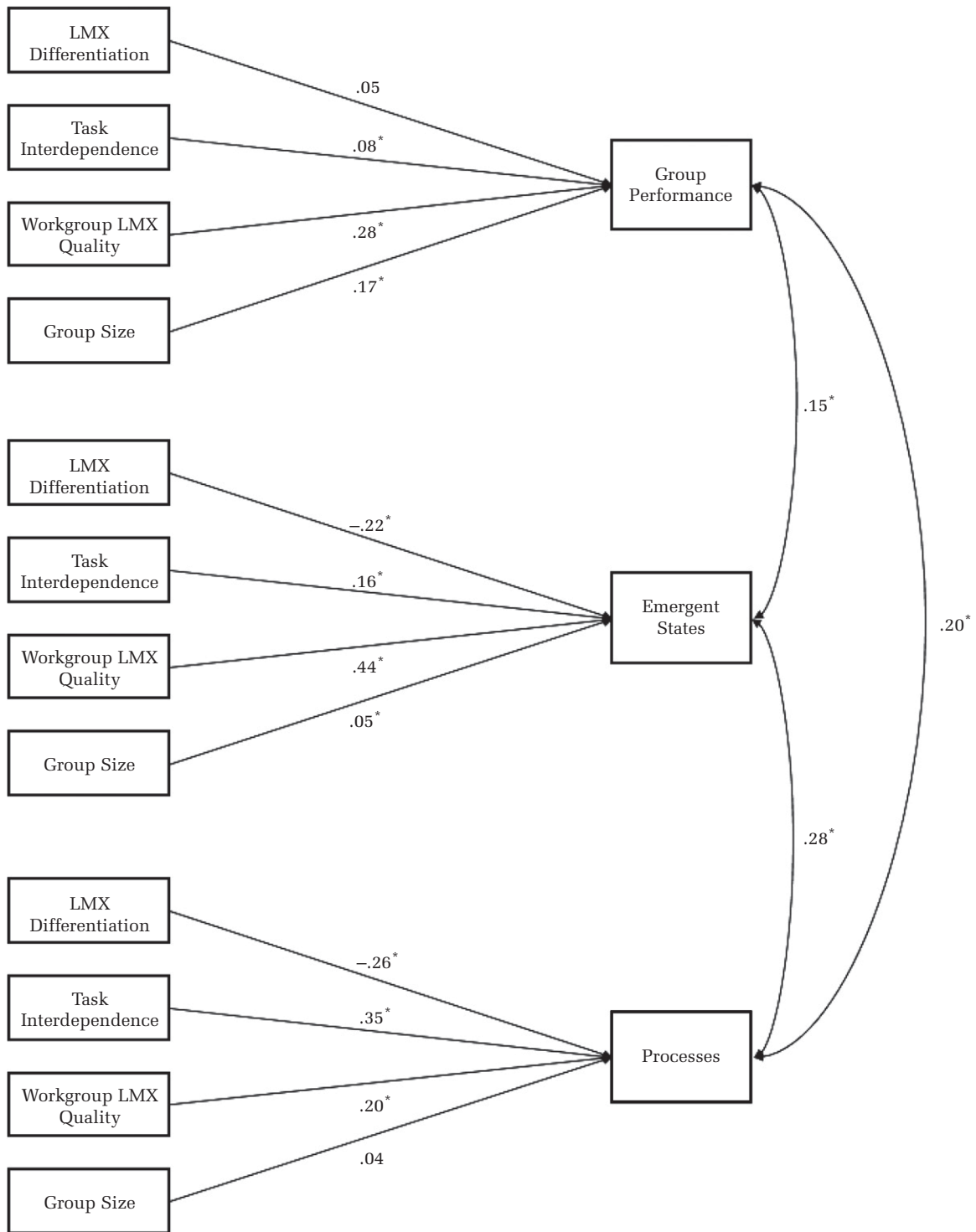
[a] ρ from de Jong et al. (2016).
[b] ρ from LePine et al. (2008).
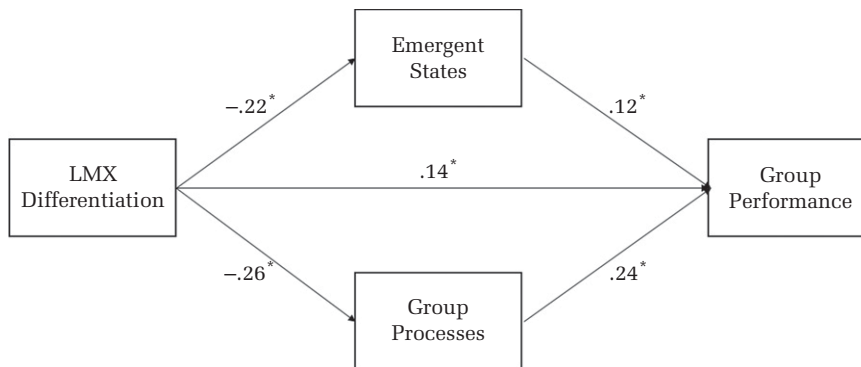[c] ρ from Courtright et al. (2015).
[d] ρ from supplementary analyses (see Appendix A).

FIGURE 1
Incremental Effects of LMX Differentiation on Group Outcomes

Notes: n = 1,442 (harmonic mean). Standardized coefficients reported.
* *p* < .01

FIGURE 2

Meta-Analytic Path Modeling Results Using an Input–Mediator–Outcome (IMO) Model of Group Effectiveness

Effects of LMX Differentiation on Group Performance
Indirect Effects (via Emergent States) = −.03[*]
Indirect Effects (via Group Processes) = −.06[*]
Direct Effects = .14[*]
Total Effects = .05

Notes: n = 1,442 (harmonic mean). Standardized coefficients reported.
* *p* < .01

performance, mediated through both emergent states (β = −.03, *p* < .01) and group processes (β = −.06, *p* < .01), thereby providing support for Hypothesis 3. When accounting for the relationships between group performance and both mediating factors, the results revealed a significant direct positive relationship between LMX differentiation and performance (β = .14, *p* < .01). This finding is counter to the non-significant results from (a) the meta-analytic correlations presented in Table 1 and (b) the results in Figure 1 (after controlling for workgroup characteristics), suggesting that our hypothesized positive relationship between LMX differentiation and group performance (Hypothesis 1) was suppressed by the indirect negative relationship mediated through emergent states and group processes (Cohen, Cohen, West, & Aiken, 2003; Tzelgov & Henik, 1991). The implications of these findings are considered in further detail in our discussion section.

Moderator Analyses

The results for continuous moderators using WLS regressions are presented in Table 3 (significant results are bolded) and for categorical moderators in Table 4 (minimum *k* = 3).

Task interdependence. Hypothesis 4 predicted that task interdependence will strengthen the negative relationships between LMX differentiation and both (a) emergent states and (b) group processes,

and (c) strengthen the positive relationship between LMX differentiation and group performance. To test this hypothesis, we matched the data coded from O*NET for task interdependence to each study. Although these procedures yielded a small number of studies that could be included in our analyses, the use of WLS regressions can compensate for the expected error in estimation by taking into account the accuracy of larger sample sizes derived from primary studies (i.e., number of workgroups), even when only a small number of studies are available, by anchoring the estimated regression line around these results (Steel & Kammeyer-Mueller, 2002). These results did not support the moderating role of task interdependence for the relationships between LMX differentiation and (a) group performance (β = .03, *p* = .94), (b) emergent states (β = .34, *p* = .51), or (c) group processes (β = −.64, *p* = .17). Based on these analyses, Hypothesis 4 was not supported.

Cultural collectivism. Hypothesis 5 predicted that cultural collectivism will strengthen the negative relationships between LMX differentiation and both (a) emergent states and (b) group processes, and strengthen the positive relationship between LMX differentiation and group performance. Using the continuous values for individualism–collectivism obtained from Hofstede's study of national culture (Hofstede, 2001), we tested this hypothesis using WLS regressions (see Table 3). Our results did not support the moderating role of

TABLE 3
WLS Analyses for Continuous Moderators of LMX Differentiation and Group Outcomes

Variable	k	n	β	R^2
Emergent States				
Task interdependence (Hypothesis 4a)	6	1,291 (5,282)	.34	.12
Collectivism (Hypothesis 5a)	20	2,723 (13,253)	.21	.04
Power distance	20	2,723 (13,253)	−.03	.00
Workgroup LMX quality	17	2,260 (10,997)	−.10	.01
Group size	17	2,245 (10,937)	−.60*	.36
Group Processes				
Task interdependence (Hypothesis 4b)	6	1,245 (5,899)	−.64	.42
Collectivism (Hypothesis 5b)	16	1,941 (10,396)	−.33	.11
Power distance	16	1,941 (10,396)	.55*	.31
Workgroup LMX quality	16	1,905 (10,259)	.06	.00
Group size	15	1,864 (10,067)	−.31	.10
Group Performance				
Task interdependence (Hypothesis 4c)	10	1,595 (7,469)	.03	.00
Collectivism (Hypothesis 5c)	22	2,871 (14,628)	−.15	.02
Power distance	22	2,871 (14,628)	.05	.01
Workgroup LMX quality	20	2,439 (12,506)	−.06	.00
Group size	20	2,451 (12,644)	−.47*	.22

Notes: k = number of independent effect sizes; n = total number of groups from studies (number of individuals within these groups in parentheses); β = standardized WLS regression coefficient; R^2 = amount of variance in effect sizes attributable to study-level moderator.
  * $p < .05$

cultural collectivism for the relationships between LMX differentiation and (a) group performance (β = −.15, $p = .50$), (b) emergent states (β = .21, $p = .38$), or (c) group processes (β = −.33, $p = .21$). Based on these results, Hypothesis 5 was not supported.

TABLE 4
Categorical Moderators of LMX Differentiation and Group Outcomes

Criteria	k	n	r	90% CI	ρ	V_{art}	80% CV	*Fail-safe n*
Group Performance								
Service	9	1,608 (8,005)	−.02	−.09, .05	−.02	33.7	−.18, .14	
Science & Tech	5	419 (2,454)	.11	.04, .17	.12	100.0	.12, .12	7
Measurement								
Variance	10	924 (5,185)	−.02	−.12, .09	−.02	27.1	−.26, .23	
SD	10	671 (4,240)	−.01	−.06, .05	−.01	100.0	−.01, −.01	
Emergent States								
Manufacturing	5	357 (2,094)	−.17	−.29, −.05	−.26	50.7	−.46, −.06	31
Military	4	432 (1,853)	−.04	−.09, .01	−.05	100.0	−.05, −.05	
Service	9	1,563 (7,621)	−.36	−.46, −.27	−.48	19.8	−.69, −.27	96
Measurement								
Variance	3	460 (2,500)	−.15	−.26, −.05	−.18	53.0	−.29, −.06	14
SD	6	409 (2,941)	−.14	−.28, −.01	−.15	33.8	−.40, .10	24
Group Processes								
Military	3	209 (988)	−.38	−.46, −.31	−.52	100.0	−.52, −.52	34
Service	7	1,196 (5,666)	−.39	−.42, −.37	−.42	100.0	−.42, −.42	66
Measurement								
Variance	5	415 (2,963)	−.18	−.33, −.04	−.20	30.5	−.43, .02	25
SD	3	168 (1,756)	−.11	−.53, .32	−.10	8.9	−.70, .51	

Notes: k = number of independent effect sizes; n = total number of groups from studies (number of individuals within these groups in parentheses); r = sample-size weighted mean uncorrected correlation; CI = confidence interval around uncorrected correlations; ρ = estimated true-score correlation, corrected for measurement error; V_{art} = percentage of variance in corrected correlations attributable to study artifacts; CV = credibility interval around corrected correlations; *Fail-safe N* = number of past or future studies with null findings needed to reduce ρ to .05.

Supplemental analyses. Despite the lack of support for our predicted relationships in Hypotheses 4 and 5, given the extensive focus on moderators in the LMX differentiation literature, we conducted post hoc analyses to explore other study-level moderators that we were able to code for. These included (a) workgroup LMX quality, group size, and cultural power distance as continuous study-level moderators (Table 3), and (b) job types and operationalizations of LMX differentiation as categorical study-level moderators (Table 4).

With respect to workgroup LMX quality, prior reviews have suggested that the extent to which differentiation influences group outcomes may depend upon the overall quality of LMX a leader forms with the group as a whole (Anand et al., 2015). For example, when LMX differentiation is high and collective LMX quality is low, differences in resource allocations could be more salient because more individuals experience low-quality exchanges with the leader. Our exploratory results did not indicate that workgroup LMX quality was a significant boundary condition (at the study level) for the relationships between differentiation and (a) group performance ($\beta = -.06$, $p = .79$), (b) emergent states ($\beta = -.10$, $p = .69$), or (c) group processes ($\beta = .06$, $p = .83$).

Turning to group size, prior research has suggested that larger collectives can bring both advantages (e.g., diversity in information) and disadvantages (e.g., difficulties in coordination). However, as a group increases in size, the number of relationships a leader must manage also increases. Thus, smaller workgroup size may reduce the negative influence of differentiation on emergent states and processes, given that a leader has less demands on his/her time and energy, whereas these relationships may be exacerbate in larger workgroups. Additionally, the demands of larger workgroups are more likely to tax leader resources, leaving fewer beneficial resources to go around. Thus, the performance benefits of differentiation may also suffer as group size increases. Results of our moderator analyses revealed that the positive relationship between differentiation and group performance was buffered ($\beta = -.47$, $p < .05$), suggesting that the difficulties associated with managing larger groups may negate the benefits associated with LMX differentiation. We also found evidence that the negative relationship between LMX differentiation and emergent states was accentuated ($\beta = -.60$, $p < .05$), suggesting that group size exacerbated the negative influence of LMX differentiation for

group harmony and solidarity. However, group size was not a significant moderator of the LMX differentiation and group process relationship ($\beta = -.31$, $p = .25$), though the direction of the coefficient was similar to our results for emergent states.

In regard to other cultural dimensions beyond collectivism that may qualify the effects of LMX differentiation, "power distance" (defined as the extent that individuals are tolerant of inequality in power distributions in society; Hofstede, 2001) may be particularly relevant (see Anand et al., 2015; Rockstuhl et al., 2012). Considering that power distance focuses on the acceptability of unequal distribution of power, the positive influence of LMX differentiation on performance may be stronger when cultures are more accepting of unequal distributions of power (i.e., high power distance) and the negative influence of differentiation on emergent states and processes may be weaker when cultures are more accepting of unequal distributions of power. Our exploratory analysis revealed some support for that idea. Although power distance did not influence the relations between LMX differentiation and performance ($\beta = .05$, $p = .83$) or emergent states ($\beta = -.03$, $p = .91$), it did influence the negative association between LMX differentiation and group processes ($\beta = .55$, $p < .05$), attenuating the relationship when cultural power distance was high.

In terms of job types, we categorized studies into four broad categories, including manufacturing (e.g., paper product manufacturing, steel and iron manufacturing, vehicle manufacturing), military (e.g., reserve officer training corps, military artillery unit, military infantry personnel), service (e.g., banking clerks, clothing sales associates, health care service teams), and science/tech (e.g., R&D teams, information system development teams, high-tech companies). The nature of tasks and the context in which each of these job types exist may moderate the relationships between LMX differentiation and group outcomes. For example, considering that "knowledge characteristics" (defined as knowledge, skill, and ability demands placed on an individual in the job; Morgeson & Humphrey, 2006) vary across job types, differentiation may be more justifiable for jobs in which knowledge characteristics are relatively higher (e.g., science and technology) because employee inputs (i.e., knowledge, skills, and abilities) are more varied in such contexts. In contrast, in contexts in which knowledge characteristics are relatively lower (e.g., manufacturing and

service), differentiation may be less justifiable because inputs are less varied.

Results of moderator analyses using categorical variables are reported in Table 4 (only when subgroups had a sufficient number of studies to draw comparisons). First, with respect to group performance, our results suggest that LMX differentiation had (a) a non-significant relationship for service-related occupations ($k = 9$, $\rho = -.02$, 90% CI [$-.09$, .05]), and (b) a significant positive relationship for science and technology-related occupations ($k = 5$, $\rho = .12$, 90% CI [.04, .17]). Since we find support for the positive relationship only in jobs in which knowledge characteristics are relatively higher (e.g., science and technology), this provides suggestive evidence that differentiation may be more justifiable in such contexts. Second, with respect to emergent states, the results show that LMX differentiation had (a) a non-significant relationship for military occupations ($k = 4$, $\rho = -.05$, 90% CI [$-.09$, .01]), and a significant negative relationship for both (b) manufacturing ($k = 5$, $\rho = -.26$, 90% CI [$-.29$, $-.05$]) and (c) service-related ($k = 9$, $\rho = -.48$, 90% CI [$-.46$, $-.27$]) occupations. Finally, with respect to group processes, the results show that LMX differentiation had a significant negative relationship for both (a) military occupations ($k = 3$, $\rho = -.52$, 90% CI [$-.46$, $-.31$]) and (b) service-related occupations ($k = 7$, $\rho = -.42$, 90% CI [$-.42$, $-.37$]). These results for emergent states and group processes are partially in line with the idea that, when knowledge characteristics are lower (e.g., manufacturing and service), differentiation is less justifiable. Overall, these results provide some preliminary evidence of notable differences across broad categorizations in job types, possibly attributable to knowledge characteristics.

Finally, existing operationalizations of LMX differentiation have varied considerably across studies (Anand et al., 2015; Martin et al., 2018). Specifically, most of the studies included in this meta-analysis operationalized LMX differentiation as either the variance ($k = 16$) or standard deviation ($k = 16$) of individual LMX reports. Two studies used r_{WG} to represent differentiation, two used the average standard deviation among individual items, two used the coefficient of variation, and three did not report this information. When separating operationalizations into categories of group outcomes (see Table 4), we were only able to examine differences between variance and standard deviation, due to the lack of studies using other methods (i.e., $k < 3$). For the most part, results of subgroup analyses did not show significant differences between how LMX

differentiation was operationalized, as indicated by overlapping confidence intervals. The notable exception was found in the relationship between LMX differentiation and group processes: studies using variance showed a significant negative relationship ($k = 5$, $\rho = -.20$, 90% CI [$-.33$, $-.04$]), whereas the relation was non-significant in studies using standard deviation ($k = 3$, $\rho = -.10$, 90% CI [$-.53$, .32]). These results suggest substantially more variability in effect sizes when studies use standard deviation as an operationalization.

Taken together, the results of our supplemental analyses provide some support for the importance of moderators in LMX differentiation research (Liden et al., 2006), and, although exploratory in nature, point to several directions for future research to pursue.

DISCUSSION

LMX differentiation represents an emerging literature that seeks to extend LMX theory and research beyond an individual or dyadic perspective. Considering that variability in LMX quality is a natural byproduct of establishing high-quality relationships with some members of a group but not others (Dansereau et al., 1975; Liden & Graen, 1980), LMX differentiation remains an important topic for research and practice. However, LMX differentiation scholars have noted the seemingly paradoxical nature of LMX (e.g., Li & Liao, 2014). On one hand, the fundamental underpinnings of LMX theory suggest that differentiation is necessary for effective workgroups (Graen & Uhl-Bien, 1995; Liden & Graen, 1980). On the other hand, existing perspectives on LMX differentiation often suggest that differences in LMX quality can create relational boundaries between group members and hinder the effectiveness of workgroups (e.g., Hooper & Martin, 2008; Li & Liao, 2014). Thus, the purpose of this study was to develop a conceptual framework to elucidate both the positive and negative influences of LMX differentiation at the group level and theoretically integrate our arguments with extant research on workgroup effectiveness. Our results have several theoretical and practical implications that contribute to the study of LMX differentiation, as follows.

A Theoretical Integration and Extension of LMX Differentiation Research

First, much of the extant research has attempted to understand LMX differentiation by considering the

boundary conditions that qualify its effects with group-level outcomes (e.g., Erdogan & Bauer, 2010; Liden et al., 2006). However, without a parsimonious theoretical framework that can explain how LMX differentiation is related to group-level outcomes (i.e., beneficial or detrimental) and why these effects occur (i.e., the theoretical mechanisms driving these relationships), it remains difficult to specify generalizable boundary conditions for these relationships. Most prior research has made the implicit assumption that individual-level theory will translate to group-level outcomes, and has taken either a generally positive or negative approach to understanding differentiation. In contrast, we adopt an equity–equality perspective, derived from allocation preferences theory, to derive distinct predictions for the relationship between LMX differentiation and group-level outcomes, thereby clarifying the seemingly "paradoxical nature" of LMX phenomena (Li & Liao, 2014). Our meta-analytic results were particularly clear on the negative pattern of relationships between LMX differentiation and our group-level indicators of harmony and solidarity (emergent states and group processes).

Second, using the IMO model of group effectiveness as a framework, we theoretically integrate our equity and equality predictions with existing research on workgroups and teams. This not only provides a conceptual model that specifies the proximal and distal nature of group outcomes, but also allows us to empirically decompose the total effects of LMX differentiation on group performance (a more distal indicator of group effectiveness) into both direct and indirect pathways. These results revealed a more complicated relationship between LMX differentiation and group performance: not only do emergent states and group processes carry the indirect negative influence of LMX differentiation on group performance, but these indirect relationships suppressed the direct positive influence LMX differentiation has on performance. By theoretically integrating our predictions into the IMO model, we find support for both the beneficial and detrimental effects of LMX differentiation, thereby unifying the various theoretical perspectives that have been taken in prior research.

With this in mind, our findings suggest that studies on LMX differentiation should clearly specify the nature of the group-level outcomes of interest, and that it is imperative to account for the direct and indirect influences of LMX differentiation in tandem. Specifically, the results of our meta-analytic investigation suggest that the mixed empirical findings may have been attributable to the positive relationship being suppressed by the negative indirect relationship, as indicated by the non-significant meta-analytic correlation between LMX differentiation and group performance as well as a near zero total effect shown when aggregating both direct and indirect effects. Although our results were based on the accumulated body of research on LMX differentiation, almost no studies have shown this effect. Without an adequate consideration of both of these pathways, future research in this emerging area of research may draw misleading conclusions regarding the influence of LMX differentiation in workgroups, thereby exacerbating the inconsistent evidence in this literature.

Finally, although our results serve to clarify the paradoxical nature of the LMX phenomena, there was also considerable heterogeneity within the meta-analytic results in our study. Tying our results back to the almost exclusive focus on moderators in the literature, this suggests that there remain additional factors that may account for the variability in the relationships between LMX differentiation and group outcomes. On the basis of allocation preferences theory and prior research on LMX, we hypothesized (but did not find support for) the moderating role of task interdependence and cultural collectivism. Thus, we extended our investigation to include supplemental analyses based upon other study-level variables that we were able to code. These analyses suggest that systematic differences across broad job categories (possibly attributable to knowledge characteristics), workgroup size, and cultural power distance appear to influence the relations between LMX differentiation and workgroup outcomes. Considering the exploratory nature of these analyses, however, we see these as particularly fruitful avenues for future research on the influence of LMX differentiation at the group level.

Practical Implications

In addition to the theoretical and empirical contributions discussed above, our results also have several practical implications. The beneficial and detrimental effects of LMX differentiation place leaders of workgroups between the proverbial "rock and a hard place." The paradox of adhering to different allocation principles suggests that, by adhering to one, leaders may often violate the other. This

suggests that leaders must be keenly aware of the tradeoffs associated with differentiation and should align their decisions with the goals of the workgroup and the broader organization (Pichler, Varma, Michel, Levy, Budhwar, & Sharma, 2016). To date, the literature has typically dealt with this issue by investigating when the use of equity or equality principles may be more or less important (e.g., Colquitt & Jackson, 2006). However, in practice these issues are more complex, given that the consequences of differentiation do not occur in isolated situations. For example, the tradeoffs associated with motivating greater output from high performers through differentiation may also increase dissatisfaction and antagonism within the workgroup. In turn, this could be particularly deleterious when workgroups are expected to remain intact for an extended period of time (i.e., higher temporal stability; Hollenbeck, Beersma, & Schouten, 2012). Therefore, the implication for managers is not simply whether they *should* selectively differentiate their exchange relationships, but to be practically aware of *how* their actions will shape the effectiveness of their workgroups.

As another practical implication, considering that research on organizational justice has shown that procedural fairness can buffer the detrimental effects of failing to adhere to equity or equality principles (Brockner & Wiesenfeld, 1996), adhering to procedural justice rules may be a useful way to mitigate the negative effects of choosing to differentiate or not (Pichler et al., 2016). This suggests that organizations should implement developmental programs that train managers on enacting justice principles, which can help to alleviate some of the problems experienced by workgroup members (Skarlicki & Latham, 1996, 1997). In sum, because our results suggest that the tradeoff between equity and equality drive the detrimental effects of LMX differentiation, the implication for organizations is that adhering to procedural justice rules may be a "one size fits all" solution.

Strengths, Limitations, and Future Research Directions

Our study has several notable strengths, including the use a parsimonious theoretical framework to account for both the beneficial and detrimental consequences of LMX differentiation, and the use of meta-analytic techniques to synthesize the accumulated body of research on LMX differentiation. As with all studies, however, there are several limitations that should be noted. First, the total number of studies included in our meta-analytic investigation was relatively limited (compared to individual-level meta-analytic studies). Nevertheless, these studies make up the entire body of work to date that has considered LMX differentiation at the group level, and includes 4,114 workgroups made up of 21,745 individuals.

Second, in categorizing operationally distinct group outcomes (e.g., coordination, team–member exchange), we abstracted to a higher level of conceptualization. These decisions were driven by our focus on the general pattern of relationships between LMX differentiation and group-level outcomes, while not being overly constrained by the operational differences across individual studies (Hunter & Schmidt, 2004; Lipsey & Wilson, 1993; Viswesvaran & Ones, 1995). To do so, we grounded our categorizations in the well-established and extensive research on workgroups and teams, which articulates conceptual differences between performance, emergent states, and group processes (Kozlowski & Ilgen, 2006; Marks et al., 2001; Mathieu et al., 2017). In addition, we report the meta-analytic results for the subgroups that make up our categories of group outcomes, which generally support our theoretical groupings and provide more precise estimates of the variables of interest for organizational researchers in each of these subdomains (e.g., justice climate, conflict, team–member exchange).

Third, most of the individual studies included in our meta-analytic investigation (like most meta-analyses) did not utilize research designs that can definitively infer causality among the constructs in this study. However, positioning emergent states and group processes as mediating mechanisms between LMX differentiation and performance is largely consistent with the theoretical ordering of these relationships, as described by the IMO model of group effectiveness (e.g., Ilgen et al., 2005; Marks et al., 2001; Mathieu et al., 2008). Thus, it is important that readers keep this in mind when interpreting the results of this study, and future research should seek to confirm our findings using designs better suited for establishing causation (e.g., controlled laboratory or longitudinal designs).

Finally, our results did not support the moderating role of task interdependence or cultural collectivism. We acknowledge these analyses may be limited due to the lack of available information reported across primary studies that could be used to assess study-level differences, and caution readers from drawing definitive conclusions based strictly

on these results. Our supplementary analyses, although not grounded in the theoretical perspective that we apply to LMX differentiation, do provide support for the importance of moderators as suggested in past research (Liden et al., 2006). For example, our exploratory results suggest that systematic differences across broad job categories (possibly attributable to knowledge characteristics), workgroup size, and cultural power distance seem to alter the association between LMX differentiation and workgroup outcomes. This not only ties our framework back to past work on the moderators of LMX differentiation, but also provides initial guidance on whether the moderation may occur on the indirect pathway to group performance—via either emergent states or group processes (e.g., cultural power distance)—or the direct pathway (e.g., science and technology job types).

Finally, we note that there was considerable variability in how past studies have operationalized LMX differentiation. Although most of the studies included in our meta-analytic investigation operationalized differentiation using within-group variance or standard deviation, we echo recent calls in this literature (e.g., Anand et al., 2015) that research must reach a consensus on how differentiation should be best measured to accurately reflect its conceptualization. We maintain that agreement indices are the least suitable measure of differentiation, given that prior research has brought forth several critical issues associated with the use and interpretation of r_{WG} as a measure of dispersion in multilevel research (Roberson, Sturman, & Simons, 2007), and that standard deviation and variance are more appropriate approaches for operationalizing dispersion or disagreement in groups (Chan, 1998; LeBreton & Senter, 2008). Taken together, these findings offer potential opportunities for future studies on LMX differentiation to pursue.

CONCLUSION

LMX remains one of the most prominent approaches for understanding how leader–follower relationships influence workplace outcomes. As organizations become increasingly reliant on group-based work structures, differences in LMX quality remain a critical issue for the effectiveness of workgroups. The results of this study strongly support the perspective that differentiation should not be thought of as being unilaterally good or bad (Anand et al., 2015), but as having tradeoffs that must be fully considered within the workgroup context.

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APPENDIX A

TABLE A1
Supplemental Analyses

Criteria	*k*	*n*	*r*	90% CI	ρ	V_{art}	80% CV	Fail-safe *n*
Emergent States–Processes	6	494 (3,372)	.45	.32, .59	.57	48.4	.42, .73	63
Workgroup LMX Quality								
Performance	22	1,732 (10,200)	.25	.18, .31	.28	33.1	.06, .51	103
Emergent states	17	1,435 (8,069)	.43	.34, .52	.51	16.9	.20, .82	156
Group processes	19	1,257 (8,109)	.26	.19, .34	.33	36.0	.09, .58	107
Task interdependence	7	586 (3,469)	.20	.09, .31	.24	38.4	.03, .44	26
Group size	29	2,354 (13,473)	−.08	−.14, −.02	−.09	30.0	−.32, .15	79
Group Size								
Performance	18	2,266 (11,805)	.13	−.01, .26	.14	6.7	−.32, .59	
Emergent states	18	2,357 (11,470)	−.01	−.05, .04	−.01	50.7	−.14, .12	
Group processes	17	2,108 (11,032)	−.02	−.06, .02	−.02	63.3	−.12, .08	
Task interdependence	6	535 (3,193)	−.06	−.14, .03	−.07	69.2	−.17, .04	

Notes: *k* = number of independent effect sizes; *n* = total number of groups from studies (number of individuals within these groups in parentheses); *r* = sample-size weighted mean uncorrected correlation; ρ = estimated true-score correlation; V_{art} = percentage of variance in corrected correlations attributable to study artifacts; CI = confidence interval; CV = credibility interval; Fail-Safe *N* = number of past or future studies with null findings needed to reduce ρ to .05.

APPENDIX B

TABLE B1
Coding Information for Samples Included in Meta-Analysis

Study	*n* (Workgroups)	Group Performance	Emergent States	Group Processes	Job Type	Country of Sample
Al-Shammari and Ebrahim (2014)	42		−.15[a]		Mixed	Bahrain
Anand (2011)	54		−.28[a]		S	India
Auh, Bowen, Aysuna, and Menguc (2016)	56			−.38	S	Turkey
Boies and Howell (2006)	37		−.24	−.22	MT	Canada
Chen, Chen, Zhong, Son, Zhang, and Liu (2015)	46	−.22			Mixed	China
Chen, He, and Weng (2018; Sample 1)	23		−.52	−.36	S	Taiwan
Chen et al. (2018; Sample 2)	41		.15	−.04[a]	MF	China
Cheng and Li (2012)	45	.07			S&T	China
Choi (2013)	57	.11		−.04[a]	Mixed	Mixed
Cobb and Lau (2015)	87		−.03[a]	−.44[a]	MT	USA
Erdogan and Bauer (2010)	25		−.53[a]		S	Turkey
Ford and Seers (2006)	51			.18[a]	MF	Mixed
Guan, Luo, Peng, Wang, Sun, and Qiu (2013)	223		−.04		MT	China
Han (2014)	828	.06[a]	−.31[a]	−.40	S	China
Haynie, Cullen, Lester, Winter, and Svyantek (2014)	27		.14[a]		MF	USA
Herdman, Yang, and Arthur (2017)	74	.08		.39	Mixed	China
Hu and Liden (2013)	35			−.16	Mixed	China
Kwak (2011)	26		−.42[a]		MF	South Korea
Lau (2008)	87	−.24	.01	−.39[a]	MT	USA
Le Blanc and Gonzalez-Roma (2012)	33	.06	.17		S	Netherlands
Lee and Chae (2017)	63	.23			S	South Korea
Li and Liao (2014)	82	.03		−.34	S	China
Li, Fu, Sun, and Yang (2016)	59	−.08			S&T	China
Liao, Wayne, Liden, and Meuser (2013)	71	−.12	−.49	−.54	S	USA
Liden et al. (2006)	120	.07			Mixed	USA
Lin and Rababah (2014)	210	−.04	.02		Mixed	Jordan
Liu, Lin, Huang, and Lin (2010)	47	.18			S&T	Taiwan
Liu et al. (2014; Sample 1)	138		−.23		MF	China
Liu et al. (2014; Sample 2)	125		−.23[a]		MF	USA
Naidoo, Scherbaum, Goldstein, and Graen (2011)	125	.17			S&T	USA
Ni and Ge (2013)	143	.11		.07	S&T	China
Pichler, Livingston, Yu, Varma, Buhdwar, and Sharma (2014)	62	.11			Mixed	Dubai
Savage (2016)	334	−.19	−.62		S	USA
Seo, Nahrgang, Carter, and Hom (2017)	96		−.06		S	China
Stewart and Johnson (2009)	65	−.07			MT	USA
Sui et al. (2016)	145	−.01	−.10	−.31[a]	Mixed	China
Tordera and Gonzalez-Roma (2013)	24	−.10[a]			S	USA
Tse (2012)	99	−.32	−.29	−.32	S	China
Williams, Scandura, and Gavin (2009)	37			−.34	S	USA
Zhang, Waldman, and Wang (2012)	74	.07			S	China
Zhao (2015)	98	−.36		−.47	Mixed	China

Notes: For coding job type, S = service; MF = manufacturing; MT = military; S&T = science and technology; Mixed = multiple job types included in sample. For coding country, Mixed = multiple countries included in sample.

[a] Indicates an aggregate effect size derived using Hunter and Schmidt's (2004) formula for composite scores.