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Constructing the Team: The Antecedents and Effects of Membership Model Divergence

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ABSTRACT

Scholars have established that team membership has wide-ranging effects on cognition, dynamics, processes, and performance. Underlying that scholarship is the assumption that team membership – who is and who is not a team member – is straightforward, unambiguous, and agreed upon by team members. In this study, I argue that this is not the case. I build on theories of social construction and shared mental models to suggest that team members’ models of team membership are socially-constructed and, due to changing environmental conditions, increasingly do not align across a given team’s members. In a study of 38 formally-defined software and product development teams, I identify drivers of “membership model divergence” and the effects of such divergence on the teams in which it occurs. In additional analyses I compare the effects of membership model divergence among team members with divergence between team members’ and team managers’ models and explore the indirect impact of membership model divergence on performance. I conclude by addressing the implications of membership model divergence for theory, methods and management practice.
“NewPro” is a ten-member product design team in a large multinational consumer electronics manufacturer. Recently, Anne and Bob discovered that their components’ interfaces failed to align—an error that resulted in weeks of rework and substantial conflict. Investigating the source of the incompatibility, they discovered that while they had each designed their interface based on consultations with their teammates, who those teammates were differed. A few weeks later, Caroline missed a major new opportunity because she assumed Dave—as the most customer-facing engineer in NewPro—would keep her informed of any relevant market shifts. When asked why he failed to keep Caroline in the loop, Dave countered: “I don’t pay attention to that stuff, that’s Emily’s responsibility—she’s in marketing,” to which Caroline replied “…but she’s not even in the team.” These scenarios illustrate some of the effects of a frequently overlooked phenomenon: membership model divergence—defined as misalignment among team members’ models of who are, and who are not, team members.

A team is defined as a bounded set of interdependent individuals with shared responsibility for a common goal or outcome (Alderfer 1977; Hackman 1987), and the literature on groups and teams implicitly assumes that information about membership is easily accessible (Diehl 1990), unambiguous, and commonly held. The assumption that teams agree upon their membership—who belongs to the bounded unit—also underlies practitioners’ understandings and subsequently informs their behavior and decisions. In this study I challenge the assumption that a team’s members agree upon their team’s membership and show that membership model divergence occurs and greatly affects team dynamics.

An increasingly relevant phenomenon, the assumption of agreement about team membership was unproblematic in traditional contexts of collocated, stable, and mutually exclusive teams. However, numerous shifts—towards more globally distributed work (Martins et al. 2004); fluid creation, redesign, and disbanding of teams (Thiry and Deguire 2007); and concurrent multiple team membership (O’Leary et al. Forthcoming)—are creating a more complex and dynamic team context. This increases the likelihood of membership model divergence and its effects on teams in theory and practice.

The effects of membership model divergence can be understood through the lens of shared team mental models. Shared mental models are shared understandings of the relevant elements of a
team’s context like physical environment, member skills and experience, interpersonal dynamics and interaction patterns, and technologies (Klimoski and Mohammed 1994). Shared team mental models facilitate coordination and information transfer and improve team dynamics (for a review see Mohammed et al. 2010). However, while scholars have explored the effects of sharing mental models of technology, tasks, interactions, and member skills (e.g., Cannon-Bowers et al. 1993), we have largely overlooked team models of membership – particularly problematic as such models underlie our theories and theorizing.

As the example of Caroline and Dave showed, membership model divergence threatens the very definition of the teams in which it occurs. Central to the definition of the team as a bounded set of interdependent individuals with shared responsibility for a common goal or outcome is the bounded set of individuals. Thus, by suggesting that bounded set may be variable and contested, membership model divergence affects our ability as scholars to define and clearly identify the teams we study.

Membership model divergence further affects the applicability of existing theories assuming a single, shared, unambiguous model of the team. For example, scholars of boundary spanning have found that in order to perform necessary team functions like information acquisition, information control, and external relations, team members take on distinct roles (e.g., as scouts or guards) when interacting across team boundaries (Ancona and Caldwell 1992). As a result of membership model divergence, a given interaction may be considered boundary spanning by some team members and internal to the team by others. This calls into question our ability to identify and cleanly differentiate among teams’ strategies for approaching the environment that have previously been found to predict team performance (e.g., Ancona 1990). Similarly, research on roles and norms has shown that individuals look to teammates to learn team roles and norms (Bettenhausen and Murnighan 1985), and use these to shape behavior (e.g., Chatman and Flynn 2001). Membership model divergence means the model of “the team” that members look to in order to learn existing roles and norms differs across team members, potentially producing ambiguity and ultimately conflict over the team’s norms and roles. Thus we must reevaluate extant theory on teams to assess how it applies to teams experiencing membership model divergence.
Representing an unshared mental model of team membership, membership model divergence affects practice by impeding team-level communication and cognitive processes as team members differ in their understanding of the team’s role, knowledge, and skill sets (see Mohammed et al. 2010). Furthermore, mental models of team membership define a psychologically constructed boundary of the team that delimits an individual’s “social universe” (Hackman 1992 p. 201) and determines what information is considered relevant when creating other mental models. Thus, membership model divergence further affects the how shared are mental models of other phenomena.

In the following sections, I show that membership model divergence is common, and present and test hypotheses built around two research questions: 1) What are the causes of membership model divergence? and 2) What are the effects of membership model divergence on emergent team processes and states? I address the implications of membership model divergence for practice and for existing and future theory. In so doing I address a gap in our understanding outlined by Guzzo and Dickson in their call for research “to clarify issues of inclusion and exclusion by virtue of team boundaries, how boundaries relate to effectiveness, and how the nature of boundaries might shape the effects of interventions intended to raise team performance” (1996: 332).

THEORETICAL BACKGROUND

I begin this section by defining membership model divergence and discussing key issues surrounding its conceptualization. I then address the existing research I draw upon to frame the discussion of membership model divergence and to understand its causes and effects. I review existing theory on shared team mental models to highlight the potential impact of membership model divergence. I then examine the process of social construction that leads to mental models and why it might lead to team members holding unshared models. I conclude by outlining recent changes to the collaborative context that promote more divergent social constructions resulting in increased membership model divergence.

Defining mental model divergence

As noted, I define team membership model divergence as divergence among team members’ models of who are, and who are not, team members. The simplicity of this definition belies a number of important assumptions and decisions including: 1) the distinction between members’ models of
team membership and their understandings of what membership entails; 2) the relationship of membership to formal and informal organizational structures; 3) how to bound the team within which the phenomenon may occur; 4) the appropriate level of analysis; and 5) the distinction between divergence of mental models and disagreement on them. I discuss each below.

First, membership model divergence is – at its core – about who is and who is not considered to be a member of a given team. As such, it is intended to capture the most simple and objective difference in models of the team. It is not about differences in team members’ behavioral models of what it means to be a member of the team nor expectations of roles and norms. Membership model divergence does not preclude the existence of more broad differences in understanding – for example on the definition of a team itself or a particular team’s identity – but these are distinct phenomena. Merely holding divergent models of a team’s component parts is enough to trigger the effects illustrated in the opening vignettes and those hypothesized in the next section. Thus, team membership model divergence solely captures the extent to which team members share the same model of who is, and who is not, a team member.

Second, while mental model divergence does not itself capture differences in how team members conceptualize or understand membership, those understandings nevertheless inform the models of the team that mental model divergence does address. Making this task more difficult is the complex relationship between teams and the informal organizational structures (Krackhardt and Stern 1988; Lincoln and Miller 1979) that inevitably exist alongside them. Importantly, although the set of individuals in an actor’s network may not align with his or her set of teammates, there is an important distinction between the two – a sense of membership. Research on the effects of membership finds powerful psychological effects on individuals (for a review see Hogg and Terry 2000). Membership affects self-conceptions (Abrams and Hogg 2003), attitudes (Terry et al. 1999), beliefs (Chen and Kenrick 2002), and behaviors (Moreland 1985), leading Lickel and colleagues to note that: “much of what people consider important, from the work they accomplish to the emotions they feel, is influenced by their membership in groups” (2000 p.223). Importantly, while affiliations may in reality be continuous, individuals tend to conceptualize their membership in categorical terms (Freeman 1992). As Freeman notes, “most attempts to specify group structure represent interpersonal linkages
in binary, or on/off, terms. Such binary models are unable to capture the variation in people’s tendencies to get involved with the group” (Freeman 1992 p. 153). Thus, for the purposes of this study, I consider individual team members’ mental models to be constructed on the basis of a dichotomous assessment of team membership.

Third, and clearly related, identifying the set of members whose models of the team must be compared presents a tricky conceptual issue. Accepting the existence of divergent membership models calls into question our ability to clearly identify the set of people who might be experiencing the phenomenon. Considering the operationalization of this construct provides a clear illustration of this quandary: given differing models of who is and is not a team member, it is unclear whose models of the team we should compare in order to assess whether a team’s membership models diverge. While this circularity cannot be fully resolved, I address it by making explicit two typically unspoken assumptions: that team members self-identify as members and that they appear on the official organizational team roster. Self-identification has, in fact, been included in many team definitions (e.g., Alderfer 1977), and presence on official team rosters is a common conceptual and operational assumption in many existing studies of teams (e.g., Ancona and Caldwell 1992).

Starting with a team’s officially sanctioned membership provides both a consistent baseline and a link to ongoing discussions among scholars and practitioners that assume agreement on team membership. Importantly, this should not be taken as implying that official definitions of the team are in any objective sense more correct than those held by team members, but rather as a simplifying assumption that allows us to more clearly and directly link membership model divergence to existing theory. Self-identification is required if we are to consider membership model divergence to reflect a characteristic of the team itself. Without self-identification, individuals’ assessments of a team’s membership are characterizations of a third party, rather than characteristics of their own team. Instead of superseding the traditional definition of a team noted earlier, this provides the explicit underlying conditions required for a robust exploration of membership model divergence.

Fourth, membership model divergence is a team-level construct that reflects a team’s lack of a shared team-level mental model of membership. Clearly, there is an analogous dyad-level construct that captures the misalignment of any two team members’ mental models of the team and that
underlies any team-level model divergence. Such dyadic misalignment of models and furthermore the individual-level processes that lead to a member choosing to include or not include a particular individual are certainly interesting topics worthy of study in their own right. In this study, however, I draw on the existing literature on shared mental models to focus on the extent to which the membership models held in a team diverge. I address this at length later in this section.

Fifth, and finally, it is important to note that membership model divergence does not imply active disagreement or conflict over those differing models of team membership. While membership model divergence may eventually lead to interpersonal tensions, such tensions are not definitionally required. Membership model divergence means only that team members’ models of team composition differ, irrespective of whether such differences are contested or even recognized.

**The importance of shared team mental models**

In what has become a central tenet of sociology, Thomas and Thomas noted: “If men define situations as real, they are real in their consequences” (1928 p. 571). Thomas and Thomas highlight the importance of mental representations in driving our perceptions, understanding, and, ultimately, behavior. A mental model is broadly defined as a “psychological representation of the environment and its expected behavior” (Holyoak 1984 p. 193). Such representations are the result of an accumulation and organization of knowledge arising from past experiences that helps individuals to make sense of their context, helps them to predict future behavior and states, and guides their actions (Rouse and Morris 1986). Individuals use this body of organized knowledge to interpret and make sense of their context, which helps them to predict future behavior and states (Rouse and Morris 1986; Walsh 1995).

First applied to teams by Cannon-Bowers and Salas (1990), a *team mental model* is a shared understanding of key, relevant elements about a team’s environment (Klimoski and Mohammed 1994; Mohammed et al. 2010). A substantial body of scholarship has been conducted on team mental models (also *shared* mental models or *shared team* mental models), their antecedents, and their effects (for a review see Mohammed et al. 2010). Team mental models have typically been assessed on two distinct dimensions: their similarity and their accuracy (Mohammed et al. 2010). While findings for the effects of mental model accuracy have been inconsistent, studies have consistently
found that shared, consistent mental models significant benefit teams (Mohammed et al. 2010). Sharing similar mental models enables team members to anticipate each other’s needs and actions, allowing them to more effectively coordinate their work (Cannon-Bowers et al. 1993; Marks et al. 2000) – in particular facilitating the retrieval and sharing of information within the team (Faraj and Sproull 2000). As a result, research has consistently identified cognitive similarity as a key element of success (DeChurch and Mesmer-Magnus 2010; Lim and Klein 2006; Mathieu et al. 2000), leading Mohammed and colleagues to argue that “both team successes and failures speak to the necessity of members being ‘on the same page’ with respect to what tasks to perform and with whom to coordinate actions” (2010 p. 877). Thus, extant scholarship consistently finds that shared mental models benefit teams. While these findings hold across mental models of all aspects of teams, I further suggest that mental models of team membership are particularly important to team functioning as outlined in the next section.

**Team mental model content and the role of team membership**

In early discussions of team mental models, scholars differentiated among four categories of model content including a shared sense of: equipment, task, team interaction, team (Cannon-Bowers et al. 1993). More recently, however, researchers have used a simpler taxonomy, focusing on mental representations of either the task (what is being done) or team (who is doing it) (e.g., Mathieu et al. 2000). Though certainly related, while some have found high positive correlations between team mental models of the task and the team (Lim and Klein 2006), others have found no significant correlations between them (Mathieu et al. 2005; Mathieu et al. 2000). I consider models of membership to be team-related.

In line with the arguments outlined earlier, sharedness of models of team-related factors have been repeatedly shown to improve performance (Mathieu et al. 2000) and group dynamics (Marks et al. 2002; Mathieu et al. 2000) either independently or in interaction with sharedness of models of task-related factors (Smith-Jentsch et al. 2005). We would therefore expect the lack of shared models of team-related factors to negatively affect teams. Teams with unshared mental models of team-related factors lack the commonly held understanding that would allow them to implicitly coordinate their actions without the need for overt communication (Cannon-Bowers and Salas 2001; Cannon-
Bowers et al. 1993). Diverging models of team membership therefore increase confusion and coordination challenges within the team.

Compounding this effect, a shared team mental model of membership defines the team itself. Mental models of the team itself delineate who team members do or do not consider to be members of the team. Such models of team membership determine what information is and is not considered relevant in the creation of other mental models, with groups defining an individual’s “social universe” (Hackman 1992 p. 201). Thus, unshared models of team membership may in turn affect how shared are a team’s mental models of other task- or team-related factors. Thus, diverging models of team membership have a secondary, recursive, effect. Given these consequences of unshared mental models of team membership, it is important to understand the antecedents of such mental models and why we might expect these models to be shared or unshared. Theories of social construction provide insights into this process.

Social construction: A source of unshared mental models and membership model divergence

Scholars of social constructivism argue that social interactions provide individuals with the information they use to shape their worldview (Palincsar 1998). Similar arguments form the basis of Berger and Luckman’s seminal work on the social construction of reality (1966). These effects are powerful and easily triggered – even brief interactions with others shape individuals’ interpretations of novel situations (Sinclair et al. 2005), prompting them to perceive and interpret such situations in ways that were similar to those interaction partners. Such arguments – that social perception shapes social reality – are pervasive throughout the psychology literature (see Fiske and Taylor 2008; Jussim 1991), leading Pyszczynski and colleagues to note that “Taken together, this work provides compelling support for the impact of social interactions on how we perceive reality” (2010 p. 733).

Tying this to shared mental models, while scholars have noted that shared mental models are shaped by – and shape – behavioral interactions within teams (Marks et al. 2001), to date scholars have focused on how team member interactions result in convergence of mental models. However, the more a team’s members differ in their experiences – especially their interactions with their teammates – the more those differing experiences will translate into differing models of the team. When team members differ in their models of the team, those individuals identified by some as members are
identified by others as non-members – which I term membership model divergence. This matches prior findings that managers and team members often hold differing models of the team (Haas 2002; Mortensen and Hinds 2002).

Drawing on these theories of social construction and shared team mental models, I suggest that differing experiences within a team result in individual members experiencing divergent individual social construction processes, which, in turn, yield unshared models of the team – and consequently membership model divergence. Furthermore, given our understanding of the effects of unshared mental models, when such membership model divergence does occur, it stands to significantly affect the ongoing processes of those teams. As no two people’s experiences in any context are identical, team members’ experiences in teams and their subsequent social constructions have always varied. Recent changes in the global work context, however, have substantially changed the environment within which teams function - increasing the likelihood of divergent experiences occurring and thus membership model divergence.

**Changing context: Why is membership model divergence increasingly likely and serious?**

Recent changes in the nature of collaboration – towards short-term, project-based, and overlapping teams – are increasing the extent to which social construction leads to divergent models of the team. In traditional teams – characterized by stable, exclusive membership – the social construction process was unproblematic. As individuals spent their time collaborating with a single, stable set of teammates, they created a large body of shared experience and common ground, which in turn served as the basis of the models they created. Importantly, team members built their models of the team around the same set of shared experiences, resulting in similar models of the team.

The rapid pace of change, growing product complexity, and a greater need for customer-focused innovation found in today’s economy means that organizations increasingly rely on project-based teams that are assembled to work on specific short-term projects and disbanded upon their completion (Brown and Duguid 2001; Hobday 2000; Prencipe and Tell 2001). The inconstant nature of such work has been consistently characterized as “short-term and fluid” (Prencipe and Tell 2001) or “self-contained, complex, and temporary” (Grabher 2002), involving specialized employees organized around “short-term project objectives” (Lindkvist 2004). Such work requires that
individuals frequently switch contexts upon completion of each project. Furthermore, not all team members start and end their work with a project at the same time, entering and leaving as their particular expertise is needed. Moreover, as project teams are designed to leverage employees’ differentiated skills (Lindkvist 2004), individuals with unique skills increasingly find their time divided across multiple teams (e.g., Hobday 2000). The overlap between any two teams can range from none to complete, and may even shift over time as different projects manifest different temporal rhythms such that individuals may be active members of a given project at certain times and have little interaction with it at others (for a discussion see O’Leary et al. Forthcoming).

In this increasingly common context, individuals spend less time in each team, frequently enter and exit the team at different times, and may only dedicate a portion of their available hours to that team. As a result, the amount of time collaborators have to work together, creating shared experiences on which to build convergent definitions of the team itself, is decreasing. Project-based teams may therefore find it difficult to establish shared understanding and a common knowledge base (Lindkvist 2004).

In summation, we find evidence that 1) shared team mental models – particularly those of team membership – are powerful drivers of behavior in team environments; 2) team members’ models of the team are socially constructed, with individuals’ divergent experiences leading a team to disagree on team membership; and 3) changes in the nature of work are increasing the variety of member experiences in teams and thereby increasing the likelihood that members’ models of the team will diverge.

**HYPOTHESES**

In this study I identify both drivers and effects of membership model divergence in teams. As noted, the literature on social construction of reality suggests that individuals’ models of their contexts are shaped by their experiences and interactions (Palincsar 1998). Consequently, given that individuals’ idiosyncratic experiences provide them with different inputs to the process of social construction, their resultant mental models will differ as well. We therefore would expect some level of membership model divergence to exist in most if not all teams. This is in line with the divergent models of the team that have been found in prior studies (Haas 2002; Mortensen and Hinds 2002). I
do not explicitly hypothesize about the existence of membership model divergence as existence is implied in hypotheses of antecedents and consequences. The hypotheses presented are framed in terms of relative levels of membership model divergence rather than absolute amounts, thus, I focus on predicting the drivers and effects of membership model divergence irrespective of the baseline level one might find in most teams.

Before presenting these hypotheses, it is important to note that team members’ mental models both shape, and are shaped by, interactions in an ongoing cycle (Marks et al. 2001). In line with this, I argue that membership model divergence occurs as part of an ongoing, iterative, and reflexive cycle of interpretation and social construction. A team’s pattern of relationships shapes its members’ perceptions of the team, which then influences future relationships. Similarly, while I hypothesize that membership model divergence affects certain emergent team states and processes, those states and processes in turn shape future membership model divergence. Lacking the longitudinal data required to fully map these ongoing relationships, I identify certain factors as antecedents and others as effects to reflect the clarity and expected strength of the mechanisms linking those constructs in one direction versus another.

**Antecedents of membership model divergence**

Many factors can affect the differing experiences of team members upon which they base their models of the team. In this study I focus on three factors likely to affect individuals’ models of the team: time dedicated to the focal team – as part-time engagement in a team bounds opportunities for shared experiences; amount of interaction – as interaction provides individuals with opportunities to share their models of the team, thereby promoting convergence; and heterogeneity of interaction, as differing social experiences provide team members with differing experiences on which to build their models of the team.

**Time dedicated to the team as an antecedent of membership model divergence**

Studies have found that individuals increasingly work concurrently on multiple teams (Zika-Viktorsson et al. 2006). In so doing, they must necessarily divide their time across those teams, giving them less opportunity for interaction and shared experiences within any one team. This arises due to the reinforcing effects of non-overlapping schedules and increased external demands on team
members’ time. As noted by O’Leary and colleagues, the effects of working on multiple teams are compounded (Forthcoming). First, the less time team members dedicate to a given team, the less time they have in which to interact with and observe the rest of their team. Second, as a given team member’s teammates are themselves dedicating less time to the focal team, those teammates are less likely to be present even when the focal team member is present himself or herself. Both situations have the same net effect of fewer opportunities to interact and share experiences that have been shown to predict the sharedness of team mental models (Smith-Jentsch et al. 2005). Given that multiple team members’ time on a given team is unlikely to align perfectly, any reduction in dedicated time is further multiplied, further reducing the time available for teams to share the information and experiences that form the bases of their models (see O’Leary et al. Forthcoming). Therefore, the percent of their time a team’s members dedicate to it will be negatively related to that team’s membership model divergence (i.e., the team’s models will converge).

Hypothesis 1a: Percentage of time dedicated to a team will be negatively related to membership model divergence

Intra-team interaction as an antecedent of membership model divergence

Interaction is the basis of the “social” part of the social construction of reality, with interacting individuals tending to develop similar understandings (Rentsch and Klimoski 2001). It is through interaction that team members gain information about their environment – information that is then used to construct their models of that reality. This interaction is itself a shared experience; thus, the more a team interacts, the more common ground its members have and the more likely they will model the team in similar ways. Furthermore, interaction allows team members to share their models of the team and thereby influence others and increase convergence. This is particularly the case as individuals are biased towards sharing information that is already commonly held (Stasser and Titus 1985). Thus the more a team interacts, the more similar the information on which its members will base their models of the team, leading to more convergence in team members’ mental models of team membership.

It is, however, also important to recognize that not all interaction within a team includes all team members. Early work on intra-group communication (Bavelas 1950) found patterns of
interaction differed dramatically within teams, ultimately affecting team outcomes. These early findings have been reinforced by research on social networks (e.g., Sparrowe et al. 2001), and more recently on virtual and distributed teams (e.g., Wiesenfeld et al. 1999). The more a team’s interaction patterns differ, the more different the underlying information on which team members build their models of the team, as mental schema are built incrementally through repeated interactions (Fiske and Linville 1980). Thus heterogeneous intra-team interaction should be positively related to membership model divergence.

Combining these two arguments on intra-team interaction, I hypothesize that increased interaction increases common ground resulting in more aligned member models (reducing membership model divergence); however controlling for amount of interaction, differences in those interaction patterns will reduce common ground (increasing membership model divergence).

Hypothesis 1b: Average team interaction will be negatively related to membership model divergence

Hypothesis 1c: Heterogeneity of team interaction will be positively related to membership model divergence

Consequences of membership model divergence

Though membership model divergence is likely to influence a wide range of team dynamics, I focus on two. The first, capturing the effects of membership model divergence on a team’s cognitive processes, is transactive memory. The second, capturing the effect of membership model divergence on interpersonal dynamics, is identification with the team. I selected these as representative of cognitive and social effects respectively and because theories of transactive memory and identification are both predicated on the existence of a bounded group.

The effects of membership model divergence on transactive memory

Effective transactive memory systems coordinate content knowledge as well as meta-knowledge about the location of that expertise within a group (Wegner et al. 1991). They allow team members to categorize, store, and retrieve information in a way that maximizes teams’ breadth and depth of knowledge while minimizing redundancy and recall effort (Hollingshead 2001). Effective transactive memory systems are characterized by: knowledge specialization (i.e., the differentiation of
knowledge across members), *knowledge coordination* (i.e., awareness of who has what knowledge and how to access it), and *knowledge credibility* (i.e., trust in the knowledge held by other members) (Liang et al. 1995).

In teams experiencing membership model divergence, differing models of the team impede the effectiveness of a team’s transactive memory by creating unintentional redundancies or gaps in information transfer and reducing member credibility. The second NewPro scenario (in which Dave failed to keep Caroline informed of a market shift because he thought it wasn’t his responsibility) provides an illustration of such issues. First, Caroline held an incorrect model of Dave’s knowledge, thus impeding coordination. Second, Dave did not attend to and store information on market shifts, reducing specialization. Third, Dave’s failure to capture and provide such information to Caroline negatively affects his credibility as an information source. Thus, membership model divergence negatively affects transactive memory – as reflected in prior research that finds that convergence of team mental models is positively related to effectiveness of coordination (Marks et al. 2002) and expertise identification and allocation (Mortensen and Hinds 2002). Thus, membership model divergence will be negatively related to transactive memory effectiveness.

Hypothesis 2a: Membership model divergence will be negatively related to transactive memory effectiveness

The effects of membership model divergence on identification with the team

Research on social identity and self-categorization posits that individuals categorize their surroundings, differentiating between those categorized as “ingroup” (similar) and “outgroup” (dissimilar) (for a review see Hogg and Terry 2000). Furthermore, individuals ascribe values to these categories and the items within them, with those in the ingroup valued more highly than those in the outgroup (Tajfel and Turner 1986). A large body of research has found that a sense of team identity improves both teams’ dynamics and outcomes (e.g., Bezrukova et al. 2009; Hinds and Mortensen 2005).

In teams experiencing membership model divergence, differing models of team membership form a basis for intra-team ingroup-outgroup distinctions. Furthermore, as prototypes are highly contextual, based on and maintained by features of the immediate context (Fiske and Taylor 2008),
differing perceptions of membership lead to misaligned reference groups (Lawrence 2006) and thus conflicting prototypes. Teams experiencing membership model divergence will therefore experience less cohesive identities as a result of including individuals considered team members (ingroup) by some but not team members (outgroup) by others. Thus, membership model divergence will be negatively related to identification with the team.

Hypothesis 2b: Membership model divergence will be negatively related to identification with the team

Putting these hypotheses together yields the following overall model of relationships.

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Insert Figure 1 about here
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METHODS

I conducted a survey-based study of software development teams in a single division of a large, multinational software company. The teams studied were formal, well established (not ad-hoc) and project-based. The organization explicitly identified and named all teams in the sample (e.g., the “Financial Module team”) and in all cases an official management-sanctioned team roster existed. That official roster was used to bound the sample in both study phases, thereby ensuring a consistent starting point and aligning with prior research (this decision is addressed in the discussion).

I initially contacted 443 individuals in 49 teams. Excluding teams with less than 60 percent of members responding or with fewer than 3 respondents reduced the sample to 38 teams (378 respondents). The mean non-response rate for teams in the final sample was 19 percent (1.74 per team), with interviews suggesting non-respondents were not systematically different from the rest of the population. The majority of team members (65 percent) worked as developers or in related fields (user interface design, quality, etc.) creating, maintaining and supporting highly interdependent code; 27 percent worked as project or development managers; and the remaining 8 percent worked in marketing, as technical writers or in related fields. The mean number of teams of which each respondent was a member was 1.81. Of the 38 teams in the sample, 27 were geographically dispersed,
with team members in as many as five locations. All respondents considered themselves members of
the teams identified by their managers.

The survey was divided into two phases, administered approximately two weeks apart, but
sent to the same set of individuals – those identified on the official management-sanctioned team
roster. I used the phase 1 survey to collect data on team member demographics and membership
attributions and the phase 2 survey to gather data on respondents’ perceptions of the team and their
teammates. Both survey phases were tailored to each recipient such that all questions explicitly
identified the team as defined by the team manager. For example, all members of the “Alpha” team
received surveys with questions of the form “How long have you been a member of the Alpha team?”
to remind them about which team they were responding. As noted, however, the sample surveyed in
phase 2 was identical to that of phase 1.

Survey Measures

To capture respondents’ assessments of team membership, I asked respondents to verify or
adjust a list of team members provided by their manager. Given that respondents were aware that the
initial list was provided by their team manager, this question provided a strong priming towards
agreement with the management-sanctioned list and therefore a conservative quantification of
membership model divergence. Lacking existing studies of membership model divergence on which
to draw, I calculated membership model divergence as follows. The membership attributions of each
pair of respondents (i,j), regarding every other potential teammate, were coded as 1 if different and 0
if the same, and added. The sum was then divided by the total number of unique individuals
referenced by that pair, yielding a percentage of divergence. To address the nonlinearity inherent in
percentage measures, I used the following transformation of the above membership model divergence
measure (see Cohen et al. 2003): 

\[ A = \frac{\text{arbstat} \sqrt{P}}{P} \]

To assess time dedicated to the team, I asked respondents to report the percentage of time
they dedicated to the team in question. The team level mean was used as a measure of focal team time
commitment. I created measures of interpersonal interaction using respondents’ self-report data on
how frequently they interacted with each member of their team, either face-to-face or mediated by
email, phone, voicemail, videoconference, teleconference, instant messenger, fax, or paper documents. I calculated mean levels of interaction within each team and used these as measures of average intra-team interaction. I used the team-level mean of the Euclidean distance between team members regarding interaction with each target as a measure of intra-team interaction heterogeneity.¹

I measured transactive memory using Lewis’s (2003) measure, asking respondents to rate the accuracy of 15 statements about their team (e.g., “I have knowledge about an aspect of the project that no other team member has”) using a five-point Likert scale (1 = “not at all accurate”, 5 = “very accurate”). The mean of these ratings was then calculated to create a reliable (α = .87) measure of transactive memory. The mean of all individual-level measures yielded a reliable (α = .96) team-level measure of transactive memory. To verify that aggregation to the team level was justified, I estimated within-group inter-rater reliability scores based on the formula derived by James, Demaree, and Wolf (1984). The inter-rater reliability scores indicated that the team-level measure of transactive memory was justified (ICC₁ = .21, ICC₂ = .80, rwg = .96).

I measured identification with the team using a 13-item scale adapted from Tyler (1999) in which team members rated statements (e.g., “I see myself as a member of the team”) on a five-point Likert scale (1 = “not at all characteristic,” 5 = “very characteristic”). The mean of the 13 items formed a reliable (α = .80) score of how strongly the individual identified with the team, and inter-rater reliability scores indicated that combining them into a team-level measure of identification was justified given inter-class correlation coefficients (sample-wide, mean by team) of (ICC₁ = .30, ICC₂ = .70, rwg = .92).

Importantly, the measure of membership model divergence did not result from a direct survey item measuring perceived divergence, but rather was calculated based on respondents’ objective identification of the members of their team. Respondents were given no clues as to the purpose of that identification, thereby reducing the possibility of common methods bias that might otherwise occur if respondents were asked to assess membership model divergence as a characteristic of their

¹ I conducted Kolmogorov-Smirnov tests to assess normality and found that average interaction was non-normal (z = 2.03, p<.01). The natural log yielded a more normal distribution which passed the test of normality (z = .70, p>.20) but did not affect the pattern of relationships. The transformed variable was used in all subsequent analyses.
team. Furthermore, the separate phases of the survey further reduced potential common methods bias between the independent and dependent variables, as the items used to assess the independent variable (membership model divergence) and those used to assess dependent variables (effectiveness of a team’s transactive memory and identification with the team) were measured two weeks apart.

RESULTS

Membership model divergence existed in 28 (72 percent) out of the 38 teams in the sample, with a mean of .69 (s.d. = .52, values ranging from 0 to 1.68, see Table 1 for descriptive statistics and correlations). Within teams experiencing membership model divergence, the mean was .93 (s.d. = .36), thereby providing evidence of the existence of naturally occurring membership model divergence.

To test the relationships proposed in my model, I used structural equation modeling (SEM) with maximum likelihood estimation to analyze the saturated measurement model, the structural model corresponding to the full set of hypotheses, and the individual hypotheses.

I assessed model fit using several statistics. I used the Chi-square test that assesses the goodness of fit between the reproduced and observed correlation matrices. The non-significant Chi-square [$\chi^2(8) = 7.524, p = .48$] here indicated that the departure between the model in this study and the data is not significant (see Figure 2). Because the Chi-square test is highly sensitive to sample size, I also used three other widely used goodness of fit criteria that are not sensitive to sample size (Bentler and Bonett 1980): Incremental Fit Index (IFI) and Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI). These indices have expected values of 1.00 when the hypothesized

2 All values reported in tables refer to the arcsin transformed measure. Values for the untransformed measure were: mean = .16, s.d. = .16, range from 0 to .55. Within teams experiencing membership model divergence, mean (untransformed) membership model divergence was .22 (s.d. = .14). The correlation between the transformed and untransformed measures was .96.
model is true, and a value of .90 or higher suggests an adequate fit (Bentler and Bonett 1980). The values for all three within the saturated model indicated an excellent fit (IFI = 1.01, TLI = 1.02, and CFI = 1.00). Finally, I used the Root Mean Squared Error of Approximation (RMSEA), which is an estimate of the discrepancy between the original and reproduced covariance matrices in the population. A RMSEA of .05 or lower represents a good fit (Browne and Cudeck 1993) and my saturated model yielded a RMSEA value below .01.

I examined the sources of membership model divergence by testing three hypotheses predicting the antecedents of membership model divergence. In Hypothesis 1a I predicted that the mean percentage of team members dedicated to their team would be negatively related to membership model divergence and that model path was significant and in the expected direction (β = –.28 p < .01). In Hypotheses 1b and 1c I predicted that membership model divergence would be negatively related to teams’ average level of interaction, but positively related to heterogeneity in that interaction. Both hypotheses were supported, with average interaction significantly negatively related to membership model divergence (β = –.46, p < .01), and heterogeneity in interaction significantly positively related to membership model divergence (β = .51, <01). Thus, I find support for Hypotheses 1a-c.

I explored the effects of membership model divergence by testing two hypotheses predicting the effects of membership model divergence. I predicted that membership model divergence would be negatively related to team transactive memory effectiveness (Hypothesis 2a) and mean identification with the team (Hypothesis 2b). Both paths were significant in the model and in the expected direction, with weights of β = −.30 p < .05 for transactive memory effectiveness and β = –.33 p < .05 for identification.

Further analysis

Beyond the hypothesized model, I tested two alternative models and one extension. I use the first model to examine the relationship between team size and membership model divergence, as team size has frequently been identified as a cause of unshared team mental models. With the second model I use the divergence between team member and team manager membership models to assess role of the accuracy of team members’ models of team membership, as mental model accuracy has been
suggested as another important characteristic of shared team mental models. With the third model I link the predicted effects on transactive memory and identification to team performance.

**Team size as a predictor of membership model divergence**

Scholars have argued that team size is negatively related to the development of a shared team mental model (Cannon-Bowers et al. 1993; Klimoski and Mohammed 1994; Rentsch and Hall 1994). As noted by Rentsch and Klimoski (2001), however, these arguments use size as a proxy for opportunities for team member interaction. As I model interaction explicitly within this study, I expect the effects of team size on membership model divergence operate through interaction frequency and heterogeneity. To test this, I ran an alternative model that included team size as a predictor of both amount and heterogeneity of interaction. To assess team size, I compared two measures: the team size as reported by the team manager, and as the total number of individuals identified as team members by survey respondents. The two measures of team size were highly correlated ($r = .66 \ p < .001$) and yielded a similar pattern of results. Thus I used a measure based on manager-reported team size. Chi-squared and goodness of fit indices indicated a reasonable fit with the data [$\chi^2(12) = 14.941, \ p = .25; \ NFI = .80, \ IFI = .95, \ TLI = .91, \ CFI = .95, \ RMSEA = .08$). As expected, team size was negatively and significantly ($\beta = –.39 \ p < .05$) related to average interaction – although not significantly related to heterogeneity of interaction ($\beta = .19 \ n.s.$) – thereby supporting the suggested link between team size and communication. The rest of the model remained largely unchanged and as fit indices indicated the resultant model was a poorer fit than one that did not include team size, I did not include team size in the final reported model.

**Member-manager membership model divergence as a proxy for model accuracy**

As noted, team mental models have typically been assessed on two dimensions – with respect to their similarity and accuracy. The analyses above assess the former, but not the latter. One might logically counter that the key driver of the noted effects is not divergence among team members, but an incorrect model of something that is objectively correct. Assessing the accuracy of socially constructed shared mental models raises a conceptual and methodological issue as it is difficult to determine which is the “correct” model against which accuracy is judged (Mohammed et al. 2010).
Teams may hold “multiple equally good yet different mental models” (Mathieu et al. 2005 p. 39). Building on prior research that typically assesses agreement against “subject matter experts” (Lim and Klein 2006), I assess accuracy with respect to the model of the team held by the team manager, as managers can reasonably be considered as having the best overall sense of a team, and their mental models of the team have typically been used as the basis for prior teams research.

I created a measure of member-manager membership model divergence following the same approach as used to create the measure of membership model divergence. In this case, however, I compared each team member’s assessment of membership against that of the team manager. Mean member-manager membership model divergence was .81 (s.d. = .53, min = 0, max = 1.81). To assess whether member-manager membership model divergence was in fact a better predictor of the noted effects, I repeated the analyses above, substituting member-manager membership model divergence for membership model divergence. I present the resulting model in Figure 3.

The non-significant Chi-square [$\chi^2(8) = 7.247, p = .51$], combined with the other fit indices (NFI = .84, IFI = 1.02, TLI = 1.05, CFI = 1.00, RMSEA = .00), indicated that the alternative model was a reasonable fit for the data. Yet within the model only percentage of time dedicated to the team was related to member-manager membership model divergence ($\beta = -.40$ $p < .01$), and importantly neither the effectiveness of a team’s transactive memory nor the extent to which team members identified with the team were significantly related to member-manager membership model divergence. This matches the theoretical model outlined earlier, as less time spent dedicated to the team means less opportunity to learn and appropriate the team manager’s mental model. Importantly, the negative effects of membership model divergence noted earlier – less effective transactive memory and reduced identification with the team – did not result from member-manager membership model divergence.

This additional analysis establishes team and member-manager membership model divergence as distinct constructs with differentiable effects. It furthermore illustrates that membership
model divergence is a better predictor of the noted effects (on transactive memory and identification) than is member-manager membership model divergence. Relative to prior scholarship on formal and informal teams, while it may be tempting to explain away membership model divergence as reflecting differences between formal and informal organizational structures, these findings suggest otherwise. Membership model divergence reflects an internal clash between perspectives held by team members. In this case, rather than recognizing their experience-based networks as a parallel informal network, team members used the information they gained from their experiences to redefine their understanding of the team itself.

Effects on performance

While the tested hypotheses establish effects of membership model divergence on team cognition and dynamics, they do not address the ultimate effect of membership model divergence on team performance. Given prior research establishing both identification and transactive memory effectiveness as predictors of team performance (e.g., Ellemers et al. 2004; Lewis 2004 respectively) it stands to reason that these mediate the relationship between membership model divergence and performance.

Effective transactive memory systems boost performance by reducing time and effort wasted on coordination miscues, searches for external knowledge and assistance, and misuse of available knowledge (Austin 2003). Knowledge of member skill-sets and expertise also allows teams to approach problems more flexibly (Moreland et al. 1996), thereby allowing for more novel solutions. Similarly, multiple studies have found that a lack of identification with the team impedes rapport and subsequent consensus building (Moore et al. 1999), and ultimately team effectiveness (Polzer et al. 2003). These findings suggest that membership model divergence may affect performance through its effects on transactive memory and identification – in line with prior work finding an indirect link between shared team mental models and performance operating through team processes (Mathieu et al. 2000).

In line with this prior theory, I tested an alternative model that included indirect paths from membership model divergence to performance through transactive memory effectiveness and identification. To measure performance I used member ratings of performance on seven dimensions
(e.g., efficiency, meeting customer/client needs, adherence to schedule/budget) relative to all other teams with which they had experience (Ancona and Caldwell 1992). The mean of respondents’ ratings yielded a highly reliable estimate ($\alpha = .84$) of performance. To validate the accuracy of team member ratings, a sub-sample of team managers was asked the same question regarding the teams they managed. Manager ratings had similar reliability ($\alpha = .85$), were significantly positively correlated to member ratings ($r = .63$, $p < .01$), and yielded similar patterns of correlation with other measures. However, given the small number of manager ratings, I used member ratings to assess performance.

To verify that any performance effects were not the result of a direct link to membership model divergence, I also tested a model that included a direct link between membership model divergence and performance. However, that direct link was not significant and the model including a direct link was a slightly poorer fit for the data. Thus, in line with the findings of Mathieu et al. (2000), I modeled performance as driven by transactive memory effectiveness and identification with the team.

While identification with the team was not significantly related to performance ($\beta = .12$, n.s.), performance was significantly related to the effectiveness of a team’s transactive memory system ($\beta = .71$, $p < .01$) and the non-significant Chi-square [$\chi^2(12) = 10.108$, $p = .61$], combined with the other fit indices (NFI = .89, IFI = 1.02, TLI = 1.05, CFI = 1.00, RMSEA = .00), indicated that the alternative model was a reasonable fit for the data. Thus, these additional analyses suggest that membership model divergence reduced team performance by reducing the effectiveness of the team’s transactive memory system.

**DISCUSSION**

In this study I provide the first systematic examination of membership model divergence, its antecedents, and its effects on emergent team states, processes, and outcomes. Occurring widely within the teams in my sample, membership model divergence was negatively related to the mean percentage of time that members spent in the team and the mean level of interaction in the team, while being positively related to heterogeneity in team interaction patterns. Membership model divergence
was in turn negatively related to both the effectiveness of teams’ transactive memory system and the strength of its members’ identification with the team. In additional analyses I found evidence that the negative effect of membership model divergence on transactive memory effectiveness translated to lower team performance, although the same was not true for identification. These results confirm that membership model divergence, beyond simply reflecting a characteristic of the team, has measurable effects on critical team dynamics and ultimately performance. Furthermore, it appears these effects occur primarily as a result of processes well established in the teams literature – by making it more difficult for teams to coordinate their cognitive processes. The lack of a significant link between identification and performance may reflect the fact that the teams in this sample were engaged in knowledge work that was intrinsically motivating and allowed teams to work around the obstacles typically posed by a low identification.

**Implications**

This research has implications for theory, research, and practice. In outlining the theoretical implications, I return to the theoretical bases for this research outlined earlier and focus on the implications of membership model divergence for: 1) how we understand teams and membership, and build theory based on that understanding; 2) our understanding of the changing nature of teams themselves; 3) our methodological approaches to the study of teams; and 4) managerial practice. I address each of these in the following section.

**Implications for how we view teams and membership**

The findings of this study have significant implications for how we think about membership and how we define teams themselves. Traditionally we have viewed membership – and teams – as objectively defined. We view teams as shaping individual member behaviors and inter-member dynamics through their definitional characteristics of shared goals, interdependence, and boundedness.

Membership model divergence implies that members’ behaviors are strongly shaped by how they *perceive* the team, and I find team-level outcomes affected by the alignment of such models across members. More than a difference between formal and informal groups, respondents in this study defined their teams differently – differences driven by differing experiences. This variation does
not invalidate prior scholarship linking membership and team member behavior, but begins to disentangle the effects of objective definitions of a team and the subjective understandings of it. Thus, this study provides further evidence of the important role of membership in shaping behavior. The existence of membership model divergence does, however, emphasize that membership is a complex construct and suggests an alternative perspective on membership and teams as socially constructed phenomena that are not invariant across members. This has implications for how we define teams and build theory based on that definition.

Recognizing that members socially construct membership suggests that we may need to reassess our definition of the team. Instead of focusing on an objectively identifiable “bounded set of individuals” it may benefit us to shift our definition to focus on individuals’ perceptions of such a set, and the sense of entitativity it provides. Clearly, such shifts in or approach to teams go far beyond the scope of this study and require more investigation. Nevertheless, this study clearly highlights the value of looking beyond formal team rosters and considering the effects of team members’ perceptions and interpretations of their team. Whether or not we redefine teams themselves, the findings of this study show that teams are not unambiguous and objectively defined constructs as we often treat them. This has implications for theories that we – explicitly or implicitly – base on a traditional understanding of team membership.

**Implications for theories based on our understanding of membership**

More broadly, membership model divergence and socially constructed membership further affect our theories built upon an understanding of teams as objectively defined. As illustrated in the boundary-spanning example discussed earlier, predictions about the behavior of someone identified, by some, as a boundary spanner may not hold if that individual does not view himself or herself as spanning the team’s boundary. The existence of membership model divergence suggests a more refined treatment that considers individuals to be boundary spanners not on the basis of an external definition of the team but as defined with respect to the team model held by the boundary spanner himself or herself. This calls into question the predictive ability of theories of traditional boundary spanning when applied in contexts like that studied. Furthermore, this opens potential new avenues of investigation to explore the relationship between a team member’s own self-identification as holding a
particular boundary spanning role and teammates’ external expectations of boundary spanning behavior.

Similarly, returning to the earlier discussion of norms, if individuals look to their teammates to learn team roles and norms (Bettenhausen and Murnighan 1985), as a result of membership model divergence, each team member may look to a different set of individuals. Learning and adopting different and potentially clashing roles and norms may lead to miscommunication and conflict as well as greater fluidity and change in norms as teams adjust them to reconcile differences. Thus we may need to adopt a more nuanced and multilevel model of team role and norm formation that accounts for individual members’ differing sources for learning appropriate roles and norms.

Last but not least, this study has implications for the theories of shared mental models on which it is based. By recognizing that team members may differ in their understanding of the team, this research suggests membership itself as an important aspect of reality that individuals socially construct and that subsequently forms part of the mental models that they may or may not share with their teammates. The findings of this study suggest that we explore membership as a particularly important mental model that may or may not be shared. In so doing, we provide a more nuanced understanding of team-focused shared mental models, and further address Mohammed and his colleagues’ call that: “researchers move away from referencing TMMs in the abstract toward specifying content domain and property. Rather than assuming a unitary construct, labels such as ‘teamwork mental model accuracy’ or ‘taskwork mental model similarity’ acknowledge the complexity and multifaceted nature of TMMs, fostering more precise conceptualization and operationalization” (Mohammed et al. 2010 p. 881).

More generally, membership model divergence affects those theories built around the mental representations of the team held by its members. Boundary spanning relies on members perceiving a defined team that must be protected and coordinated, necessitating specific activities. Similarly, roles and norms reflect agreed upon patterns of behavior for a given group of people. In these cases, membership model divergence is particularly relevant to the extent that members fail to recognize they hold different underlying models. In contrast, membership model divergence may not be relevant for theories not built around a commonly held entity. For example, a theory of technology adoption
might not be affected by membership model divergence unless there is a theoretical justification for how team members’ models of the team shape their technology adoption behaviors. In the absence of that justification, agreement on team composition may be a reasonable simplifying assumption.

**Implications for our understanding of the changing nature of work**

Teams scholars have noted that the context of work is changing, and with that teams themselves (Hackman and Katz 2010). By examining one key effect of such changes on intra-team dynamics, this study highlights the importance of considering the changing context of work. As noted by Hobday (2000), many existing studies of project-based successes and failures have not explored intra-project dynamics, ignoring the interpersonal relationships which often drive performance. The small number of exceptions have typically been focused at the level of the individual (e.g., Leroy and Sproull Forthcoming), system or community (e.g., Marks et al. 2005), or across levels (Mortensen et al. 2007). Notwithstanding, it remains a minimally studied domain, particularly at the level of the team.

I begin to unpack the intra-team dynamics occurring among members of a project-based team and illustrate how contextual factors may interact with intra-team behaviors like interaction and team cognition. Beyond the specific intra-team dynamics discussed in this study, these findings reinforce the need for more research on intra-team dynamics in project-based multiple-team contexts.

More broadly, this research has implications beyond project-based organizations. The notion that boundaries must be flexible and change over time to better adapt to their environment is not new (Arrow and McGrath 1995), nor is it uniquely a characteristic of project-based work. Given the increased prevalence of project-based teams – even in organizations that are not entirely project-based – membership model divergence may be a reality even for teams that are not, themselves, project-based. Furthermore, although project-based teams provide a context within which membership is increasingly complex, it is not clear that the phenomenon affects only those contexts. In light of this changing context, we must also reconsider our methodology.

**Implications for methodology**

The existence of membership model divergence and the noted contextual changes increasing its likelihood have important implications for our methods as well. A study’s methodological
approach is a key determinant of a researcher’s ability to capture and recognize existing membership model divergence or replicate it in experimental settings. In fact, study design is likely one of the reasons membership model divergence has remained largely unstudied to date. Much of our understanding of membership effects has come from social psychology experiments, which, as McGrath and colleagues noted, have been “laboratory research on ad hoc groups working for short periods of time” (2000 p. 96). In such situations, random assignment to short-term in-lab groups artificially eliminates membership model divergence. As membership model divergence is likely to be difficult to replicate in laboratory settings, the simplifying assumption of membership model alignment may be taken into account in future experimental work. In field studies team membership has often been explicitly delineated by providing respondents with membership lists they are not given the opportunity to validate (e.g., Ancona and Caldwell 1992). Lacking this validation and the comparison process it entails, such studies have been unable to uncover existing divergence in mental models. In those cases where membership has not been delineated, membership model divergence has typically gone unmeasured or has been identified as measurement or recall error. Such results may therefore arise from accurate measurement of a prevalent phenomenon with predictable and substantial effects on team performance. It is important that future field research capture members’ perceptions of a team’s composition, either directly or by allowing respondents to individually validate membership lists.

Implications for practice

Given the negative effects of membership model divergence on team processes and outcomes, at first glance it may appear that managers and members should put their efforts into reducing membership model divergence. Before jumping to that conclusion, however, we must consider that the negative effects noted may arise not from divergence – members holding different models of the team – but from their being unaware that their models differ. A focus on agreement suggests managers should seek to reduce membership model divergence, for example by increasing member exposure and information (e.g., increasing time spent on the team or promoting communication among team members). In this way, managers might work to “clarify” membership and increase alignment of team members’ membership models around a single model (e.g., that published in team
rosters or instantiated in technologies like information systems). A focus on awareness, in contrast, would encourage team members to share their differing models. While this would no doubt affect the level of membership model divergence in the team, it might also allow teams to avoid some of the negative consequences of membership model divergence. Importantly, an awareness-focused approach might allow teams to leverage as-yet unexplored potential benefits of membership model divergence, for example as a potential source of cognitive diversity and creativity. In addition, a focus on awareness reduces the significant effort and coordination required to ensure team members continue to hold the same mental model, especially amidst fluidly shifting project-based work. While the relative merits of an agreement versus an awareness approach remain empirical questions for future research, at the very least managers and members should be aware of the existence and effects of membership model divergence. Armed with that knowledge, team members may be able to assess and discount confusion or disagreement that arises from members working with differing underlying perceptions of the team.

CONCLUSION

Team membership has long been considered one of the most basic and powerful drivers of behavior, dynamics, and outcomes in teams. With this study I suggest that this may not be the case. Against the backdrop of a shift towards more broadly scoped, fluidly shifting, and structurally interdependent work, we must consider the important role of the social construction of membership and the possibility of a team’s members disagreeing on its very composition. In this study I show that membership model divergence occurs and drives important dynamics and outcomes. In so doing I address a gap in our understanding outlined by Guzzo and Dickson in their call for research “to clarify issues of inclusion and exclusion by virtue of team boundaries, how boundaries relate to effectiveness, and how the nature of boundaries might shape the effects of interventions intended to raise team performance” (1996 p. 332). This study further outlines one of the key mechanisms underlying such boundary issues, addressing Jussim’s (1991) call to heed words of Russell: “If everyday experience is not to be wholly illusory, there must be some relation between appearance and the reality behind it.” Membership model divergence provides us with an important construct that helps us to understand the complex relationship between people and their teams.
REFERENCES


### Table 1: Descriptive statistics and correlations between key variables

<table>
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<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
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<th>2</th>
<th>3</th>
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<th>5</th>
<th>6</th>
<th>7</th>
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<td>Membership Model Divergence</td>
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<tr>
<td>Member-Manager Membership Model Divergence</td>
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<td>0.53</td>
<td>0.54</td>
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<td>Team Size</td>
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<td>0.25</td>
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<td>Time Dedicated to Team</td>
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<td>-0.44</td>
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<td>*</td>
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<td>37.68</td>
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<td>-0.06</td>
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<td>*</td>
<td>0.78</td>
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</table>

* p < .05, ** p < .01

Values are standardized and membership model divergence refers to transformed measure: $2\arcsin\sqrt{P}$.
FIGURES

Figure 1: Model of relationships

Figure 2: SEM of membership model divergence

Figure 3: SEM of member-manager membership model divergence

Figure 4: SEM of membership model divergence predicting team performance
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