A metatheoretical framework of diversity in teams

Margarita Mayo
IE Business School, Spain

Maria Kakarika
NEOMA Business School, France

Charalampos Mainemelis
ALBA Graduate Business School, The American College of Greece, Greece

Nicolas Till Deuschel
IE Business School, Spain

Abstract
In the last 22 years, research on diversity in teams has been propelled by information processing and social categorization theories, and more recently, by theories of disparity/(in)justice and access to external networks. These theories stress different diversity processes, treating team diversity respectively as variety of information, as separation, as disparity, and as variety of access. We appraise this literature by identifying major problems in the way these four foundational theories are used either alone or in combination, arguing that the related theoretical models are inherently incomplete and static. In an attempt to resolve these problems, we introduce a metatheoretical framework that relates these four foundational theories according to the metadimensions of group boundary and diversity mindset. We also propose a metatheoretical model that identifies interactions among the four diversity processes and specifies diversity response patterns to team success or failure over time. Our metatheoretical approach resolves significant omissions in the literature and penetrates into the dynamic nature of team diversity in more complex, temporally sensitive and synthetic ways.

Corresponding author:
Margarita Mayo, IE Business School, Alvarez de Baena 4, Madrid 28006, Spain.
Email: margarita.mayo@ie.edu
Diversity is a highly complex phenomenon that can both enhance and disrupt team performance. Consider a hypothetical product development team at a leading manufacturer of industrial and medical products. This four-member team is composed of one mid-level female accountant, one newly hired female biomedical engineer, one established male executive vice-president (VP) of marketing and one male mid-level production manager with a degree in industrial engineering. The biomedical engineer is passionate about biomedical innovation, while the production manager is equally committed to incrementally improving the company’s existing products for the gas and oil industry. Team members have a variety of in-house connections: the biomedical engineer meets regularly with other medical staff to discuss new products, the production manager meets weekly with other industrial engineers from the manufacturing department to coordinate workflow and the VP of marketing has executive meetings to plan marketing strategies. During lunchtime, the two females get together in the office and the two males join their old-time group of friends. Top management considers medical marketing core to business growth, whereas accounting and engineering on the industrial side are perceived as less competitive functions. How can one predict the ‘effects of diversity’ in this team?

On the benefits versus the challenges of working with people different from oneself, scholars are generally divided. Attempts to organize this fragmented and contradictory literature and to explain the positive and negative effects of team diversity mainly cluster around two dominant theoretical perspectives: information processing and social categorization (Milliken and Martins, 1996; Srikanth et al., 2016; Van Knippenberg and Schippers, 2007; Williams and O’Reilly, 1998). Diversity may be an asset as ‘variety’ or an informational resource, but also a liability as ‘separation’ or a source of interpersonal conflict and intergroup biases (Harrison and Klein, 2007; Van Knippenberg et al., 2004). Beyond these two approaches, Harrison and Klein (2007) described ‘disparity’ in terms of justice/injustice, while other researchers have focused on differences in access to external networks (e.g. Li, 2013; Oh et al., 2004; Zenger and Lawrence, 1989). These four theories are (or at least claim to be) internally consistent; however, none of them can account for the full range of team diversity effects. Empirical research reflects this silo conceptualization (see meta-analysis by Van Dijk et al., 2012). But Harrison and Klein (2007: 1220) suggested that diversity types ‘are likely to co-occur within units’ and ‘may well have joint consequences for unit outcomes.’

The risk of focusing exclusively on either the benefits or the challenges of diversity is that we fail to answer the crucial question of what enables some diverse teams to use their differences to enhance team performance whereas others do not (Van Knippenberg et al., 2013). To understand diversity, we need to pay attention to interrelationships and interdependent effects on team processes and outcomes (Harrison and Klein, 2007). Unfortunately, the literature is missing guidance on how the various theoretical views may be brought together (Joshi and Roh, 2009) and lacks a metatheoretical foundation that can propel the development of a new wave of more integrated and nuanced studies.
Our purpose in this article is to address this gap by developing a metatheoretical framework of diversity in teams.

Metatheoretical approaches are particularly suitable to situations where a social phenomenon is complex and where two or more theories of it exist but their accumulated knowledge bases remain fragmented (Tsoukas, 1994). Metatheory ‘is primarily the study of theory, including the development of overarching combinations of theory’ (Wallis, 2010: 78). Metatheories clarify the assumptions, conditions, limitations, implications and contradictions associated with a set of theories (Abrams and Hogg, 2004; Wallis, 2010); or/and they unify knowledge by supplying:

...a conceptual scaffolding that is sufficiently broad to encompass all of the specific knowledge domains distinctly pertinent to the field under consideration, that can serve as a coherent framework for systematically interrelating the essential knowledge elements within and among those domains. (Anchin, 2008: 325)

Unlike mere literature reviews, metatheoretical frameworks use ‘metadimensions’ to integrate and differentiate a set of theories under a common conceptual umbrella (Wallis, 2010). For example, Tsoukas (1994) used four metadimensions (management functions, task characteristics, management roles and management control) to integrate various theories of management; Chao and Moon (2005) used three metacategories (demographic, geographic and associative) to integrate theories of culture; King et al. (2010) used two metadimensions (external attribution and intentionality) to integrate theories of organizations as social actors; and Crossan and Apaydin (2010) used three metadimensions (leadership, managerial levers and business processes) to integrate theories of innovation. In this article, we use two metadimensions, group boundary and diversity mindset, to integrate four theories of diversity in teams.

Our article is structured as follows. First, we appraise the theoretical patterns in the team diversity literature over the last two decades, arguing that the theoretical models that underpin it are inherently incomplete and static. Here, we move beyond the predominant two-theory framework of information processing and social categorization (see the categorization-elaboration model [CEM]; Van Knippenberg et al., 2004, 2013) by considering two additional theoretical perspectives, disparity/(in)justice and access to external networks. Taken together, these four foundational theories serve as conceptual building blocks to explain diversity effects on team process and performance. Second, we propose a metatheoretical framework consisting of two metadimensions – group boundary and diversity mindsets – that clarifies the similarities and differences among the four foundational theories. Third, we argue that diversity entails all the processes that these four theories describe, propose novel ways to integrate them and articulate conditions under which one theory is likely to be more fruitful than the other three, based on our analysis of group boundary types and diversity-related mindsets. Finally, we develop a metatheoretical model that integrates the four foundational theories and considers diversity response patterns to team success or failure over time. We also encourage scholars to pay more attention to status disparities in social categorization and to the role of external networks in information processing within teams – in short, to think of diversity in a more complete and dynamic way.

The fourfold framework that we propose contributes to the literature in several ways. First, it identifies the domain within which a given diversity theory is likely to account for
group processes and outcomes. Specifying a theory’s scope of reference provides useful standards against which to evaluate the assumptions underlying specific empirical studies. Furthermore, our fourfold framework points out how each of the four theoretical approaches is inherently incomplete, thus clarifying conceptual ambiguities. Second, the dominant theories in the extant team diversity literature are also too static in temporal terms. Our fully-embracing model entails temporal dimensions that encourage scholars to focus on the dynamic nature of diversity and consider various response patterns of diverse teams to positive or negative feedback over time. Third, our framework integrates different perspectives in the disconnected but increasingly important literature addressing the issue of what diverse teams are capable of achieving. By shedding light on where and when team diversity increases performance, our integrative model encourages future research to think of diversity not in a ‘one-liner’ but rather in a ‘multifaceted’ unifying way. Our pluralistic framework may sharpen researchers’ predictions and insight by providing a systematic and dynamic way to compare, integrate and empirically test alternative theories.

We define diversity as the degree to which there are differences among people within a work-team (Jackson, 1992; Van Knippenberg and Schippers, 2007; Van Knippenberg et al., 2013). Work-teams are groups that:

(a) are composed of two or more individuals, (b) exist to perform organizationally relevant tasks, (c) share one or more common goals, (d) interact socially, (e) exhibit task interdependencies (i.e. workflow, goals), (f) maintain and manage boundaries, and (g) are embedded in an organizational context that sets boundaries, and constrains the team, and influences exchanges with other units in the broader entity. (Kozlowski and Bell, 2003: 6)

We focus on teams that conduct rather complex tasks (such as project and management teams), because such teams exhibit the characteristics listed above and need to be examined pluralistically.

Four theories of diversity in teams

For our critical appraisal of theoretical patterns in the team diversity literature we first identified studies on diversity within teams published in the organizational behavior literature between 1991 and 2014. These articles were all published in leading journals in management, sociology and psychology and used ‘diversity’ and ‘diverse’ as keywords. We also used snowball sampling, adding empirical articles cited in the initial group of articles and those cited in recent meta-analyses by Joshi and Roh (2009) and Van Dijk and colleagues (2012). Our objective was not to compile an exhaustive literature review, but rather to identify (a) the foundational theories in the field, (b) empirical articles that draw on two or more of these foundational theories and (c) the resulting problems of integration. In Table 1, we summarize the four foundational theories. Below, we critically discuss first the two more established theories, social categorization and information processing, and then the two emerging theoretical approaches, disparity/(in)justice and external networks.

Social categorization (diversity as separation)

A substantial amount of team diversity research is based on social categorization and social-identity theory (Tajfel, 1981; Turner, 1987). These theories assume that individuals
Table 1. Theories of diversity in teams.

<table>
<thead>
<tr>
<th>Theory</th>
<th>Main assumptions, conditions and tenets</th>
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<tr>
<td>Social categorization</td>
<td>• At least two psychological groups exist that oppose one another within the work team in terms of values and beliefs, and represent larger social groups (e.g. male vs. female).&lt;br&gt;• These two subgroups confront each other and engage in intergroup conflict via the allocation of resources. The motive is self-esteem via positive identification with a social group.&lt;br&gt;• The outcome of interest is affect. Loyalties to the subgroup rather than the group diminish feelings of trust and cooperation.&lt;br&gt;• Limitations: selective and limited focus on sex, race and age as key drivers of conflict between subgroups; lack of attention to deep-level attributes, salience specificity and temporal dynamics of diversity.</td>
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<td>Information processing</td>
<td>• The group is relatively isolated from a larger social context.&lt;br&gt;• Team members differ in knowledge, skills and abilities, and these differences are relevant to the task at hand. Team members are aware of these differences (transactive memory) and are motivated to accomplish the task at hand.&lt;br&gt;• The outcome of interest is the performance on the task. Synergy among team members’ differences results in positive performance.&lt;br&gt;• Limitations: selective and limited focus on top management and cross-functional teams; lack of attention to faultlines and temporal dynamics of diversity.</td>
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<td>Disparity-In(justice)</td>
<td>• At least two subgroups exist within the work team whose members differ in their hierarchy and power. Team members are aware of these ‘status’ differences and experience them as inequities. The motive is getting legitimacy.&lt;br&gt;• The outcome of interest is individual members’ legitimacy and power to reduce feelings of injustice.&lt;br&gt;• Limitations: lack of attention to group norms and temporal dynamics of diversity.</td>
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<td>External networks</td>
<td>• At least another physical group exists as part of a larger social entity. Team members actively participate with the external environment via communication with non-team members. The motive is task completion as well as selling the accomplishment to the rest of the social system (e.g. product development teams).&lt;br&gt;• The outcome of interest is the quality of the final product as well as its fit within the entire system.&lt;br&gt;• Limitations: lack of attention to external group processes related to variety of access and to temporal dynamics of diversity.</td>
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define themselves against others (Barinaga, 2007) using easily observable ‘primitive generic social categories’ such as sex and race (Randel, 2002; Stangor et al., 1992). This view approaches groups as open systems, since group members identify primarily not with the work team but with a larger social group outside it. Tajfel (1981) and his associates showed that the mere cognition of belonging to a psychological group resulted in in-group favoritism and out-group discrimination (e.g. Brewer, 1979), socio-emotional
and behavioral biases that create ‘separation.’ This stream of research mostly examines differences in attitudes and beliefs derived from differences in category membership. Maximum diversity as separation refers to perfect disagreement between subgroups with different beliefs, values or attitudes (see Harrison and Klein, 2007), which significantly impair group functioning and performance. For example, the product development team described above may be polarized on whether to produce a new medical product line for patient emergency monitoring or improve the existing industrial side of the business by offering a line of products to power and water utilities.

Empirical studies typically examine diversity in race or ethnicity and sex and explain its negative effects in terms of social identification and conflicting attitudes (e.g. Ely, 1994; Tsui et al., 1992; Van der Zee et al., 2004). For example, Tsui and colleagues (1992) found that increasing demographic dissimilarity was associated with lower psychological commitment. Similarly, Jackson and colleagues (1991) found that age heterogeneity in the workgroup decreased social integration, in turn increasing the proportion of group members leaving the organization.

**Information processing (diversity as variety of information)**

In contrast, the information processing approach emphasizes that a diverse configuration of individuals provides the group with a variety of skills, perspectives and knowledge that can make it more productive (Bantel and Jackson, 1989; Homan et al., 2007; Kilduff et al., 2000; Tadmor et al., 2012; Van Knippenberg and Schippers, 2007; see also meta-analyses by Bell et al., 2011 and Horwitz and Horwitz, 2007). Maximum variety of information is present when each member has unique expertise (as in our product development team) (Harrison and Klein, 2007). The key idea is that a team that conducts complex tasks needs a large pool of cognitive resources for effective information processing, debate, problem solving and group performance (Simons et al., 1999).

Results from empirical studies generally confirm these effects. For instance, Thornburg (1991) found that educational heterogeneity increased group creativity, Somech and Drach-Zahavy (2013) found that functional heterogeneity increased group creativity, and Joshi and Roh’s (2009) meta-analysis confirmed that educational and functional diversity improved team performance. Kilduff and colleagues (2000) found that cognitive diversity differentiated successful from unsuccessful top management teams, while Olson and colleagues (2007) found that it improved decision-making indirectly through task conflict.

**Disparity/(in)justice (diversity as disparity)**

The disparity and (in)justice view predicts that increasing heterogeneity in power, status and prestige harms the team and its members. Maximum disparity occurs when one team member significantly outranks all other members in terms of a socially valued asset or desired resource (as our VP of marketing substantially outranks the others in pay and status). The resulting comparisons among team members lead to ‘internal competition, suppression of voice, reduced (quality of) communication, and interpersonal undermining’ (Harrison and Klein, 2007: 1201). Perceptions of ‘nonlegitimate’ asymmetry may
cause feelings of injustice that distract members from key tasks and impair team cohesion and performance (Greenberg, 1987).

The empirical literature confirms that status or power disparity induces a sense of relative deprivation (e.g. Deutsch, 1985) that in turn reduces collaboration and results in deviance (e.g. Siegel and Hambrick, 2005). Eisenhardt and Bourgeois’s (1988: 743) study of Top Management Team (TMT) decision-making provides a relevant example: when the CEO’s power far exceeded that of other TMT members, the CEO was likely to engage in ‘tactics for controlling and withholding information,’ while other executives in the team were likely to engage in ‘alliance and insurgency behaviors.’ More recently, Groysberg et al. (2011) found that too many Wall Street stars in a group that also had lower status members decreased its effectiveness.

External networks (diversity as variety of access)

Group members may differ not only in knowledge and skills (individual human capital) but also in social connections to actors outside the group, both within and outside the organization (social capital) (Oh et al., 2004). The ‘variety of access’ approach to diversity thus treats groups as open systems. Maximum variety of access is present when each member’s social network is unique (see Burt, 1992). A broad distribution of external ties can enhance team effectiveness (Burt, 1992; Nahapiet and Ghoshal, 1998) and creativity (Perry-Smith and Mannucci, 2015), especially for teams subject to strong external demands (e.g. boards of directors, or our product development team). Such ties provide instrumental resources (e.g. technical support, money, partnerships, projects); socio-emotional resources (e.g. social support; see Swann et al., 2009); and legitimacy (i.e. political support), because having diverse external connections, as opposed to having just lots of external connections, makes it easier to lobby, manage impressions and appear legitimate and credible to outsiders (Ancona and Caldwell, 1992a; Perry-Smith and Mannucci, 2015).

The first empirical study that approached diversity in an ‘external’ manner found that tenure similarity exerted stronger influence than age similarity on technical communication outside the group in situations where skills develop slowly (Zenger and Lawrence, 1989). More recently, in a representative study that followed the structuralist network theoretical tradition, Oh and colleagues (2004) found that teams with more relationships with leaders of other groups were more effective. Similarly, Li (2013) found that TMT diversity in social capital improved strategic behavior. Also, Venkataramani et al. (2014) recently found that teams were more likely to develop radical creative ideas when team members and team leaders had network connections to different sources of information within and outside the team.

A critique of the foundational diversity theories

Each of the above four theories is inherently incomplete and presents a static view of diversity in teams for several reasons. To begin with, diversity research on social categorization (separation) has a tendency to pre-select sex and/or race as the key drivers of conflict between subgroups and thus of team failure. Such a limited view ignores other
equally important deep-level diversity attributes such as personal attitudes (Harrison and Klein, 2007; Mayo et al., 2016). For example, Baer et al. (2008) found that demographic diversity was negatively related to team creativity in an initial task but not in a subsequent task, whereas diversity in deep-level personality traits showed complex patterns of significant effects on team creativity in the subsequent task.

The information processing (variety of information) approach, on the other hand, tends to pre-select educational or functional differences as key attributes, and therefore often fails to explicitly consider the underlying cognitive differences that improve the team’s information processing, as well as ignoring demographic characteristics. In addition, such an approach overlooks that multiple diversity attributes may coincide to form faultlines (Mayo et al., 2016) that in turn affect team performance over time. In our example, team productivity may be weakened by value differences between the relatively younger biomedical engineer and the more established industrial engineer.

Further, while the relatively new disparity/injustice approach is useful to account for diversity of status that is often found in teams, it fails to consider the extent to which team members accept those status differentials as legitimate or not. For example, in some cultures age may confer higher status, and this disparity may not have negative effects. Yet, status differentials do seem likely to influence team failure when they are not in line with group norms.

Finally, the external networks (variety of access) approach remains largely underexplored, as most studies have examined internal group processes such as communication patterns rather than external processes that provide resources, legitimacy and advice. To illustrate the latter with the product development team example, the marketing VP’s connections to members of the executive committee are essential to get legitimation and funding, while the engineers’ connections to other organizational members can bring critical intangible resources to the team, such as medical and industrial expertise.

A metatheoretical integration of four diversity theories

Awareness of these critiques, and in particular their incompleteness and static nature is evidenced by researchers’ attempts to build and test models that combine theories together. Yet, even these combined models have their limitations. Our critical examination of the extant literature revealed that any single theory is incomplete, as are existing combined theories (Table 1). There are four major problems: selection attribute bias, single attribute bias, de-contextualization of teams and neglect of change over time. First, there is a selection attribute bias especially in the way ‘separation’ and ‘variety of information’ are treated. Scholars have mainly examined gender, race and age as attributes inviting social categorization processes, or education and functional expertise in cross-functional and top management teams as attributes related to information elaboration. Second, because diversity is based on multiple attributes, understanding diversity effects requires consideration of the relative salience of social categories – the extent to which a social attribute is psychologically prominent in the minds of team members (Turner, 1987; Van Knippenberg et al., 2004). Yet, team diversity research faces problems when it comes to studying faultlines or multiple dimensions in combination (Mayo et al., 2016). Third, teams do not operate in a vacuum but rather in an organizational space where they interact to different degrees depending on the permeability of their
boundaries. Therefore, the relative importance of each theory in explaining diversity may often depend on whether the team has open or closed boundaries (external networks are important in groups with open boundaries). Yet, diversity scholars have not explicitly acknowledged this major condition. Fourth, scholars have not treated the early success or failure of a diverse team as a condition that further shapes its outcomes by leading members to think of their differences as beneficial or harmful.

We observed in the existing literature that each of the four theories (a) focuses on a different underlying diversity attribute (beliefs, information, status and external ties); (b) assumes that members share a particular diversity-related *mindset*, which varies from cooperative to adversarial; and (c) applies to teams with a particular *boundary* type, which can vary from open to closed. As Figure 1 shows, juxtaposing the two metadimensions of mindset and boundary type generates a metatheoretical framework with four quadrants. Theories in quadrants 2 and 3 view diversity as facilitating team performance through process gains, such as increased ideas and external resources, while theories in quadrants 1 and 4 view diversity as inhibiting team effectiveness through process losses such as interpersonal competition and in-/out-group conflict.

**Group boundary type**

Groups vary in the extent to which they are connected with their external environment (Marrone, 2010). Theories in quadrants 3 and 4 assume *open-boundary groups*. The sociological network view emphasizes that team members gain resources through external communication networks with outsiders. Social categorization theory assumes that each team member behaves as an ‘agent’ or ambassador of a larger social group. For example, a female team member with a strong gender identification could behave on behalf of other women in the organization, keeping the boundary of the work team psychologically open to them. In contrast, theories in quadrants 1 and 2 assume *closed-boundary groups*. Information processing theory explains the positive effects of diversity as a result of elaboration of information processes inside the team, and justice theory explains the negative effects of diversity as a function of injustice and potential conflicts of interests within the team.

The metatheoretical implication of the framework that we propose is that when the group is cognitively isolated from the outside and/or its members have high disparity in status, one can examine the effects of diversity on team effectiveness by considering information and justice theories. However, if the team is embedded in a larger social unit and/or its members have strong identifications with other social groups, then researchers also need to consider external ties and social categorization theories.

**Diversity-related mindsets**

Diversity mindsets are team members’ mental representations of their diversity and its effects on the group’s performance (see Van Knippenberg et al., 2013). *Cooperative mindsets* are typically associated with setting ideal goals (Ely and Thomas, 2001), with exploring new ideas (March, 1991) and with group norms of knowledge-sharing based on who knows what (transactive memory). In contrast, *adversarial mindsets* are associated with setting practical goals of preventing damage by exploiting existing knowledge
Figure 1. A metatheoretical framework of diversity configurations.
Cooperative mindsets harvest the benefits of diversity by creating synergy, rendering the whole greater than the sum of its parts and fostering information processing and access to external ties (see quadrants 2 and 3), whereas adversarial mindsets favor the rise of social categorization and injustice processes, feeding interpersonal tensions and intragroup conflict (see quadrants 1 and 4). Cooperative mindsets are likely to stimulate performance and creativity (Van Knippenberg et al., 2004), especially when team performance depends on the integration of diverse perspectives into a single final creative product (Harvey, 2013, 2014; Mainemelis et al., 2015), whereas adversarial mindsets are likely to disrupt team processes and performance (Van Knippenberg et al., 2013).

As is often the case in social science, empirical reality tends to relax the ideal conditions of team diversity theories, rendering any single theory largely incomplete. Most teams in organizations are not completely open or completely closed and do not have purely cooperative or purely adversarial mindsets – they may occupy a multitude of different positions in the conceptual space shown in Figure 1. Reflecting this, researchers have sought to integrate two or more theoretical perspectives in order to increase the descriptive and predictive validity of their studies. However, these studies are themselves subject to critique, as the discussion below demonstrates.

**Composite models of diversity**

The Appendix presents a table that shows 15 possible conceptual models that may explain the effects of diversity in teams. The first four sets are single-focus models. Alternatives 12 through 34, the dual-focus models, represent cases in which only two of the four theories are brought to bear on a given team. Alternatives 123 through 234 represent the four possible tri-focus models; alternative 1234, the quad-focus model. The left column of the table lists exemplary studies for some of the theoretical combinations, while the right column graphically illustrates the generic conceptual model of each composite possibility. The question marks (?) indicate theoretical combinations for which we could not find an empirical study in the literature, and thus signify additional opportunities for future research. Space limitations prevent us from providing an extensive discussion of each theoretical possibility. Instead, we present several examples of how complex models can be constructed by integrating the foundational theories of diversity, thus advancing our understanding of team diversity processes. However, dual- and tri-focus models have also limitations, which we shortly discuss in the next section before we build our quad-focus model that highlights the full range of relationships.

**Separation-information models: Interplay of social categorization and information processing theories**

The most common integration of two theoretical approaches in the team diversity literature uses both social categorization and information processing theories (e.g. Bunderson and Sutcliffe, 2002; Kirkman et al., 2013; Pelled et al., 1999; Srikanth et al., 2016; Van Knippenberg et al., 2013; see also meta-analysis by Van Dijk et al., 2012), thus approaching groups as entities with varied group boundaries and diversity mindsets. For example,
Jehn et al. (1999) found that social category diversity increased relationship conflict, while informational diversity increased task conflict. Studies of diversity faultlines – simultaneous differences in several attributes (e.g., Barkema and Shvyrykov, 2007; Homan et al., 2007; Pearsall et al., 2008; Rico et al., 2007, 2012; Van Knippenberg et al., 2011) – also inevitably examine both diversity as separation and diversity as variety of information (see the meta-analysis by Thatcher and Patel, 2011). The more sophisticated categorization-elaboration model (CEM) of diversity (Van Knippenberg et al., 2004, 2013) proposes that variety of information improves team outcomes such as innovation and decision-making, and this relationship is moderated by separation (see Appendix). That is, intergroup biases derived from social categorization and adversarial diversity mindsets disrupt the team’s in-depth elaboration of task-relevant information.

The CEM has been very useful in uncovering the conditions that moderate negative team outcomes of social categorization and foster positive effects of cognitive resources (Ely, 2004; Jackson and Joshi, 2004; Jehn and Bezrukova, 2004; Kearney and Gebert, 2009; Mitchell et al., 2011; Mohammed and Angell, 2004; Polzer et al., 2002; Van Dick et al., 2008; Wegge et al., 2008). For example, studies have found that members of diverse teams benefit more from variety of information under various specific conditions, such as common goals (Schippers et al., 2003), psychological safety (Polzer et al., 2002), need for cognition (Kearney et al., 2009), national diversity (Kirkman et al., 2013), collective team identification (Van der Vegt and Bunderson, 2005) and structural disconnections between team members (Balkundi et al., 2007). Also, managerial strategies that encourage individuals to classify others in new overarching ways may reduce categorization biases and allow better use of varied information (Rico et al., 2012).

However, the CEM has rarely explored how positive informational and negative social categorization effects may change over time (Barkema and Shvyrykov, 2007). Exceptions include Molleman et al. (2010), who studied medical teams over time, integrating social categorization and information processing theories; Watson and colleagues (1993), who found that with sufficient time to resolve group process issues, culturally diverse groups improved their cognitive performance; Baer and colleagues (2008), who found that the effect of demographic diversity on team creativity became non-significant over time; and Pelled and colleagues (1999), who found that the positive effects of functional diversity on task conflict weakened over time as members developed a common understanding of tasks. More recently, Srikanth and colleagues (2016) introduced a ‘dynamic coordination-based’ model that focuses on the timing and flow of separation and information diversity processes, as well as on the role of intervening processes such as representation gaps and coordination failures. Nevertheless, to date the dual-focus separation-information models (CEM) do not explicitly consider how over the long run, interpersonal conflicts may be resolved and common frameworks and shared task understandings may arise, so that cognitive resources and cooperative mindsets can come into play.

Separation-disparity models: Interplay of social categorization and disparity/(in)justice theories

Separation-disparity models have approached groups as entities with adversarial mindsets. For example, relational demography research illustrates how disparity can moderate
separation effects on team outcomes, as social categorization varies according to the status of team members in demographically diverse teams (Chattopadhyay, 1999; Chattopadhyay et al., 2004, 2010; Tsui et al., 1992). Chattopadhyay and colleagues (2010) found that (high-status) surgeons working with high proportions of (lower-status) nurses reported fewer accusations of incompetence and displayed less negative emotion than nurses working with high proportions of surgeons. These findings are explained by expectation states theory (Berger et al., 1977), which suggests that demographic characteristics such as gender and age are associated with status beliefs ‘imported’ from the broader society. The resulting separation can be mitigated when the relationship between the leader and team members emphasizes inclusion rather than status (Nishii and Mayer, 2009). These findings suggest that the negative effects of social categorization are likely to be intensified by injustice. However, the dual-focus separation-disparity models ignore the documented potential of diverse groups to develop cooperative mindsets over time.

Separation-access models: Interplay of social categorization and external-networks theories

Approaching groups as entities with open boundaries and varied diversity mindsets, the separation-access models largely ignore information processing and disparity dynamics. Keller (2001) found that functional diversity (in job and technical expertise) enhanced project performance by increasing external communication, but it also decreased social cohesion, as group members with different functional goals, norms and values had to work together under pressure, resulting in high job stress. Reagans and Zuckerman (2001) and Reagans et al. (2004), who used demographic diversity to signify both separation and access, found that diversity as separation reduced internal network density (group cohesion), thus reducing team performance. In contrast, increased external network range (variety of access) improved team performance. These results suggest that the positive effects of external network processes and cooperative mindsets are likely to be undermined by social categorization and its related adversarial mindsets. What is missing from the dual-focus separation-access models, however, is the effect of status on the salience of social categories. These models assume equal distribution of status within the team, and thus are unable to account for ‘real world’ processes in which status differentials may alter which social categories become salient in the minds of team members.

Information-disparity models: Interplay of information processing and disparity/(in)justice theories

Three studies have examined the interplay of information processing and disparity/(in)justice. De Dreu and West (2001) found that team innovation was linked to minority dissent, moderated by participation in decision-making. Minorities acted as the devil’s advocate, stimulating creative thinking. Groysberg and colleagues (2011) found that too many high-status individuals with overly similar expertise impaired a team’s performance. And Buyl et al. (2011) found that TMT functional diversity (indicating high variety of information) increased firm performance more when the CEO was not the founder of the firm (indicating high disparity). That is, how disparity interacts with variety of
information depends on whether the disparity involves task-related expertise (De Dreu and West, 2001; Groysberg et al., 2011) or political power (Buyt et al., 2011), giving rise to cooperative versus adversarial mindsets, respectively. The focus remains yet on the internal dynamics of the group and therefore the dual-focus information-disparity models discount external influences of social categorization and outside access. However, in groups with open boundaries such as TMTs, important external networks may influence team performance (e.g. Oh et al., 2004).

**Information-access models: Interplay of information processing and external networks theories**

The information-access models we examined in the literature focus exclusively on diversity’s positive effects on cooperative mindsets, typically ignoring the group’s potential to develop adversarial mindsets. Jointly, access to others outside the team and elaboration on varied information within the team may improve team outcomes (see Appendix). As Ancona and Caldwell (1992b) found, demographic diversity increases supervisors’ ratings of innovation by (a) improving the clarity of information and (b) increasing external communication with other groups. More recently, Miller and del Carmen Triana (2009) found that board racial diversity was positively related to both innovation and firm reputation, which in turn increased performance. The mediating effect via innovation suggests that racial diversity increases variety of information, ‘resulting in more diverse ideas, which influence innovation’ (Miller and del Carmen Triana, 2009: 778). The mediating effect via reputation suggests that racial diversity increases access to external networks, because ‘diverse board members . . . signal . . . [that they] are well equipped to understand the diverse environment in which the firm operates’ (Miller and del Carmen Triana, 2009: 775). Variety of functional backgrounds can enhance external networks, while variety of access can elicit further information, so the two kinds of team diversity influence each other directly and may strengthen cooperative mindsets. The dual-focus information-access models nevertheless overlook the potential that social categorization and disparity – both particularly prevalent in work teams – may jointly generate adversarial mindsets.

**Separation-information-disparity models: Interplay of social categorization, information processing and disparity/(in)justice theories**

To our knowledge, the only authors who have attempted to integrate separation, information and disparity perspectives are Brodbeck et al. (2011), who explain how the benefits of cooperative mindsets derived from variety of information within the team may be influenced by an interaction of separation and disparity (see Appendix), and thus adversarial mindsets. In their multilevel model, the authors propose a three-way interaction: ethnic group diversity is a source of varied information that both increases and decreases the outcome of learning, depending on individual ethnic dissimilarity and ethnic societal status. They found that the positive effects of variety of perspectives could be realized when the dysfunctional effects of social categorization and status differences were jointly overcome. The learning benefits of variety of information materialized mainly
for low-status members in high-status-dominated groups, who considered high-status members as valid sources of information. While the tri-focus separation-information-disparity models account for several team diversity processes, they remain incomplete as they do not consider the importance of the group’s access to external networks that might strengthen cooperation by bringing resources and political support.

**Information-disparity-access models: Interplay of information processing, disparity/(in)justice and external-networks theories**

Studies that integrate theories emphasizing information processing, disparity/(in)justice within the team and access to external networks are missing from the literature. The first attempt to develop such a model was a qualitative study by Ely and Thomas (2001), which identified three cultural diversity perspectives that influence how groups realize the benefits of cooperative mindsets. The integration and learning perspective, which corresponds to information processing, describes how varied information can enhance core work processes, such as learning and change. The discrimination and fairness perspective, which is related to disparity/(in)justice, supports an increased representation of traditionally underrepresented groups to ensure equality and eliminate discrimination. The access perspective focuses on how to bridge the group with its broader context, providing critical information about markets and clients. The authors found that only the integration and learning perspective could provide sustainable benefits, suggesting that the positive effects of cooperative mindsets derived from variety of information and access may be moderated by disparity and adversarial mindsets. For example, in our product development team, the established marketing EVP outranks the rest of the members and can potentially force his views on them, while lower-status members may covertly withhold their information and external-network resources. These two possibilities may of course be action and reaction, but they may also occur independently. Finally, the tri-focus information-disparity-access models neglect social-categorization effects. Based on social identification, in-group members in a work team may be biased against out-group members raising intra-group conflict.

All in all, the above-described combined models tend to be incomplete and static as each of them misses at least one fundamentally important diversity process. Thus, the incompleteness of these combined models paves the way for a more comprehensive, all-embracing model.

**Towards a quad-focus metatheoretical model of diversity in teams**

Figure 2 depicts a metatheoretical model that represents the interplay of all four theories and can be used as a general conceptual springboard for developing a larger set of more specific investigations. While this model captures all four theories, it is inevitably complex and it presents significant empirical challenges. We encourage scholars to consider all four theories in unison and to tackle the associated empirical defies in an attempt to help the four theories transcend their inherently incomplete and static nature.
Figure 2. A dynamic metatheoretical model of diversity in organizational teams.
Separation-information-disparity-access model: The full composite model

Within our full four-theory model there will be two three-way interactions in which the positive effects of diversity of information and/or access on team outcomes will be jointly moderated by diversity separation and disparity. We have argued so far that differences in values, beliefs or attitudes and associated conflicts reduce the positive influence of cooperative diversity mindsets derived from variety of information or access on team outcomes. Scholars may extend this work and explicitly consider how these reductions may intensify when members have strongly adversarial mindsets derived from a concentration of power and status in one or few members. That is, polarized values and beliefs within the team, coupled with status or power differences, may block the beneficial effects of the team’s human and social capital. In sum, our metatheoretical framework proposes complex nested inter-relationships within a single quad-focus model, in which the positive and negative effects of the diversity dimensions interact, thus enhancing theory building regarding team diversity effects over time.

Responses of diverse teams to success or failure over time

Integrating all four theoretical approaches to diversity implies a developmental approach that considers reciprocal effects over time, a critical characteristic of work-teams (McGrath, 1991). The complex temporal dynamics in teams are not only linear but also cyclical (Kozlowski et al., 1996). Even though temporal considerations have received some attention in the categorization-elaboration model (e.g. Srikanth et al., 2016), they are largely missing from disparity and external network approaches. Table 2 highlights the temporal dynamics of team diversity. This is important because over a longer period of time disparities may smooth out, and with familiarity, the group may become ready to use its extended social capital as motivation to complete the task increases.

As Figure 2 shows, at any given initial time (t1) the four basic diversity processes interact to influence future team outcomes at the subsequent time point (t2). The experience of success or failure, coupled with the diversity mindset and the type of team boundary at the time the group processes its success or failure, is likely to initiate different response patterns at the subsequent time point (t3), which may have lasting effects over longer periods of time (see Table 2).

Information/network upward spiral. As a group with a cooperative mindset receives signals of success, it attributes this success to its own ability and effort (Weiner, 1992), and its efficacy grows. Increased efficacy is likely to spark upward spirals between performance and process that amplify deviations (Lindsley et al., 1995) and foster ‘constructive engagement with team diversity’ (Van Knippenberg et al., 2013: 189). That is, as successful groups reflect jointly on how to maintain this success (Edmonson, 1999), they are likely to discuss each other’s diversity mindsets and reinforce their mental representation of teamwork (see Van Ginkel and Van Knippenberg, 2009). They will also likely facilitate the creative use of each other’s cognitive and social resources, and the initial success will attract more external connections. Thus, we may expect information upward spirals in relatively closed-boundary teams and network upward spirals in open-boundary
teams, bridging vertical and horizontal organizational lines (Oh et al., 2004; see top left quadrant of Table 2).

**Guideline 1.** Diversity theorists should explicitly consider how teams with cooperative mindsets respond to positive performance feedback over time. Teams with closed boundaries will likely initiate an information upward spiral and suppress disparities, while those with open boundaries will likely initiate a network upward spiral and suppress separation.

**Disparity/categorization downward spiral.** In contrast, early task difficulties and exposure to negative feedback can spark downward spirals in groups with adversarial mindsets (see Hackman, 1990). An initial failure may foster interpersonal dislike and feelings of injustice as members blame each other and view their diversity as a cause of their poor performance. Publicly expressing these feelings prevents learning and can eventually discourage group members from trying to perform well. Research has shown that diversity may disrupt team reflexivity (Schippers et al., 2003), which is key for learning from experience. Once a team is labeled a ‘poor performer’ it can be very difficult to develop further information, and outsiders are likely to cut their ties with a failing team. In an effort to restore high performance the most dissimilar members may decide – or be driven – to leave (Tsui et al., 1992). It is thus likely that performance failures will alter the team’s understanding of teamwork (Hackman and Wageman, 2005) and ultimately its actual composition. In closed-boundary teams, status differentials are magnified; in open-boundary teams with strong emphasis on social categorization, competition and distrust will likely increase, reducing diversity over time (see bottom right quadrant of Table 2).

**Guideline 2.** Diversity theorists should explicitly consider how teams with adversarial mindsets respond to negative performance feedback over time. Teams with closed boundaries will likely initiate a disparity downward spiral, suppressing variety of information, while teams with open boundaries will likely initiate a categorization downward spiral, suppressing variety of access.

| Team success | Closed boundary team: Information upward spiral (suppress disparity) | Open boundary team: Network upward spiral (suppress separation) (G1) |
| Team failure | Closed Boundary Team: Information diversity mindfulness (suppress disparity) | Open Boundary Team: Network diversity mindfulness (suppress separation) (G3) |

| | Closed boundary team: Disparity blindness (suppress variety of information) | Open boundary team: Categorization blindness (suppress variety of access) (G4) |

| Cooperative diversity mindset | Adversarial diversity mindset |

### Table 2. Diversity response patterns to team success and failure.
**Information/network diversity mindfulness.** When team failure is coupled with cooperative diversity mindsets, the team can reflect and learn from its failures (Van Knippenberg et al., 2013). Negative performance feedback encourages members to discuss their opportunities for change, revising their team processes and correcting past errors. In this process they will eventually become mindful about their human and social capital, with closed-boundary groups emphasizing information elaboration and open-boundary groups emphasizing access to external networks. Longitudinal studies on diverse teams show that after a period of negative outcomes, some teams recover to even outperform homogeneous teams (e.g. Watson et al., 1993; see bottom left quadrant of Table 2).

*Guideline 3. Diversity theorists should explicitly consider how teams with cooperative diversity mindsets respond to negative performance feedback over time. Teams with closed boundaries will likely become mindful of their informational resources, suppressing diversity as disparity, while teams with open boundaries will likely become mindful of their network resources, suppressing diversity as separation.*

**Disparity/categorization diversity blindness.** When a diverse team with an adversarial mindset receives signals of team success, members may begin to question their assumptions about the negative consequences of status and social category differences. The positive affect associated with unexpected success may increase cohesion in the team and make such teams blind to their differences. Closed-boundary groups may become blind to disparities, while open-boundary groups may become blind to diverse categorizations. But this blindness also occludes the advantages of their varied human and social capital. Thus, positive feedback may not be enough to help them reap the benefits of information and network variety (see top right quadrant of Table 2).

*Guideline 4. Diversity theorists should explicitly consider how teams with adversarial mindsets respond to positive performance feedback over time. Teams with closed boundaries will likely become blind to their own disparities, suppressing variety of information, while teams with open boundaries will likely become blind to their own social categories, suppressing variety of access.*

**Conclusion**

Our metatheoretical framework (Figure 1) provides a common conceptual space that highlights rather than suppresses the theoretical differences in assumptions, conditions and foci of research on work group diversity, providing useful standards against which to evaluate the assumptions underlying empirical studies. It identifies specific theoretical possibilities that have rarely been explored to date, stimulating the design of more conceptually robust studies that employ less univocal and more complex theoretical foundations.

The integrative model that we propose (Figure 2) serves as a guide for future research on the types of relationships that might hold between the four basic diversity process theories over time. Diversity scholars are increasingly including longitudinal designs, and we see real promise in research that examines nonlinear dynamic models and feedback loops from performance outcomes to team processes and composition. It may well be that these feedback loops, and the cycles they imply, differ depending on the kinds of diversity involved and on the kinds of theoretical processes or mechanisms invoked.
Accordingly, we highlight the need to treat team diversity as an outcome and identify how it gets reshaped by team performance through the development of diversity mindsets. When the feedback fits the mindset, the response to diversity is a reinforcing spiral – positive or negative. In contrast, when there is a misfit between the feedback and the mindset, the group is likely to engage in reflexive learning, which may be either blind or mindful.

Can all team diversity processes be explained by just four theories and their interplays? Turning this hypothetical question on its head, we note that our metatheoretical framework and the associated model that we propose can also stimulate more theoretical and empirical research on the limits of the explanatory power of the four theories combined. In the end, the ultimate determinant of our metatheoretical framework’s value will be researchers’ efforts to move away from single and dual toward more complex explanations, using novel moderators and mediators, and focusing on feedback loops. We hope that our parsimonious metatheoretical framework will help these scholars extend and enrich the ways they think about diversity and how diversity processes can translate into high-performance work teams.

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**Note**

1. A list of empirical articles that draw on two or more of these four single-focus theories is available from the first author.

**References**


Margarita Mayo is Professor of Organizational Behavior at IE Business School and a Fulbright Alumni of Harvard University, USA. Her research interests revolve around leadership, diversity and identity processes in organizations. Her upcoming book focuses on new approaches to authentic leadership. Her publications have appeared in the leading academic journals – including Journal of Applied Psychology, Academy of Management Journal, Academy of Management Learning & Education, Organizational Research Methods, The Leadership Quarterly, Journal of Vocational Behavior and Human Resource Management. Her work has also appeared in international media, such as Harvard Business Review, Financial Times, Forbes, The Times of India and The Globe and Mail. A research award winner at the Center for Creative Leadership, INFORMS and the Emerald
Group, she was selected as one of the world’s next generation thought leaders in the *The Next Generation Business Handbook*. Margarita has been recognized as October 2016 Thinker of the Month by Thinkers50 global management list. [Email: margarita.mayo@ie.edu]

**Maria Kakarika** is Associate Professor of Organizational Behavior at NEOMA Business School in France. Her research focuses on leadership and team diversity. Her work has been published in *Human Resource Management, Academy of Management Learning and Education, Academy of Management Best Paper Proceedings*, and cited in *Financial Times*. Maria teaches at both the MBA and the executive levels, employing innovative methods such as art workshops. She has also received several best reviewer awards from the Organizational Behavior and Diversity Divisions of the Academy of Management. [Email: maria.kakarika@neoma-bs.fr]

**Charalampos (Babis) Mainemelis** is Professor of Organizational Behavior at ALBA Graduate Business School at The American College of Greece. His research focuses on creativity. His contributions to creativity research include three original theories of creativity and timelessness, creativity and play, and creative deviance, and a recent metatheory of creative leadership. His work has appeared in *Academy of Management Review, Academy of Management Annals, Research in Organizational Behavior, Leadership Quarterly, Journal of Management Inquiry, Creativity Research Journal* and *Journal of Organizational Change Management*. He is the recipient of *Academy of Management Review’s* 2010 Best Article Award and finalist of *Academy of Management Annals’s* 2015 Best Article Award. He is a member of the Editorial Board of *Academy of Management Review* and recipient of its Outstanding Reviewer award in 2009 and 2014. [Email: bmainemelis@alba.edu.gr]

**Nicolas Till Deuschel** is a PhD Candidate at IE Business School in Madrid, Spain. His research focuses on workplace creativity of individuals, team diversity and its interactions on individual processes and regulatory focus theory adapted to the group context. With his corporate experience as a consultant at McKinsey and Company, Roland Berger and as a Vice President Group HR at Swiss Re he is especially concerned to bridge academic research to effective management practices for executives. He taught as an adjunct professor at the Grande Ecole Rennes ECS in France and frequently advises in workshops with executives and C-suites at Fortune 500 companies. [Email: tndeuschel.phd2015@student.ie.edu]
Appendix. A matrix of conceptual interactions among diversity theories.

<table>
<thead>
<tr>
<th>Conceptual Models</th>
<th>Social Categorization (CAT)</th>
<th>Information Processing (INFO)</th>
<th>Disparity / Injustice (DISP)</th>
<th>External Networks (NET)</th>
<th>Conceptual Models (Figures)</th>
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<tr>
<td>Single-focus theories</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Separation models (Tsui et al., 1992)</td>
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<td>No</td>
<td>No</td>
<td>No</td>
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<td>2. Information models (Wiersema and Bantel, 1992)</td>
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<td>No</td>
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<td>-</td>
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<td>3. Disparity models (Eisenhardt and Bourgeois, 1988)</td>
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<td>No</td>
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<tr>
<td>4. Access models (Oh, Chung and Labianca, 2006)</td>
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<td>No</td>
<td>No</td>
<td><strong>Yes</strong></td>
<td>-</td>
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<tr>
<td>Dual-focus theories</td>
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<tr>
<td>12. Separation-information models (Jehn et al., 1999)</td>
<td><strong>Yes</strong></td>
<td><strong>Yes</strong></td>
<td>No</td>
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<td>-</td>
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<td>13. Separation-disparity models (Chattopadhyay et al., 2010)</td>
<td><strong>Yes</strong></td>
<td>No</td>
<td><strong>Yes</strong></td>
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<td>14. Separation-access models (Keller, 2001)</td>
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<td>-</td>
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<td>Social categorization (CAT)</td>
<td>Information processing (INFO)</td>
<td>Disparity / in(justice) (DISP)</td>
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<tr>
<td>23. Information-disparity models (De Dreu and West, 2001)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>24. Information-access models (Miller and Triana, 2009)</td>
<td>No</td>
<td>Yes</td>
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<td>34. Disparity-access models (?)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
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</tr>
</tbody>
</table>

**Tri-focus theories**

123. Separation-information-disparity models (Brodbeck, Guillaume, and Lee, 2011) | Yes | Yes | Yes | No |                              |
124. Separation-information-access models (?) | Yes | Yes | No  | Yes |                              |
### Appendix. (Continued)

<table>
<thead>
<tr>
<th>Social categorization (CAT)</th>
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<th>Disparity / in(justice) (DISP)</th>
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**Quad-focus theories**

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![Diagram](image-url)