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Work group diversity dynamics: a novel approach to diversity research

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Introduction

Organizations worldwide are witnessing an ongoing shift from work organized around individuals to team-based work structures (Kozlowski & Bell, 2013). Work groups are emerging as the basic building blocks of organizations incorporating traits such as variety in skills and expertise which enable them to carry out complex interdependent work (Salas & Cannon-Bowers, 2000). Phenomena like globalization and demographic changes fueled the transformation of the workforce with work groups becoming increasingly diverse in organizations over the last decades, a trend which will become an important concern for the future as well (Bell, 2011). Managing work group diversity in organizations and conceptualizing diversity theory and practice became both a major challenge and a key concern for organizational behavior researchers (Harrison & Klein, 2007). As a result, various theories emerged to explain diversity, its typology and its effects on group performance (Lambert & Bell, 2013). These theories gave rise to extended research on the concept of diversity and its effects. Most of this research is primarily focused on determining simple effects of diversity on unit-level outcomes such as task performance (Williams & O'Reilly, 1998). Unfortunately, as research on the field accumulated over the years the effects of diversity on performance have been inconclusive and recent meta-analytic studies have not been very straightforward in providing concrete evidence for both the positive and negative effects of diversity (van Knippenberg & Schippers, 2007). This ambivalence in research findings gave rise to the study of more composite research models incorporating moderating and mediating variables in order to explain the effects of diversity (Jackson et al., 2003). The increasing attention to the moderators and mediators of diversity suggests the need for the development of even more complex conceptualizations of diversity, moving away from direct main effect causality and focusing on a deeper understanding of the interweaving of the group processes evolving in diverse teams (Roberson et al., 2017).

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Our work addresses this need by investigating the actual processes taking place in diverse work groups under the lens of temporality and dynamics. We argue that within diverse work groups, as group members interact in the pursuit of a given task or a goal, certain patterns of observable phenomena are evolving. We ascribe the temporal and dynamic conceptualizations of these phenomena as work group diversity dynamics. These dynamics appear in diverse work groups as a result of the different attributes of the group members and are affected by the interactions between the individuals (group members), the group itself and the context (organization). Our perspective suggests that work group diversity dynamics transform and change over time, they have a lifecycle and a varying degree of intensity and, are distinct from the group members' activities related to taskwork.

This paper makes several contributions to diversity research in organizations. First, by using a temporal and dynamic lens for studying diversity, we shift our focus from investigating the effects of the different dimensions of diversity on performance to exploring and defining the operation of a possible series of evolving phenomena that might appear in diverse work groups along with the potential facets of these phenomena. Second, we disentangle the processes which take place within diverse work groups in terms of the interactions between group members towards the pursuit of a given task. Finally, our perspective highlights the temporal and dynamic character of the concept of work group diversity, a view that seems to be uncharted in diversity literature (Srikanth et al., 2016).

In order to develop our proposition on work group diversity dynamics, we use what we have learned from previous diversity research and try to further unpack our understanding of the complexities of the diversity–outcome relationship.

In the following sections we begin by introducing the state of the art in diversity research. Based on the literature, we highlight the temporal issues documented in diversity research. Then, we focus on the processes taking place within diverse work groups and we

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build up the concept of work group diversity dynamics. Next, we provide a profile on work group diversity dynamics. Finally, we conclude by discussing some of the opportunities arising by our perspective on diversity.

Diversity research in organizational settings

Scholars have responded to the novel organizational reality of the diverse workforce with an outburst of research on diversity, generating useful insights into the outcomes of diverse work group performance (Joshi & Roh, 2009). The term diversity started to receive widespread use in the early 1990s when demographic trends became a topic of interest for those investigating workforce issues and conducting organizational research (Roberson et al., 2017). Early diversity research was guided by the study of work groups in organizations at that time and especially by the research in team composition (Mathieu et al., 2017). The later concerns how the combination of members' characteristics relates to team process and outcomes, what characteristics should be considered and what are the distributional properties of these characteristics in the work group. Such as this, diversity research was primarily focused on determining simple effects of diversity (e.g. age, gender and race) on unit-level outcomes (Williams & O'Reilly, 1998) and was expressed with the implementation of the input-process-outcome (IPO) framework (McGrath, 1984) according to which, inputs lead to processes which in turn lead to outcomes. Inputs describe antecedent factors that enable and constrain members' interactions and in early diversity research these included differences in age (Pelled, 1996), gender, race and ethnicity (Tsui et al., 1995), tenure (O'Reilly et al., 1998) and, education (Simons et al., 1999). Group processes describe members' interactions towards group accomplishment and these included communication (Smith et al., 1994) and conflict (Pelled et al., 1999) while outcomes are the results of group activity which were mostly understood as performance (Williams & O'Reilly, 1998).

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The research question has always been to identify which of the diversity facets are important and meaningful to organizations and, which of these characteristics demonstrate a sound impact on team outcomes and performance. Unfortunately, the empirical evidence that has been steadily accumulated over years of diversity research from these perspectives has shown largely mixed end results (Joshi & Roh, 2008). While many studies have found that certain aspects of diversity positively affect performance (Chatman & Flynn, 2001; Watson et al., 2002), just as many other ones have demonstrated the exact opposite (Thomas, 1999; Timmerman, 2000), while there is a considerable amount of studies reporting mixed findings (Pelled et al., 1999, Mohammed & Angell, 2003, Shemla et al., 2016). As a result, a metaphor emerged from the literature research describing diversity as a "double-edged sword" (Milliken & Martins, 1996), whereby diversity may lead simultaneously to the potential for creativity, as well as to poor performance.

In response to these contrasting results, organizational scholars have refined their theories and analyses, and their research focus has further shifted to investigate diversity with the use of models incorporating mediators and moderators in order to identify when the positive or the negative effects of diversity are more likely to prevail (Jackson et al., 1995; Schippers et al., 2003). By elaborating possible mediators and moderators of connections between work group diversity facets and group outcomes, researchers tried not only to identify when diversity maybe expected to have positive or negative effects, but also to study possible processes which may underlie the influence of diversity on work group performance (van Knippenberg & Schippers, 2007). Undeniably, this approach yielded interesting results and filled some of the gaps in understanding both the direct and indirect effects of different types of diversity on organizational performance.

However, recent reviews and meta-analyses (Stahl et al., 2010; van Dijk et al., 2012) suggest that there are still no safe and consistent research outcomes regarding the effects of

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work group diversity on performance. After almost 30 years of diversity research there seem to be no generalizable main effects of any kind of the diversity typology categories on work group outcomes and that the mechanisms and processes through which diversity is translated into individual and organizational outcomes are not yet sufficiently understood and studied (van Knippenberg & Schippers, 2007). An important issue this body of literature is bringing out, is that the various diversity typologies alone are not the only key to unlocking group outcomes and that special attention is needed to the actual simultaneous interactions and processes evolving within work groups. Scholars recognized this shortcoming in group research and advanced the standard IPO framework by introducing time as a critical factor in team functioning (Ilgen et al., 2005). The IMOI (input β mediator β output β input) framework was developed suggesting that the causal linkages may not be linear or additive, but rather nonlinear or conditional and that the mechanisms mediating work group inputs and outcomes are more temporal and dynamic in nature. A growing volume on work group research today, addresses this issue by focusing on the simultaneous, interrelated and reciprocal relationships and interactions which unfold over time in work groups and are associated with team outcomes (Mathieu et al., 2008).

Until recently, only a handful of studies applied the temporal and dynamic perspective as a lens for investigating diverse work groups, suggesting that diversity in work groups has different short and long-term effects in ways that are not fully captured by the currently dominant double-edged sword metaphor (Srikath et al., 2016; Harvey et al., 2017; Lanaj et al., 2017; Mayo et al., 2017; van Dijk et al., 2017). These studies highlight the fact that by casting a temporal and dynamic net over diversity research, the potential of revealing new insights into how work group composition and differences influence group processes and outcomes can be further developed and maximized.

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Temporal issues in diversity research

Time in the study of groups can be understood as a non-spatial continuum, in which events occur in succession from the past through the present to the future (Ancona et al., 2001). Time and change are not new concepts in diversity literature and early studies have advanced the idea that the effects of diversity may change over time (McGrath et al., 1995). Since the early days of diversity research, scholars have suggested that time plays its own role on diversity effects upon work group outcomes by carefully examining how certain patterns of diversity aspects unfold and change over time and how these patterns are linked to performance. For example, some studies suggested that the impact of demographic diversity on group social integration is weakened as group members have the opportunity to collaborate and learn more about each other (Harrison et al., 1998). Furthermore, certain facets of demographic diversity (surface vs deep-level) have been shown to respectively have a negative or positive impact on group cohesion and task performance, from the early stages of member interaction and through extended tenure (Harrison et al., 2002). In the same line of proposition, a number of studies highlighted the fact that the effects of demographic diversity on outcomes such as task cognitive performance may weaken over time (Pelled et al., 1999). Scholars usually conceptualized and implemented time in diversity research as snapshots in which a particular type of behavior is supposed to happen. They designated T1 as the given initial time in which the various diversity inputs (e.g. work group member characteristics) interact to initiate different response patterns and influence future team outcomes at subsequent time points designated as T2, T3 etc.

Such as this, diversity research examined the interactions in demographically and culturally diverse groups and how the between-group differences converged and affected group process and performance over time (Watson et al., 1993; Watson et al., 1998). Other studies investigated how differences in personality, educational background, work experience

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and especially tenure affected cooperation (Chatman & Flynn, 2001; Hobman et al., 2004) and performance of team members (Mohammed & Angell, 2003) through the passage of time. Some researchers also looked at less investigated diverse work group characteristics such as group functional heterogeneity, preference for group work, group potency, and outcome expectations as predictors of group effectiveness over time (Jung et al., 2002). A body of research focused on the types of conflict experienced by demographically diverse teams over time (Pelled, 1996) and how the emerging patterns of conflict affected other team processes (e.g. communication, competition) as well as team performance (Jehn & Mannix, 2001). Also, a number of authors implemented time in diversity research by studying the changes that are happening within the actual life cycles of teams and looking at the effects of diversity on performance during these cycles (Zellmer-Bruhn et al., 2008; Joshi & Roh, 2009; Acar, 2010). Finally, recent diversity research introduced more complex and dynamic multilevel time measurement models to record the risks to organizational life over time, due to the existence of demographic diversity within work groups (Sacco & Schmitt, 2005). Table 1 presents the studies in diversity research in which time is implemented.

[Insert Table 1 around here]

All of these studies suggest that both temporal and dynamic aspects are present within diverse work groups; what is happening while diverse work group members interact towards the achievement of a common goal or a given task demonstrates dynamic features and is bound by time. Numerous authors on work group research have noticed that the role of time in work group functioning is not properly depicted in the typical unidirectional, linear IPO framework commonly used in diversity research (Marks et al., 2001) and that researchers should examine the potential influence of time and the presence of a dynamic, curvilinear relationship between diversity and performance (Lau & Murnighan, 1998). The majority of group diversity studies to date is largely cross-sectional and captures the relationship between

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diversity and its outcomes at one point in time (Horwitz & Horwitz, 2007). Past researchers seem to assume that diversity characteristics such as work group membership and individual perceptions would remain consistent, stable and static within a work group during a study or its life cycle. By doing so, they fall short of depicting them as dynamic variables that might change over time and they miss the opportunity to capture the complex nature of the interactions and relationships among diverse work group members throughout time (Horwitz, 2005). Several scholars argue that processes in work groups can only be fully understood if their temporal dynamics are taken into account both in theory and measurement (Tannenbaum et al., 2012). The unfolding and interweave of the patterns of interactions that develop at the group level of diversity analysis over time cannot be easily predicted and by viewing diverse work groups under a dynamic system lens carries with it the implication that the relations between the individual member, the work group and the organization are multivariate, bidirectional, and nonlinear (McGrath et al., 1995). Adapting this approach can further help our understanding on the importance and impact of diversity on individuals, work groups and organizations as it unfolds over time.

From group dynamics, team processes and emergence, to work group diversity dynamics

Prior to continuing our narrative on work group diversity, we want to highlight the dynamic nature and the complexity of work groups by relying on the Complex Adaptive Systems framework (CAS) (Eidelson, 1997). When discussing teams as a CAS, literature understands groups as complex, adaptive and dynamic systems that are not static, but develop, evolve and adapt as they interact with their members (the smaller systems embedded in them) and with their organizations (the larger systems in which they are embedded) over time and operate via processes and situational demands that unfold over time (Arrow et al., 2000; McGrath et al., 1995). By introducing the dynamic systems perspective in our

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operationalization of work groups in diversity research we expand our focus from the

elements (i.e. diversity facets) and agents (i.e. group members) in the embedding system (i.e. work group, organization), to their interactions (Ilgen et al., 2005).

The idea of sharpening the focus on what is happening inside diverse work groups while they function and perform over time on the pursuit of goal achievement follows closely the development of group research. Within diverse work groups, members interact over time to perform organizationally relevant tasks and accomplish shared goals. They bring in their similarities or differences in demographics, skills, values, personality or even organizational status to exchange ideas and communicate, to collaborate, to agree or disagree, to forge interpersonal relations. The way they operate inside their groups and the way their work groups function within a broader organizational entity may change through organizational constraints and boundaries, so they have to adapt according to possible situational demands. As the individual member actions along with the group interactions unfold and change over time, they leave a footprint on members' experiences and behaviors. In diversity research most of these actions/ interactions are guided or ruled by the differences between work group members.

The way individuals and groups act and react to changing circumstances was coined as group dynamics by psychologist Kurt Lewin (1951). The term refers to the processes inside and between work groups that distinguish people working in groups from individuals and was used to highlight the importance of studying the work group as a unit, to develop theories on how work groups operate and finally to evaluate work group effects. Scholars refined this definition at a later point by describing group dynamics as the influential actions, processes, and changes that occur within and between groups and included in the definition, the scientific study of those processes as well (Forsyth, 2006). The influential actions and processes unfolding in diverse groups has been a major research topic in diversity research

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(van Knippenberg & Schippers, 2007). Typically, studies of work group diversity would document the types of diversity present in teams and then assess whether differing degrees on the types of diversity are systematically related to team processes and outcomes (Jackson & Joshi, 2011). For example, in a study by Ancona and Caldwell (1992), the varying degrees of tenure (type of diversity) were linked to innovation (performance) through communication (process).

Within the vast majority of published diversity research, the phrase group process has been used as a generic term to describe the actions, interactions and processes standing between the work group diversity and outcomes. Such as this, the term mingled a wide range of interactions like communication, conflict and cohesion on the long-term viability of the group, and became a dimension, a variable which was the precursor/ predecessor to effective group performance and upon which the various diversity characteristics have an effect and impact (Jackson et al., 2003; Jackson & Joshi, 2011; Milliken & Martins, 1996; Shemla et al., 2014; Van Knippenberg & Schippers, 2007; Williams & O'Reilly, 1998). The prevailing conceptual model in diversity research became the input-process-output model (IPO model) (McGrath, 1984), in which processes are viewed as single constructs and as mediating mechanisms linking group inputs to outputs. Inputs include any diversity characteristic (e.g. age, race, ethnicity, tenure) as antecedent factors that may influence, directly or indirectly, the work group members and the work group itself. Outputs are understood as the consequences of the work group interactions and in diversity research work group performance drew the most attention. Table 2 presents the group processes in diverse work groups as they are depicted in reviews of diversity literature.

[Insert Table 2 around here]

Scholars in group research suggested that the IPO model carries some worth noting limitations (Forsyth, 2006). While the Input-Process-Output links imply a time sequence (the

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passage of time), the IPO framework is often interpreted as a sequential one, with inputs leading to processes which in turn leading to outcomes and there is rarely a discussion of how the processes might be affected by time. Also, the IPO model seems to understate the complex interdependencies among the variables that influence work group outcomes, by suggesting a linear progression of effects proceeding from one stage to the next (I MA >P and PMA

>0). In our operationalization of the work group, we adopted the perspective that work groups are complex performance entities embedded in a multilevel system which incorporates individual, team, and organizational level elements, and where the work group interacts with internal (members) and external (organization) context in an ongoing and dynamic way (Arrow et al., 2000; Ilgen et al., 2005; Kozlowski & Bell, 2003). Work groups emerge from coordinated interdependences among their individual members and are actively engaged with their organizations in two-way interchanges. This multilevel approach recognizes that other factors may as well affect work group (inputs), the nature of the group's work activities (processes), and the variety of outcomes that result from the group's activities (outputs). Most of the diversity research seems to have overlooked possible interchanges between the multiple levels in which diverse groups interact. For example, differences in educational background, experience and cultural background (workgroup-inputs) can be combined to affect team commitment (workgroup-process) (Schipper et al., 2003), the degree of which will in turn have an effect on performance (workgroup-output). At the same time, organizational practices such as effective leadership (context-input) can possibly affect team commitment (workgroup-process) but also individual work group members' behavior (individual-input) too, which in turn can possibly weaken task conflict (workgroup-process) and improve performance (workgroup-input) (Somech, 2006). The combinations of multi-directional interactions in a multilevel system where diverse workgroups belong are boundless. By abandoning the linear progression to depict and investigate the effects of

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diversity, attention is placed to when (time), where (level), and with whom (individual, workgroup, organization) various processes become relevant or prevail within diverse work groups.

Finally, some of the constructs within the process (P) stage of the IPO model are not actually processes at all, in the sense of activities that work group members are engaged in, combining their resources to resolve (or fail to resolve) task demands (Kozlowski & Ilgen, 2006), but are rather characteristics or states of the group that emerge over time as members interact with one another. Again, this holds true in diversity research; while elaboration of task-relevant information (the group-level exchange, processing, and integration of diverse information and perspectives) which lies at the core of the positive effects of diversity (van Knippenberg et al., 2004) can be seen as an activity, task conflict (the disagreements about the work itself) emerges in diverse work groups, as members bring in differences in viewpoints, ideas and opinions to accomplish a given task (Jehn et al., 1999). This qualitative distinction or rather conception, lead scholars in group research to further define team/group processes by specifying their content in detail along with their applicable timing (Marks et al., 2001). By outlining how temporal factors impact team functioning, Marks and colleagues proposed the temporally based IPSO framework of team processes and emergent states (where S stands for states), according to which a number of critical teamwork processes occur recursively over a series of loops while emergent states vary frequently with time. Such as this, team processes are defined as members' interdependent acts that convert inputs to outcomes through cognitive, verbal and behavioral activities directed toward organizing task work to achieve collective goals, while emergent states are the constructs that characterize properties of the team that are typically dynamic in nature and vary as a function of team context, inputs, processes, and outcomes (Marks et al., 2001).

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This taxonomy can be used as a handy vantage point for addressing some of the issues associated with the processes which occur within diverse work groups and specially how these processes are related to time or might be affected by time. As it has been already discussed, numerous typologies of work group processes have been utilized in diversity research to illustrate the effects of the different aspects of diversity on outcomes. By using Marks et al. (2001) typology, a further classification of the diverse work group processes, as they have been documented in the literature, can be made; communication and cooperation for example, can be classified as team processes, through which diverse work group members concentrate on how to accomplish a given task, how to monitor the task progress, how they are coordinated within their work group and how they monitor and back up their fellow team members. It should be noted here that there are numerous typologies in group research literature classifying team work processes, each one emphasizing on different aspects of team work (how teams function) and the way these are used to direct taskwork (what these teams

are doing). For instance, communication and cooperation are two of the six distinct team processes in Tannenbaum et al. (1992) model of team effectiveness. We choose to implement Mark et al. (2001) typology in our study because we believe it indicates more potential applicability in diverse work groups. In this way, social categorization processes like intergroup bias can be seen more as emergent states. Intergroup bias is the systematic individual tendency to evaluate work group members more favorably than others and stems from behavior (discrimination), attitude (prejudice), and cognition (stereotyping) (Hewstone et al., 2002). It does not describe member interaction, so it is not a process per se but rather the product of a diverse work group member's personal experience. It is a fluid and malleable construct which can be influenced by the context; for example, organizational practices which increase the quantity and quality of intergroup contact have been shown to reduce intergroup bias (Pettigrew & Tropp, 2006). Finally, intergroup bias can serve both as a

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workgroup input to workgroup processes by disrupting the elaboration of task-relevant information (van Knippenberg et al., 2004) or as a direct outcome (reduced performance on a given task) (Williams & Reilly, 1998).

Mark and colleagues work (2001), places emergent states along with team processes in a recurring phase model where the two constructs unfold in sequenced temporal units in which the work groups perform on their path to goal accomplishment. We build on this approach to further sharpen our focus on the interactions which are taking place within diverse work groups by casting a temporal and dynamic net over them. We suggest that within diverse work groups, as group members interact in the pursuit of a given task or a goal, certain patterns of observable phenomena are evolving as a result of the different attributes of the group members. We ascribe the temporal and dynamic conceptualizations of these phenomena as work group diversity dynamics that coexist and/or unfold along with team processes and echo emergent states.

A new perspective in diversity research

We conceptualize work group diversity dynamics as recurring patterns of observable phenomena which manifest in work groups as a result of the diverse attributes of group members when these individuals interact in the pursuit of a given task or a goal. These patterns are bounded by time; they display a lifecycle by having a beginning and an end and, they develop over time. They are dynamic; their intensity varies as a function of time. They unfold in an episodic fashion and they exert and receive internal (group members) and external (context) causal forces since diverse work groups are embedded in complex and interactive multilevel systems; such as this, they can serve as inputs and outputs in between levels depending on past group member experiences (feedback and memory). Figure 1 provides the general framework where work group diversity dynamics are placed within a multilevel system. The nesting arrangement suggests that contextual factors (organization)

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affect the nature of group processes and work group diversity dynamics. In turn, the group context affects certain competencies and characteristics of members and their distributions throughout the team. The arrangement draws in terms of organization from the CAS framework (Eidelson, 1997) where multiparty systems are formed of individuals, which are nested in parties (groups) that are ultimately nested in a larger system, where they interact, generating the hierarchical organization of CAS. Outer layers (i.e., higher level factors) influence inner layers and upward influences exist as well. The dashed lines emphasize interactions within levels.

[Insert Figure 1 around here]

We conceive episodic fashion as a sequence of temporal intervals in which the work group members perform on their path towards a given goal or a task. We define episodes as temporal performance units by the end of which the outcomes serve as inputs in the form of past group member experiences (feedback and memory) within the framework where diversity work group dynamics unravel. This approach resembles Mathieu and Button's (1992) definition of episodes, which are seen as performance trials, or other distinguishable periods of time over which performance accumulates and subjects receive feedback. Within episodes, the work group diversity dynamics are building up and unfold through interactions

between all of the elements embedded in the multilevel system. We choose to conceptualize work group diversity dynamics by implementing episodes for a number of reasons; because dynamics occur over time, in order to observe them and describe any of their features, we need to apply temporal metrics. Performance units (such as goal accomplishment periods) are the existing intervals and the time windows where the dynamics appear and, the time scales used to measure them. As temporal units they represent the linear, measurable and objective time but most importantly they are also the experienced, subjective time which can be affected by the past, present and future and consequently by feedback and memory. This is

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important because individuals choose to aggregate their experiences into episodes so that they can reflect upon it and give it meaning (Schutz, 1967). By bracketing time in performance episodes, work group members may reflect easier upon what happened and, built up memory and give meaning upon their experiences, creating dependencies to future actions. Objective episode time is essential to specify when phenomena occur and develop, while episodes as subjective time units provide the means by which individuals understand work experiences given that the present is inherently bounded within the context of the past and the future (Johns, 2006).

Let us return to intergroup bias and examine it under the lens of work group diversity dynamics. As members of demographically heterogeneous work groups interact with each other, they express preferences or categorize themselves and others in terms of demographic attributes and they tend to favor fellow group members which they perceive as similar than dissimilar to the self (van Knippenberg et al., 2004). This is happening at the individual level. As diverse work group members collaborate, organize and coordinate to accomplish their given task, that is, as team processes are performed, their tendency to favor fellow group members starts to build up and they may display discrimination, prejudice and stereotyping which are all facets of intergroup bias (Hewstone et al., 2002). As intergroup bias unfolds in the group level, it exerts and receives forces to and from the group members, the team processes and the embedding context. This is evidenced for example through the appearance of low satisfaction and low commitment to the work group (Williams & O'Beirne, 1998), through the dysfunctioning of the work group (Pelled, 1996) and through the reduction of identification with the subordinate level (Hogg & Terry, 2000). The organization responds to the manifestation of intergroup bias by implementing strategies to recategorize members' conceptual representations in the work group (Gaertner et al., 1989) and to highlight a common group identity (Hornsey & Hogg, 2000). Also, as work group members interact over

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time, their perception towards fellow members may well change, as they get to spend more time together with each other (Harrison et al., 1998). At the same time, the actual interdependence, (a team process), linking groups and the group members' subsequent competitive or cooperative responses, exerts forces on the strength of intergroup bias (Brown & Abrams, 1986). As a result, the intensity and the magnitude of intergroup bias may be reduced or even muted but it may be also amplified, leading to the generation of further forces exerting pressure to all of the components of the system (Brewer & Brown, 1998); in this way intergroup bias displays some form of lifecycle and varying intensity during the temporal work group performance episodes. Figure 2 provides an example of intergroup bias during a performance episode within a multilevel system.

[Insert Figure 2 around here]

Once the outcome is produced, the experience generated as a result of the manifestation of intergroup bias becomes part of the individual and the collective group memory (Cronin et al., 2011). Such as this, it reflects the capacity of the multilevel system (individual, work group, organization) to retain the effects of intergroup bias and also, to introduce dependence, in the sense that intergroup bias as a work group diversity dynamic can evolve and interact within the embedding system in different fashion. Its future manifestation will be influenced by the prior history of the group. Also, as the work group moves to the next performance episode, intergroup bias as a work group diversity dynamic, has the potential to demonstrate a recurring influence structure, to feed upon itself. This feedback loop is influenced by the interactions across all levels in the multi system. The intensity of intergroup bias in the next performance episode can be either self-limiting for

example, because of the fact that work group members perception towards fellow members may have changed over time due to their interaction (Harrison et al., 1998) or it can be self-

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reinforcing when self-categorization is threatened or suppressed by organizational practices (Brewer & Brown, 1998).

Our definition of workgroup diversity dynamics draws from the concept of emergent phenomena as proposed in the works of Goldstein (1999), Corning (2002) and Waller et al. (2016). According to Goldstein (1999), emergence is the arising of novel and coherent structures, patterns and properties during the process of self-organization in complex systems. Emergent phenomena are conceptualized as arising in systems of interactive agents (CAS) and occurring at the macro level (group) in contrast to the micro level components out of which they arise. Peter Corning (2002) implemented the concept of synergy to limit and refine the scope of emergence by proposing that emergent phenomena are subsets of the vast and cooperative interactions that produce synergetic effects of various kinds. The synergy of interactions is associated specifically with contexts in which the constituent parts are having different properties, which are modified, reshaped or even transformed by their participation in the whole. Finally Waller and colleagues (2016) suggested that emergent team phenomena emanate from the behaviors of group members and include emergent states, behavioral patterns and structures.

Our approach is to emphasize the link of time to the patterns of observable phenomena that manifest in work groups as a result of the diverse attributes of group members. We suggest that time in the study of work group diversity dynamics can also be seen as the β -experienced time β (Roe, 2008) during performance episodes, that is the perceptual experience of all of the agents in a multilevel system that flows in a recursive manner. By studying work group diversity dynamics we actually look at what is happening in diverse work groups; the patterns of observable phenomena. Work group diversity dynamics are temporally bounded and dynamic, they have a beginning and an end designated respectively as onset and offset and they have a duration, forming a pattern of varying and

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changing intensity (Roe, 2005). Our designation of an offset does not necessarily mean that the phenomenon is not observable anymore or ceases to exist, but rather that its amplitude demonstrates a trajectory of growth or decline throughout the observation period (it can be weakened, vanished but also intensified). In this manner, intergroup bias for example, appears at some point in time (onset), has a certain course of development (amplitude-intensity) and changes over time (weakens or amplified-offset) under the forces it exerts and receives within the embedding multisystem. There can be off course more than one patterns of observable phenomena developing at the same time (e.g. intergroup bias and conflict) with different onsets, offsets and intensity as team processes unravel during the interactions within the multilevel system. This approach introduces elements of delay, persistence, growth and decline which all highlight the instability of diversity work group dynamics, a view that is overlooked in diversity research. Figure 3 illustrates the properties of work group diversity dynamics.

[Insert Figure 3 around here]

By adopting a conceptual framework which incorporates temporality and dynamism in the study of diverse work groups, a new perspective is provided: what is happening when diverse work group members collaborate, when and at what point this is happening, how long it persists, when it is dormant or activated, how it changes over time and finally, how its intensity and its pattern of development are affected by all of the elements and their interactions within the multilevel system (individuals, groups and organization).

Proposition 1

Work group diversity dynamics are recurring patterns of observable temporal and dynamic phenomena which manifest in work groups as a result of the diverse attributes of group members when these individuals interact in the pursuit of a given task or a goal.

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Profile of work group diversity dynamics

Adopting a conceptual framework which incorporates temporality and dynamism is the first step towards unraveling diversity dynamics in work groups. As diverse group members interact, they are engaged in activities and combine their resources towards organizing task work in order to achieve collective goals (Kozlowski & Ilgen, 2006). At the same time, temporal and dynamic observable phenomena are evolving as a result of the differences these individuals are bringing into their groups and such as this, work group diversity dynamics unfold and coexist with team activities. By drawing a profile on work group diversity dynamics, a useful distinction can be further made on the possible forms in which these dynamics can exist and manifest along with the team processes that take place within diverse work groups.

By integrating what we have learned from previous diversity research, we derive five distinct work group diversity dynamic profiles: structural, social, cognitive, affective and task dynamics. This categorization is used to clarify constructs that have been used extensively as processes and research variables in diversity literature (cf. Williams & O'Reilly, 1998) and also to specify their application within a multilevel system (individuals, groups and organization) where diversity manifests and studied.

Structural dynamics

Structural dynamics are related to the development and maintenance of the unification and high density of the group structure. These include faultlines, subgroups, schisms and cross categorization. Faultlines are defined as hypothetical dividing lines of varying strength that split a group into relatively homogenous subgroups based on the group members' alignment along multiple individual attributes (both visible and non-visible) (Thatcher & Patel, 2011). Subgroups are subsets of group members, which are characterized by a form or degree of interdependence that is unique when compared to that of other members (Carton &

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Cummings, 2012). A note should be made here; faultlines are hypothetical divisions based on inputs (diverse work group member attributes) and exist in respect to team composition, while actual subgroups emerge when faultlines are activated. Schisms refer to when group members decide to leave the group due to an intergroup clash on opinions and ideas (Sani & Todman, 2002). Crosscategorization refers to the accentuation or reduction of the perceived differences within subgroups compared to the differences between subgroups (Homan et al., 2010).

Social dynamics

Social dynamics in diverse work groups correspond to the group's accommodation and response to collective norms, psychological climate, customs and rituals, and are suggestive of intergroup relations while various aspects of the work are being accomplished. These include social integration, intergroup bias, group identification, group commitment, group climate and trust. Social integration reflects the attraction to the group, the satisfaction with other members of the group, and the social interaction among the group members (Smith et al., 1994). Intergroup bias refers generally to the systematic individual tendency to evaluate work group members more favorably than others and stems from behavior (discrimination), attitude (prejudice), and cognition (stereotyping) (Hewstone et al., 2002). Group identification is the individual member's identification with the work group due to the embodiment of salient aspects of the member's social identity in the group (van Knippenberg et al., 2004). Group commitment can be understood as the force that binds the individual to a course of action or the willingness to contribute to the achievement of a given task (Meyer et al., 2002). Group climate are the collective perceptions of the degree to which all members of the group are integrated into the social life of the group. (Jehn et al., 1999). Trust, is a psychological state that manifests itself in the behaviours towards others, is based on the

1 Both group identification and commitment are concepts similar to group cohesion, which is very often used in diversity research (cf. Williams & O'Reilly, 1998).

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expectations made upon behaviours of these others, and on the perceived motives and intentions in situations entailing risk for the relationship with those others (Costa et al., 2001).

Cognitive dynamics

Cognitive dynamics in diverse work groups are related to the common and collective group perception and stimuli interpretation, group knowledge acquisition and organization and, group information representation and decision making. These include knowledge/information sharing (elaboration), transactive memory, diversity mindsets and group learning. Knowledge/information sharing, exchange and elaboration is the conscious and deliberate attempts on the part of group members to collectively utilize their available informational resources, exchange work-related information, keep one another apprised of activities, and inform one another of key developments (Bunderson & Sutcliffe, 2002). Transactive memory refers to cognitive structures or knowledge representations that enable team members to organize and acquire information necessary to anticipate and execute (future) actions specific to group task (Kozlowski & Ilgen, 2006). Diversity mindsets capture members' knowledge of their team's diversity, of how this diversity might affect team processes and performance, and how diversity should be engaged (van Knippenberg et al., 2013). Group learning refers to the acquisition of knowledge, skills and performance capabilities of the group through interaction and experience based on unique individual contributions (Kozlowski & Ilgen, 2006).

Affective dynamics

Affective dynamics in diverse work groups correspond to the common group affective tone, emotional responses and expressions. These include intergroup emotional, affective or relationship conflict and group emotional intelligence. Intergroup emotional, affective or relationship conflict refers to the interpersonal affective incompatibilities among group members which may manifest as tension, antipathy and annoyance among the members in the

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group (Jehn, 1995). Group emotional intelligence, refers to the perception, identification, understanding, and management of emotion (Ashkanasy et al., 2002).

Task dynamics

Task dynamics in diverse work groups are related to the content of the tasks being performed by the group but also to the collective contribution towards group performance and performance outcomes. These include task conflict, task creativity, task outcome reflexivity and task motivation. Task conflict are the disagreements about the nature of work and the content of the task being performed as a result of differences in viewpoints, ideas and opinions (Jehn, 1995). Task creativity is the production of novel and useful ideas concerning the given task (product, services, processes and procedures) (Shin & Zhou, 2007). Task outcome reflexivity is the extent to which the group overtly reflects and communicates on the task outcome and adapts its functioning as a whole to the current or anticipated circumstances (Schippers et al., 2003). Task motivation is the initiation, choice and persistence of the tendency to exert effort on behalf of the collective towards the achievement of a given task (van Knippenberg, 2000). Table 3 presents a categorization of group processes and diversity dynamics.

Proposition 2

Diversity dynamics in work groups are conceptualized through structural, social, cognitive, affective and task related profiles.

[Insert Table 3 around here]

Discussion

Researchers in the field of OB seem to be increasingly aware of the importance to study the effects of diversity in work group outcomes. We have outlined the state of the art and the limitations in diversity research and highlighted the need for the development of more complex conceptualizations of diversity in order to advance a deeper understanding on the

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processes evolving in diverse work groups. From the earliest days of diversity research, scholars have been largely focused on the individual differences of work group members and used them as inputs and antecedents in IPO models to establish causalities to group processes and performance (Kozlowski & Ilgen, 2006). By doing so, they often neglected the temporal aspect of behavior and how it changes over time (Cronin, 2011). This is an interesting omission and only a relatively small number of empirical works have featured time as a substantive variable (e.g. Harrison et al., 1998; Harrison et al., 2002) or suggested episodic approaches in group research (Marks et al., 2001).

To answer the call for the development of more complex conceptualizations of diversity (Roberson et al., 2017), we proposed work group diversity dynamics as an alternative avenue for elucidating research focused on diverse work groups and we collapsed it eventually into five profiles drawing from key findings in previous diversity research.

By introducing the concept of diversity dynamics and the multilevel system as the content domain for diversity research, we make an important contribution and distinction in the literature on the conceptualization of the processes which take place within diverse work groups and the comprehension of the temporal and dynamic character of these processes. When we start to think of phenomena which unfold over time and are dynamic by nature, we shift our focus from the traditional perspective of β "what is diversity" to β "what happens within diverse work groups". In this way we disentangle the activities taking place within diverse work groups, we define the actual processes, we stress upon the complex interdependencies within the multilevel system where these processes unfold and finally we highlight how these processes might be affected by time and dynamism. Figure 4 illustrates proposed configurations of work group diversity dynamics.

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[Insert Figure 4 around here]

Our approach extends the opportunities for further advancing diversity research. First of all, by looking at diversity through phenomena will create a greater awareness of how variables that were previously taken as inherently stable may actually change over time. Such as this, we can start taking into account concepts such as activation, growth, intensity, delay, persistence and decline when studying the interactions within diverse work groups. When investigating intergroup bias for example, it would be interesting to examine the initial levels of stereotypes perception, its existence and causes, what triggers or activates its growth, when and how it evolves as a pattern of varying intensity, when and if it reaches a ceiling point and what forces it exerts and receives within the multilevel system it resides. Such a view has the potential of providing further theoretical and methodological contributions to our current understanding of diversity and may also expand the pallet of tools we have to intervene and suggest solutions on diversity related issues in the workplace. Figure 5 illustrates proposed configurations for comparing work group diversity dynamics within a performance episode.

[Insert Figure 5 around here]

As a next step, we may conceptualize the relationships between two or more work group diversity dynamics by linking or comparing their temporal and dynamic parameters

(e.g. onset, intensity, duration and offset), by looking at their development trajectories and by trying to identify sequential and causal dependencies. For instance, one may look into intergroup bias compared to team creativity and investigate which of the two dynamics is preceding the other in terms of onset or offset, how long the time lag between them is, which one displays higher intensity and how their upward and downward trends relate to each other. Figure 6 illustrates possible configurations for comparing work group diversity dynamics between performance episodes.

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[Insert Figure 6 around here]

Then, by studying the path dependency and the patterns of diversity dynamics within work groups, we can actually study growth trajectories in their own right, that is

idiosyncratically, and consider the special conditions applying to the singular case taking into account the special characteristics of the multilevel system it is embedded in. For example, it is not clear at all where specific group members' mental model (memory) come from, how and when they become shared and how they may affect what the group members will do in the future based on their experience. The same applies to feedback or to past group experiences which mold future behaviors. These are all points missed by traditional research and can be further clarified by implementing a temporal approach.

Finally, researchers need to realize and embrace both the temporal and dynamic character of diversity and the inherent complexity of the multilevel systems in which the work groups of today operate and function. By embracing these complexities as a novel challenge that needs to be assessed and modelled, a further opportunity to adopt the perspective that groups are constantly changing in nearly every facet of their operations over time is provided.

In conclusion, after almost 50 years of diversity research it seems that there is still much room to move forward and workgroup diversity dynamics is a concept that would help the research field to yield greater insights into the interrelationships between diversity, the individual, the work group and the organization itself.

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Table 1. Studies in diversity research in which time is implemented

Unit of measurement	Total time	No. of points
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Study Dimensionsofdiversity Groupprocesses Findings

(Time) (Units) intime(TA)

Watsonetal.,1993 Culturaldiversity Interaction, problem Week 17 4 Improvementonprocessand solving performanceandthebetween-group differencesconvergedovertime

Harrisonetal.,1998 Surface,deeplevel Socialintegration, Monthsspentinggroup 1.5 1

Theeffectsofsurface-leveldiversity

diversity jobsatisfaction, oversocialintegrationweakenedwhile

groupcohesiveness theeffectsofdeep-leveldiversity

strengthen

Watsonetal.,1998 Culturaldiversity Teamorientation, Week 16 3 Diverseteamsreportedmoreselfself-orientation orientedbehaviorsovertimeand performedbetter.

Chatman&Flynn,2001 Surface/deeplevel Cooperation Week 12 2 Cooperationimprovedovertime diversity

Harrisonetal.,2002 Surface,deeplevel Teamsocial Week 16 3 Collaborationweakenstheeffectsof diversity integration surface-leveldiversityandstrengthens

thoseofdeep-leveldiversityovertime

Jung,etal.,2002 Functionalheterogeneity Preferenceforwork Week 13 2

Individualistspaymoreattentionto

group,group identifyingdifferencesinexperiences,

potency,outcome skills,andabilitiesamonggroup

expectations1 membersthancollectivistsovertime

Mohammed&Angell,2003 Heterogeneity, Teamorientation Week 15 5 Relationshipsbetweenheterogeneity, personalitytraits personalitytraitsandperformance differedthroughtime.

Hobmanetal.,2004 Visible,informational, Workgroup Week 4 2 Negativerelationshipbetween

andvaluediversity involvement dissimilarityandworkgroup

involvementovertime

Sacco&Schmitt,2005 Demographicdiversity Turnover Week 70 11 Demographicmisfitislinkedtoturnover (sex,race,age) overtime

Zellmer-Bruhnetal.,2008 Perceivedsimilarity Conflict,information Week 14 3

Perceivedsimilarityisnegativerelatedto

sharing,subgroup subgroupformationandteam

formation effectivenessovertime

Acar,2010 Surface/deeplevel Emotionalconflict Week 14 3 Surface-leveldiversitywasnegatively

diversity linkedtoemotionalconflict,deep-level

diversitywaspositivelylinkedto

emotionalconflict

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Table 2. Group processes in diversity reviews

Study Review period No. of studies Conceptualization of diversity Group processes Outcomes

Milliken & Martins, 1996

Williams & O'Boyle & Reilly, 1998

Jackson et al., 2003

Mannix & Neale, 2005

Van Knippenberg & Schippers, 2007

Joshi & Roh, 2009

Stahl et al., 2009

Jackson & Joshi, 2011

Shemla et al., 2014

1989-1994

1958-1998

1997-2002

1973-2005

1997-2005

1992-2008

1966-2007

1996-2011

1992-2014

34 Salient/ non-observable diversity

80 Salient (Demographic: age, sex, race, tenure, education)

63 Relation-oriented and task-oriented, salient and non-observable
204 2factor (e.g. surface β↔deplevel), multifaceted

111 Salient (Demographic, functional), dispersion, diversity mindsets

43 Relation-oriented, task-oriented diversity

108 Cultural diversity

88 Relation-oriented, task-oriented diversity

31 Perceiveddiversity

Identification with the group, satisfaction, information processing, decision making, cooperation, communication, commitment, role conflict, role ambiguity, work related friction, perceiveddiscrimination, socialintegration, supervisorβ↔s affect for subordinate, innovation

Cognitive processes (Stereotyping, bias), careful analysis, better information use, conflict, communication problems, effective communication factionalism, liking, cohesiveness

Cohesion, satisfaction, commitment, communication, conflict, cooperation, intergroup bias, use of information Communication, intra/ intergroup bias, team conflict, commitment, team identification, social integration, cognitive conflict, satisfaction, cohesion, coordination

Subgroup formation, intergroup bias, common identity, relational conflict, social interaction, group identification, cooperation, trust, team communication, information processing, team reflexivity, task conflict, interdependence

Communication, intergroup bias, task and team interdependence, communication, satisfaction, commitment, cooperation, socialintegration, team identification, task and relationship conflict, team learning behaviors

Creativity, brainstorming, conflict, communication, commitment, group identity, cohesion, satisfaction, social

integration

Affective and attitudinal (cohesion, conflict, commitment, satisfaction), behavioral (communication, use of information, learning behavior)

Information exchange, collaborative decision making, satisfaction, turnover, cohesion, cooperation, intergroup bias, conflict, group involvement, group integration, team identification

Individual, group and organizational performance

Group Performance

Individual and group performance
Group performance

Group Performance

Group performance

Process losses and gains (team performance)

Group Performance

Group Performance

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Organizational context

Work group

Individual

Diversity

dynamics

Work group

outcomes

Organizational

outcomes

Processes

Same level

Between levels

Figure 1. The general framework where work group diversity dynamics are placed within a multilevel system

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recategorization

perception bias satisfaction

cooperation Feedback &

Memory

Feedback &

Memory

Episode (n) Episode (n-1) Episode (n+1)

t context group individual

Same

Between

Figure 2. Proposed example of work group diversity dynamics within a multilevel system

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Figure 3. Properties of work group diversity dynamics
 amplitude
 duration
 onset offset Min value
 Max value
 incremental discontinuous
 growth decline
 stabilization

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Table 3. Work group processes and diversity dynamics

Processes Diversity dynamics

Communication Structural
 Cooperation Faultlines
 Coordination Subgroups
 Monitoring Schisms
 Planning Cross categorization
 Task formulation Social
 Task and team interdependence Social integration
 Task ambiguity Intergroup bias

Group identification
 Group commitment
 Group climate
 Trust

Cognitive

Knowledge/ information sharing (elaboration)
 Transactive memory
 Diversity mindsets
 Group learning

Affective

Intergroup affective conflict
 Group emotional intelligence

Task

Task conflict
 Task creativity
 Task outcome reflexivity
 Task motivation

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Feedback &
 Memory
 Feedback &
 Memory
 Episode(n) Episode(n-1) Episode(n+1)
 tclimatecreativityconflictbias
 Figure4.Proposedconfigurationsofworkgroup diversitydynamics

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Feedback &
 Memory
 Feedback &
 Memory
 Episode (n) Episode (n-1) Episode (n+1)
 climate
 creativity
 conflict

bias
Min value delay
intersection
Max value
stability
growth decline
onset offset
t

Figure 5. Comparison of work group diversity dynamics parameters

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Feedback & Feedback & Feedback &
Memory Memory Memory

Episode (n)
climatecreativityconflictbiasEpisode (n+1)
biasconflictcreativityclimate

Figure 6. Configuration and comparison of work group diversity dynamics between episodes