An enhanced conceptualisation of management teams: Adaptive, self-adjusting teams that interact at multiple levels of analysis

S. Batohi

Gordon Institute of Business Sciences, University of Pretoria,
PO Box 478, Edenvale 1610, Republic of South Africa
sbatohi@gmail.com

This article highlights two themes that emerged from an in-depth multiple-case study of management teams in South African corporations that deserve closer attention in future research. First, it is shown that team composition is not static and changes adaptively in response to changing task demands. Hence, team characteristics such as maturity, or team member characteristics, including skills and competencies, need to be understood and modelled as variable rather than constant. To date, this has not been the case in the management team literature. Second, the findings highlight the prevalence and importance of within-team dynamics with particular reference to subgroup interaction. It is shown that spontaneous, informal sub-group formation is a common and constructive feature of management team functioning. This calls for a reconceptualisation of management teams to acknowledge that they are not indivisible units of analysis. Yet the very essence of the notion of a team, as consistently defined in the management literature, need not be violated or invalidated. The defining attributes of teams, including a common purpose, task interdependence among members and a shared identity may remain intact. What needs to change is our theorising about management teams, to take due cognisance of their dynamic, adaptive, self-regulating functioning in business organisations.

*To whom all correspondence should be addressed.

Introduction

Teams have been shown to be an important organisational form that allow organisations to achieve what would not otherwise be possible (West, Brodbeck & Richter, 2004). As indicated by West *et al.* (2004: 467) "The use of teams to accomplish tasks that could not otherwise be accomplished is central to our species' development." The research reported in this article seeks to advance understanding of teams by focusing on two important characteristics that have not received due attention in the literature. Specifically, this research highlights the dynamic, as opposed to stable nature of most business teams. Evidence is presented to show that rather than being relatively invariant in composition, business management teams frequently function as adaptive entities with continuous adjustments of team composition in response to changing task demands. A crucial process within such teams, particularly when faced with the challenge to innovate, is shown to be spontaneous and informal dyad or subgroup formation, with reversion to the fuller team as needed.

In the management literature, teams are hypothesised to provide benefits such as increased flexibility and creativeness, and are considered to be able to provide value because of the different perspectives and skills that the team members have (Langan-Fox *et al.*, 2001). Teams are formed for a purpose or objective and this involves the attainment of one or more outcomes, such as designing new products or determining strategic direction (Cohen & Bailey, 1997).

There are numerous definitions of teams, most of which include the following criteria: small size (Gibson & Gibbs, 2006), defined membership (Edmondson, 1999), shared responsibility for outcomes (Cohen & Bailey, 1997; Edmondson, 1999), some interdependence or relationship and common goals (Paulus, 2000), commitment to collaboration and joint accountability (Jones & Bearley, 2001), a common purpose for which they are mutually accountable (Bassett-Jones, 2005) and (some) shared accountability (Gibson & Gibbs, 2006). The key characteristics of teams are thus defined membership, a common goal, interdependence and some shared accountability for goal achievement. A business management team can thus be defined as "*a small set of people within an organisation who have a common goal and are dependent on one another to achieve that goal*".

Numerous models of team function and behaviour have been suggested in the literature. Some relate to the development of teams (Jones & Bearley, 2001; Tuckman, 1965) and others consider the manner in which inputs, context, and team characteristics interact to result in outputs from the team (Ilgen *et al.*, 2005; Mathieu, Maynard & Rapp, 2008). Various models of team development have been presented in the literature, including Tuckman's (1965) *Stages of Team Development Model* which identifies four stages of group development, and the *Team Development Matrix* of Jones and Bearley (2001) that considers task behaviour and relationship behaviour to be different dimensions in understanding team development. These

models assert that teams go through stages of development, at different paces, dependent on the team and the environment. Models such as the *Stages of Team Development Model* expect teams to move through the stages in a linear fashion, whereas other models expect teams to move though similar stages in a non-linear fashion, even reverting to stages that have been previously completed, if circumstances change (Smith, 2001). It has also been recognised that teams are not static entities; roles can change, existing members can leave and new members can join and the organisation context or environmental context could change (Cini, 2001; Ilgen *et al.*, 2005). It is therefore probable that teams move backwards and forwards through stages of development as asserted by Smith (2001). Hence team development can be conceptualised as changes to team states and team processes over a period of time, as may be needed for effective team functioning.

Ilgen *et al*. (2005) provide a useful review of the state of team research and propose an updated model for team functioning, the IMOI (Input-Mediator-Output-Input) model. The traditional approach to team functioning consisted of an Input-Process-Output (IPO) model. Ilgen *et al*. (2005), however, argue that this approach is limited when teams are understood as complex, adaptive, dynamic systems. Ilgen *et al*. (2005) indicate that it may be more than processes that impact the relationship between inputs and outputs; cognitive or affective states could also affect the outputs of a team and outputs could even affect inputs. Like many others, however, this model does not highlight the importance of the interaction that takes place within the team. Leonard and Sensiper (1998), who assert that interaction is the only manner in which team members can share knowledge, perhaps come closer to portraying the manner in which teams actually work.

Past research has identified the importance of the organisational context for the operation of teams (West, 2002). The nature of the task that the team is allocated to undertake and factors such as common goals (Ford, 1996) or shared vision (Pearce & Ensley, 2004), task interdependence (Van der Vegt & Janssen, 2003) and the routine or complex nature of the task (West *et al*., 2004), are important predictors of behaviour in teams. Leaders affect the context within which the team operates (Shalley & Gilson, 2004), can motivate or demotivate team members (Mumford, 2000), and can influence team effectiveness via cognitive, motivational, affective and coordination processes (Zaccaro, Rittman & Marks, 2001).

Various characteristics internal to the team such as the size of the team (Curral *et al*., 2001), the age of the team (Van de Ven, 1986) and the individual characteristics of the team members (Amabile, 1983) can affect the performance of a team. The processes and emergent states have a close relationship with the outcomes of the team. Emergent team states such as potency (Ilgen *et al*., 2005), trust (Bijlsam-Frankema, De Jong & Van de Bunt, 2008), psychological safety (Edmondson, Roberto & Watkins, 2003), cohesiveness (Guzzo & Dickson, 1996), social networks within and outside the team (Reagans, Zuckerman &

McEvily, 2004) and team mental models or "transactive" memory (Ilgen *et al.*, 2005) have been shown to have an influence on team outcomes. Team processes such as communication (Gibson & Gibbs, 2006), discussion and debate (Simons, Pelled & Smith, 1999), conflict (Jehn, 1996), social support (Carson, Tesluk & Marrone, 2007), reflexivity (Hirst & Mann, 2004) and conformity (Van de Ven, 1986) can directly affect processes in a team. One characteristic that has been highlighted as important by a number of authors is the differences among the team members. Information processing (Van Knippenberg & Schippers, 2007) and cognitive resource diversity theory (Horwitz, 2005) considers diversity to be valuable to teams, whereas similarity/attraction theory (Williams & O'Reilly, 1998) or social identity theory (Fay *et al*., 2006) consider individual differences to be detrimental to team outcomes.

Even though a multitude of different antecedents, mediators and moderators possibly influencing team outcomes have been investigated the manner in which teams function is not clear. In specific areas, such as the effect of diversity on team dynamics and performance, the results are often indefinite or have low effect sizes (Ancona & Caldwell, 1992; Bowers, Pharmer & Salas, 2000). Some authors suggest that this could be due to the effect of missing mediator variables (Ancona & Caldwell, 1992; Bowers *et al*., 2000; Richard *et al*., 2004). In other cases the research subjects were students and therefore it may not be possible to generalise results to real organisational teams (Bijlsam-Frankema, *et al*., 2008). Furthermore, only a few authors, such as Driver (2003) and Ely and Thomas (2001) offer in-depth insight into teams by using qualitative data to obtain a "thick description" of the operation of teams. It is clear from the literature that a deeper understanding of the interdependencies and relations within teams is required. Based on this there appears to be a need to step back, and to try to understand, again, the multitude of factors that affect the operation of real business management teams in their organisational context in order to determine whether there are any important relationships or factors that have not yet been considered in the literature on the complex relationship between team characteristics and team outcomes.

Method

This article presents the findings of research designed to provide further insights into the relationship between team composition and behavioural outcomes. The teams selected for inclusion in the study were business management teams in South African corporations. In order to obtain an "insider view" of the operation of the teams, open-ended, in-depth interviews were conducted with each of the team members. The interviews were focussed on those tasks which team members necessarily worked together on to achieve the required outcomes. Grounded theory building techniques as outlined by numerous grounded theory exponents (Charmaz, 2006; Corbin & Strauss, 2008; Glaser & Strauss, 1967) were used. Over 500 pages of interview transcripts were obtained. The data was coded, higher-order code categories were created and common themes were determined. Each team

was analysed separately first, with a multilevel focus at the individual, sub-group and full team levels of analysis, before cross-case analysis was conducted based on all teams and all levels of analysis.

Purposive selection or theoretical sampling was used as a basis for case selection. The aim was not to achieve statistical representativeness, but rather the inclusion of a broad spectrum of business management teams, from a variety of industry sectors, at different management levels, to enable meaningful themes and patterns to emerge relevant to team composition, functioning and behavioural outcomes. The objective was to allow for the detection and interpretation of theoretically important similarities and differences across diverse teams. As indicated by Corbin and Strauss (1990: 9) "the representativeness of the concepts, not of persons, is crucial." In order to ensure that only teams that met the stated definition of teams were included in the study, the team supervisors or leaders were first interviewed to ensure that common goals and task interdependence existed in the teams. Numerous prospective teams were rejected due to the members not being truly interdependent or not possessing common goals. Seven business management teams were selected, based on clear evidence that they had been set challenging and innovative tasks to perform that would demand interdependence among the members and commitment to a common purpose.

The first team investigated was the Technical Project Team, which was tasked with the creation of a product for a new market. The Core Project Team was a team tasked with the implementation of a new information technology (IT) system throughout a company that was generally resistant to change. The Project Stream Team was responsible for the implementation of the human resources component of the IT system roll-out in the same organisation. The next team was an executive management (EXCO) team with overall responsibility for a subsidiary company within a listed group of companies. The Private Company Management Team was the executive management team of a private company, which needed to innovate in order to ensure survival in harsh trading conditions. The Product Development Team was a high-level team consisting of the heads of various businesses and business units of a listed group of companies with the responsibility of creating an innovative new product for the annual product launch for one of the group companies. The Marketing Product Development Team was responsible for the creation of marketing campaigns, which were known to be novel, for its client base.

The two major themes that emerged from the study, the adaptive self-adjusting nature of teams and dyad and sub-group interaction within teams, are treated separately below from a results and discussion perspective.

Adaptive, self-adjusting nature of teams

Results

Arising from the within-case and cross-case analyses, ample evidence was found of the adaptive, self-adjusting nature of teams. Either the occupants of roles within the teams changed, or the size of the team changed to accommodate fewer or extra members. Some of these changes were temporary, whereas other changes were more permanent. Some changes consisted of the addition of consultants from outside the company; at other times additional company employees were included in the team. It was also found that these changes to the team composition were not random, but were often deliberately sought by the team members based on the requirements of the task and the available knowledge, expertise and perspectives within the team.

All but one of the teams experienced changes to their composition during the course of the projects or tasks they were required to execute. The Core Project Team, which comprised a combination of company employees and consultants tasked with a major information technology project in a consumer services organisation, indicated that *"Quite a few [changes occurred], especially on the consultant's side, but on the [the Company] side it was fairly stable all the way through."* The membership of the EXCO team and the Project Stream Team also varied, with some members being replaced. These changes did not result in any change to the roles or the size of the team, but did result in changes to role occupants, hence altering team demographics and other characteristics.

In the Product Development Team the core members remained the same, but the extended team expanded and contracted as required. One of the members of this team said that *"They're not the only players in this; there are other players in this as well. But this is the core team. But the team also, it expands and contracts as you go on."* The reason given by this team for inclusion of additional team members was the need for expertise absent in the initial team. Sometimes greater technical expertise was required, at other times financial expertise was required or resources with an implementation orientation were included in the team. The additional team members were included based on the particular requirements of the task being executed. The Private Company Management Team also varied the number of team members during the course of the study. However in this team the size of the team was reduced, to better match the requirements of the organisation. The Private Company Management Team and the EXCO Team also relied extensively on consultants for different aspects of their activities, even though the consultants were not regarded as formal members of the team. In the Private Company Management Team, which was in the process of formulating the company strategy, different consultants were utilised at different times in the formulation of the strategy and creation of schemes to improve customer acquisition and retention.

The composition of the Marketing Product Development Team also varied. However, in this case, this was based on the stage of the product development process. One of the team members indicated that *"Yes I'm part of the team at a different stage so everything starts here [pointing to a drawing] and then I jump in on that and then this becomes an even bigger team."* Here, the change to the team was similar across different tasks that the team executed and was clearly defined in the company's product development process. In some respects, the core group in the Product Development Team was similar, with the core team members taking responsibility for the initial idea generation and additional members then contributing to the refinement of the idea to make it practical to implement.

In the organisation in which the Marketing Product Development Team resided, teams were found to be completely fluid and organic, and work could even shift from one team to another during the course of the task being executed. As indicated by one of the team members: *"The brief actually went to a different team. It's one of those things that's quite organic, the whole process is quite organic, and they were briefed on it and they were having a review [soon] and we, myself and [The Art Director] who work as a team together, we happened to ask them how things were going and they were struggling, so we joined on board, just accidentally."* These additional resources eventually joined the team and took over the delivery of the product. In this organisation, not only did the membership of the team change whilst projects were being executed, but the work could even shift from team to team.

The only team that did not exhibit changes in composition during the course of the project or task it was working on was the Technical Project Team. Unlike the other teams, this was a relatively low level project team where each member had specific responsibilities as outlined in the project plan. A different phenomenon emerged in this team and organisation: employees of the company often belonged simultaneously to different teams. One of the team members indicated that, *"Teams at [the Company] are relatively loosely defined in the sense that one or more members of each team will conceivably be members of other teams too. These members will consequently get to know many other employees and hence may become aware of where the expertise in various fields resides. These references are then offered to other team members who would otherwise be unaware of this i.e. very much a word-of-mouth referral system."* This would allow the team members to have greater access to resources and expertise in the organisation, but would also have an effect on team dynamics.

The results of the team analyses indicated that it was difficult to define the boundaries of any team precisely. The composition of the teams investigated was not stable over time and was found to be dependent on the current activities and challenges of the team. The boundary of a team was found to vary even during the execution of a single team task, or in the creation of a solution to a particular business problem. The business management teams were also found to be responsible for the execution of multiple tasks, each of which involved a somewhat different set of people, simultaneously. In a related manner, team members were also found to be simultaneously members of multiple teams, thereby further reducing the delineation of team boundaries. New team members were sometimes added as a result of existing members leaving the team, but in most situations such changes were due to deliberate decisions by either the team leader or team members.

Such fluid team boundaries may have an effect on aspects of team functioning, including team development, team processes, emergent team states and the relationship between these and team outcomes. Teams were found to vary in diversity in terms of demographic, cognitive and personality variables during the course of task execution. The current team development models such as the IMOI model may need to be reconsidered. This is further complicated by the evidence that teams actively seek to find the necessary resources to assist based on the current needs and resources available within the team. The absence of clear team boundaries creates a challenge for research on the functioning and performance of business management teams.

Discussion

Of the many different models of team functioning that are described in the literature; only few of these consider changes to the composition of teams. Worchel, Coutant-Sassic and Grossman (1992) consider temporary team members and indicate that, in the so-called group productivity phase, group members actively search for temporary members who could assist the group with specific tasks and then exit the group. Ilgen *et al.* (2005) suggest an input-mediator-output-input model which states that the outputs of team processes can affect team processes and emergent states, but do not explicitly include that the team processes or outcomes could result in changes to the team composition. Mathieu *et al.* (2008) in their team effectiveness model specifically mention that outcomes, team processes and team states could affect team composition and structure. However the possible manner in which these changes to the team composition could affect the dynamics of the team is not covered in any of the theories or models of team functioning.

Little or no empirical research has contemplated the antecedents and effects of composition flexibility on the operation of teams, the implications for research or the practical effects of these changes. As indicated by Hirst (2009) research teams are often treated as stable entities for the purposes of research. Hirst (2009) studied how changes to the team membership can have an impact on the overall functioning of the group. However, even Hirst (2009) specifically researched teams where members left the team voluntarily and were then replaced, rather than teams where members were added or changed as needed for the tasks the team needed to execute. Others, such as Cini (2001), consider the effect of newcomers from the perspective of minority influence.

The adaptive, self-correcting nature of teams can be understood from the perspective of the knowledge-based view (KBV) of companies. The knowledge based view is a variation of the resource based view (RBV), with knowledge seen as the key resource for most organisations (Reinmoeller, 2004). Related to this is that a company competes through dynamic capabilities, defined as "the ability of an organisation to learn, adapt and change and renew over time" (Reinmoeller, 2004: 92). The resource based view can be extended to the level of analysis of a team. Just as companies can be considered to be a collection of resources, so too can teams. Teams would naturally attempt to enhance their competitive position and effectiveness by adapting to achieve the best possible combination of resources, including knowledge resources. This means that teams can take active decisions to retain core resources within the core team, and adapt the team composition as required for specific tasks.

One of the benefits of teams is that different team members bring different knowledge and associative structures to the group and may thus explore a fuller range of ideas and come up with better solutions to problems and tasks (Paulus, 2000). Richard and Shelor (2002) indicate that the different opinions that exist within teams would aid decision making. Teams which are more diverse could have broader perspectives and thus generate higher quality solutions (Milliken & Martins, 1996). However as seen from this study, it is possible that existing team members, depending on the task to be executed, may not have the necessary opinions or perspectives, making it important that additional, temporary team members be co-opted to assist with specific team tasks. This supports the view that teams actively seek temporary team members to fill the gaps in the knowledge or skill of the existing team members (Worchel *et al*., 1992).

It is not expected that all teams would adapt their composition. One of the factors that could have an influence on the likelihood of a team seeking new knowledge or perspectives, and therefore new team members, could be the nature of the problem faced. In this study the nature of the problem displayed a connection with whether the team composition was changed or not. Teams with less well-defined or ill-defined problems changed their composition more readily than teams with well-defined problems. Problems in organisations can range from well-defined to ill-defined (Reiter-Palmon & Illies, 2004: 234) or can be categorised as intellective tasks, which have a single correct answer, and decision-making tasks, where the objective is for the group to reach consensus on the best possible solution (Jackson, 1992). Jackson suggests that dissimilar team members could provide different perspectives that could assist in decision-making tasks. Reiter-Palmon and Illies (2004) also indicate that ill-defined problems could have competing goals and many possible solutions, none of which satisfies all goals. These types of problems may require divergent thinking with fluency, flexibility, and originality to take place in a team (Ziv & Keydar, 2009). Ill-defined problems could also require the generation of novel ideas, which in turn could require the combination and encoding of new concepts or knowledge categories (Reiter-Palmon & Illies, 2004) and could thus necessitate a greater level of knowledge creation in a team. Teams which are responsible for the execution of decision-making tasks or ill-defined problems are thus more likely to seek additional team members in order to find solutions more effectively due of the different perspectives of these team members.

In order for a team to exhibit flexibility in composition the team members would need to have the ability to draw on external knowledge sources (Austin, 2003). There would need to be both suitable resources which the team members can draw from, and sufficient autonomy in the team such that the team is able to make a decision regarding its own membership. Higher level teams are more likely to be able to recruit temporary team members because of the greater autonomy of these teams. It is possible that higher level teams would also have more ill-defined problems. The level of autonomy and the type of task could also be related to the type of team. As found in this study, lower level project teams are typically constituted and populated based on skills, experience and knowledge planned before the start of the project and finalisation of the team composition. The individual tasks or outcomes required from each team member are thus clearly defined. Even though it is possible that new team members may be required due to unexpected requirements for the project, this would be the exception rather than the rule. Other teams, at higher management levels, are mostly formed to address ill-defined problems or may be required to solve a wide variety of different problems. The type of team can be seen to be dependent on the nature of the problem. The nature of the problem thus appears to be a more important predictor of the willingness of the team to vary its composition than the type of team.

The need to recruit temporary new team members is dependent on the existing breadth and distribution of knowledge and perspectives in the team. Teams which are more homogenous cognitively would require diverse resources to execute their tasks. Teams which are more homogenous from an experience, qualifications or functional background perspective may need additional resources. One factor that appears to influence the homogeneity of a team is its maturity or longevity. As team longevity increases, teams typically become more homogenous (Van de Ven, 1986). The addition of new and temporary members to a mature team is one way in which to maintain or bolster the skills, experience and knowledge available within the team. As indicated in the *Information/Decision-making Theory of Diversity* (Milliken & Martins, 1996), diversity would help teams because of factors such as the potential for diverse teams to have broader perspectives and thus generate higher quality solutions. However, other theories of diversity, such as *social identity theory* and *similarity/attraction theory* argue that diversity could harm teams by reducing cohesiveness and communications and result in the creation of subgroups (Bassett-Jones, 2005) and affective conflict (Pelled, 1996). As seen in this study, it is possible for companies to obtain the benefits of both homogeneity and heterogeneity by

having a core team with team members who have worked together for a long period of time, complemented by temporary members as and when required. This enables organisations to benefit from the diverse knowledge and experience available in a heterogeneous team, while still enjoying benefits such as trust, mutual understanding and psychological safety (Edmondson, 1999) that are associated with mature, cohesive teams (Malhotra & Majchrzak, 2004), and the openness that occurs as a result of team development.

In order to be effective in recruiting new team members, existing team members must understand the knowledge present in the team and the location of that knowledge (Austin, 2003). This is called transactive memory. With transactive memory, the team would understand its own areas of weakness in terms of experience, knowledge and skills and would thus be able to better decide on the necessary assistance from outside the team. Transactive memory in the team could thus moderate the relationship between the type of tasks the team is required to execute and the flexibility of team composition. Teams with good transactive memory are more likely to recruit temporary new members because these teams have a clearer understanding of deficiencies in the team's knowledge, skills or perspectives. Teams with greater longevity are more likely to have greater transactive memory, and longevity could be a predictor of the propensity of teams to recruit temporary new team members. Teams may actively develop transactive memory to speed up this process, thus reducing the dependence on longevity.

Changes to team composition could be conceptualised as the creation of new short duration teams. The definitions of teams currently do not include a temporal component. For how long does a team need to exist before it can be regarded as a team? It is argued here that a team exists just as long as the group of people have a common goal and are interdependent. There can be short and long duration teams. The concept of a limited lifespan of a team is not new. Teams such as aircraft crews and project teams have a limited duration for which the team members remain together (Guzzo & Dickson, 1996). However, these teams tend to remain together for the duration of a flight or project respectively, whereas the study has shown that teams could change even during the course of a single project or task being executed by a team. Guzzo & Dickson (1996) indicate that because of the short lifespan of aircraft crew teams, training is done not to increase the performance of any specific team, but rather to make individuals more effective in whatever team they became a part of.

The flexible nature of team composition has implications for those team development models which assume that the team passes through a number of phases before reaching effectiveness. If teams can exist for short periods of time, these teams may not have sufficient time to develop, even though they may have to deliver according to the common goals within this time. New team members can also affect the emergent states in the team, including such factors as trust, psychological safety, harmony and cohesiveness. New team members would not immediately share the mental models of the other team members and would need to be integrated into the team in terms of the distribution of knowledge and perspectives. Temporary new members in teams could affect team processes and could reduce the likelihood of groupthink, reduce the pressure to conform, aid the benefits of minority influence, enhance cognitive processing and increase the level of debate in the team.

Together with the changes in team composition the knowledge and experience in the team could change dynamically. Depending on the profiles of the members added to the team the demographic profile of the team could also change. The vast majority of research with teams as a unit of analysis assumes that the team membership or composition is stable. For research into business management teams, it is crucial that the possible flexible nature of team composition be taken into consideration.

Dyad and Subgroup Interaction in teams

Results

In the within-case and cross-case analyses of teams in this study, discussion and debate, as expected, emerged as one of the most important team processes. The evidence, however, indicates that teams seldom work as a complete unit and that subgroup interactions are crucial to the operation of the team. The Private Company Management Team stated, *"... basically I speak daily with [the CEO] and then it's just him and I. I speak daily with [the COO], a lot with [the Trading Manager]. [The Customer Collaboration Executive] is out more so we don't speak too much. Not as a group, [but] we are speaking to each other all the time."* In this team, formal full team discussions did take place, but less frequently than the dyad discussions. When referring to the subgroup interactions, the Product Development Team stressed the high frequency of these interactions, *"Once again, we speak to each other the whole day, every day, this group. So, on the back of that, we are discussing these things all of the time, very, very frequently,"* and stated that the dyad discussions happened *"much more than you think".* Virtually every team investigated reported high levels of subgroup and predominantly dyad interactions.

The dyad interactions were seen as critical for the team to make progress in achieving its objectives. The team leader of the Project Development team expressed the importance of the dyad interactions in the statement: *"But without the two person interactions going on you don't make progress ... we are all busy. ... This is not our only job here. We've all got big portfolios that we're looking after. You're going to get this brainstorm session together once a week maybe. But in between that there's a lot of work that needs to be done. There are decisions that need to be made."* It was clear from this team that work needed to take place in the interval between the full team meetings, which could not take place frequently enough to complete the task on schedule.

The subgroup interactions that occurred were frequently informal and occurred as soon as one person had an idea or a thought. As indicated by the EXCO team *"If we, after the EXCO we decide to sit down and have a chat, often you get into the deeper issues outside of the meeting."* The deeper issues were often discussed outside of the formal team meetings, when not all the team members were involved. The Product Development Team supported this when they stated: *"And these discussions are not restricted to formal meetings here. A lot of this is [the Marketing Director] and I on the phone at 10 o'clock at night discussing an aspect of it [the product being developed]."* Another team member indicated that *"I find that the best ideas come in conversation and more often than not, a casual one."* The dyad and subgroup interactions that occurred often resulted in the best ideas, even though, and possibly because these were informal meetings or conversations.

In the teams studied, discrete subgroup discussions were not seen in isolation, but were part of a stream of conversations that took place during which the solutions were developed and refined. The Marketing Product Development Team said, *"So it wasn't like a group got together and plotted out exactly what it [the product] was looking like; it more 'evolved' through different conversations that took place."* In the teams with ill-defined problems, a stream of conversations or interactions took place in order to refine ideas to find an optimal solution to the problem. There were also situations, where although there was no clear solution the problem was well-defined. Here the entire team met and worked together to find an optimal solution. The subgroup interaction that was evident did not involve only members of the team, sometimes people from outside of the team were involved. The two areas of flexible team composition and subgroup interaction could thus overlap.

Team members are simultaneously individuals, as well as part of dyads and teams and belonged to the organisation as a whole. One of the team members in the Marketing Product Development team indicated that *"I'm more comfortable working alone and then sharing what I've got in a group environment."* The development of solutions to business problems was not restricted to any one level and occurred at individual, dyad, subgroup and full team level.

These dyad or subgroup interactions not only enabled the team to make progress with the task at hand, but were also found to improve the contribution from less confident and experienced team members. As stated by the EXCO team, *"... we saw the result of the informal coming out in the formal sessions, where they would stand up and would be accountable for what they were saying, whereas before they would sit back and keep quiet."* These discussions thus also helped in the development of individuals and the team as a whole. There was on the other hand evidence that subgroup interactions could be detrimental to the team. In one of the teams the female team members were generally left out of the informal discussions: *"... and basically [Female 1] goes to work and [Female 2] and [Female 3] would leave. They did not partake. It was a pity because sometimes you are getting into the real deep issues."* In this team some of the

team members also lobbied the team leader for the acceptance of their own ideas, despite the team as a whole having agreed on a different solution. The teams which were more successful with subgroup interactions were those that ensured that these discussions was taken back to the full team.

The evidence shows that not only does subgroup interaction occur more frequently than team level interaction, but that these were crucially important to the functioning of the team. Given the importance of these discussions in real business teams, it is unfortunate that business management researchers have not attempted to understand the importance and dynamics of these interactions.

Discussion

One important finding of this study was that the interaction that took place within subgroups of teams was crucial in order to make progress in creating required business solutions. The importance of interaction between team members in the form of discussion and debate is well-grounded in the extant literature (Malhotra & Majchrzak, 2004). However, very little of the past research attempts to understand subgroup or dyad interaction in teams. Gooty and Yammarino (2011) state that dyads are the least studied level of analysis in organisations. The study of dyad interaction within teams is even rarer. Considerable research does exist in a related field, namely leader-member exchange (Atwater & Carmeli, 2009; Scott & Bruce, 1994; Tsui & O'Reilly, 1989). However this research only focuses on the vertical relationship between the leader and team members, rather than between team members or subsets of the team members. Other researchers consider dyads as a unit of analysis within organisations (Gooty & Yammarino, 2011) or whether dyads exhibit similar dynamics as teams (Moreland, 2010), but not the influence of dyads on interaction in teams.

It is argued that there are two major ways in which subgroup interaction potentially affects teams. Subgroup interaction in teams could firstly have the effect of enhancing the quality of the social interaction between the team members, and secondly have the effect of improving the cognitive processing of the team as a whole.

Social effects

Discussion and debate appear to be the primary means of interaction within business management teams. However some team members may not have the confidence to suggest their ideas and opinions at full team meetings. This is especially relevant considering the flexible nature of team composition and therefore the limited time available for newcomers to adjust to the team. One reason for the occurrence of subgroup discussions in teams could be that team members feel psychologically safer in smaller groups. Psychological safety, which is defined as a "shared belief that the team is safe for interpersonal risk taking" (Edmondson, 1999: 354), is the confidence that the team

members have that there will be no negative consequences for speaking out when they have something to say (Edmondson, 1999) and where they could mention issues that have not been noticed by others (Fay *at al.*, 2006). Gilson and Shalley (2004) found a significant relationship between socialising with co-workers, during and outside work time and psychological safety. Dyads and small groups can present a less threatening environment in which to present and test ideas and opinions of team members, before suggesting the idea to the entire team. When these subgroup interactions are encouraged or condoned in teams, it is likely that the contribution from team members would be improved and that team members may also be prepared to express dissenting views more easily.

Team members are likely to have differing competence and experience levels. Subgroup interactions, which could serve as a form of social support, could build the confidence of team members to express their thoughts openly in full team meetings. Face to face interactions between team members can enhance trust in teams, which is important for knowledge sharing in organisations (DeTienne, Dyer, Hoopes & Harris, 2004). Subgroup interaction could also increase cohesion in teams and strengthen the bonds between the team members. Cohesiveness could result in higher performance in teams (Guzzo & Dickson, 1996), or higher productive capacity (Wendt, Euwema & Van Emmerik, 2009), and could result in higher levels of innovation whilst under financial constraints (Hoegl, Gibbert & Mazursky, 2008). It is likely that socialising in smaller groups may be easier and more effective than socialising in large groups, especially when some of the members are still new to the team. Evidence of this in terms of social support provided to newer and less experienced team members was found in this study.

Team cognitive processes

As suggested by Frederiksen (1984) many of the problems that we face in real life, including social, political, economic and scientific problems are ill-structured. Many problems faced by management teams are likely to be ill-defined or ill-structured. Individual team members are unlikely to have all the information required for the completion of ill-defined tasks, and communications is therefore required to transfer and diffuse knowledge so that the team can develop solutions (Chen, Chang & Hung, 2008). Cognitive stimulation can also occur when more than one person discusses a topic (Nijstad & Stroebe, 2006). Gilson and Gibson (2006) reason that knowledge sharing and learning need to take place in order for innovation to occur and that, without team interaction, the efforts and insight of individuals may be without benefit. However, what was found in this study moves beyond this; team interaction is important, but interaction between subsets of the team may be even more important for effective cognitive processing in teams. The use of subgroups and dyads can optimise the interaction and knowledge creation that takes place in teams. These are likely to result in cognitive processing benefits

that combine the benefits of group cognitive processing with individual processing.

In the past research, teams have been found to operate less effectively than anticipated. When teams do not operate at a level which matches the additive capabilities of the individual team members, it is said that either process gain or process loss occurs (Taylor & Greve, 2006). Process loss appears to be a significant effect, with research finding that individuals are more capable than teams of using diverse knowledge and experience for creative outcomes (Taylor & Greve, 2006), and that activities such as team brainstorming are often less effective than team members working individually (Paulus, 2000). One of the inefficiencies in groups is that only one person can speak at a time. Others have to wait for their turn to speak and express their ideas, and may also not be able to think effectively during this time (Nijstad, Stroebe & Lodewijkx, 2002). Keyton, Beck, and Asbury (2010) indicate that expression of ideas in a team setting is complicated as team members need to listen to others, think of their ideas, and prepare to speak at the same time. Nijstad and Stroebe (2006), however, suggest that the production blocking is not caused by limitations on the amount of time available to speak but by people not being able to express their ideas at the time they choose. Nijstad and Stroebe (2006) indicate that larger groups experience higher production blocking than smaller groups. They also indicate that in dyads the loss is minimal, which supports the findings of this study that dyad interaction is particular importantly. In this study dyad discussions were generally found to be informal and occurred shortly after the individual thought of ideas, thus overcoming the major cause of production blocking as argued by Nijstad and Stroebe whilst still retaining the benefits of having a team.

It has been argued that team members do not fully develop concepts before they express these to other team members, but rather form the ideas and concepts whilst communicating to others (Keyton *et al.*, 2010). Communication with others is thus important for the development of solutions to problems. This does not need to involve the entire team. It is argued that the greater the number of team members, the more complicated the process becomes, and that dyad interaction is an effective way of simplifying the process. The teams studied showed that in a business environment, smaller group discussions can take place much more frequently than full team meetings, thus enabling solutions to be generated more rapidly. Ideas do not need to move from individual thinking directly to full team discussion and debate, but can be tabled in subgroups for refinement prior to being tabled before the full team.

Dyad and subgroup interaction in teams is a potentially fruitful area for future research. From the evidence it is clear that in order to fully understand the interaction in teams, it is necessary to understand the most important unit of analysis, which appears to be subgroups that form spontaneously within teams. Obtaining a fuller understanding of this within-team interaction, its manner or operation, antecedents and consequences, could lead to an enhanced understanding

of business management teams, with potential benefits for practitioners and businesses using teams.

Conclusion

This study has found that teams are neither stable in composition, nor do team members always work together as a unit. The teams studied were found to exercise discretion in adapting their own composition to meet changing task demands and readily accommodated the spontaneous formation of subgroups, including dyads, to focus on tasks and sub-tasks, for the fulfilment of team goals.

To accommodate these findings, our concept of management teams needs to be expanded to include both variability in composition and internal structure and dyad and subgroup interaction. The definition of management teams as currently used in much of the literature is valid, subject to the caveat that what is considered to be a team at any moment in time may need to be reassessed. The definitions of "team" that appear in the literature generally incorporate the notions of task, outcome or purpose. Based on the findings in the current study, it is argued that the tasks that a team is required to execute, the outcomes expected of the team and the purpose of the team, influences both the optimum composition of the team at any moment in time, and also the subgroup interaction needed to facilitate the accomplishment of the common goal. Team composition and the sub-group interaction within a team are dependent on the nature of the challenges faced by the team over time, as it progresses towards its goal. This is exemplified by the following interpretive narrative, generated by the researcher in the course of case analysis, based on the findings from the Product Development Team:

An executive management team has been tasked with creating a new product for the company's annual product launch. There is no predefined expectation of the product to be developed, but there are boundaries based on the business model. A subset of the team comes up with an idea, which is then presented to the team supervisor who supports the idea but thinks that the idea is not ambitious enough, and encourages the team to develop the idea further. The team members have different roles in the organisation and thus each considers the idea from a different perspective. When an individual team member has some thought related to a facet of the idea, it is discussed, at any time and at any place with one or more other team members. At certain stages the team as a whole decides that they do not have sufficient skills and experience required to analyse and design certain facets of the idea, and thus individuals are co-opted from outside the team to assist with these areas. At times the idea is presented to the team supervisor, who is not a regular member of the team. Based on the feedback from the supervisor, the team then refines or changes facets of the idea, which involves subgroups conducting in-depth examination of different facets of the idea. The teams regularly meet as a whole to discuss the suggestions from the different subgroups, which are often partially overlapping, to ensure that the facets work together and that

the overall product is viable in the marketplace. Once the product is fairly well specified, other individuals who will be involved in the implementation of the idea become involved in discussions with the team and subsets of the team. At some stage the idea is accepted, launched and then handed over to the implementation team.

As illustrated by this excerpt and found in the study as a whole, it is proposed that an expanded conceptualisation of teams is needed. This study provides evidence of the volatility of both team membership and interaction within teams.

Most of the current definitions of a team either implicitly or explicitly include stability of membership as a defining attribute of a team. Changes to team composition as observed in this study constitute evidence of the flexibility of management team boundaries in practice. Hence when a set of people have a task to perform in pursuit of a common goal and interdependence is a condition for goal achievement, then a team can be said to exist, even though the membership does not remain constant over time and not all members are involved together at all times in all facets of task performance. Changes in team composition can be expected in response to changes in task demands over time. Less well defined tasks are more likely to give rise to changes in the initial team composition as the team progresses toward task accomplishment and requirements for particular skills, experience and perspectives emerge. This suggests the following propositions for testing:

Proposition 1a: Management teams will adapt their composition in the course of task execution in pursuit of a common goal to achieve the optimum mix of resources, in terms of skills, experience and perspectives, needed to match changing task demands.

Proposition 1b: The less well defined a team task, the more likely initial team composition will change in the course of task execution in pursuit of a common team goal.

In this study, it was found that interaction occurs within teams at multiple levels of analysis. This includes full team discussions, dyad or subgroup discussions and interaction with members from outside of the team. Subgroup interaction and discussion within teams was found to be beneficial to team functioning by enhancing social interaction in the team and leveraging cognitive processing benefits. Hence, in order to understand the operation of a team as a whole, it is essential to understand the interaction that takes place at different levels of analysis within the team. From a cognitive processing perspective, teams can benefit from cognitive processing at different levels of analysis, including individual, dyad, subgroup and full team cognitive processing as well as cognitive processing in interaction with individuals or groups from outside of the team. Neither teams nor tasks are indivisible units of analysis. Tasks in management teams can be complex and ill-defined. Many tasks or objectives of management teams consist of different phases, multiple facets or different sub-objectives, which may be best handled by subsets of the

teams or a team comprising others from outside of the team. Teams may also be too complex a system to understand without first understanding the interaction that occurs within the team. This suggests the following propositions for testing:

Proposition 2a: Subgroup interaction within a team will enhance the contribution of subgroup members to the team as a whole, and will thereby enhance the performance of the teams challenged with complex, ill-defined tasks.

Proposition 2b: Subgroup interaction within a team will enhance the cognitive processing within the team and will thereby enhance the performance of the teams challenged with complex, ill-defined tasks.

Proposition 2c: The cognitive processing within a team will shift back and forth across levels of analysis within the team, spanning individuals, dyads, larger subgroups and the full team in response to task demands, task complexity and clarity of task definition.

Future research into teams, particularly management teams in business, needs to take this dynamic adaptability of teams into account, both with regard to an understanding of the flexibility of team boundaries and the facilitation of interaction within teams at different levels of analysis.

These findings have implications for practitioners. In the case of senior management teams the adaptive self-adjusting nature of teams is likely to be commonplace. Teams at senior management level would typically have broad objectives, requiring the team to deal with varying demands in creating solutions which require a wide range of skills, knowledge and perspectives. Activities such as team building need to be restructured to shift the focus from teams and the development of teams, to the development of individuals into "team players" who can quickly join and become effective in new teams. Management also needs to create an enabling environment for the adaption of team composition. Teams need to not only understand that it is possible to supplement their resources when required, but that the organisation encourages this. The importance of subgroup interaction has practical implications for management who want to achieve optimum performance from teams. Interaction within subsets of the full team, where emerging ideas and opinions can be discussed and debated in a context of greater psychological safety, needs to be encouraged. Management would, however, need to ensure that this does not degrade into counter-productive lobbying and alliance formation for ulterior motives such as individual gain.

Certain limitations of the study have been identified. The emphasis on grounded theory building has meant that the focus was not on the testing of the theoretical insights that emerged. The results are derived from a limited number of management teams drawn from a small number of companies across a variety of business sectors in South Africa. The results thus cannot be generalised statistically to the general population of organisations. The primary data

was gathered using individual interviews rather than team level interviews. Team level interviews could have enriched the data. The researcher was the main instrument for both data collection and analysis in this research. Readers of this research should accordingly take cognisance that the researcher, as the primary research instrument, may have introduced bias, despite of the best practice processes followed to limit this.

The two concepts in teams that have been identified as a part of this study have received little formal attention in the literature. The new directions presented in this article are not intended to replace the existing theories and models in the field, which are grounded in a vast amount of empirical work. The new directions related to adaptive self-adjusting teams are expected to expand our understanding of the operation of teams, particularly business management teams, which have discretion to make decisions regarding their own composition. Understanding the nature and value of subgroup and dyad interaction within larger business management teams is expected to lead to a finer-grained understanding of the operation of teams in a business context and thus advance the understanding of business management teams. Suitable empirical testing will, if in support of the conclusions and propositions developed here, extend theory beyond a conception of teams as static in membership and unitary in functioning to a more flexible, organic perspective in which teams are understood as adaptive and self-regulating, with porous boundaries and internal interaction on multiple levels of analysis.

Acknowledgement

References

Amabile, T.M. 1983. *The social psychology of creativity*. New York: Springer-Verlag.

Ancona, D.G. & Caldwell, D.F. 1992. 'Demography and design: Predictors of new product team performance', *Organizational Science*, **3**(3): 321-41.

Atwater, L. & Carmeli, A. 2009. 'Leader-member exchange, feelings of energy, and involvement in creative work', *The Leadership Quarterly*, **20**: 264-75.

Austin, J.R. 2003. 'Transactive memory in organizational groups: The effects of content, consensus, specialization, and accuracy in group performance', *Journal of Applied Psychology*, **88**(5): 866-78.

Bassett-Jones, N. 2005. 'The paradox of diversity management, creativity and innovation', *Creativity and Innovation Management*, **14**(2): 169-75.

Bijlsam-Frankema, K., De Jong, B. & Van de Bunt, G. 2008. 'Heed, a missing link between trust, monitoring and performance in knowledge intensive teams', *The International Journal of Human Resource Management*, **19**(1): 19-40.

Bowers, C.A., Pharmer, J.A. & Salas, E. 2000. 'When member homogeneity is needed in work teams: A meta-analysis', *Small Group Research*, **31**(3): 305-27.

Carson, J.B., Tesluk, P.E. & Marrone, J.A. 2007. 'Shared leadership in teams: An investigation of antecedent conditions and performance', *Academy of Management Journal*, **50**(5): 1217-34.

Charmaz, K. 2006. *Constructing grounded theory: A practical guide though qualitative analysis*. London: Sage Publications.

Chen, M., Chang, Y. & Hung, S. 2008. 'Social capital and creativity in R&D project teams', *R&D Management*, **38**(1): 21-34.

Cini, M.A. 2001. 'Group newcomers: From disruption to innovation', *Group Facilitation*, **3**: 3-13.

Cohen, S.G. & Bailey, D.E. 1997. 'What makes teams work: Group effectiveness research from the shop floor to the executive suite', *Journal of Management*, **23**(3): 239-90.

Corbin, J. & Strauss, A. 1990. 'Grounded theory research: Procedures, canons and evaluative criteria', *Qualitative Sociology*, **13**(1): 3-21.

Corbin, J. & Strauss, A. 2008. *Basics of qualitative research: Techniques and procedures for developing grounded theory*. 3rd Edition. Los Angeles: Sage Publications.

Curral, L.A., Forrester, R.H., Dawson, J.F. & West, M.A. 2001. 'It's what you do and the way that you do it: Team task, team size, and innovation-related group processes', *European Journal of Work and Organizational Psychology*, **10**(2):187-204.

DeTienne, K.B., Dyer, G.D., Hoopes, C. & Harris, S. 2004. 'Toward a model of effective knowledge management and directions for future research: Culture, leadership and CKOs', *Journal of Leadership and Organizational Studies*, **10**(4): 26-43.

Driver, M. 2003. 'Diversity and learning in groups', *The Learning Organization*, **10**(3): 149- 166.

Edmondson, A.C. 1999. 'Psychological safety and learning behavior in work teams', *Administrative Science Quarterly*, **44**: 350-83.

Edmondson, A.C., Roberto, M.A. & Watkins, M.D. 2003. 'A dynamic model of top management team effectiveness:

Managing unstructured task streams', *The Leadership Quarterly*, **14**: 297-325.

Ely, R.J. & Thomas, D.A. 2001. 'Cultural diversity at work: The effects of diversity perspective on work group processes and outcomes', *Administrative Science Quarterly*, **46**(2): 229-73.

Fay, D., Borrill, C., Amir, Z., Haward, R. & West, M.A. 2006. 'Getting the most out of multidisciplinary teams: A multi-sample study of team innovation in health care', *Journal of Occupational and Organizational Psychology*, **76**: 553-67.

Ford, C.M. 1996. 'A theory of individual creative action in multiple social domains', *Academy of Management Review*, **21**(4): 1112-42.

Frederiksen, N. 1984. 'Implication of cognitive theory for instruction in problem solving', *Review of Educational Research*, **54**: 363-407.

Gibson, C.B. & Gibbs, J.L. 2006. 'Unpacking the concept of virtuality: The effects of geographic Dispersion, electronic dependence, dynamic structure, and national diversity on team innovation', *Administrative Science Quarterly*, **51**: 451-95.

Gilson, L.L. & Shalley, C.E. 2004. 'A little creativity goes a long way: An examination of teams' engagement in creative process', *Journal of Management*, **30**(4): 453-70.

Glaser, B.G. & Strauss, A.L. 1967. *The discovery of grounded theory: Strategies for qualitative research*. New Brunswick: Aldine Transaction.

Gooty, J. & Yammarino, F.J. 2011. 'Dyads in organizational research: Conceptual issues and multi-level analyses', *Organizational Research Methods*, **14**(3): 456-83.

Guzzo, R.A. & Dickson, M.W. 1996. 'Teams in organizations: Recent research on performance and effectiveness', *Annual Review of Psychology*, **47**: 307-38.

Hirst, G. 2009. 'Effects of membership change on open discussion and team performance: The moderating role of team tenure', *European Journal of Work and Organizational Psychology*, **18**(2): 231-49.

Hirst, G. & Mann, L. 2004. 'A model of R&D leadership and team communication: The relation with project performance', *R&D Management*, **34**(2): 147-60.

Hoegl, M., Gibbert, M. & Mazursky, D. 2008. 'Financial constraints in innovation projects: When less is more?', *Research Policy*, **37**: 1382-91.

Horwitz, S.K. 2005. 'The compositional impact of team diversity on performance: Theoretical considerations', *Human Resource Development Review*, **4**(2): 219-45.

Ilgen, D.R., Hollenbeck, J.R., Johnson, M. & Jundt, D. 2005. 'Teams in organizations: From input-process-output models to IMOI models', *Annual Review of Psychology*, **56**(1): 517-34.

Jackson, S.E., 1992. 'Team composition in organizational settings: Issues in managing an increasingly diverse workforce'. In Worchel, S., Wood, W. & Simpson, A. J., *Group process and productivity*. London: Sage Publications. P.p.138-73.

Jehn, K.A. 1996. 'A multimethod examination of the benefits and detriments of intragroup conflict', *Administrative Science Quarterly*, **40**(2): 256-82.

Jones, J.E. & Bearley, W.L. 2001. 'Facilitating team development: A view from the field', *Group Facilitation*, **3**: 56-65.

Keyton, J., Beck, S.J. & Asbury, M.B. 2010. 'Macrocognition: A communications perspective', *Theoretical Issues in Ergonomics Science*, **11**(4): 272-86.

Langan-Fox, J., Wirth, A., Code, S., Langfield-Smith, K. & Wirth, A. 2001. 'Analyzing shared and team mental models', *International Journal of Industrial Ergonomics*, **28**: 99-112.

Leonard, D. & Sensiper, S. 1998. 'The role of tacit knowledge in group innovation', *California Management Review*, **40**(2): 112-31.

Malhotra, A. & Majchrzak, A. 2004. 'Enabling knowledge creation in far-flung teams: Best practices for IT support and knowledge sharing', *Journal of Knowledge Management*, **8**(4): 75-88.

Mathieu, J.E., Maynard, M.T. & Rapp, T. 2008. 'Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future', *Journal of Management*, **34**(3): 410-76.

Milliken, F.J. & Martins, L.L. 1996. 'Searching for common threads: Understanding the multiple effects of diversity on organizational groups', *Academy of Management Review*, **21**(2): 402-33.

Moreland, R.L. 2010. 'Are dyads really groups?', *Small Group Research*, **41**(2): 251-67.

Mumford, M.D. 2000. 'Managing creative people: Strategies and tactics for innovation', *Human Resource Management Review*, **10**(3): 313-51.

Nijstad, B.A. & Stroebe, W. 2006. 'How the group affects the mind: A cognitive model of idea generation in groups', *Personality and Social Psychology Review*, **10**(3): 186-213.

Nijstad, B.A., Stroebe, W. & Lodewijkx, H.F.M. 2002. 'Cognitive stimulation and interference in groups: Exposure effects in an idea generation task', *Journal of Experimental Social Psychology*, **38**: 535-44.

Paulus, P.B. 2000. 'Groups, teams and creativity: The creative potential of idea-generating groups', *Applied Psychology: An International Review*, **49**(2): 237-62.

Pearce, C.L. & Ensley, M.D. 2004. 'A reciprocal and longitudinal investigation of the innovation process: The central role of shared vision in product and process innovation teams (PPITs)', *Journal of Organizational Behavior*, **25**: 259-78.

Pelled, L.H. 1996. 'Demographic diversity, conflict, and work group outcomes: An intervening process theory', *Organizational Science*, **7**(6): 615-31.

Reagans, R., Zuckerman, E. & McEvily, B. 2004. 'How to make the team: Social networks vs. demography as criteria for designing effective teams', *Administrative Science Quarterly*, **49**:101-33.

Reinmoeller, P. 2004. 'The knowledge based view of the firm and upper echelon theory: Exploring the agency of TMT', *International Journal of Learning and Intellectual Capital*, **1**(1): 91-104.

Reiter-Palmon, R. & Illies, J.J. 2004. 'Leadership and creativity: Understanding leadership from a creative problem-solving perspective', *The Leadership Quarterly*, **15**: 55-77.

Richard, O.C., Barnett, T., Sean, D. & Chadwick, K. 2004. 'Cultural diversity in management, firm performance, and the moderating role of entrepreneurial orientation dimensions', *Academy of Management Journal*, **47**(2): 255-66.

Richard, O.C. & Shelor, R.M. 2002. 'Linking top management team age heterogeneity to firm performance: Juxtaposing two mid-range theories', *International Journal of Human Resource Management*, **13**(6): 958-974.

Scott, S.G. & Bruce, R.A. 1994. 'Determinants of innovative behaviour: A path model of individual innovation in the workplace', *Academy of Management Journal*, **37**(3): 580-607.

Shalley, C.E. & Gilson, L.L. 2004. 'What leaders need to know: A review of social and contextual factors that can foster or hinder creativity', *The Leadership Quarterly*, **15**: 33-53.

Simons, T., Pelled, L.H. & Smith, K.A. 1999. 'Making use of difference: Diversity, debate, and decision comprehensiveness in top management teams', *Academy of Management Journal*, **42**(6): 662-73.

Smith, G. 2001. 'Group development: A review of the literature and a commentary on future research directions', *Group Facilitation*, **3**: 14-44.

Taylor, A. & Greve, H.R. 2006. 'Superman or the fantastic four? Knowledge combination and experience in innovative teams', *Academy of Management Review*, **49**(4): 723-40.

Tsui, A.S. & O'Reilly, C.A. 1989. 'Beyond simple demographic effects: The importance of relational demography in superior subordinate dyads', *Academy of Management Journal*, **32**(2): 402-23.

Tuckman, B.W. 1965. 'Development sequence in small groups', *Psychological Bulletin*, **63**(6): 384-99.

Van de Ven, A.H. 1986. 'Central problems in the management of innovation', *Management Science*, **32**(5): 590-607.

Van der Vegt, G.S. & Janssen, O. 2003. 'Joint impact of interdependence and group diversity on innovation', *Journal of Management*, **29**(5): 729-51.

Van Knippenberg, D. & Schippers, M.C. 2007. 'Work group diversity', *Annual Review of Psychology*, **58**(1): 515-41.

Wendt, H., Euwema, M.C. & Van Emmerik, I.J.H. 2009. 'Leadership and team cohesiveness across cultures', *The Leadership Quarterly*, **20**: 358-70.

West, M.A. 2002. 'Sparkling fountains or stagnant ponds: An integrative model of creativity and innovation implementation in work groups', *Applied Psychology: An International Review*, **51**(3): 355–387.

West, M.A., Brodbeck, F.C. & Richter, A.W. 2004. 'Does the 'romance of teams' exist? The effectiveness of teams in experimental and field settings', *Journal of Occupational and Organizational Psychology*, **77**: 467-73.

West, M.A., Hirst, G., Richter, A. & Shipton, H. 2004. 'Twelve steps to heaven: Successfully managing change through developing innovative teams', *European Journal of Work and Organizational Psychology*, **13**(2): 269-99.

Williams, K.Y. & O'Reilly, I.C.A. 1998. 'Demography and diversity in organizations'. In Staw, B.M. & Cummings, L.L. *Research in Organizational Behavior*. London: Jai Press Inc. P.p.77-140.

Worchel, S., Coutant-Sassic, D. & Grossman, M. 1992. 'A developmental approach to group dynamics: A model and illustrative research'. In Worchel, S., Wood, W. & Simpson, J. A. *Group Process and Productivity*. London: Sage Publications. P.p.181-202.

Zaccaro, S.J., Rittman, A.L. & Marks, M.A. 2001. 'Team leadership', *The Leadership Quarterly*, **12**: 451-83.

Ziv, M. & Keydar, E. 2009. 'The relationship between creative potential, aesthetic response to music, and musical preferences', *Creativity Research Journal*, **21**(1): 125-33.