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Complex Adaptive Systems: Adapting and Managing Teams and Team Conflict

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Abstract

Complexity comes from dramatic structural changes to organizations and governments such as globalization, global competition, workforce diversity, and continual innovations. Complex adaptive systems (CAS) are organizations that are a composite of the interconnected whole. Teams must manage and operate in emerging ecosystems, understand factors that lead to team effectiveness when managing and facilitating teams and team conflict, and understand the development of conflict models. This chapter provides an overview of teams, CAS, conflict stages, and conflict models. This chapter presents adaptive leadership as one leadership style that offers organizations with the capabilities of reacting to changing environments quickly. Adaptive leadership offers a prescriptive approach for managers and leaders to follow when dealing with organizational conflict while operating in today's complex and global environment.

Keywords: teams, complex adaptive systems, conflict, intergroup conflict, intragroup conflict, conflict management

1. Introduction

"Teams are pervasive in today's world" [1]—and they are needed. Collaboration and teamwork are required, more so today than in the past, to handle today's complex problems [2]. Today's complexity comes from dramatic structural changes to organizations and governments such as globalization, global competition, workforce diversity, and continual innovations [3]. Also, deMattos et al. [3] highlighted the information revolution and the creation and destruction of organizations as contributors to this complexity.

Within the complexity literature, complexity results from the "inter-relationship, inter-action, and inter-connectivity of elements within a system" [3], among elements that make up the

system (micro-level), and among different systems (macro-level). In the organizational science's literature, organizations are viewed as being complex adaptive systems (CAS) that are a composite of the "interconnected whole" [4]. West [2] identified the growth of this complexity due to, in part; the digital revolution, the increasing diversity as a result of interconnectedness and globalization, the interconnectedness within and across entities, the need for inclusion, and a growing demand in the need to belong amongst these interconnections [2]. Aghina et al. [5] highlighted advances in technology and connectivity as reasons why organizations needed to create "new forms of engagement within and across organizational boundaries" (The evolving organizational challenge). Also, organizations must learn to become competitive in these new "rapidly emerging 'ecosystems'" that involve multiple organizations and business sectors.

Driving and managing these interconnections are collaborative entities, teams and small groups. In today's workplace, teams have become the common collaborative entity. West [2] highlighted this point by stating that "teamwork is ubiquitous in modern organizations". Keller and Meaney [6] reported that research conducted by McKinsey & Company showed executives were "five times more productive when working in one [high-performing team] than they are in an average one [team]".

In placing teams as CAS [7, 8] that manage and operate in these emerging ecosystems, teams become one of the antecedents or predictors to an organization's survival. To provide successful high-performing teams, organizations must be able to facilitate the factors that lead to a team's effectiveness. These factors are known as the 9-Cs in which team conflict is one of these factors. These concepts are important to understand when managing and facilitating teams, especially when it comes to managing team conflict. This chapter is divided into four sections. The first section discusses teams, what they are, what are the 9-Cs of team effectiveness, team transitions, team failure mechanisms, and team leadership. The second section looks at CAS and how teams and small groups are considered CAS and what this means to the organization and the larger emerging ecosystem. Also, team conflict will be positioned within these CAS as a key factor that should be considered in any team and organizational system. Next, this chapter reviews traditional organizational conflict models from the literature. Following, the discussion moves to reviewing the literature on traditional intragroup conflict and newer, emerging, intragroup conflict types. Next, this chapter previews different conflict management models and techniques that could be used for managing teams and, more specifically, team conflict. In conclusion, this chapter introduces adaptive leadership as one potential leadership style to implement when dealing with complex adaptive systems and intragroup conflict in today's complex and global environment.

2. Teams

Cohen and Bailey [9] defined teams in the following manner:

A team is a collection of individuals who are interdependent in their tasks, who share a responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems (for example, business unit or the corporation), and who manage their relationships across organizational boundaries.

Cohen and Bailey [9] used the terms team and group interchangeably, noting that the field of management typically refers to teams, whereas academic literature typically uses the term group. We will consider teams and small groups as being synonymous to one another for this book chapter.

Kozlowski and Ilgen [10] defined teams as: “Complex dynamic systems that exist in a context, develop as members interact over time, and evolve and adapt as situational demands unfold”. Gibson [11] described a group as a social aggregation with meaning, with a limited number of interacting people, and with shared objectives. Relating to the shared objectives, Cohen and Bailey [9] noted that some groups have different degrees of *groupness* (or sharedness), where teams with high degrees of groupness are more independent compared to groups with lower degrees of groupness.

Teams are composed of individuals working on interdependent tasks which contribute to the overall task objective of the collective. The first identifier of a team is the interdependency of individual members working toward a common goal. Second, team members are required to interact to combine each team member’s interdependent portion of the overall task. In combining each individual effort into a composite representative of the team’s output, team members must interact with one another. This interaction involves shared responsibilities in which authentic communication [12] is a requirement. Finally, a team must also be adaptive as indicated by Cohen and Bailey [9]. Today’s knowledge economy presents complex dynamic problems to which teams need to adapt. Although adaptability may not be an initial requirement for a team, if a team is to remain successful in a “dynamic, shifting, and complex environment” [10], it must learn to be adaptive.

3. Team effectiveness: 9-Cs

The literature on team performance or team effectiveness has grown into essentially 9 core processes (**Figure 1**). One example of this expansion is in the addition of conflict to this list of core processes. Weaver et al. [13] did not include conflict in their list of core processes whereas Dinh and Salas [14] and Salas et al. [1] included conflict. All-in-all the current literature presents a total of nine core processes that need to be considered when participating in, or managing, highly effective teams: coaching, cognition, cohesion, collective efficacy, collective identity, communication, conflict, cooperation, and coordination. Definitions for each of these processes are provided in **Table 1**.

Among these core processes, Dinh and Salas [14] differentiated between internal and external dynamics. Internal dynamics include a team’s core processes, or emerging states, whereas external dynamics are composed of influencing conditions. Emerging states include the processes of coaching, cognition, communication, conflict, cooperation, and coordination [1, 14]. Influencing conditions (**Figure 2**) include context, composition, and culture. Definitions for these influencing conditions are also provided in **Table 1**. Within these six emerging states, Dinh and Salas [14] and Salas et al. [1] included the processes of collective efficacy and collective identity as part of the cooperation process.



Figure 1. Teamwork processes.

Factor	Definition	Source
Emerging States		
Coaching	Direct interaction with a team intended to help members make coordinated and task-appropriate use of their collective resources in accomplishing the team's work.	Weaver et al. [13], p. 15; see also Hackman and Wageman [80]
	An enactment of leadership behaviors to establish goals and set direction towards the successful accomplishment thereof.	Dinh and Salas [14], p. 23; see also Fleishman et al. [77]
Cognition	The host of activities performed by both individuals and teams for the sake of team effectiveness.	Dinh and Salas [14], p. 23; see also Hackman and Wageman [80]
	A foundational component of effective team processes, as it allows teams to enter performance episodes with a mutual baseline understanding of how to engage in the task at hand.	Dinh and Salas [14], p. 24; see also Salas et al. [1]
	Detecting and recognize[ing] pertinent cues, make decisions, problem solving, storing and remembering relevant information, planning, and seeking and acquiring necessary knowledge.	Weaver et al. [13], p. 15; see also Orasanu [90]
	Shared cognition: The collective understanding among team members regarding team member interactions and team tasks.	Hinsz and Ladbury [81]; see also Turner et al. [92]
Cohesion	Team cognition: The organized understanding of collective knowledge among team members.	Mohammed and Dumville [85]; see also Turner et al. [92]
	Affective attraction to the team, team goals, and desire to remain part of the team.	Weaver et al. [13], p. 15; see also Zaccaro and Lowe [93]; Beal et al. [73]
	The degree to which team members desire to remain in the team and are committed to the team goal.	Forsyth [78]

Factor	Definition	Source
Collective Efficacy	The feeling of belonging to a group, liking the tasks a group performs, and having an identity with a group.	Turner [91]
	The process of keeping team members together and united.	Dion [74]; see also Turner [91]
	Team efficacy: The perception that the team is capable of performing well at a given task.	Levi [88], p. 65
	The collective sense of competence or perceived empowerment to control the team's performance or environment.	Dinh and Salas [14], p. 18; see also Katz-Navon and Erez [86]; Mahieu, Gilson, and Ruddy [89]; Zaccaro et al. [87]
Collective Identity	The belief, shared among a substantial portion of the group members, that the group is capable of organizing and executing the actions required to attain the group's goals and successfully complete its tasks.	Forsyth [78], p. 138
	Perceptions of oneness with a particular group.	Weaver et al. [13], p. 15; see also Ashford and Mael [72]
Communication	One's sense of individuality is replaced by a shared sense of unity.	Forsyth [78], p. 138
	Exchange of information that teams use to perform such tasks as negotiating their goals, making decisions, and providing one another task status information.	Weaver et al. [13], p. 15; see also Fussell et al. [79]
	The process by which a person or group sends some type of information to another person or group.... Three basic parts of communication: sender, receiver, message.	Levi [88], p. 102
Conflict*	A transactional process, in which communicators can send and receive information simultaneously and influence these pathways.	Dinh and Salas [14], pp. 21–22
	The perceived incompatibility in interests, beliefs, or views held by one or more team members.	Dinh and Salas [14], p. 23; see also Jehn [82]
	Differences or incompatibilities in interests, values, power, perception and goals.	Yasmi et al. [31]; see also Turner [44]
Cooperation	Being either a set of incompatibilities or an awareness of being threatened or frustrated or perceived to be threatened.	Turner [44], p. 151
	Motivation and desire to engage in coordinative and adaptive behavior.	Weaver et al. [13], p. 15; see also Fiore et al. [76]
Coordination	A performance situation that is structured in such a way that the success of any one member of the group improves the chances of other members' succeeding.	Forsyth [78], p. 436
	The enactment of behavioral and cognitive mechanisms necessary to perform a task and transform team resources into outcomes.	Salas et al. [1], p. 603; Dinh and Salas [14]
	The process of orchestrating the sequence and timing of interdependent actions.	Marks et al. [15], pp. 367–368
	Coordination activity: Processes aimed at managing dependence through collaboration, coordination, negotiation, and feedback.	Drach-Zahavy and Somech, [75], p. 149

Factor	Definition	Source
Influencing conditions		
Context	Situational characteristics or events that influence the occurrence and meaning of behavior, as well as the manner and degree to which various factors (e.g., team member characteristics, team behaviors processes) impact team outcomes.	Salas et al. [1], p. 611
	Situational opportunities and constraints that affect the occurrence and meaning of organizational behavior as well as functional relationships between variables.	Johns [83], p. 386
Composition	Team building: Making sure the team has common goals and that members can work together to achieve them.	Levi [88], p. 328
	The mix of knowledge, skills, abilities, and other characteristics (KSAOs) of team members.	Mathieu et al. [84], pp. 522–523
Culture	Team culture: The shared perception of how the team should operate to accomplish its goals. Team norms, member roles, and patterns of interaction are included in the team culture.	Levi [88], p. 265
	The assumptions people hold about relationships with each other and the environment that are shared among an identifiable group of people (e.g., team, organization, nation) and manifest in individuals' values, beliefs, norms for social behavior, and artifacts.	Salas et al. [1], p. 613

*More complete definitions of the different types of conflict will be provided in later sections of this chapter.

Table 1. Definitions of team effectiveness core processes.

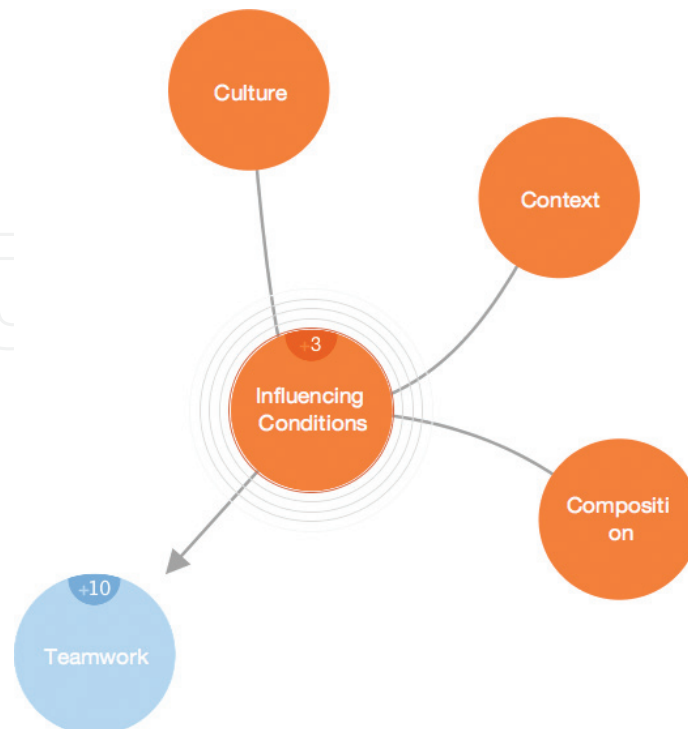


Figure 2. Influencing conditions.

For this chapter, we will maintain that there are nine emerging states (coaching, cognition, cohesion, collective efficacy, collective identify, communication, conflict, cooperation, and coordination) and three influencing factors (context, composition, and culture).

4. Team transition processes

The overall team processes are presented as a taxonomy by Marks et al. [15] with three categories: transition phase processes, action phase processes, and the interpersonal processes. These processes are categorized around three phases in which the transition phase mostly occurs during the beginning stages of team formation, the action phases take place after team formation and during team task work, and the interpersonal processes occur throughout the entire time up to the point that the team completes its goal. **Figure 3** provides a diagram showing these different phases of the team transition processes.

4.1. Transition phase

During the transition phases team members primarily concentrate on distributing tasks, scheduling of activities, and allocation of resources. These transition phases aid the team in accomplishing

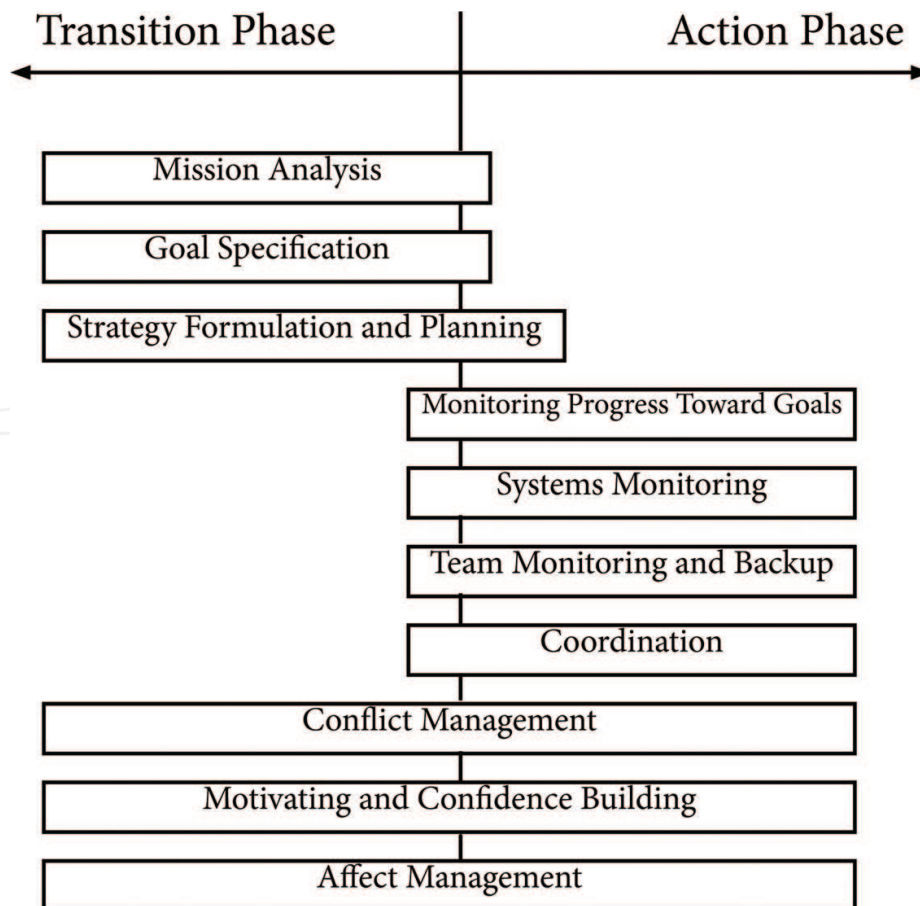


Figure 3. Team transition processes.

their goal or objective [15]. LePine et al. [16] described these transition phases as: "Actions that teams execute between performance episodes". Among the transition phases, Marks et al. [15] identified three processes: mission analysis, goal specification, and strategy formation and planning. Mission analysis involves team member's interpretation and evaluation of the team's mission, identification of the team's goal and its environment, and assessing resources required compared to resources available [15]. Goal specification relates to prioritizing goals of the team as well as associating these goals with the organization. Strategy formulation and planning identifies decisions that need to be made to achieve the team's goal, the team's expectations, assignment of duties, lines of communication, along with setting priorities and deadlines. Stout et al. [17] identified that teams high in planning (e.g., strategy formulation and planning phase) are more effective at communicating with team members at critical times, when needed the most.

4.2. Action phases

Action phases relate to the team's activities aimed specifically toward goal accomplishment [15]. This phase concentrates on team activities that lead toward goal attainment. The action phases have four processes: monitoring progress toward goals, systems monitoring, team monitoring and backup responses, and coordination activities [15]. The first process, monitoring progress toward goals, relates to team members paying attention to, interpreting, and communicating information that allows team members to assess and provide feedback to the team's progress. The second process, systems monitoring, tracks a team's resources and environment. Team monitoring and backup responses, the third process, provides support services for team members. This process gives team members individual feedback, coaching/mentoring, assistance in task completion, etc.... The last process, coordination activities, related to "the process of orchestrating the sequence and timing of interdependent actions" [15]. This process is conducted by individual members as a shared-leadership role, and by the team's leader/manager if one is assigned.

4.3. Interpersonal phases

The interpersonal phases relate to those team activities that are primarily concentrated toward managing relationships, internal and external. Interpersonal phases are different from the transition and action phases in that they are mostly present throughout the duration that the team is formed. The interpersonal processes involve three processes: conflict management, motivating/confidence building, and affect management [15]. Conflict management is geared toward managing conflict so that constructive conflict is facilitated and destructive conflict is diminished. Understanding conflict in small group settings requires viewing conflict from the individual's perspective as well as from the perspective of the collective. Conflict is prevalent throughout a team's formation, a further discussion of conflict that takes place in small group settings, intragroup conflict, will be provided in the next section. Conflict management focuses on identifying areas of agreement and disagreement among team members, identifying any barriers relating to task accomplishment, to better identify intragroup conflict. Conflict management then optimizes collaborative efforts around conflict by collectively selecting the best course of action in resolving conflicting issues. The second process in the interpersonal processes, motivating/confidence building, involves "activities that develop and maintain members' motivation and confidence with regard to the team accomplishing its goals and objectives" [16]. The last process, affect management, facilitates emotional balance

among team members. This last process monitors members' emotions, social cohesion, team member frustrations and excitement, as well as examining team morale [16].

4.4. Putting the pieces together

The taxonomy of team processes presented by Mathieu et al. [18] incorporates transition phase processes that evaluate past achievements and plan future achievements with action phase processes that involve activities dedicated to goal accomplishment. Throughout the transition and action phase processes, interpersonal processes are continually being managed. Mathieu et al. [18] identified: "Some processes are more likely to occur during transition periods, whereas others are more likely to occur during action periods. Interpersonal processes are expected to occur throughout transition and action phases". Of these interpersonal processes, conflict is a key determinant that is not only prevalent in all small group settings, but it has the potential to be destructive to the point of preventing a team from accomplishing its stated goals. This chapter further identifies these different intragroup conflicts and addresses how best to manage these conflicts.

5. Complex adaptive systems

Just as organizations are viewed as being complex adaptive systems (CAS) [19, 20], teams are also viewed as being CAS. We utilize the definition provided by Uhl-Bien et al. [21] for CAS:

Neural-like networks of interacting, interdependent agents who are bonded in a cooperative dynamic by common goal, outlook, need, etc. They are changeable structures with multiple, overlapping hierarchies, and like the individuals that comprise them, CAS are linked with one another in a dynamic, interactive network.

In this definition of CAS, neural-like networks represent teams while the interacting and interdependent agents represent individual team members. As one of the characteristics of a team involves having a common goal, this definition fits well for teamwork settings. The overlapping hierarchies represent components of shared leadership that takes place in teams, no one team member leads the whole team through all tasks. It is advantageous for teams to use the skills, experiences, and resources available to them when deciding who will lead the team during each stage of the team's goal. It could be that multiple team members take an individual leadership role before the team meets its stated goal, resulting in a self-organizing shared leadership function. Teams are dynamic in nature in that each individual member is working independently as well as interdependently on their own task as an effort to contribute to the collective's main objective.

Complex adaptive systems consist of six primary functions: they operate in open systems, they are self-organizing, they operate on the *edge of chaos*, they adapt to external changes, they require interactions among individual agents, ultimately resulting in a new emergent collective or product.

5.1. Open systems

Systems theory and systems thinking operate in closed systems, a change in one part of the system results in an expected and predictable change in another part of the system. Closed systems provide a level of predictability and are partially sheltered from external forces. In

contrast, complexity theory or complexity thinking operates in open systems. Open systems are non-linear, unpredictable, in which changes in one part of the system could lead to predictable results just as easy as unpredictable results.

5.2. Self-organizing

Operating in open systems requires self-organizing systems compared to directed systems. Systems that are controlled, or directed every step of the way, are less able to react to multiple threats from the environment (external of the system). Systems that are capable of self-organizing and reorganize as needed, are better able to operate in open systems more effectively compared to controlled systems. This key characteristic, the ability to self-organize, is defined by Varga [22] as: “self-organization occurs through the dynamics, interactions and feedbacks of heterogeneous components”.

5.3. Edge of chaos

The *butterfly effect*, as described by Olbolensky [23], states that small changes in one part of a system can yield dramatic changes in other parts of the system, if not the whole system. Sometimes these changes are planned, but other times they are reactive to external forces (e.g., governmental policy changes, industry changes, mergers). Managing these butterfly effects are what CAS do, they operate on the *edge of chaos*: “they are able to balance order and chaos”. Complex adaptive systems self-organize and allocate resources so that they adapt to external changes by making the appropriate adjustments to the system, just enough so not to reach chaos but to adapt to external forces.

5.4. Adaptability

Being able to adapt to external forces is one requirement when operating in open systems. For a system to self-organize, then alter its course and reorganize, it must be adaptable. Adaptive systems “have a high degree of awareness to its local context as well as a high capability to change internally” [23]. This adaptability characteristics includes a team and its members to adapt to both internal and external forces. One example of internal forces could be intragroup conflict, with intergroup conflict being an example of external forces.

5.5. Interactions

Interactions are identified as being representative of “causal processes at the lower levels” [24], and can represent structural or behavioral processes. In viewing behavioral processes in a team setting, facilitation constructive conflict as opposed to destructive conflict will aid in a team’s interactions, thus becoming more effective and adaptive. In complexity terms, facilitating interactions aids emergence.

5.6. Emergence

Complex adaptive systems operate from the bottom-up in a dynamic manner that facilitates interactions among the system’s agents (e.g., individual team members) with the potential of producing emergent, new, structures [22]. Beck and Plowman [19] identified emergence as “new

structures and new forms of behavior in open systems far from equilibrium”, whereas Campbell-Hunt [25] identified it as “new structures around which organizational activity is reassembled”.

Operating in complex and open systems, teams must be free to self-organize as they adapt to external and internal forces, allowing team members to interact accordingly until the team emerges as a new entity to address the current environment. This process identifying teams as complex adaptive systems is described best by Beck and Plowman [19]:

When provoked by either an unforeseen opportunity or threat, a CAS moves away from equilibrium or stability, toward instability or disequilibrium.... In doing so, a system experiences adaptive tensions that give rise to emergent self-organization, the ability to spontaneously arrange its components in a purposeful way without the direction of a higher level coordinator.

5.7. Groups as complex adaptive systems

Groups are best represented as being complex adaptive systems (CAS). McGrath et al. [7] highlighted this point by describing groups as: “complex entities embedded in a hierarchy of levels and characterized by multiple, bidirectional, and nonlinear causal relations”. McGrath et al. [7] identified groups as “complex entities embedded in a hierarchy of levels and characterized by multiple, bidirectional, and nonlinear causal relations”. Ramos-Villagrasa et al. [8] proposed that viewing teams as CAS was more than just a metaphor anymore, it has become a “change in the epistemology of teams”. Ramos-Villagrasa et al. [8] highlighted this new epistemology as providing researchers to: “(a) adopt a different logic of inquiry, (b) to deal with temporal issues, (c) to raise the level of theoretical sophistication, and (d) thus to lead to better practical applications”. One example of this is in [26] complex adaptive team systems model that utilizes naturally occurring team processes (see TELDE model [27]) to drive organizational interventions.

6. Traditional organizational conflict

6.1. Conflict models

Conflict models can be classified as being either descriptive or normative in design. Lewicki et al. [28] identified the key identifier in differentiating between descriptive and normative conflict models as their origin of analysis. Descriptive conflict models tend to be built down from human behavior theories, mainly from academia [28]. In contrast, Lewicki et al. [28] differentiated normative conflict models as those that are built up from direct experience by practitioners.

Six general approaches to conflict were identified by Lewicki et al. [28]: the micro-level approach, the macro-level approach, economic analysis, labor relations approach, bargaining and negotiation, and third party dispute resolution. These different approaches to conflict have been derived from both academia and practitioners, have evolved to address specific needs, have emerged to accompany specific industries, and have originated due to excessive frequency of usage [28].

The micro-level approach best fits with the purpose of this review to identify cognitive conflicts in team settings. The micro-level approach is based in psychological theory concentrating

on conflict within and between participants while looking at small group behavior, inter- and intra-personal interactions [28]. A review of the conflict theories from the Lewicki et al.'s [28] manuscript will be concentrated on those classified as being descriptive conflict models from the micro-level approach.

The predominant paradigm within the micro-level approach is presented as being [29] organizational conflict model. Additional models within the micro-level approach that are descriptive had been identified as: [30] *Fight, Debate, Stages of Conflict*; [31] *Stages of Conflict*; and [32] *Conflict Escalation*. The following sections will explore further the literature on these micro-level approaches.

6.1.1. Pondy's (1967) stage model

Three conceptual models were presented by Pondy [29] in his seminal article: the bargaining model, the bureaucratic model, and the systems model. These conceptual models deal with interdepartmental conflict (bargaining model), vertical hierarchy conflict (bureaucratic model), and lateral conflict (systems model). Although Pondy's conceptual models were identified to conceptually represent conflict in organizations, both the bureaucratic and systems models could be utilized to represent conflict in a team setting. The bureaucratic model could be associated with conflict between team leadership and team members, whereas the systems model could be representative of team member to team member conflict. Pondy [29] identified common threads for each of these three conceptual models. These commonalities are summarized below with the original emphasis changed from organization to team:

1. Each conflict relationship is composed of a sequence of interlocking conflict episodes.
2. Conflict may be functional as well as dysfunctional for the individual and the team.
3. Conflict is intimately dependent upon the stability of the team [29].

To further elaborate on the characteristics of conflict, Pondy [29] identified five conflict episodes: "1) latent conflict (conditions), 2) perceived conflict (cognition), 3) felt conflict (affect), 4) manifest conflict (behavior), and 5) conflict aftermath (conditions)". This systematic organization has been helpful to provide a framework for evaluating the type of conflict team members have experienced or thought they have experienced.

Latent conflict is driven by conflict related to scarce resources, autonomy, and divergence of goals. Role sets within teams is one example of latent conflict, with this latent conflict possibly generated between the team members. Pondy [29] identified latent conflict to occur when "the focal person receives incompatible role demands or expectations from the persons in his role set".

With a focus on teams, conflict could occur when a team member receives incoherent task assignments or expectations from other team members. Although there might be no conditions for latent conflict in the team, perceived conflict in a team setting is likely to occur when one team member misunderstands the positions of the other team members. To manage conflict within the team, Pondy indicated that a suppression mechanism and an attention-focus mechanism can be present during a perceived conflict episode. When a team member blocked a conflict, the suppression mechanism was applied to team member conflict. In contrast,

Pondy explained that the activation of the attention-focus mechanism was applied where team members focused on conflict related more to behaviors within the team organization rather than the personal values of the team members.

Felt conflict refers to the “personalization of conflict” [29]. This conflict could be present in situations where inconsistent demands on team members are made or when a team member feels anxiety through the personalization of conflict [29]. The amount of conflict felt by team members has been observed to be at different levels; there is the possibility that one person might feel conflict with another team member of which that team member has no idea there is any conflict. The level of anxiety felt is personalized.

Manifest conflict represents the levels of behavior that one may take due to the conflict. A team member may react hostile toward a perceived or threatening conflict, which could result in a disruption of other team members. A key element noted within manifest conflict was the intention to create, hence manifest, a conflict situation to frustrate a team member and result in non-cooperative behavior.

Lastly, Pondy [29] explained two possible outcomes for the episode of conflict aftermath; not all conflict has the impact of limiting the achievement of goals within the team. If conflict has a positive effect on both the team members and their performance, then the conflict aftermath would be positive and the team members would be more receptive and experienced controlling future conflict situations. Alternatively, if the conflict had a suppression effect, then team members may react unfavorably during the next conflict episode, or even worse, team members could unleash unresolved issues from a past conflict episode, eventually resulting in poor team cohesion and performance.

6.1.2. Fight/game/debate

Three levels of conflict were introduced by Rapaport [30]: fight, game, and debate. At the first level, fight conflict, responses to conflict are automatic responses, which are manifested by chains of events rather than by rational choice [30]. Within the fight conflict, Rapaport [30] explained that there were both positive and negative feedback loops that account for either the stability or instability of the system. The essence of the fight level is the basic fight or flight responses that are embedded into our psychological make-up. To move beyond these basic animalistic responses, one incorporates cognitive senses as a component of conflict, transforming one from the fight level to the game level of conflict. Rapaport [30] further identified various types of games including zero-sum games where both players eventually lose something, the non-zero sum game where the win of one player does not necessarily mean the loss of the second player, and the three-person coalition game where the final outcome is ultimately decided by the social norm or the majority rule. Within the third aspect, Rapaport [30] described the debate level of conflict as one in which the opponent needs to be convinced of the outcome. As an attempt to persuade someone to listen to an alternate position one often needs to offer new insights that are not threatening [30]. The debate level of conflict offers a situation in which each side has an opportunity to present their position while the other side listens, and vice versa. By providing both sides a position, and allowing each alternative side to listen to opposing views, a better resolution or decision could be made.

Of the three levels of conflict presented by Rapaport [30] the debate level of conflict would be the best level of conflict to model in a team setting. The exchange of information is critical to resolve the team's conflict. This exchange of information allows team members to consider other points of view, which can lead to productive resolution. This is supported by Rapaport [30]: "a shift in the outlook of the other can take place only together with a shift in one's own outlook".

6.1.3. Stages of conflict

Escalation theory is presented by Yasmi et al. [31] to represent the escalation of a conflict when nothing is done to address the conflict or if the conflict is not addressed in a timely manner. Escalation theory within conflict in teams is "based on inter-individuals' conflicts within organizational settings" [31]. The model presented by Yasmi et al. [31] is based on Glasl's (as cited in Thomas [31]) stage model of conflict escalation which involved nine stages of escalation: (1) hardening, (2) debate, polemics, (3) actions, not words, (4) image and coalition, (5) loss of face, (6) strategies of threat, (7) limited destructive blows, (8) fragmentation of enemy, and (9) together into the abyss.

The first stage of conflict, hardening, takes place when a typical disagreement in opinion or policy occurs between two parties. As each party attempts to resolve the conflict, both sides become more fixed in their positions, hence the descriptive term, hardening, used for this stage. Thomas [33] explained that progression to stage two occurs when either side loses faith in resolving the conflict: "When straight argumentation is abandoned in favour of tactical and manipulative argumentative tricks, the conflict slips into stage 2". During the second stage of debate, the two parties continue to hold onto their fixed position, furthering their diverging positions. Thomas identified that rational interactions escalate into emotional and power issues during this stage. At this point mistrust becomes an issue and one or both parties begin to act without consulting the other side [33]. This leads us to the third stage, actions, not words. During the actions stage, each party views the other as a competitor in which verbal communication is diminished due to a lack of trust between the parties [33]. Both parties begin to feel a sense of helplessness in that neither side can resolve the conflict.

Once the conflict becomes a matter of either victory or defeat for both parties, as Thomas [33] pointed out, the conflict has entered into the fourth stage, images and coalitions. During this fourth stage, each party suppresses the opinions and suggestions presented from the other party resulting in in-action. Attacks become more prevalent and take a form that borders acceptable norms for the two parties involved. Thomas identified these attacks as dealing through "insinuation, ambiguous comments, irony and body language" (stage 4). Once these attacks expand beyond the acceptable norms for the two parties then the conflict has entered into stage 5, loss of face. Thomas [33] identified attacks during this fifth stage to be directed toward a person's status within the group or organization, a person's 'face'. Once the conflict escalates to where one or both parties begin to make ultimatums or threats, Thomas indicated that the escalation has entered into stage 6, strategies of threats. Beyond this sixth stage, those stages of limited destructive blows, fragmentation of the enemy, and together into the abyss, are present in rare cases [33]. In most cases, conflict within a team setting will be of the stages between hardening (stage 1) and loss of face (stage 5).

6.1.4. Conflict escalation

Escalation can take one of two forms according to Pruitt [32]. Escalation where one party becomes increasingly resistant while the second party remains open to discussion is what Pruitt termed *unilateral escalation*. Alternatively, Pruitt identified *bilateral escalation* to indicate when both parties are increasingly resistant to the other corresponding party. When bilateral escalation is present on both sides, counter to each other's opinions, this eventually leads to what Pruitt termed a *conflict spiral*, resulting in an escalation in magnitude. The longer the conflict spiral persists, and the higher in magnitude the conflict becomes, each party's members may begin to develop a new set of norms surrounding the conflict. At this point, it is harder to reverse the process due to the new, differing, set of norms that have developed on the two opposing sides [32]. This view of conflict escalation provided by Pruitt is most relevant to conflict in teams in that Pruitt identified that "groups are also more prone to escalation than are individuals".

6.1.5. Dual concerns

Dual concerns have been identified in the literature to represent the dual nature of 'concern for oneself' and 'concern for others' [34–36]. The interaction of the concern for self and concern for others occurs on a diagonal where low concern for self and a low concern for others results in a team experience that attempts to avoid the conflict. As the level of concern increases along the diagonal, the level of positive strategy for conflict resolution is implemented. The highest concern for self and for others on the diagonal represents a compromise situation for team members. Although the level of concern seemingly provides for positive outcomes related to conflict resolution, team members with little or no experiences have been observed to have difficulty integrating conflict resolution strategies for long-term solutions in team conflict situations [35]. It is expected that team members who experience the stages of conflict and are novices to conflict, would have difficulty achieving positive outcomes.

7. Traditional intragroup conflict

Conflict in group settings (e.g., teams, department, task group) has been described as being a dynamic process consisting of a series of conflict episodes [29]. Greer et al. [37] supported this description by indicating that "conflict is dynamic". Likewise, Pondy [29] proposed: "Conflict can be more readily understood if it is considered a dynamic process". Since Pondy's [29] stages of conflict, the field of intragroup conflict has expanded into a multidimensional model. Balkundi et al. [38] indicated that team conflict could have multiple effects including distracting team members, undermining relationships, and reducing the team's ability to function (similar to those effects outlined by Pondy's conflict episodes). Team conflict is synonymous with intragroup conflict or within group conflict. Intragroup conflict can be formally defined as: "Perceived incompatibilities or perceptions by the parties involved that they hold discrepant views or have interpersonal incompatibilities" [39].

Traditionally, intragroup conflict has been described as being a multidimensional construct [40] consisting of task, relationship, and process conflict. Intragroup conflict originated with Jehn [39] in which task and relationship conflict were first combined into one larger concept - intragroup conflict. Further expansion of intragroup conflict began with the introduction of process conflict [40–43]. At this point, intragroup conflict was identified as consisting of the “trio of task, relationship, and process conflict” [44]. Jehn and Chatment [41] highlighted the point that the three intragroup conflict types were interrelated and each one should be included in any research effort that looks at intragroup conflict (Figure 4).

7.1. Task conflict

Task conflict is associated to task related functions and the judgement differences that arise when completing specific tasks [44]. Jehn [39] identified that high levels of task conflict could be associated with “tension, antagonism, and unhappiness among group members and an unwillingness to work together in the future”. Also, task conflict relates to differences in opinions or viewpoints about the team’s task, including task awareness, disagreement of work issues, and disagreements surrounding the work being conducted [37, 40, 44, 45]. Increasing task conflict has been associated to increasing team performance [46], up to a point. Like most things, too much results in negative consequences.

7.2. Relationship conflict

Relationship relates to interpersonal conflict: “Interpersonal animosity, tension, or annoyance” [45]; also cited in Turner [44] between team members. Whereas disagreements related to task work fall under the task conflict arena; disagreements about non-task work issues are identified as being relationship conflict. Relationship conflict has been identified as being negatively associated with group performance [37]. Also, relationship conflict is potentially the most detrimental conflict type that must be managed effectively. Greer et al. [37] highlighted relationship conflict as having a lasting effect on a team’s performance when not managed properly.

7.3. Process conflict

The coordination of activities, scheduling of task work, and allocation of resources make up process conflict. Process conflict has been identified as disagreements about assignments of

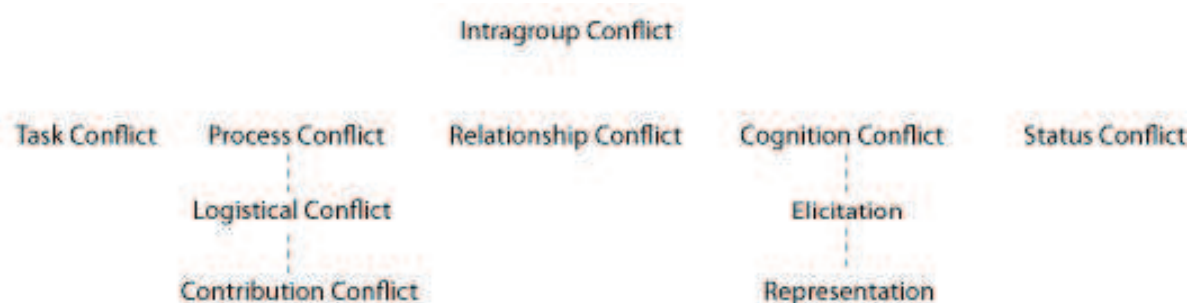


Figure 4. Intragroup conflict.

duties and resources [43], conflict over logistics [37], controversies relating to task accomplishment [42], to simple disagreements over procedures [40, 41]. Process conflict has been shown to negatively impact team performance [46]. As confusion about how to accomplish a task grows, or when resources become unavailable for task completion, tensions grow, resulting in process conflict. Managing process conflict early on during the team's initial formation pays dividends, especially when process conflict has the potential to lead to relationship conflict and status conflict, ultimately resulting in a snowball effect being counter-productive to team performance.

8. Emerging intra-group conflict

8.1. Logistical and contribution conflict: process conflict

Once intragroup conflict had been generally accepted by the field, some extensions to the original trio had been proposed. These extensions had extended process conflict into two separate sub-components, logistical conflict and contribution conflict [44, 47]. Logistical and contribution conflict were derived as extensions of process conflict primarily due to the lack of process conflict being able to differentiate itself from task and relationship conflict, resulting in most studies dropping process conflict and only using task and relationship conflict [47]. Reasons for this were highlighted in Behfar et al.'s [47] research: "Process conflict has been difficult to distinguish empirically from task conflict and is often highly correlated with relationship conflict". Also, process conflict has been confused with task and relationship conflict due to the inconsistencies in their definitions [47]. Logistic conflict relates to allocation of resources for task accomplishment, whereas contribution conflict identifies with coordination of these activities: "Logistical conflict is about task-related differences, but contribution conflict is about people related differences" [47]. From their studies, high levels of logistical conflict can lead to poor group performance and the presence of contribution conflict negatively affected group satisfaction and other team processes [47].

8.2. Cognition conflict

Much in the same manner that process conflict was confused with other types of intragroup conflict due to inconsistent definitions within the literature, so too was cognition conflict misrepresented. A number of studies would identify cognition conflict by name, and use the definition for task conflict (see [44]). Missing from the trio of conflict was the cognitive aspect, representing the team member's representation of knowledge and understanding and the representation of the team's shared knowledge. From the literature relating to team mental models (TMM) and shared mental models (SMM), Turner [44] introduced the construct of cognition conflict to the trio of intragroup conflict. Cognition conflict represents "team member cognitive states (overlapping cognitive representation of team member knowledge, team member representation of tasks, equipment, working relationships, and situations)". Here, cognition conflict was represented by two sub-categories: elicitation and representation. Elicitation represents the team's accuracy of knowledge and representation represents similarity in team member structures [44].

8.3. Status conflict

More recently, Bendersky and Hays [48] introduced status conflict to the intragroup conflict conversation. Status conflict relates to conflicts that arise due to hierarchical structures within the group [48]. Bendersky and Hays [48] defined status conflict as: “Disputes over people’s relative status positions in their group’s social hierarchy”. In their research, they [48] identified status conflict to be negatively associated with information sharing, and highly impactful to group performance (negatively associated).

9. Conflict management and related techniques, approaches and skills

Much research has been conducted on conflict management. This section defines what conflict management is and how it encompasses conflict resolution and dispute resolution. Three conflict management approaches: Robbins [49] levels for conflict; Lan’s [50] individual perspective; and Rahim and Magner’s [51] and Thomas’ [52] concern for others are presented as broad strategies on how to think about conflict management. Also, ten techniques: problem solving [45, 53]; collaboration [54–56]; avoidance [51, 52]; competition [51, 52, 54]; accommodation [51, 52]; compromise [51, 52, 57]; authoritative command [49, 57]; altering structure variables [45, 53]; altering human variable [45, 53]; and expanding resources [49] are provided as tactics for implementing conflict management.

9.1. What is conflict management?

Research on conflict management is extensive. Conflict management is widely studied in a range of disciplines such as sociology, psychology, economics and organizational development [50]. Maybe this is because conflict is always present and occurs in families, political parties, religious groups, businesses, and many other situations [50, 58]. Managers can invest substantial resources in managing conflict [49, 50].

Conflict management, conflict resolution, and dispute resolution are sometimes used synonymously in the literature, but they are not necessarily the same [45, 49, 59]. Just as there are formal conflict (typically associated with settings of defined laws and policies) and informal conflict (typically associated in settings of unwritten communication norms between individuals and groups) types, there are formal and informal conflict management methods [53]. Dispute resolution is often associated with formal work policies, governance, courts, and political situations [60, 61]. Conflict resolution is often associated with the informal interactions between family, team members, colleges, and groups [62–64]. Both terms can be used for formal and informal interactions.

The evolution from dispute and conflict resolution to conflict management includes disputes but is broader — representing stress, tensions, and strains that may or may not have surfaced or been expressed. Management includes resolution, but also includes prevention and containment [45, 59]. Conflict resolution is often seen as a sequence of post-conflict events

intended to end hostility [58]. Whereas, conflict management is more. Management recognizes that not only can conflict be too high, but it also can be too low. Conflict management asks the question, what is the desired level of conflict necessary for success at the interpersonal, group, or intergroup level [49]. Thus, conflict management not only recognizes that conflict can hinder progress, it embraces the idea that conflict enables new ideas, better decision making, and creativity itself [49, 58, 65].

9.2. Conflict management approaches and techniques

Approaches and techniques for conflict management vary greatly from conversations, to third-party involvement, to violent acts [58, 62, 66]. This section will focus on resolving and stimulating conflict through nonviolent constructive approaches and techniques. As with strategies and tactics, approaches, like strategies, tend to be broad in nature - ideas and guides to thinking. On the other hand, techniques are more like tactics that are more specific and actionable. This section will be spent focusing on techniques. However, approaches are identified as a basis for explaining how the techniques developed.

9.2.1. Approaches

One approach outlined by Robbins [49] focused on the desired level for conflict. This approach defines conflict as an opposition between two parties. It recognizes that conflict can occur at the interpersonal, group, or intergroup level. This approach considers the traditionalists, behaviorist, and the interactionist view of conflict management. With both the traditionalists and the behaviorist, the approach is to eliminate conflict. But, the interactionist encourages conflict. Through this approach, conflict enables change. Therefore, conflict management is not just the resolution of conflict, but also the stimulation to foster improvement. Eight different conflict management techniques are identified [49].

Another approach outlined by Lan [50] considers the individual status of the conflicting parties. This approach to conflict takes a U.S. centric view. In this approach, the distinct conflict players are the conflicting parties, the observers or onlookers and conflict resolvers. There are three authority related values systems: managerial, political, and legal. The managerial system values efficiency and effectiveness and views the individual as an impersonal objective case. The political system values representation and views the individual as a member of a group. The last system, the legal system, values constitutional integrity; it views the individual as having equal rights. Conflict management is evaluated, stimulated and resolved through one or a combination of these systems. Three primary conflict management techniques are presented with additional alternative techniques [50].

Within the last approach, proposed by Thomas [52] and by Rahim and Magner [51], each consider the concern for others (cooperativeness) and concern for self (assertiveness) as key predictors in how individuals will manage conflict. These researchers used a two by two matrix to predict conflict management styles based on the strength of each consideration—ranging from high concern for both self and others to low concern for self and others. Five conflict management techniques are identified [51, 52] and are presented in the following section.

9.2.2. Techniques

The following conflict management techniques have been highlighted in the research approaches mentioned above and from related research on conflict management approaches, techniques, and skills. Techniques are not mutually exclusive and may have some overlapping concepts. Different techniques may be more appropriate based on conflict type (task, process, or relational), outcomes, timing, and the power position of interacting parties [44, 45, 54].

9.2.2.1. Problem solving

Problem solving is the most direct technique. Problem solving is often associated with managing task related conflict [44, 45]. Through this tactic, parties involved in the conflict interact to define, assess, and solve the problem [49, 50]. Interactions to arrive at problem definition among conflicting parties, observers and/or conflict resolvers may involve debate and discussion of ideas [45]. Through communications and direct interactions to confront the problem and related parties, information can be gained to move forward [57, 66]. Problem-solving can be executed through individual interaction, workshops, and third-party mediation [50, 58].

9.2.2.2. Collaboration

Collaboration is often seen as the most desired technique [54]. Through the collaboration tactic, one focuses on both high concern for others (cooperativeness) and high concern for self (assertiveness) in conflict management [51, 52]. The collaborative technique can be described as integrative and cooperative because it constructively searches for information that can be used to develop mutually satisfactory agreements [55, 56]. Collaboration can also be described as smoothing, which focuses on common interest between parties and deemphasize differences [49, 57, 67]. In some situations, cooperation has to evolve and grow over time allowing for small victories to build trust while enabling flexibility and learning [68].

9.2.2.3. Avoidance

This is the opposite technique to collaboration. Avoidance is often practiced when there is a low regard for self and the opposing position in a conflict [51, 52]. Withdrawal, ignoring, suppression, and not addressing issues represent this technique [46, 50, 58, 68].

9.2.2.4. Competition

With the competition technique, one focuses on high regard for self (assertion) and low regard for the opposing position (low cooperation) in managing conflict [52–53]. This technique can also be labeled as dominating and is often used when there is a perceived power imbalance favoring the dominant party [51, 54].

9.2.2.5. *Accommodation*

The opposite tactic to the competitive technique is accommodation. With this technique, one focuses on a low regard for self and a high regard for the opposing position [51, 52]. This technique is also referred to as obliging and can result in quick resolve and being viewed favorably by the opposition [51].

9.2.2.6. *Compromise*

Compromise is similar to collaboration. The difference is that there is a high regard for self and opposing positions in the short-term, but not necessarily in the long-term [51, 52]. Compromise can also be termed bargaining or negotiating; [57, 67, 68]. It is often facilitated through an exchange and giving up one demand to secure another [49].

9.2.2.7. *Authoritative command*

Through this technique a formal authority dictates the solution [49]. Authoritative command can be viewed as forcing [57, 67] a win-lose scenario. This technique can be implemented by a leader, manager, group vote, arbitrator, court or other party [45, 49, 50].

9.2.2.8. *Altering structural variables*

Changing structure may be reflected in different group dynamics, roles, responsibilities, coordination tactics, new boundaries, or systems [45, 49]. This technique is closely associated with managing process related conflict [44, 45]. To execute this technique, a third-party may enable the change for better process or structure utilizing negotiations, arbitration, or mediation [58, 68].

9.2.2.9. *Altering human variable*

This technique is closely associated with relational conflict management [44, 45]. It involves using education, awareness, training, and other constructive means to change the attitudes of one or more conflicting parties, but may be the hardest to implement [49, 66]. Cognitive analysis, posited by [67], is part of this technique. Cognitive analysis recognizes that conflict resolution is based on human judgement, which can be inaccurate and inconsistent. Conclusions about an outcome on the surface can have deeper implications that are both different than what is expressed on the surface and hard to explain. This cognitive difference can be a source of team conflict through elicitation and representation [44, 67]. Cognitive analysis outlines a system to communicate and clarify differences in cognition [67].

9.2.2.10. *Expanding resources*

Expansion of resources may be the easiest technique to implement. If resources and means are available, making more of the scarce resource, that is causing the conflict, available to the parties involved enables a high sense of satisfaction to everyone [49].

10. Conclusion

10.1. Inter-group versus intragroup processes and adaptive leadership

Hempel et al. [69] highlighted research indicating that inter-group (external) and intra-group (internal) conflict are highly related. If a team is unable to manage inter-group conflict they are also less likely to manage intra-group relations, including intra-group conflict. Hempel et al. [69] pointed this out by stating “within-team processes can influence between-team processes”. In fact, they went as far as to identify competition between groups often results in lower within group performance. This would seem counterproductive to typical motivational techniques that believe that competition yields a greater aggregate compared to no competition among groups. However, when viewing teams as CAS these research results make sense. In CAS, changes in one part of the system results in changes in the whole system. If the change in one system causes a large enough dissonance among other parts of the system this could potentially result in the whole system emerging as a different entity. In the case of managing a team’s internal processes, including intra-group conflict, each team must be able to operate effectively internally prior to successfully operating among other teams, thus contributing to the whole organization. If one team is unable to manage its internal processes successfully, this could have drastic effects on other teams and, ultimately, the whole system—the organization.

Complex adaptive systems work both ways, small changes in one system (or sub-system) can affect the larger system just as well as changes in the environment or the larger organization can affect lower level systems. As Hempel et al. [69] indicated: “The way teams within the organization manage conflict with other teams influence how they manage their internal conflicts”. Here, it is critical that managers provide the resources, tools, and freedom for teams to operate independently enough to manage their internal processes as well as providing the mechanisms that allow teams to manage among one another within the organization. Managers need to be aware of the modes of operation within and among teams and small groups to allow the overall system or organization to self-correct, to be adaptive.

Adaptive organizations are not heavily managed. If they were, they would not be able to react to external changes quickly enough. Adaptive leadership provides mechanisms for organizations to react quickly to external changes, offering a prescriptive approach for leaders to help their followers confront and manage conflict issues in complex and changing environments [70]. Adaptive leadership “focuses on the strategies and behaviors that encourage learning, creativity, and adaptation in complex organizational systems” [71]. Northouse [71] presented six behaviors for adaptive leadership:

- Get on the balcony: a metaphor for adaptive leaders to step away from the fray to gain a bigger perspective;
- Identify adaptive challenges: adaptive leaders focus on the problems that they alone cannot solve and require collaboration with others;

- Regulate distress: adaptive leaders monitor the stress that people are experiencing during times of uncertainty while helping them to recognize the need for change but not to be overwhelmed by it;
- Maintain disciplined attention: adaptive leaders influence others to remain focused with the task at hand despite the difficult nature of the work or the tendency to avoid it;
- Give the work back to the people: adaptive leaders empower others to take ownership of their work by allowing them to solve their own problems and take responsibility for both positive and negative outcomes;
- Protect leadership voices from below: adaptive leaders listen and are open to ideas from those who are in the minority in order to avoid group-think.

The authors identify adaptive leadership as one potential leadership style to better manage in today's complex environment. However, there are other leadership styles that may work just as well (e.g., complexity leadership theory, shared leadership). More research is needed to identify which types of leadership styles work best in complex environments, adaptive leadership is only identified here as one potential style.

10.2. Future directions

Complex adaptive systems are a composite of the interconnected whole that empowers teams and leaders to understand and address intragroup conflict in complex and adaptive situations. Future research relating to the five different intragroup conflict strategies presented in the current chapter is recommended. Currently, there is no study or instrument incorporating all five intragroup conflict constructs in the same study (task, relationship, process, cognition, status). This line of research could benefit the literature relating to small group and organizational behavior research in two key areas. First, a comprehensive instrument on intragroup conflict would be composed and validated. Second, this instrument would be utilized in future research efforts to better identify the effects of intragroup conflict on team performance as well as identify the impact that different leadership styles might have on intragroup conflict.

The taxonomy of team processes presented in the current chapter from Marks et al. [15] provides probably one of the best temporal models for teams. This model identifies the team transition, action, and interpersonal phases as a team works toward goal attainment. However, this model is essentially a linear model and does not address complexity and emergence. Future team process models are recommended to be developed using complexity theory to position the construct of emergence as a key outcome of team processes caused by the interactions facilitated by organizational leaders or managers. This is important to address because today's teams are more self-directed and achieve their outcome once emergence has surfaced. Current team process models are just beginning to incorporate emergence as a key team process. Better understanding of the antecedents to this emergence (e.g., interactions) will provide better utility for teams and organizations in the future.

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