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Collective Achievement, Cohesive Support, Complementary Expertise: 3Cs Emergent Model for Shared Leadership

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Abstract

Society is asking for a shared leadership approach to deal with diverse, complex, and dynamic situations. Existing studies on shared leadership, however, lack clear theoretical analysis and/or sufficient empirical evidence. To fill this research gap, this article first clarifies conceptual ambiguities regarding shared leadership. Second, inspired by social exchange theory (SET) and emergence theory on team cooperation, it proposes a novel model, 3Cs, to characterize shared leadership through three dimensions: *collective achievement* leadership, *cohesive support* leadership, and *complementary expertise* leadership. This model explains how *macro*-level shared leadership phenomenon emerges through *micro* individual behaviours, and is compatible with but more concrete and comprehensive than the current understanding of shared leadership in either a composition form (i.e., team members perform homogeneous leadership behaviours) or a compilation form (i.e., team members perform heterogeneous leadership behaviours). A mixed-methods approach combining a qualitative study on 12 international graduate students in a leadership program and a quantitative study on 86 leaders and 370 team members from Chinese enterprises was conducted to confirm the validity of the proposed model. This model provides human resource development (HRD) professionals with a comprehensively practical approach regarding how to develop shared leadership.

Keywords: shared leadership, emergence theory, collective achievement leadership, complementary expertise leadership, cohesive support leadership

1. Introduction

Traditional studies on leadership are dominated by top-down and bureaucratic paradigms (Uhl-Bien, Marion, and McKelvey 2007). While this individualistic approach is efficient in executing decisions, its effectiveness is problematic given an unpredictable world with much more diversity, complexity, and dynamics than ever before in human history. It is important to study a less hegemonic and more diverse perspective for practising leadership (Pearce and Sims 2000; Brink and Tanggaardb 2016).

For that purpose, increasing attention has been given to a plural form of leadership approach, i.e., *shared leadership*, that overcomes the limitations of traditional individualistic leadership models by sharing influence and leadership responsibilities among peers (Pearce and Conger 2003; Denis, Langley, and Sergi 2012). This concept has been shown to be positively related to team and organizational performance (e.g., Carson, Tesluk, and Marrone 2007; Wang, Waldman, and Zhang 2014; Barnett and Weidenfeller 2016), innovation behaviour and knowledge creation (Hoch 2013), as well as contributions to mutual learning, organizational adaptive capacity, and active problem solving (Clarke 2013).

However, despite the blossoming of studies on shared leadership in recent decades, there remains no consensus on how it should be defined or measured (D'Innocenzo, Mathieu, and Kukenberger 2016; Zhu et al. 2018). The existing literature on the definition of shared leadership is fragmented due to a lack of rigorous theoretical analysis and/or large-scale empirical evidence (Avolio, Walumbwa, and Weber 2009; Zhu, Liao, Yam, and Johnson 2018). We know little regarding how team members dynamically adopt and perform leadership roles (Clarke 2013). Therefore, characterizing and measuring shared leadership is a major challenge that leadership researchers are facing (Hoch and Kozlowski 2014).

Many existing studies have primarily relied on one *aggregate* approach that assumes that shared leadership consists of five types of leadership behaviours (i.e., transformational, transactional, aversive, directive, and empowering leadership; see Pearce and Sims [2002]). Although this approach touches on one of the core issues in shared leadership research – "*what* is being shared in shared leadership" (Zhu et al. 2018) – it is limited because it is inherently based on the traditional *micro* view of individualistic

leadership. The aggregate approach emphasizes a top-down process and does not reflect how *macro* leadership functions may be allocated when peers step into the role of leading one another. Furthermore, this approach neither differentiates among individuals in shared leadership nor captures the unique leadership influence of team members (D'Innocenzo, Mathieu, and Kukenberger 2016).

In contrast, some recent studies have attempted to characterize shared leadership from a *macro view* of team behaviours. A prevalent measurement method is to capture the overall degree of shared leadership at a team level from a social network aspect, e.g., evaluating the *density* of shared leadership in a team by asking each team member to rate the degree to which the team depends on their peers for leadership and then calculating the overall shared leadership density in that team by dividing the sum of all ratings of one another's leadership by the total relationship ties among members (Carson, Tesluk, and Marrone 2007). Compared with the aggregate approach, this macro approach recognizes the different leadership influences of different team members, thus incorporating interpersonal influence nuances to understand shared leadership. However, existing macro studies do not capture shared leadership behaviour content well and only provide a very rough overall sense of how much leadership influence is shared among team members (Zhu et al. 2018). Furthermore, the current literature contains no theory connecting *macro* team behaviours and *micro* individual behaviours in which shared leadership members may engage.

This study considers developing a shared leadership theory combining micro individual behaviours and macro team behaviours. Supporting this approach is the well-known *social exchange theory* (SET), which suggests that two or more individuals may implement a cost–benefit analysis by exchanging the taking of risks and enjoyment of benefits (Gouldner 1960). We note that SET is supported by a biological theory that evolution has resulted in life itself implementing give-and-take behaviour (Dawkins 1976), and a recent study provides theoretical evidence for this theory by mathematically proving that "cooperation flourishes most in societies that are based on strong pairwise ties" (Allen et al. 2017, Abstract).

Another support for our approach, emergence theory, studies a process of *emergence* in which complex social phenomena manifesting at a higher, collective level system are created through interactions of lower-level subsystems (Kozlowski and Chao 2012; Kozlowski et al. 2013). This theory

argues that certain team states representing member perceptions, cognitions, affections, and motivations will be developed through social interactions such as communications and perception exchanges (Marks, Mathieu, and Zaccaro 2001).

The root of emergence theory came from the Boids model for mimicking bird flocking behaviour (Reynolds, 1987), which states that flocking can be explained by the interaction of individual agents following three rules: *separation* to avoid crowding neighbours, *alignment* to move towards the average heading of neighbours, and *cohesion* to move towards the centre of neighbours. An interesting extension of Boids, the Autonomous Boids model adds a "change of leadership" rule, in which a boid seeing a clear space begins to lead the flock and other boids follow it and absorb it back into the flock (Hartman and Benes 2006).

We note that the emergence approach is compatible with the current understanding of shared leadership as a *composition form* (i.e., team members perform homogeneous leadership behaviours; Kozlowski and Klein 2000) or a *compilation form* (i.e., team members perform heterogeneous leadership behaviours; Kozlowski and Klein 2000). In fact, emergence theory suggests that interactive processes make team members' perceptions, values, beliefs, and behaviours converge homogeneously (i.e., composition) through alignment and cohesion or make them remain heterogeneous (i.e., compilation) through separation.

Unfortunately, we observe that while SET and emergence theory seem good for explaining work teams, they are *insufficient* to explain shared leadership. One missing point is that they allow the existence of *free riders*. An agent in the centre of a flock can play no leadership role at all but simply continue being a follower. Such a free rider does not contribute to leading the team with sufficient input and thus should be explicitly excluded from a shared leadership definition. Additionally, we contend that a *common goal* is also missing in SET and emergence theory but should be included in a shared leadership definition (Pearce and Conger 2003).

Therefore, we conclude that a comprehensive theory on shared leadership should include four elements: common goal, composition form, compilation form, and no free riders. This study attempts to clarify the definition and provide a model for shared leadership based on this observation. We develop a novel scale for measuring our model through careful and large-scale empirical research

consisting of a mixed-methods approach with qualitative and quantitative studies. As a result, we propose an emergent model of shared leadership, 3Cs, in which (1) *collective achievement leadership* and (2) *cohesive support leadership* represent the content arising through convergent interaction dynamics, while (3) *complementary expertise leadership* represents the content arising through divergent dynamics. This model explains both the theoretical and empirical aspects of shared leadership better than existing studies, e.g., the common goal is addressed by collective achievement leadership, and the no free-rider rule is covered by complementary expertise leadership. We believe that this research provides human resource development (HRD) professionals an intriguing perspective on how to develop shared leadership.

The rest of the article is organized as follows. In Section 2, drawing on SET and emergence theory, we provide a theoretical discussion of our 3Cs model by reviewing the literature on shared leadership. Sections 3 and 4 present a qualitative and a quantitative approach, respectively, to study the proposed theory and to develop a scale for measuring the 3Cs model. Finally, Section 5 summarizes the article by discussing the limitations and future work.

2. An emergent 3Cs model for shared leadership through social exchange processes

This section, drawing on SET and emergence theory, provides a theoretical discussion of the proposed emergent 3Cs model from a review of the literature on shared leadership.

2.1. Defining shared leadership

Current research on shared leadership lacks a unified definition of the concept (D'Innocenzo, Mathieu, and Kukenberger 2016; Zhu et al. 2018). As shown in Table 1, there are numerous ways in which shared leadership is defined. One major controversy among them is the nature of shared leadership. The discussion diverges in considering it a team process or an emergent team state. For example, Ensley and colleagues (2006, 220) define shared leadership as "a team process where leadership is carried out by the team as a whole, rather than solely by a single designated individual." A contrasting view defines shared leadership as an emergent property in which leadership influence is distributed among team members (e.g., Carson, Tesluk, and Marrone 2007).

We agree that shared leadership is an emergent team property rather than a team process because shared leadership is dynamic in nature and represents particular team cognitive, motivational, and affective states as a function of team inputs, processes and outcomes (Marks, Mathieu, and Zaccaro 2001). Adapted from D'Innocenz and colleagues (2016), we define shared leadership as an emergent team phenomenon whereby leadership roles and influence are combined or distributed among team members according to team needs. This definition aligns with Pearce and Conger's (2003) suggestion in the sense that shared leadership is dynamic in nature and that the source of leadership influences derives from multiple directions. Our definition differs, however, in arguing that shared leadership is an emergent property in which team members perform both identical and nonidentical leadership behaviours. It also suggests that shared leadership, as structured collective behaviour, emerges through individual interactions within a team.

【Insert Table 1 about here】

Kozlowski and Klein (2000) suggest two forms of emergence: composition and compilation. The composition form occurs when member interactions, depending on contextual contingencies, lead to a coalescence of member perceptions, feelings, behaviours, and other characteristics over time (Kozlowski and Chao 2012). Homogeneous understandings among individuals of a unit are thus generated. In this case, "entities combine to create a new entity with a more complex composition and new qualities due to the coalescence of the parts" (Fulmer and Ostroff 2016, S123). In contrast, compilation divergence may also emerge through micro interaction dynamics and engender a complex combination of lower-level characteristics, perceptions, and behaviours (Kozlowski and Klein 2000).

We remark that SET also supports the emergence process of shared leadership behaviours through reciprocal processes. SET argues that individual interactions, which are intrinsically endorsed by mutually expected rewards, generate obligations among those involved, which may result in or fortify high-quality social relationships (Blau 1964; Cropanzano and Mitchell 2005). Social relationships are formed based on exchange rules, which Gouldner (1960, 162) called "the norm of reciprocity". Reciprocity refers to social equilibrium, which depends on "the schema of giving and

returning the equivalence". Gouldner posited that reciprocity is the basic and universal principle to which all social structures should conform. In reciprocal processes, interpersonal influence is exerted by identifying interactions and specifying everyone's role in the social system (Seers, Keller, and Wilkerson 2003). This proposition provides an understanding of how shared leadership behaviours may emerge through reciprocal processes, as authority in this social system is not assumed to be limited to an appointed leader but rather extant in the form of "fluid expertise" through which group members mutually exert leadership influence (Fletcher and Käufer 2003). In other words, different types of leadership influence may emerge through social exchanges based on reciprocity. These leadership influences eventually generate both composition and compilation forms of leadership behaviours.

In the following, we further discuss how different forms of shared leadership may emerge through the social-psychological processes of social exchanges by reviewing the literature on shared leadership. As a result, we can formulate a novel model of shared leadership by embedding the aforementioned four elements (i.e., common goal, composition form, compilation form, and no free riders) with existing literature on share leadership. The final model consists of three dimensions, i.e., *collective achievement*, *cohesive support*, and *complementary expertise*; therefore, it is called 3Cs in this study.

2.2. Collective achievement leadership

Collective achievement leadership occurs when team members collectively organize tasks and engage with others to find solutions for mistakes and conflicts that arise within the team (Avolio, Bass, and Jung 1999). This type of leadership is manifested by encouraging everyone in the team to think differently, ask challenging questions, and seek different ideas and solutions (Bass 2008).

According to Gouldner (1960), people reciprocate because they believe that the transactions of goods and services will ultimately result in a fair equilibrium in which everyone is content. In the context of shared leadership, behaviour choices result mainly from the following three types of beliefs: that everyone is qualified and essential to stay in the team, helping achieve team goals and making collective decisions; that the efforts exerted by each team member will ultimately attain balance; and that team goals will ultimately be achieved if all members adhere to the group decisions and collaborate. In other words, the group members believe that the task loads are equitable and that solutions to

problems are the best choice for the group because they are the results of "the sum of all members' wisdom", based on which the group will achieve positive results that will ultimately benefit all members (Cropanzano and Mitchell 2005).

Shared leadership behaviours are greatly improved compared to unshared behaviours because the interests of any single individual are not violated in terms of the distribution of task loads or expected outcomes. A collective agreement on task flows and problem solving eventually protects the collective beliefs shared by team members. However, if the tasks related to team goals are poorly planned or arranged, if the strategy is perceived as inequitable or infeasible, or the issues within the team cannot be solved, it is highly possible that team goals will not be achieved and that team members will be unsatisfied.

Similarly, Wellman (2017) suggests that contextual factors cause teams to converge either on an authority ranking relational model (i.e., leadership systems are constructed based on a hierarchical ordering of group members) or on a communal sharing relational model (i.e., leadership systems are constructed based on group members' consensus and unity) to guide their leadership activities. Groups adopting the communal sharing relational model are more likely to develop a system with widespread leadership participation than groups adopting the authority ranking relational model because individuals in the former groups believe that every member in the team can engage in leadership. If only a few individuals in the team dominate all leadership interactions, it will violate the groups' core relational principles that everyone is qualified and important to achieving team goals.

Wellman (2017) further suggests that intellectual stimulation is one type of prevalent leadership behaviour in communal sharing groups. Intellectual stimulation behaviours refer to seeking perspectives from others and collectively generating solutions to shared problems. Team members seek opinions from one another to reach a shared consensus regarding group behaviours because they consider everyone in the group qualified for leadership. Those behaviours include seeking and considering alternative perspectives on what the group should do and engaging others to cogenerate solutions to group problems. Group futures and management do not depend on the individual will of any of the group members (Carson, Tesluk, and Marrone 2007). Instead, they derive from a mutually satisfactory agreement shared by team members. We call this type of emergent shared leadership

behaviour *collective achievement leadership*, referring to the extent to which team members seek perspective to manage group work and solve team problems collectively. Note that the common goal and compilation form elements are covered by this dimension.

2.3. Cohesive support leadership

Homans (1958) argued that the dynamics of social exchange behaviours generate an equilibrium status in small groups by shaping the group norms that define the values of the members – "the work towards group cohesiveness". Team cohesion refers to the degree to which a group attracts members to remain within the group (Zaccaro, Rittman, and Marks 2001). In a cohesive group, all members are satisfied with what they give and what they receive; "the more cohesive a group is, the larger the number of members that conform to its norms" (Homans 1958, 600).

Members exercising shared leadership believe that mutual support and help are essential to motivate everyone to stay on the team, as individual success intrinsically depends on others' success. Consequently, team members care about others' status and development, as indicated by their encouragement of those who are discouraged and willingness to help peers grow. At the same time, team members engage in reciprocity, such as sharing information and knowledge, to facilitate a cohesive work environment. When teams develop mutual support and cohesiveness, group norms influence the behaviour of team members. Helping other team members is perceived as both an obligation and the rule in shared leadership settings because every team member believes it is the right thing to do.

Furthermore, team members in shared leadership perceive one another as worthy of respect, care, and devotion because, in essence, they define their teammates as equals (Wellman 2017). Therefore, they engage in reciprocal consideration behaviours such as listening to others' problems, caring about others' feelings, providing psychological support to others, taking others' suggestions, and sharing information and knowledge to support others in need (Bass 2008). Those behaviours intend to establish strong interpersonal connections with other team members by showing kindness, respect, and support. We call such behaviour *cohesive support leadership*. This dimension is defined as the extent to which team members offer mutual support and work as a cohesive team, thus addressing the compilation form element.

2.4. Complementary expertise leadership

The emergence of *collective achievement leadership* and *cohesive support leadership* is based on the development of team-level cognitive structures that guide team members in constructing their taskwork (e.g., work goals, procedures, and strategies) and teamwork (e.g., team norms and interpersonal relationships; Cannon-Bowers, Salas, and Converse 1993). Such shared mental models are essential for members to conduct shared leadership because they enable team members to agree effectively on how to achieve their goals and continue social interactions with identical mental representations of their collective task and team norms (Kozlowski and Klein 2000). However, individual characteristics do not always converge and adapt due to individual interactions in a team. Transactive memories may also emerge (Lewis 2003; Wegner 1987).

SET suggests that collective efforts generate interdependence in a social system when exchange interactions generalize the knowledge and role expectations of others while highlighting each person's different responsibilities (Seers, Keller, and Wilkerson 2003). Interdependence is established and maintained only when the needs of one party and the efforts exerted by other parties are reciprocally aligned. As such, interdependence reinforces role differentiation and division of labour. It underscores "mutual and complementary arrangements" (Cropanzano and Mitchell 2005, 876) based on the construction of a role system.

In shared leadership, members acknowledge what others know and develop an expertise network with team members' heterogeneous competencies (Lewis, 2003). Each member is indispensable because everyone can provide something cannot to the group that the other members. When complementary expertise leadership is applied, individuals succeed in developing a complementary role system and learning how to lead their peers, i.e., how to combine the leadership strengths of the group members to reach goals. As Homans (1961) claimed, to influence others, one must allow him/herself to be influenced by others. Because each member has a different role, but the group agrees to act in coordination, a partnership develops among the members in which members are aware of others' expertise and obligations as well as their own. The expertise network enhances the success of shared leadership because team members are complementary and interdependent due to their diversified

expertise and strengths. As a result, team members' knowledge and competencies fit together as a meaningful configuration.

Therefore, we contend that shared leadership is also compilational. A networked memory of each member's expertise is essential for shared leadership teams to function (Wegner 1987). Diversified expertise is mutually recognized by team members, and the individuals who have expertise take leadership roles according to the team's needs. In shared leadership teams, a network of diversified expertise ensures the functionality of a shifting mechanism of leadership roles: For example, because one's expertise may be more useful in one situation than others, one individual is thus selected and solidified in that specific situation to lead the team. In other words, everyone is significant to the team because their expertise and strengths are heterogeneous and indispensable. We term this arrangement *complementary expertise leadership*, whereby team members recognize one another's expertise and successfully build a complementary expertise network of leadership role shifting mechanisms. Notice that this dimension addresses the composition form and no free-riders elements.

3. Study 1: A qualitative study on the proposed model

To empirically study the 3-dimensional 3Cs model proposed in the previous section, a mixed-methods approach was applied. We adopted this approach because it provides a more complete understanding of our research question and stronger substantiation of shared leadership constructs (Creswell and Creswell 2018; Eisenhardt 1989). Qualitative research is useful to suggest and reflect theory that can be supported, strengthened, and generalized by quantitative research (Creswell and Clark 2017; Eisenhardt 1989). In this section, a qualitative method was sought to preliminarily test the 3Cs model. An experiment was designed for 12 graduate students who were enrolled in a leadership exchange program. Their responses to two open-ended questionnaires underwent a content analysis. The results were consistent with the theoretical assumption.

3.1. Research design and sample

An experiment was carried out in a leadership exchange program at a public university in Japan. The experiment organizer explained the study purpose and procedure to all students on their first day

in the program. Participation in this study was completely voluntary, and English was used as the primary language for communication and data collection. Twelve of the 14 students agreed to participate in the research and signed an informed consent letter. Their average age was 28. A total of 66.7% were male, and 33.3% were female. They were from various countries, including Australia, Japan, Korea, the Philippines, several European countries, and the United States. They were all enrolled in a graduate or postgraduate program during the exchange program period and had rich international experiences in leading different school projects. They spoke English as a first language or fluently as a second language.

The experiment comprised three 2-hour workshops. In the first workshop, participants were divided into four equal teams. Each team member received a letter tag: A, B, or C. Each team was asked to design an extracurricular activity for primary school students (11-year-old children) relating to one critical global issue. They were told that they would discuss detailed plans in the second workshop and carry out their plans with the target students in the third workshop.

In the second workshop, each team was directed to a separate room to conduct team discussions. After that, they were asked to complete a questionnaire with 10 open-ended questions to detail the behaviour of their team members in the second workshop. After two days (in the third workshop), each team implemented their activity plans. Then, they were asked to fill out another questionnaire with 12 open-ended questions to indicate their team member behaviours in the third workshop. The following is an example of the questions that the participants were asked: "Who was/were leaders in your team? Why do you think so? Please use detailed examples to explain."

3.2. Data coding and analysis

The survey responses were analysed with ATLAS.ti, an efficient and reliable software application, to organize and code qualitative data. A coding frame was created that used the three dimensions discussed in Section 3 (i.e., *collective achievement leadership*, *complementary expertise leadership*, and *cohesive support leadership*) as primary categories following the steps suggested by Creswell and Clark (2017) and Schreier (2012). Responses were classified as collective achievement leadership if they related to organizing and planning teamwork, making decisions, and solving problems collectively. Responses were coded as *complementary expertise leadership* if they concerned leadership

role shifting and mutual expertise recognition. Statements related to building cohesive teams were categorized as *cohesive support leadership*. No responses were found that could not fit into one of the categories described above. To determine the validity of the results, we asked one of the key participants whether the findings reflected her experiences in the program (this follows the approach by Creswell and Clark 2017). The results are presented below.

3.3. Results

Collective achievement leadership

This dimension refers to the extent to which team members seek perspective to manage group work and solve team problems collectively. In this study, we found that participants displayed leadership in a particular way, especially in the planning stage (workshop 2). Additionally, we observed that team discussions were held to solve team problems and contradictions. To understand the details of how team members managed group work and solved team problems collectively, we studied their feedback. One participant, 3C, answered:

> "I don't believe there was any one leader on the team. We all contributed ideas to the teaching assignment and took the lead in different roles…We all had a relatively equal role to play in the presenting of the material and the running of the activity." (3C)

> "At the beginning, I was a little anxious because neither of my teammates attended the initial meeting. However, we quickly came to agreement on the topic and division of work over Facebook, which made me feel much better about the teamwork." (3C)

Therefore, we found that participants shared in planning and organizing teamwork, reaching an agreement on how to arrange the team activity so that everyone's responsibilities and workload would be distributed as evenly as possible, and when one team member was unable to attend one of the workshops, the others addressed this problem through virtual discussion and decided together how to allocate team tasks. Team members did not seem to depend on one single leader to run team activities or solve team problems that arose. Instead, they were all involved in contributing ideas and sharing responsibilities to reach team objectives, as well as actively seeking effective ways to agree on solutions to team problems (Avolio, Bass, and Jung 1999). Collective achievement leadership is thus helpful to

attain member consensus on decision-making that is relevant to achieving team goals such as task allocation, responsibilities, and problem-solving mechanisms.

Cohesive support leadership

This dimension refers to the extent to which team members offer mutual support and work as a cohesive team. Because this experiment was conducted within a relatively short period, there were few moments of conflict. Hence, recognized leadership behaviours that needed improvement for team cohesiveness were not highly reported. Nevertheless, participants took necessary actions to support and help their team members. For example, in team 1, members created a positive and supportive team atmosphere through verbal encouragement and helping one another:

> "We encouraged each other, for example, when one of us completed a task, we would say "Great job, thanks!" I think this was important for keeping morale high…If I had a question about the proper way to say something in Japanese, I would ask 1A." (1B)

Consequently, we observed that cohesive support leadership was reflected when teams acted to keep team spirit positive. When someone needed help and information, others were willing to share and support. When someone successfully completed a task, they celebrated to keep team morale high.

Complementary expertise leadership

This dimension refers to team members recognizing expertise from one another and successfully building a complementary expertise network of leadership role shifting mechanisms. This construction occurs based on the creation of transactive memories of each member's expertise through interpersonal interactions (Wegner 1987). The capabilities of the team members in this study were heterogeneous and complementary, enabling each team to produce an expertise network based on everyone's strengths. Moreover, they were open-minded, allowing mutual influence (Homans 1961). Therefore, we are interested in knowing how participants constructed such networks. For example, one participant, 4C, stated the following:

> "I was an initial leader on the team because I have a background in climate change. I was able to guide us towards what we should be talking about (e.g., sources of greenhouse gases, climate change impacts, what countries are doing). This provided an initial direction for the team to work

towards. 4A took over a leadership role when he realized that he would need to do most of the speaking as the Japanese member of our team. He formed the discussion in his own vision based on what he would be comfortable with. After this transition, 4B and I provided support for 4A, providing information that he needed to put on a good presentation…

I felt that I needed to take an initial leadership role, and I suggested our topic and I work in the field of climate change…As I realized 4A wanted to take a stronger leadership role as the Japanese speaker, I allowed him to do so. Some of the choices he made I did not agree with, but I did not voice these concerns because he was the one who needed to present the material, and I wanted him to be as comfortable as possible in that role." (4C)

From this quote, we observed that participants recognized and appreciated one another's expertise and strengths. They implied that every team member was important in different ways in accomplishing team tasks. Leadership roles then shifted naturally when the team needs/priorities changed. Almost all participants indicated that the person(s) who took a leadership role in the third workshop was/were different from the person(s) in the second workshop. Leadership roles were decided based on which team member's skills and knowledge were most suited to the task at hand, and team members stepped into the leadership role accordingly. In the above example, 4C was assumed to be the initial leader because he was an expert on the team theme, so naturally, he led team discussions. In the third workshop, 4A took the leadership role because he was the only one who could communicate with students in Japanese. As a result, everyone felt comfortable and psychologically safe to take over leadership roles and responsibilities.

3.4. Discussion of Study 1

Study 1 was designed to pretest the 3Cs model of shared leadership, and the results confirmed the theoretical proposition. This study, however, was limited by its small sample size. Additionally, it was vulnerable to the possibility that shared leadership behaviours may not be the same in real organizational settings. Therefore, a quantitative study was performed to generalize the findings with the additional purpose of developing measurement items for each dimension of shared leadership, the results of which are reported in the next section.

4. Study 2: Quantitative methods for developing the measurement of the 3Cs model

Based on the findings from the pretest Study 1 in the previous section, Study 2 attempted to quantitatively test the 3Cs model of shared leadership and to develop items to measure shared leadership. This study sample included leaders and team members in Chinese organizations, and as a result, a 12-item scale was obtained to measure the three dimensions.

4.1. Scale development overview

To develop a sound and reliable measure of shared leadership, we followed Hinkin's (1995, 1998) recommendations. The development of the shared leadership scale included three phases that used a sample comprising leaders (some registered as master of business administration [MBA] students) and team members in China. During the first phase, a review of the existing literature was undertaken to generate a set of initial items. During the second phase, open-ended question surveys and in-person interviews were conducted to develop and refine the initial items. During the third phase, exploratory factor analysis (EFA) and confirmative factor analysis (CFA) were performed to assess the factor structure and reliability of the shared leadership scale with independent sample sets. The study then assessed the convergent, discriminant, and incremental validity of the newly developed scale.

4.2. Item generation

The work conducted in this phase aimed to develop a set of initial items that comprehensively reflect team-based leadership behaviours aligned with our definition of shared leadership. An extensive review of the existing leadership literature was first carried out. As a result, the initial item pool incorporated 52 items from Hiller (2002), Hoch (2014), Pearce and Sims (2002), Lewis' (2003) measurement of shared cognition, and Edmonson's (1999) learning behaviour measurement. All items were modified based on our definition of shared leadership. Because these initial items were all in English, four students (one doctoral student majoring in economics and management, one master's student majoring in Chinese-English translation, and two master's students majoring in economics and management) separately translated the items into Chinese. Then, the translations were compared and revised based on the suggestions of two midlevel managers with considerable experience working in a multicultural environment.

4.3. Item refinement

This phase included two procedures. First, 15 MBA students (leaders) who were part-time students and worked in a full-time position were instructed to complete a questionnaire to indicate their understanding of shared leadership based on their work experiences and knowledge. Of these 15 participants, 8 were male and 7 were female; 3 were top-level leaders; 7 were midlevel managers; 3 were first-line managers; and 2 were general employees who had experience in leading team projects. Participants' ages ranged from 29 to 43. The definitions of shared leadership and corresponding cases were presented to the participants before they answered the questionnaire. To ensure that these participants could freely describe their understanding of shared leadership, the interviewer did not mention any of the proposed dimensional assumptions or existing dimensions of shared leadership.

Additionally, seven face-to-face interviews were conducted with 4 other MBA students (midlevel managers) and 3 top-level leaders who worked in the credit, insurance, and consultant industries. The individuals who worked in these industries were considered potential sources of profound insight into shared leadership for two reasons. First, in general, these industries require individuals to use their leadership skills to adapt to the rapid development of information and knowledge to achieve team and company goals. Second, leaders in information-intensive industries usually have abundant experience in using shared leadership to stimulate employees' maximum potential. The interviews (each lasting approximately 2 hours) were semistructured and used open-ended questions. A sample question was "According to your work experience, what are the meaning and key characteristics of shared leadership?"

Based on the questionnaires and interview results, the study developed 33 original items reflecting shared leadership. The items were compared to the initial items produced during the first phase. Some initial items were revised or removed, and some items were newly written. After all these procedures, 67 items were generated (see Figure 1).

【Insert Figure 1 about here】

4.4. Item reduction and validation

4.4.1. Exploratory factor analysis

Sample and procedures. An EFA was used to reduce the items generated in phase 2 and explore the factor structure of shared leadership. The questionnaire included 67 items, with a cover sheet that explained the survey purpose and assured response confidentiality. A five-point Likert scale was used to measure each item, with the following range of possible answers: disagree, slightly disagree, neither disagree nor agree, agree, and strongly agree. The survey was administered to teams working at 12 Chinese companies operating in the technological, information, insurance, consultant, and service industries. Five items were negatively phrased to reduce response bias. In total, 305 respondents completed the questionnaire, and 261 valid responses (29 team leaders and 232 team members) of 29 teams were identified in the final analysis. The average age of the respondents was 31.03 years; 62.5% were females, and 37.5% were males.

Analyses and results. An EFA using the principal axis factoring method with a varimax rotation was performed to explore the measured construct of shared leadership. A nine-factor construct emerged. We re-examined each factor based on the following standards: 1) item loadings should not be less than .50, and 2) at least three items should represent the intended factor as the dominant source for the factor (Tabachnick and Fidell 2001). Based on the above criteria, six of the nine factors were considered problematic and removed. To create an efficient yet reliable scale for use in future academic research, we selected the four highest-loading items on each remaining factor and created a revised, 12-item scale of shared leadership as follows: 4 items reflecting *collective achievement leadership* (α = .86), 4 items reflecting *complementary expertise leadership* (α = .84), and 4 items reflecting *cohesive support leadership* (α = .85). The factor loadings of the 12 items in the EFA are shown in Table 2.

【Insert Table 2 about here】

4.4.2. Confirmatory factor analysis

Sample and procedures. To test the validity of the 12-item scale and the contribution of each dimension to the overall measure, a series of CFAs were applied with a new organizational sample.

Data were collected from 5 companies in China in the service, manufacturing, and real estate industries. We administered the questionnaire to those identified as high-level self-managed teams by their team leaders. In total, 37 team leaders and 136 team members from 37 teams completed the questionnaire; average respondent age was 29. This sample was also used to test convergent, discriminant, and incremental validity.

Analyses and results. The CFAs offered strong support for the proposed three-factor model. As presented in Table 3, the proposed model yielded a good fit with the data (χ^2_{51} = 102.118, p < .001, CFI = .934, RMSEA = .076, SRMR = .047). Cronbach's alphas were used to test the internal consistency of each of the following factors: *collective achievement leadership* (α = .71), *complementary expertise leadership* (α = .75), and *cohesive support leadership* (α = .81). The alpha coefficient obtained for the full shared leadership scale was .90. Additionally, the standardized loadings ranged from .54 to .88 and were all statistically significant at the .001 level.

In addition, the three-factor model was compared to four alternative models that included either one or two factors to test the distinctiveness of the shared leadership dimensions. As shown in Table 3, the first set of alternatives included two-factor models in which each two dimensions of shared leadership formed one factor, resulting in three models as follows: *collective achievement leadership* and *complementary expertise leadership* formed one dimension (χ^2_{53} = 151.133, p < .001, CFI = .873, RMSEA = .104, SRMR = .062); *collective achievement leadership* and *cohesive support leadership formed* one dimension (χ^2_{53} = 170.409, p < .001, CFI = .848, RMSEA = .113, SRMR = .065); and *complementary expertise leadership* and *cohesive support leadership* formed one dimension (χ^2_{53} = 120.746, p < .001, CFI = .912, RMSEA = .086, SRMR = .052). The final alternative was a single-factor model (χ^2_{54} = 182.825, p < .001, CFI = .833, RMSEA = .118, SRMR = .068). The chi-square difference tests between the proposed three-factor model and the above alternative models were all significant at the .01 level. The above results indicate that the hypothesized three-factor model is superior to the other models. Thus, the construct validity of the new shared leadership measure received strong support.

【Insert Table 3 about here】

4.4.3. Convergent and discriminant validity

Following the steps described by El Akremi and colleagues (2018), the convergent and discriminant validity of the newly developed scale of shared leadership were tested with the same sample for CFAs. The existing literature contends that shared leadership has both conceptual overlap with and differences from servant leadership. Servant leadership, which is characterized by its core attribute of "going beyond one's self-interest" (Van Dierendonck 2011, 1230), is intrinsically linked with shared leadership. Van Dierendonck (2011) suggests that servant leadership and empowering leadership are similar in their emphasis on delegating authority and facilitating shared goals by enhancing followers' well-being and personal development. Based on an understanding and acceptance of subordinates' characteristics, needs, interests, abilities, and potentials, servant leaders encourage subordinates to be accountable for setting and achieving goals with the necessary support to build personal strength (Liden et al. 2008). Notably, servant leaders help subordinates achieve their potential not for the sake of the organization or leader's goals but instead for the followers' own good (Ehrhart, 2004). Therefore, this study predicts that the 3Cs model is positively related to but distinct from servant leadership.

Measures. Servant leadership was measured with Ehrhart's (2004) servant leadership scale. A CFA was applied to test whether the items had good validity in measuring servant leadership with a Chinese sample. Following MacCallum and colleagues' (1999) suggestion, items with a factor loading lower than .60 were removed. Consequently, 8 items were used to measure servant leadership in this study. An example item was "My department manager spends the time forming quality relationships with department employees" (α = .88).

Analyses and results. The analysis started with a series of CFAs to assess the correlations between the *shared leadership* construct and *servant leadership*. The results showed that the three dimensions of *shared leadership* were moderately to strongly related to *servant leadership* as follows: .50 between *collective achievement leadership* and *servant leadership*; .61 between *complementary expertise leadership* and *servant leadership*; and .73 between *cohesive support leadership* and *servant leadership*. Next, CFAs were performed to test the distinctiveness of the 3Cs of shared leadership from the servant leadership measure. A CFA of the three constructs of shared leadership and servant leadership was

conducted, generating a good fit to the data (χ^2_{162} = 266.541, p < .001, CFI = .904, RMSEA = .069, SRMR = .064). Then, this model was compared with alternative models in which *servant leadership* was loaded onto each dimension of *shared leadership*. The alternative models fit the data poorly as follows: *servant leadership* and *collective achievement leadership* formed one factor (χ^2_{167} = 410.327, p < .001, CFI = .776, RMSEA = .104, SRMR = .094); *servant leadership* and *complementary expertise leadership* formed one factor (χ^2_{167} = 382.125, p < .001, CFI = .802, RMSEA = .098, SRMR = .09); and *servant leadership* and *cohesive leadership* formed one factor (χ^2_{167} = 358.872, p < .001, CFI = .823, RMSEA = .092, SRMR = .082). The chi-square difference tests were all statistically significant. Hence, the results support both the high relation of the 3Cs model to servant leadership and its distinctness. These findings provide strong evidence supporting the convergent and discriminant validity of the 3Cs model.

4.4.4. Incremental validity

In the final step, the incremental validity of the new shared leadership scale was investigated by examining whether shared leadership uniquely contributed to teamwork satisfaction beyond servant leadership or the four-type shared leadership scale (i.e., transformational, transactional, directive, and empowering leadership). The previous literature suggests that shared leadership results in teamwork satisfaction (e.g., Kocolowski 2010) because team empowerment meets the intrinsic needs of autonomy and growth (Kirkman and Rosen 1999). Additionally, teams conducting shared leadership have been found to exhibit less member conflict, greater consensus and cohesion, and higher mutual trust than those not involved in shared leadership (Bergman et al. 2012). Moreover, individuals in teams with higher task interdependence are more satisfied with their jobs and teams than those in teams with lower task interdependence because a high level of task interdependence results in greater cooperation and better performance (Van der Vegt, Emans, and Van De Vliert 2001). Therefore, the study expects the 3Cs model to explain the incremental variance in teamwork satisfaction beyond that explained by servant leadership or the four-type shared leadership measure.

Measures. The items from Mitchell and colleagues (2001) and Haas (2010) were adapted to measure *teamwork satisfaction*. We removed the items with poor factor loadings in the CFA using a cut-off of .4, which Stevens (1992) suggested should be the cut-off regardless of sample size. As a result,

a three-item scale was generated with the following items: “I am very satisfied with working together with the energized and uplifted members of this team”, “Members of this team are getting better and better at working together”, and “In general, I like working here” (α = .75). The author used the items generated in step 3 to measure *servant leadership* (α = .88). We adapted Pearce, Yoo, and Alavi’s (2004) shared leadership scale, which includes four types of leadership behaviours. The five-type leadership scale was not used because developing an efficient and short survey was essential for questionnaire administration. A sample item is “My team members urge me to assume responsibilities on my own” (α = .89).

Analyses and results. Hierarchical linear regressions were applied to test the incremental predictive ability of the shared leadership scale. Servant leadership or the four types of leadership behaviours were entered as control variables; then, the 12-item shared leadership measure was entered into the equations to test any increase in the explained variance of teamwork satisfaction. The descriptive statistics and correlations are displayed in Table 4. The model results shown in Table 5 demonstrate that the newly developed shared leadership scale yielded a significant increase in R^2 in predicting teamwork satisfaction after controlling for the effects of servant leadership (ΔR^2 = .10, $p < .001$) and the four types of leadership behaviours (ΔR^2 = .27, $p < .001$). The above results support the hypothesis and thus confirm the incremental validity of the three-dimensional construct of shared leadership.

【Insert Tables 4 and 5 about here】

4.5. Discussion of Study 2

The results of Study 2 suggest that the 3Cs model of shared leadership best fits the collected data. The EFA suggested a three-factor model, with four items per factor. The CFAs validated this finding, as testing alternative models resulted in a poorer fit. Convergent, discriminant, and incremental validity tests provided further evidence for the reliability of the newly developed scale. Therefore, we have confirmed that the 3Cs model well captures the nature of leadership behaviours involved in shared leadership.

5. General Discussion

This study, drawing on emergence theory and SET, proposed a 3Cs model that includes *collective achievement leadership*, *complementary expertise leadership*, and *cohesive support leadership* by reviewing the literature on shared leadership. This model explains how the *macro* shared leadership phenomenon emerges through *micro* individual interactions. A mixed-methods approach was applied to verify the theoretical assumption. A qualitative study using content analyses of data obtained from two open-ended questionnaire surveys provided preliminary support for the three dimensions. A quantitative study was conducted to test this model further empirically and to develop a valid measurement for shared leadership. The results suggested the scale of the 12 items with four items for each dimension.

The results suggest that the previous understanding of shared leadership was limited. The existing studies either consider shared leadership a composition form of emergence or a compilation form, whereas the proposed 3Cs model integrates both. Note that considering its dynamic nature, shared leadership can be compositional in some situations and can be compilational in others. Team members operate shared leadership by performing common leadership behaviours (i.e., *collective achievement leadership* and *cohesive support leadership*); they also distribute different leadership roles and responsibilities based on their unique expertise (i.e., *complementary expertise leadership*).

Our 3Cs model also emphasizes the significance of establishing common goals among team members by conducting *collective achievement leadership* and avoiding free-riding behaviours by conducting *complementary expertise leadership* to ensure the effectiveness of shared leadership. Team members in shared leadership need to agree on mutual goals through team discussions to direct everyone to work on the same page and solve team problems. Meanwhile, *complementary expertise leadership* ensures that those who stay in shared leadership can make unique contributions to the team so that no one will take free benefits. Moreover, *cohesive support leadership* brings everyone together with a core team spirit of mutual support and respect. This dimension ensures the smooth

implementation of the other two dimensions in which team maintenance work is equally shared among team members.

5.1. Theoretical Implications

Inspired by emergence theory and SET, our research discovered a novel emergent model of shared leadership connecting *macro* team leadership behaviours with *micro* individual behaviours, which we termed 3Cs. We found that team leadership behaviours (i.e., collective achievement leadership, complementary expertise leadership, and cohesive support leadership) emerge and develop through individual interactions over time. When team members interact and exchange orally and behaviourally, they learn how to combine common leadership behaviourss and distribute different leadership responsibilities so that the team can maximize team potential and increase teamwork efficiency. Consequently, both homogeneous (e.g., deciding workflow and conflict-solving mechanisms) and heterogeneous (e.g., leading one another with unique expertise) leadership behaviours emerge and develop.

Furthermore, our study responds to the question regarding the dynamics of how team members adopt leadership roles relating to role performance in shared leadership (Clarke 2013). The 3Cs emergent model of shared leadership implies that the leadership behaviours of team members in this schema differ from those generally associated with traditional leadership. Specifically, shared leadership involves both sharing identical leadership behaviours and building an expertise network with a role shifting scheme. Based on social-psychological interactions, team members learn about and take advantage of one another's personal characteristics, strengths, and weaknesses to develop an organized mechanism detailing each member's leadership responsibilities and roles over time.

5.2. Managerial implications for HRD

As suggested by Ardichvili, Natt och Dag, and Manderscheid (2016), there has been a growing interest in shared leadership amongst leadership development professionals, considering that shared leadership is a promising model for addressing complex problems and accomplishing intricate tasks that require diverse expertise and considerable creativity. Our research provides significant managerial insights for HRD professionals who seek practical guidance for developing shared leadership in work teams.

First, HRD practitioners should build for team members shared mental models of conducting *collective achievement leadership* and *cohesive support leadership*. Such modeling involves the development of team-level cognitive structures that guide team members to construct their taskwork (e.g., work goals, procedures, and strategies) and teamwork (e.g., team norms, interpersonal relationships, and positive team spirit). It should be noted that building positive and supportive team norms is not less important than constructing teamwork strategies. As discussed, cohesive support leadership ensures the success of the other two dimensions.

HRD professionals also ought to elaborate a role system based on each team member's strengths and expertise to foster *complementary expertise leadership*. They should identify contributions that each member can and is willing to make to the team. Then, individual contributions should be integrated to reach team goals, such as assigning a balanced task load to each team member and developing team norms for sharing leadership roles and responsibilities. While not all members are assigned a specific task or responsibility all the time, those who share leadership know when they need to adopt leadership roles and how they should act as leaders. Shared leadership only succeeds when the team avoids "free-rider" behaviours by constructing a coordinated leadership role system.

Third, our study indicates that the mutual influence of team members in shared leadership depends less on formal position than on expertise and skills, which may be interpreted as the development of informal leadership structures (Pearce and Sims 2000). This finding supports the functional leadership theory that team-based leadership encompasses a broader array of leadership behaviours and processes that were previously thought to be restricted to formal leaders (Morgeson, DeRue, and Karam 2010). Team members likely influence one another due to diverse behaviour strategies that differ from official power (Seibert, Sparrowe, and Liden 2003). Hence, HRD professionals should facilitate shared leadership by decreasing positional authority and encouraging a flat organizational structure. Furthermore, formal leaders should be open-minded to various shared leadership behaviours and nurture an environment in which all members actively participate in leadership processes.

5.3. Limitations and future directions

This research has several limitations. First, it did not empirically explore how the 3Cs model of shared leadership develops over time in the long term. Computational simulation (see Kozlowski and Chao 2012) and longitudinal studies might be adopted to examine how contextual forces influence the emergence of the three dimensions of shared leadership and how they vary according to different situations. Additionally, this study highlights the significance of both formal and informal influence in shared leadership. A potential direction for future studies is to determine what types of leadership roles formal and informal leaders may assume and how they exercise interpersonal influence differently. Moreover, perceptions of leadership can vary in different cultural contexts. The quantitative studies in this article collected data only from China and did not extend the empirical research into other contexts. Nonetheless, Western cultures are generally characterized as "valuing individual achievement, self-worth, and personal freedoms" (Kim, et al. 2017, 3083), whereas traditional Chinese culture is strongly collective but "only group oriented towards social units with which close interactions have been established" (Yau 1988, 53). Thus, the cultural dimensions particular to China may have influenced the sample's perceptions of shared leadership, which could limit generalizability. Future studies should test and implement the proposed model of shared leadership in different cultures and countries to theorise the model across contexts (Whetten 2009).

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Table 1: Summary of Representative Shared Leadership Definitions

1999	Perry, Pearce, and Sims	A collaborative process of sharing leadership within the team as a whole. (p. 38)
2000	Pearce and Sims	Leadership can emerge from a context and be demonstrated by members (other than the designated leader) of the group or organization. (p. 119)
2002	Erez, Lepine, and Elms	Leadership can be shared over time, whereby team members share (albeit not at once) in responsibilities involved in the leadership role … by clarifying who is to perform specific role behaviours (i.e., leader and member). (pp. 933–934)
2003	Pearce and Conger	A dynamic, interactive influence process among individuals in groups for which the objective is to lead one another to the achievement of group or organizational goals or both. (p. 1)
2004	Pearce, Yoo, and Alavi	Simultaneous, ongoing, mutual influence process within a team that is characterized by "serial emergence" of official as well as unofficial leaders. (p. 48)
2006	Ensley, Hmieleski, and Pearce	A team process in which leadership is carried out by the team as a whole, rather than solely by a single designated individual. (p. 220)
2007	Carson, Tesluk, and Marrone	An emergent team property that results from the distribution of leadership influence across multiple team members. (p. 1218)
2009	Avolio, Walumbwa, and Weber	An emergent state in which team members collectively lead one another. (p. 431)
2011	Gupta, Huang, and Yayla	Team's capability for collectively engaging in transformational leadership behaviours; leadership as a collective process, such that the team influences, inspires, and motivates team members. (p. 32)
2014	Nicolaides et al.	A set of interactive influence processes in which team leadership functions are voluntarily shared among internal team members in the pursuit of team goals. (p. 924)
2015	Mathieu, et al.	Horizontal leadership, wherein members exert influence over one another to realize team goals. (p. 719)

2016	D'Innocenzo, Mathieu, and Kukenberger	An emergent and dynamic team phenomenon whereby leadership roles and influence are distributed among team members. (p. 5)
2017	Hoch and Dulebohn	A collective leadership process whereby multiple team members step up to take the lead or to participate in team leadership functions. (p. 4)
2018	Zhu et al.	Shared leadership as an emergent team phenomenon whereby leadership roles and influence are distributed among team members. (p. 837)
2020	Van De Mieroop, Clifton, and Verhelst	A concept that assumes a degree of organization that is driven by the formal hierarchical leader but in which leadership, in the form of lateral influence, is possible by others, who emerge as informal leaders. (p. 493)

Table 2: Factor Loadings from an Exploratory Factor Analysis of the Shared Leadership Scale

	Factor Loadings			
	F1	**F2**	**F3**	h^2
1 Team members share in organizing tasks such that work flows more smoothly.	**.671**	.171	.227	0.531
2 Team members share in resolving conflicts and contradictions.	**.633**	.096	.084	0.417
3 Team members share in deciding how to proceed with the team's work.	**.666**	.120	.320	0.560
4 Team members share in developing solutions to problems.	**.678**	.127	.133	0.494
5 Team members are comfortable accepting suggestions from other team members.	.194	**.719**	.157	0.579
6 Team members' strengths and capabilities complement one another.	.109	**.583**	.174	0.382
7 Team members assume leadership roles in a well-coordinated fashion.	.202	**.676**	.207	0.541
8 Team members recognize and appreciate one another's expertise.	.218	**.661**	.149	0.507
9 Team members urge one another to work as a team.	.325	.293	**.556**	0.501
10 Team members share in providing support to team members who need help.	.234	.196	**.647**	0.512
11 Team members learn from one another.	.294	.061	**.549**	0.392
12 Team members share necessary information and knowledge with one another.	.363	.162	**.545**	0.455
The contribution ratio	18.92%	16.45%	13.54%	

N = 261. All factor loadings are significant at $p < .001$.

Table 3: Comparison of Measurement Models of the Shared Leadership Scale

Structure	X^2	df	CFI	RMSEA	SRMR	ΔX^{2a}
3-Factor (Proposed model)	102.118	51	0.934	0.076	0.047	
2-Factor models						
Collective achievement leadership + Complementary expertise leadership; Cohesive support leadership	151.133	53	0.873	0.104	0.062	49.015**
Collective achievement leadership + Cohesive support leadership; Complementary expertise leadership	170.409	53	0.848	0.113	0.065	68.291**
Collective achievement leadership; Complementary expertise leadership + Cohesive support leadership	120.746	53	0.912	0.086	0.052	18.628**
1 Factor Collective achievement leadership + Complementary expertise leadership + Cohesive support leadership	182.825	54	0.833	0.118	0.068	80.707**

[a]All alternative models are compared to the 3-factor proposed model.
N = 173.
**p < .01.

Table 4: Descriptive Statistics and Correlations in the Test of Incremental Validity for Shared Leadership Scale

		M	SD	1	2	3
1	Four-type leadership behaviours	3.88	0.63			
2	Servant leadership	4.47	0.50	.27**		
3	Shared leadership (12 items)	4.20	0.52	.48**	.60**	
4	Team work satisfaction	4.39	0.66	.36**	.56**	.62**

N = 173.
**p < .01.

Table 5: Regression Analysis Results of the Incremental Validity Test for the Shared Leadership Scale

	Team Work Satisfaction			
	Model 1a	**Model 1b**	**Model 2a**	**Model 2b**
Servant leadership	.56***	.32***	-	-
Four-type leadership behaviours	-	-	.36***	.07
Shared leadership (12 items)	-	.40***	-	.60***
Adjusted R^2	.31	.41	.12***	.40***
ΔR^2	-	.10***	-	.27***
df	1	2	1	2
F	61.26***	47.78***	22.25***	51.09***

N = 173.
***p < .001.

Figure 1: 67 Items Reflecting Shared Leadership

1. Team members' strengths and capabilities complement one another.
2. Team members recognize and appreciate one another's expertise.
3. Each of our team members leads others in the aspect of our project in which they have specialized knowledge.
4. Each of our team members plays a leadership role in certain situations in which they have knowledge about an aspect of the project that no other team member has.
5. Each of our team members leads other members in regard to his or her specialty.
6. Specialized knowledge from several different team members is needed to accomplish our common goals.
7. Each of our team members knows when other team members will lead in the area that they have expertise.
8. Team members are comfortable accepting suggestions from other team members.
9. Our team members trust that other members' knowledge about the project is credible.
10. Our team members are confident in relying on the information that other team members bring to the discussion.
11. When other members give information, our team members want to double-check it for themselves. (R)
12. Our team members do not have much faith in other members' expertise. (R)
13. Team members assume leadership roles in a well-coordinated fashion.
14. Our team members have very few misunderstandings about what to do during the leadership processes.
15. Our team members need to backtrack and start over a lot. (R)
16. Our team members accomplish the task smoothly and efficiently.
17. There was much confusion about how we would accomplish the task. (R)
18. Our team members encourage me to work together with other individuals who are part of the team.
19. Our team members advise me to coordinate my efforts with the others who are part of the team.
20. Team members urge one another to work as a team.
21. Our team members encourage me to find solutions to our team problems together.

22. Our team members encourage me to search for solutions without supervision.
23. Our team members encourage me to assume responsibility for the team.
24. Our team members advise me to solve problems when they pop up in my expertise area.
25. Our team members encourage me to view unsuccessful performance as a chance to learn.
26. Team members learn from one another.
27. This leadership team truly inspires the very best in me in the way of job performance.
28. Our team members have a strong personal dedication to our common goals.
29. Team members share in building and maintaining team commitment.
30. Team members share in providing support to team members who need help.
31. Team members share patience towards other team members.
32. Team members share in encouraging other team members when they're upset.
33. Team members share in listening to complaints and problems of other team members.
34. Team members share in fostering a cohesive team atmosphere.
35. Team members share in treating one another with courtesy.
36. Our team members regularly take time to figure out ways to improve our team's leadership processes.
37. Our team members tend to handle differences of opinion privately or offline rather than addressing them directly as a group. (R)
38. Our team members go out and obtain all the information they possibly can from others, such as customers, or other parts of the organization.
39. Each of our team members frequently seeks new information that leads one another to make important changes.
40. Team members share necessary information and knowledge with one another.
41. One of our team members always makes sure that we stop reflecting on the team's leadership process.
42. Our team members often speak up to test assumptions about issues under discussion.
43. Our team members invite people from outside the team to present information or have discussions with us.
44. Team members share in exchanging career-related advice among our team.
45. Team members share in helping to develop one another's skills.

46. Team members share learning skills with all other team members.
47. Team members share in being positive role models to new members of the team.
48. Team members share in instructing poor performers on how to improve.
49. Team members share helping out when another team member is learning a new skill.
50. Team members share in planning how the work gets done.
51. Team members share in allocating team resources according to our team's priorities.
52. Team members share in setting our team's goals.
53. Team members share in organizing tasks such that work flows more smoothly.
54. Team members share in deciding how to proceed with the team's work.
55. Team members share in providing helpful input about our team's work-related plans.
56. Team members share in deciding on the best course of action when a problem arises.
57. Team members share in diagnosing problems quickly.
58. Team members share in using our team's combined expertise to solve problems.
59. Team members share in finding solutions to problems that affect team performance.
60. Team members share in identifying problems before they arise.
61. Team members share in developing solutions to problems.
62. Team members share in solving problems as they arise.
63. Each of our team members is considered an "equal" to others on this team despite the job "titles" used within the organization.
64. Team members share in establishing the reward and punishment system.
65. Team members supervise and evaluate one another.
66. Team members share in resolving conflicts and contradictions.
67. Team members share in managing team workload.