Building Effective Student Project Teams: What Has Shared Transformational Leadership Got to do With it?

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Abstract

The central problem this study seeks to solve pertains to the inability of college graduates to engage effectively in teamwork. To solve this problem, we explored the antecedent and outcome of teamwork quality—*shared transformational leadership* as an antecedent and *team effectiveness* as an outcome. We hypothesized that the effect of *shared transformational leadership* on *team effectiveness* will be mediated by *teamwork quality*. The sample consists of 98 GSA students, sub-divided into 20 project teams. The findings, using MPLUS software, provide support for the hypothesis, as evidenced by a significant indirect effect between shared *transformational leadership and team effectiveness* (B = 0.56, $p < 0.01$), through *teamwork quality*. We also hypothesized that *individual-level transformational leadership* will predict *shared transformational leadership*. The hypothesis was rejected, as it was not supported by the findings. The findings have important implications for leaders, leadership educators, leadership researchers, and organizations.

Introduction

The nature of problems that organizations face today are increasingly complex and require teamwork (Roberts et al., 2016; Western, 2010). As a result, employers are highlighting the importance of teams while de-emphasizing the significance of the individual leader (McIntyre & Foti, 2013). For example, according to the Job Outlook 2019 survey of the National Association of Colleges and Employers (NACE, 2019), 78.7% of employers identify the *ability to work in a team* among their most desired attributes in college graduates (moving from fifth place in 2014 to third place), while 67.4% identify *leadership skills* among their most desired attributes (moving from second place in 2014 to eighth place). However, while the ability to work effectively in teams has been identified as one of the top skills employers want in college graduates (NACE, 2019; Stewart et al., 2016), employers have noted that college graduates are insufficiently prepared to work effectively in teams (Humphreys et al., 2015; NACE, 2019). The skills gap problem can be attributed to the nature of the curriculum being used by many leadership programs, which is too focused on the development of the individual leader, with little attention paid to leadership within teams (DeRue & Myers, 2013; Martin et al., 2018; Riggio, 2008). As such, leadership programs produce graduates who lack the capacity to work effectively in an interdependent environment that is necessary for teamwork (Han et al., 2017; Lehmann-Willenbrock et al., 2015).

While many studies have explored the effect of shared leadership on team effectiveness (Boies et al., 2010; D'Innocenzo et al., 2016; Wang et al., 2014), only a relatively few studies have examined shared transformational leadership as a predictor of team effectiveness (Ensley et al., 2006; Sivasubramaniam et al., 2002). Also, the research on the mediating effect of teamwork quality (or processes) on the relationship between shared transformational leadership and team

effectiveness is sparse and mostly theoretical (Dionne et al., 2004). Therefore, the current study seeks to supplement limited empirical evidence regarding the effect of shared transformational leadership on team effectiveness, as mediated by teamwork quality.

Literature Review/Theoretical Framework

To effectively conceptualize the current study, previous literature will be reviewed on key variables: (a) team effectiveness, (b) shared transformational leadership, and (c) teamwork quality.

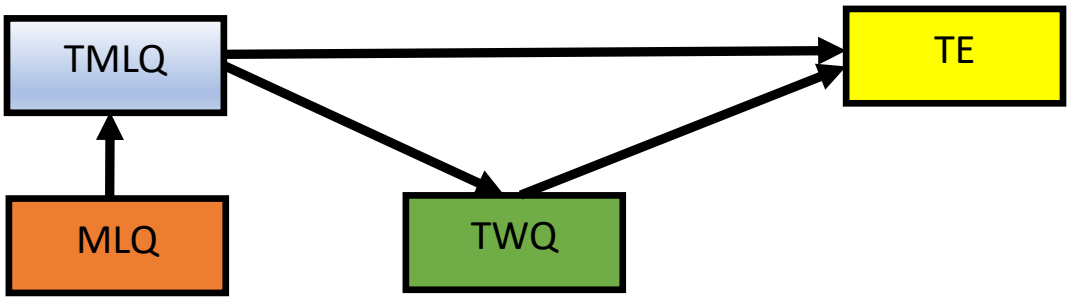
Team Effectiveness

Team effectiveness has been widely studied in the literature, and many theories of team effectiveness exist (Mathieu et al., 2008). McGrath (1964) conceptualized team effectiveness as consisting of input, process, and output. According to this model, inputs refer to individual differences such as personalities, team-level variables such as resources and external leader influences, and organizational-level variables such as organizational structure. Processes refer to the interactions among team members during task work (e.g., teamwork). Outcomes are the results of both the task work and teamwork (e.g., effectiveness).

McGrath's (1964) input-process-output model, while largely consistent over the years in team research, has seen several modifications. Ilgen and colleagues (2005, p. 520) argued that the term process is rather insufficient, and that "many of the mediational factors that intervene and transmit the influence of inputs to outcomes are not processes." Consequently, those authors (i.e., Ilgen et al., 2005) proposed an input-mediator-output model, as a more inclusive term. According to the input-mediator-output model, inputs (e.g., team members' characteristics) influence team mediational factors (e.g., teamwork quality), which in turn mediate the relationship between inputs and outputs (e.g., team effectiveness). This input-mediator-output (IMO) model serves as a framework to guide further study (see Figure 1). Based on the IMO framework, we proposed a *Shared Transformational Leadership-Effectiveness Model*, where individual-level transformational leadership of team members (MLQ) would predict shared transformational leadership (TMLQ), which would, in turn, predict team effectiveness (TE), through teamwork quality (TWQ).

Figure 1

Shared Transformational Leadership-Effectiveness Model



Shared Transformational Leadership

The first usage of the term *transformational leadership* has been attributed to Burns (1978), who used the term to describe a type of leadership where the leader elevates the follower to a higher level of motivation, and both the leader and follower are transformed in the process. Building on Burns' work, Bass (1985) conceptualized the transformational leadership theory, which suggests transformational leaders possess four behaviors: (a) charisma, (b) inspirational leadership, (c) individualized consideration, (d) intellectual stimulation. Bass and Avolio (1990) later proposed the *full range of leadership*, which consists of seven behaviors on a continuum—four transformational leadership behaviors (i.e., inspirational motivation, idealized influence, intellectual stimulation, and individualized consideration), three transactional leadership behaviors, and laissez-faire behavior.

A potential limitation of Bass' (1985) theory of transformational leadership is the ambiguity that comes with its intended level of analysis—that is, whether individual-, team-, or organizational-level of analysis (Schriesheim et al., 2009). While transformational leadership has been traditionally analyzed at the individual level, Bass and Avolio (1996) extended its analysis to the team level. As is the case with transformational leadership at the individual level, team transformational leadership consists of four behaviors—inspirational motivation, idealized influence, intellectual stimulation, and individualized consideration (Avolio et al., 1999). Avolio and colleagues (2002) conceptualized team transformational leadership as a measure of shared leadership within teams. According to Sivasubramaniam et al. (2002, p. 68), shared leadership refers to the "collective influence of members in a team on each other." Consequently, team members, through shared transformational leadership, would collectively inspire, influence, stimulate, and consider one another. At the team level, Wang and Howell (2010) identified 3 transformational leadership behaviors for team development, which include: (a) emphasizing group identity (derived from idealized influence), (b) communicating a group vision (derived from inspirational motivation), and (c) team-building.

Previous research has explored the antecedent of shared leadership. For example, Carson et al. (2007) and Fausing et al. (2015) found external factors such as coaching and empowerment from an external leader to be predictive of shared leadership (Carson et al., 2007; Fausing et al., 2015). Those researchers also identified internal factors such as shared purpose, social support, and voice (Carson et al., 2007), interdependence among team members (Fausing et al., 2015), and personality factors such as the Big Five (Hoch & Dulebohn, 2017), as antecedents of shared leadership in teams. While considerable research has explored the antecedents of shared leadership in general, research on the antecedents of shared transformational leadership is rather sparse (Nielsen & Cleal, 2011; Sun et al., 2017).

As a result of the similarity between transformational leadership behaviors at the individual and team level (Schriesheim et al., 2009), as well previous studies suggesting team member's characteristics as an antecedent of shared leadership, we predicted that the transformational leadership capacity of the individuals that make up a team would be an antecedent of shared transformational leadership in teams. In other words, the transformational leadership capacity of the individuals that make up a team would predict their ability to collectively inspire, influence,

stimulate, and consider one another. Moreover, previous studies have shown that shared leadership is more likely to develop organically in self-managed teams (i.e., a team with no formally assigned leader) (McIntyre & Foti, 2013; Yang & Shao, 1996). *Consequently, we hypothesized, in the current study, that the individual-level transformational leadership of team members will be positively related to shared transformational leadership in a self-managed team* (Hypothesis 1).

Shared Transformational Leadership and Effectiveness

Previous studies suggesting that shared leadership would predict superior team outcomes such as team effectiveness and performance are abundant in the literature. For example, researchers found shared leadership to predict consulting teams' performance (Carson et al., 2007), and virtual teams' performance (Hoch & Dulebohn, 2017). Similarly, considerable research has suggested that team transformational leadership would predict team effectiveness and performance. However, most of those studies have explored the phenomenon on a leader-follower basis—that is, the effect of a positional team leader's transformational leadership on team effectiveness (Bass et al., 2003; Braun et al., 2013; Wang et al., 2011). However, with the increasing popularity of self-managed teams in today's organizations (McIntyre & Foti, 2013; Yang & Shao, 1996), it is imperative to explore the extent that the shared transformational leadership capacity of team members influence their team effectiveness. Quite surprisingly, the research on shared transformational leadership and team effectiveness is relatively sparse (Dionne et al., 2004). Nonetheless, few studies have found that shared transformational leadership predicts superior team performance and effectiveness. For example, Sivasubramaniam and Colleagues (2002) found that the shared transformational leadership of undergraduate student project teams predicted group potency and effectiveness (as measured by team grades). Similarly, Ensley and colleagues (2006) found shared transformational leadership to predict new venture performance.

Based on the abundant evidence of the positive relationship between the transformational leadership of positional team leaders and team effectiveness (Bass et al., 2003; Braun et al., 2013; Wang et al., 2011), as well as the limited evidence of the positive relationship between shared transformational leadership and team effectiveness (Ensley et al., 2006; Sivasubramaniam et al., 2002), *we hypothesized, in the current study, that the shared transformational leadership of team members will be positively related to team effectiveness in a self-managed team* (Hypothesis 2).

The Mediating Role of Teamwork Quality

Hoegl and Gemuenden's (2001) model of teamwork conceptualizes teamwork as consisting of six components: (a) communication, (b) coordination, (c) balance of member contribution, (d) mutual support, (e) effort, and (f) cohesion. Although many studies have reported a direct effect of transformational leadership on team performance outcomes (Braun et al., 2013; Wang, Waldman, & Zhang, 2014), they have often done so without accounting for the mediating effect of teamwork processes in such relationship (Dionne et al., 2004). Zaccaro, Rittman, and Marks (2001) proposed a model of team leadership whereby teamwork processes such as team conflict control and team coordination mediate the relationship between leadership behaviors and team effectiveness. Bass, Avolio, Jung, and Berson (2003) found the relationship between transformational leadership behaviors and performance to be partially mediated by team cohesion—a component of teamwork quality.

Dionne and colleagues (2004) proposed a theoretical model whereby teamwork processes would mediate the relationship between transformational leadership behaviors and team performance outcomes. Those authors hypothesized a relationship between the four I's of transformational leadership (i.e., inspirational motivation, idealized influence, intellectual stimulation, and individualized consideration) and teamwork processes of cohesion, communication, and conflict management. First, they hypothesized that inspirational motivation/idealized influence will foster shared vision, which will in turn positively impact team cohesion (Dionne et al., 2004). Second, they hypothesized that individualized consideration will positively impact team communication (Dionne et al., 2004). Lastly, they hypothesized that intellectual stimulation will generate functional team conflict, which will in turn positively impact team conflict management (Dionne et al., 2004).

Based on Dionne and colleagues' model, Boies, Fiset, and Gill (2015) hypothesized that team communication would mediate the relationship between transformational leadership behaviors (i.e., intellectual stimulation and inspirational motivation) and team trust, while team trust would mediate the relationship between team communication and team performance. Those hypotheses were supported, providing empirical support for the mediatory role of teamwork processes (i.e., team communication and team trust) in the relationship between transformational leadership and performance outcomes (Boies et al., 2015). Similarly, Lehmann-Willenbrock, Meinecke, Rowold, and Kauffeld (2015) found that transformational leadership has an indirect effect on a team's communication style, as mediated by the leader's communication style. Several other scholars (e.g., Pillai & Williams, 2004; Stashevsky & Koslowsky, 2006) found that team cohesiveness partially mediated the relationship between transformational leadership and team performance.

All the aforementioned studies have explored the mediating role of components of teamwork quality (e.g., cohesion) and have failed to examine the mediating role of the composite measure of teamwork quality, except for a few studies (e.g., Cha, Kim, Lee, & Bachrach, 2015; Yang, Huang, and Wu, 2011). For example, Yang, Huang, and Wu (2011) found that project managers' transformational leadership styles predicted teamwork quality (as measured by a composite scale of team communication, team collaboration, and team cohesiveness), which in turn predicted team performance. Also, Cha, Kim, Lee, and Bachrach (2015) explored the mediatory role of teamwork quality on the relationship between transformational leadership of team leaders and inter-team collaboration. Those authors (Cha et al., 2015) found teamwork quality fully mediated the relationship between transformational leadership of team leaders and inter-team collaboration. Consequently, *we hypothesized, in the current study, that the effect of shared transformational leadership on team effectiveness will be mediated by teamwork quality* (Hypothesis 3).

Methods

Context

Participants from a Governor School of Agriculture (GSA) program, which took place in a large-sized land-grant university in the Southern part of the United States, were sampled for the study. The specific GSA was chosen because its participants are required to work in self-managed teams. A self-managed team is an autonomous team, where “team members are empowered to produce an entire product or service with little or no supervision” (Yang & Shao, 1996, p. 521). The GSA is a 4-week pre-college residential program with a mission to develop future leaders and scientists for careers in Agriculture (Friedel, 2019), with participants comprising of junior and senior students from various private, public, and home schools from across the state (Duncan et al., 2004). Students are required to complete a project that solves a major societal issue such as climate change, food security, etc. (Friedel, Cletzer, Bush, & Barber, 2017). In the end, students are required to submit a final team paper and deliver a presentation.

Procedures and Sample

To investigate the study’s hypotheses, we designed a cross-sectional study to explore the effect of shared transformational leadership on team effectiveness, as mediated by teamwork quality. The study sampled 100 GSA students, sub-divided into 20 project teams. Of those, 98 students that made up 20 project teams (n=20) completed the survey. The majority of respondents (82.7%) were between the ages of 16 and 17 years old. Sixty-five percent (65.3%) reported they were females while 34.7% reported they were males. While four major races were reported (i.e., Spanish/Hispanic/Latino, White American, Black/African American, and Asian American), Asian Americans (38.8%) and White Americans (33.7%) make up the majority of the respondents. Team size ranges from four to five. We received approval from the Institutional Review Board before engaging in this study.

Measures

Multifactor Leadership Questionnaire (MLQ-5X Short). An individual-level questionnaire developed by Avolio and Bass (1995) was used to measure individual team member transformational leadership. Twenty items were used from the 'MLQ-5X Short Form' to measure four transformational leadership behaviors (i.e., Idealized Influence, Inspirational Motivation, Intellectual Stimulation, and Individualized Consideration). Sample items rated by participants include: "As a leader, I talk optimistically about the future" and "As a leader, I spend time teaching and coaching." The MLQ-5X instrument uses a five-point scale ranging from 0 for 'not at all' to 4 for 'frequently, if not always.' This instrument has been well validated in the literature and has yielded a Cronbach's alpha of 0.85 (Bycio et al., 1995).

Team Multifactor Leadership Questionnaire (TMLQ). A team-level questionnaire developed by Bass and Avolio (1996) was used to measure the shared transformational leadership. Twenty-five items were used from the TMLQ to measure four transformational leadership behaviors (i.e., Idealized Influence, Inspirational Motivation, Intellectual Stimulation, and Individualized Consideration). A sample item rated by participants is: "Members of my team instill pride in being associated with each other." The TMLQ instrument uses a five-point scale ranging from 0 for ‘not at all’ to 4 for ‘frequently, if not always.’ Avolio and colleagues (2002) validated the TMLQ in prior research and reported Cronbach's alpha of 0.86.

Teamwork Quality. Hoegl and Gemuenden's (2001) teamwork quality instrument (TWQ) was used to measure teamwork quality. This instrument measures teamwork quality along six sub-constructs: communication, coordination, the balance of member contributions, mutual support, effort, and cohesion (Hoegl & Gemuenden, 2001). This is a 38-item questionnaire that uses a five-point scale ranging from 0 for 'strongly disagree' to 4 for 'strongly agree.' Sample item rated by participants is: “The team members communicated mostly directly and personally with each other.” This instrument has been validated by the authors and yielded a high Cronbach's alpha of 0.91 (Hoegl & Gemuenden, 2001).

Team Effectiveness. The team effectiveness scale of the teamwork quality instrument developed by Hoegl and Gemuenden (2001) was used to measure team effectiveness. This instrument was originally intended for project teams in organizations. Since the population in this study comprises student project teams, there was a need to adapt some of the wordings. Consequently, the team effectiveness scale was adapted by changing some of the words to reflect a student project team. Eight items were used from the team effectiveness scale, which uses a five-point scale ranging from 0 for 'strongly disagree' to 4 for 'strongly agree.' A sample item rated by participants is: "The team was satisfied with the quality of the project result." Hoegl and Gemuenden (2001) validated the scale, with a Cronbach's alpha of 0.87.

Analysis

Descriptive statistics (i.e., mean, SD) of all variables (i.e., age, gender, individual-level transformational leadership, shared transformational leadership, teamwork quality, and team effectiveness) were conducted (see Table 1). Pearson product-moment correlation and Cronbach’s alpha test of variables were conducted; the significance level was set at the 0.05 level. Exploratory factor analysis (EFA) and inter-rater reliability (i.e., R_{wg}) were also conducted. SPSS 27 was used to conduct those analyses. The hypotheses were tested by conducting a structural equation modeling procedure called path analysis, using MPLUS software (Muthén et al., 2017).

Results

The results are organized into three sections: (a) Exploratory factor analysis (EFA), (b) Data aggregation, (c) Results of correlational tests, and (d) Results of hypotheses tests.

A. EFA

Since ratings of individual-level transformational leadership, shared transformational leadership, teamwork quality, and team effectiveness were collected from a single source, there is a chance that our data might have a single source bias (Charoensap et al., 2019). To reduce the likelihood of a single source bias, previous studies have recommended *Harman’s single factor test* to show that a single factor does not explain a major portion of the variance in the data (Podsakoff et al., 2003). Thus, we conducted an EFA to examine the possibility of a single factor solution. The EFA result showed that a one-factor solution is inadequate, as a one-factor solution only explains 21.30% of the variance in the data.

B. Data Aggregation

Data were aggregated to the team-level before further analysis. To justify aggregation for data collected at the individual-level with team-level scales (i.e., TMLQ, TWQ, and TE), we conducted the R_{wg} (i.e., inter-rater reliability) within each of the 20 teams (Demaree & Wolf, 1984). Mean R_{wg} for each of the three scales met the recommended cut off point of 0.7 (Demaree & Wolf, 1984). The mean R_{wg} for the *shared transformational leadership* scale (TMLQ) was 0.86, with at least 85% of the teams having an R_{wg} of 0.70; the mean R_{wg} for the *teamwork quality* scale (TWQ) was 0.95, with all of the teams having an R_{wg} of at least 0.70; and the mean R_{wg} for the *team effectiveness* scale (TE) was 0.90, with all of the teams having an R_{wg} of at least 0.70. Besides, all median R_{wg} values were above the recommended cut-off value of 0.70. Thus, individual-level scores for each of the three scales were then aggregated to the team level.

C. Results of Correlational Test

As shown in Table 1, there was no significant relationship between any of the demographic variables (i.e., age and gender) and other variables. We excluded race from the analysis, as it loses its meaning at the team level. Similarly, we excluded team size from the analysis, as we believe its effect with other variables is already controlled for in the data—All 20 teams had 5 members each, except for 2 teams, which had 4 members each.

Also, individual-level transformational leadership was not significantly related to other variables. However, shared transformational leadership, teamwork quality, and team effectiveness were significantly related to each other (See Table 1 for significant relationships.).

Table 1

Summary of Correlations, Means, Standard Deviations and Cronbach's Alpha of Variables

VAR	1	2	3	4	5	6
1. Age	1.00	-0.32	0.16	-0.25	-0.25	-0.03
2. Gender	-0.32	1.00	-0.12	-0.07	0.00	-0.05
3. MLQ	0.16	-0.12	1.00	0.07	-0.04	-0.21
4. TMLQ	-0.25	-0.07	0.07	1.00	0.65**	0.54*
5. TWQ	-0.25	0.00	-0.04	0.65**	1.00	0.85**
6. TE	-0.03	-0.05	-0.21	0.54*	0.85**	1.00
Mean	16.50	1.35	3.89	3.80	3.46	3.87
SD	0.31	0.22	0.27	0.40	0.17	0.53
α	—	—	0.85	0.92	0.80	0.90

Note. N (individual) = 98. Variables are aggregated to team-level. N (team) = 20. VAR = variables; MLQ = Individual-level transformational leadership behavior of team members measured with the Multifactor Leadership Questionnaire; TMLQ = shared transformational leadership behavior measured with the Team Multifactor Leadership Questionnaire; TWQ = teamwork quality; TE = team effectiveness.
*p < .05 level, **p < .01 level.

D. Results of Hypotheses Tests

Hypothesis 1. In hypothesis 1, we predicted that the individual-level transformational leadership of team members will be positively related to shared transformational leadership in a self-managed team. Results (Table 2) showed that the individual-level transformational leadership of team members was not directly related to shared transformational leadership (B = 0.07, *ns*). Hence, hypothesis 1 was rejected. See Figure 2 for the path diagram.

Hypothesis 2. In hypothesis 2, we predicted that the shared transformational leadership of team members will be positively related to team effectiveness in a self-managed team. Results (Table 2) showed that the shared transformational leadership of team members was positively related to team effectiveness (B = 0.54, $p < 0.01$). Hence, hypothesis 2 was supported.

Hypothesis 3. In hypothesis 3, we predicted that the effect of shared transformational leadership on team effectiveness will be mediated by teamwork quality. Results (Table 2) showed that the effect of shared transformational leadership on team effectiveness was mediated by teamwork quality, as evidenced by a significant indirect effect (B = 0.56, $p < 0.01$). Hence, hypothesis 3 was supported. The mediation model suggested a good fit to the data ($\chi^2 = 2.72$, df = 2, $p > 0.05$, CFI = .98, TLI = .94, SRMR = 0.08).

Table 2

Results of Standardized Direct, Indirect, Total, and Total Indirect Effects

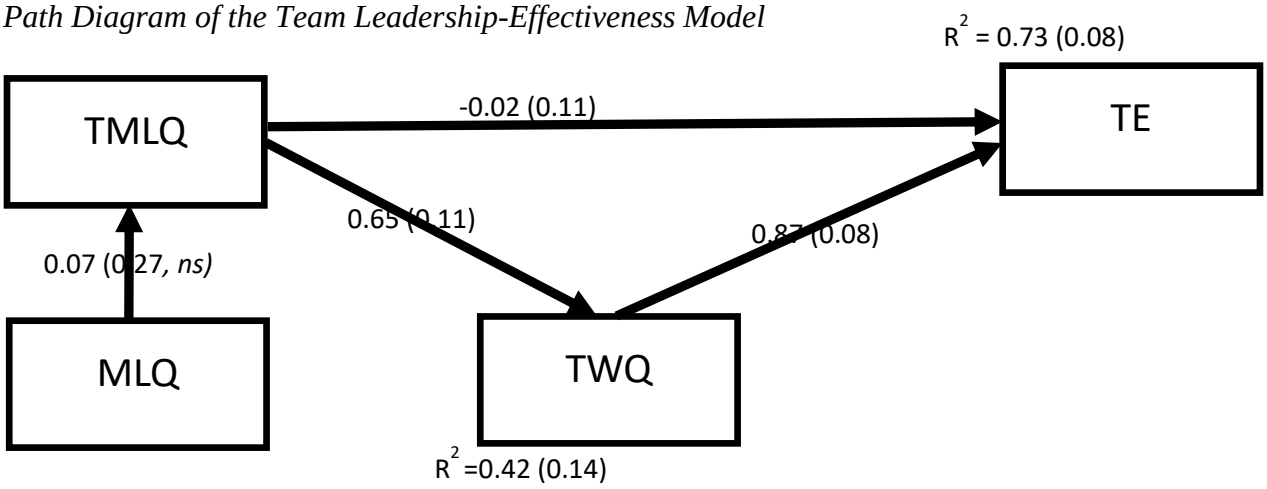
Effect	Estimate (SE)	95%CI
TMLQ on MLQ	0.07 (0.27)	-0.29 – 0.62
TE on		
TMLQ (direct)	-0.02 (0.11)	-0.16 – 0.21
TWQ (indirect)	0.87* (0.08)	0.73 – 1.01
TWQ on		
TMLQ (indirect)	0.65* (0.11)	0.47 – 0.82
Total		
TMLQ → TE	0.54* (0.13)	0.36 – 0.78
Total Indirect		
TMLQ → TWQ → TE	0.56* (0.11)	0.39 – 0.76

Note. Standardized estimates based on StdY standardization in MPlus are reported. MLQ = Individual-level transformational leadership of team members measured with the Multifactor Leadership Questionnaire; TMLQ = shared transformational leadership behavior measured with the Team Multifactor Leadership Questionnaire; TWQ = teamwork quality; TE = team effectiveness.

$p < 0.01$ (two-tailed).

Figure 2

Path Diagram of the Team Leadership-Effectiveness Model



Discussion

In the study, we found that teamwork quality mediates the relationship between shared transformational leadership and team effectiveness. The findings suggest that shared transformational leadership improves team effectiveness by improving the quality of teamwork in a team. The significant mediation effect was consistent with those of theoretical models positing that teamwork processes would mediate the relationship between team transformational leadership and team performance outcomes (Dionne et al., 2004; Zaccaro et al., 2001). The findings are also in consonance with the empirical research by Boies and colleagues (2015), who found that team communication and team trust mediated the relationship between team transformational leadership behaviors (intellectual stimulation and inspirational motivation) and team performance. Moreover, the findings provide support for the study by Yang, Huang, and Wu (2011); those authors found that project managers' transformational leadership styles predicted teamwork quality (as measured by a composite scale of team communication, team collaboration, and team cohesiveness), which in turn predicted team performance. Finally, the study provides support for the study by Cha, Kim, Lee, and Bachrach (2015); those authors found that teamwork quality fully mediated the relationship between team leaders' transformational leadership and inter-team collaboration.

Interestingly, individual-level transformational leadership of team members was not significantly related to shared transformational leadership. This finding suggests that the ability of a team to share transformational leadership may be more important than team composition based on personal characteristics (Hoch & Dulebohn, 2017). Put simply, because a team is full of transformational leaders does not mean such a team will be successful in sharing transformational leadership.

Implications

The current study has implications for leadership theory, future leadership research, and leadership practice.

Theoretical Implications

Although leadership scholars have hypothesized a positive relationship between shared transformational leadership and team performance outcomes, only a few studies have tested those propositions empirically (Ensley et al., 2006; Han et al., 2017). This study adds to the body of knowledge by contributing empirical support for the relationship between shared transformational leadership and the outcome of team effectiveness.

Moreover, while previous studies have accounted for the effect of mediating variables such as teamwork quality (Cha et al., 2015; Yang, Huang, & Wu, 2011), team communication and team trust (Boies et al., 2015), on the relationship between transformational leadership and team performance outcomes, many of those studies have been conducted with teams with positional team leaders (Braun et al., 2013; Cha et al., 2015; Yang, Huang, & Wu, 2011). The current study, therefore, supplements limited existing evidence regarding the mediating effect of teamwork quality on the relationship between team members' shared transformational leadership and team effectiveness in a self-managed team (Gupta et al., 2010).

Implications for Future Research

The current study explored the mediating effect of teamwork quality on the relationship between shared transformational leadership and team effectiveness. However, other types of shared leadership models exist in the literature (Grille & Kauffeld, 2015). Therefore, it is recommended that future studies explore the mediating effect of teamwork quality on the relationship between other types of shared leadership and team effectiveness. Moreover, while this study was conducted with self-managed student project teams, it is recommended that future studies explore other contexts such as professional work teams, virtual teams, etc.

We observed during this research that many existing theories used to describe and/or measure shared leadership lack the capacity to account for the type of leadership displayed (Grille & Kauffeld, 2015). For example, many researchers have used social network analysis to measure shared leadership (Carson et al., 2007; McIntyre & Foti, 2013). In many of those studies, team members were asked to nominate any of their teammates that have displayed leadership in the team; while this approach may measure whether or not leadership is shared, it fails to account for the type of leadership being shared. Therefore, it is recommended that future studies develop theories and instruments that more accurately measures shared leadership, as well as the type of leadership being shared.

Finally, individual-level transformational leadership of team members was not an antecedent of shared transformational leadership. We believe the small sample size of the study might have been responsible for the non-significant relationship. Therefore, it is recommended for future research to replicate the study using a large sample size. It is also recommended that qualitative studies explore the antecedent factors that support the development of shared transformational leadership.

Practical Implications

The findings of this study suggest that shared transformational leadership was positively related to teamwork quality. However, transformational leadership has, for a long time, been conceptualized as an individual-level construct by leadership scholars (Bass & Avolio, 1990b). Consequently, students are taught transformational leadership skills to lead change in their communities as individuals. However, the nature of the challenges we face in our society today are becoming increasingly complex (Rosen, 2008), and solving them requires individuals who can work collaboratively with others in a team. It is, therefore, recommended that leadership educators devote more attention to teaching college students about shared transformational leadership to foster their ability to work effectively with others in a team (Avolio et al., 2002).

Moreover, the study found that the individual-level transformational leadership of team members was not significantly related to shared transformational leadership. In other words, having a team full of transformational leaders does not guarantee a team's ability to share transformational leadership and team members need to learn how to collectively share transformational leadership in a team (Avolio et al., 2002). Consequently, it is recommended that leadership educators teach college students how to build and share transformational leadership (and other positive types of leadership) in a team.

Equally important as teaching shared leadership, is providing college students with the opportunities they need to practice shared leadership. What better ways for college students to learn how to build and share leadership with team members than completing course projects as part of a team? It is recommended that the leadership curriculum be designed in such a way that it necessitates students to complete a semester-long team project in their courses. Such projects should be problem-based, reflecting the problems in the real world. Moreover, the project should be set up as self-managed, where teachers provide guidance, while at the same time granting autonomy to teams, especially in matters of team leadership.

Finally, the study has implications for how organizations carry out human resource development. One outcome that employers have prioritized is the ability of college graduates to work effectively in teams (NACE, 2019), as many organizations are increasingly reliant on project teams, where employees are required to work as part of a team (Muethel & Hoegl, 2013). However, since the findings of the study showed that shared transformational leadership is germane for high-quality teamwork, employees who lack the skills to share (transformational) leadership with their teammates may harm teamwork quality and team effectiveness. It is therefore recommended that organizations invest in shared (transformational) leadership training for employees.

Study Limitations

A potential limitation of this study is its small sample size. Twenty teams (n [team] = 20, n [individual] = 98) completed the surveys, which is relatively small in team research (Bonett & Wright, 2015). The lack of power due to the small sample size might have resulted in the non-significant relationship between individual-level transformational leadership and shared transformational leadership.

Another potential weakness is the common source bias, since ratings of transformational leadership, shared transformational leadership, teamwork quality, and effectiveness were self-

reported (Charoensap et al., 2019). However, to reduce the chances of a common source bias, Harman's single factor test was applied to see if a one-factor solution would explain a significant proportion of the variance in the data (Podsakoff et al., 2003). Exploratory factor analysis results suggest that a one-factor solution was inadequate in explaining the variance in the data, thereby reducing the likelihood of a common source bias affecting the findings (Podsakoff et al., 2003).

Also, the sample in this study may not generalize to college students, since we sampled high school students. Although we do not anticipate the results to be significantly different with college students—since most of the students in the study are seniors, and many were already taking college courses—we realize its limitation. Therefore, we encourage studies to replicate the study in a college setting.

Lastly, the study utilized a cross-sectional survey, with survey data collected at a single time point, which makes it inappropriate to infer causal relationships with the findings (Kozlowski, 2015). Also, because team processes are dynamic processes that are sometimes not linear, it is recommended that future studies adopt a longitudinal approach to explore the relationship between shared transformational leadership, teamwork quality, and team effectiveness at different time points (Kozlowski, 2015).

Conclusion

The central problem this study seeks to solve pertains to the inability of college graduates to engage effectively in teamwork. To solve this problem, we explored the antecedent and outcome of teamwork quality—shared transformational leadership as an antecedent and team effectiveness as an outcome. We hypothesized that the effect of *shared transformational leadership* on *team effectiveness* will be mediated by *teamwork quality*. The findings provide support for the hypothesis, as evidenced by a significant indirect effect between shared *transformational leadership and team effectiveness* (B = 0.56, $p < 0.01$), *through teamwork quality*. We also hypothesized that *individual-level transformational leadership* will predict *shared transformational leadership*. The hypothesis was rejected, as it was not supported by the findings.

In summary, the current study has added to the leadership literature by expanding our understanding of the relationship between *individual-level transformational leadership, shared transformational leadership, teamwork quality,* and *team effectiveness*, and offers insights into the reason why many college graduates may struggle to engage effectively in teamwork.

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