

The Antecedents of Teacher Leadership: An Experimental Approach

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Abstract

Teacher leadership has been gaining more significance in recent years since there is evidence that it has positive impact on all school outcomes. Therefore, researchers are actively investigating the antecedents of teacher leadership to contribute to teacher leadership in educational settings. The current study aims to test the impact of school culture, openness-to-authority, teacher self-efficacy and teacher expertise on teacher leadership, using a within-subjects experimental design. 91 teachers from various state and private schools participated in the study. Participants were presented with four pairs of scenarios (8 scenarios in total). Each pair (2 scenarios) assessed one of the four concepts on teacher leadership. In each pair, the high and low value of the related concept (e.g., high self-efficacy vs low self-efficacy) was manipulated. Participants were asked to report the probability of the teacher described in the scenarios to exercise leadership. A paired t-test was conducted to compare participants' ratings of each pair. The results showed a significant difference between the first measurement and the second measurement of each concept. This result demonstrates that all four concepts have an impact on teacher leadership. School leaders can develop these four concepts to enable teachers to exercise leadership.

Keywords: Teacher Leadership, School Culture, Teacher Self-efficacy, Teacher Subject Expertise, Openness-to- authority, Experimental Design

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Introduction

Teacher leadership has the immense potential to contribute to school improvement. Therefore, both practitioners and researchers have started to pay more attention to the concept of teacher leadership. Although there are different definitions of leadership (see Bryman, 2013), leadership could be reduced to the business of "influencing" (Gronn, 2000). Leadership does not get a new meaning when it is exercised by teachers. It is still about influencing the beliefs, actions and values of others (Katzenmeyer & Moller, 2001). Teacher leadership can be defined most succinctly as teachers assuming leadership roles beyond their classrooms while simultaneously fulfilling their classroom responsibilities (Wenner & Campbell, 2017).

Teachers can exercise leadership as principals do. However, teacher use different sources of power than principals in order to exercise leadership. As Hoyle (1986) argues, teachers do not have access to the authority which comes from the legal rights to make decisions governing others. In order to exercise leadership, teachers draw upon other sources of power that stems from informal or non-authoritative means (Hoyle, 1986). Teachers can be given formal authority to exercise leadership but it could be argued that teachers may find it easier to exercise leadership informally without a formal role (Bolat, 2013) since sometimes hierarchical authority that comes from formal position can prevent individuals from exercising leadership (Heifetz, 2004) because in the context of schools it could be perceived against the norm of the

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teaching culture that advocates egalitarianism (Little, 1990; Lortie, 1975). Therefore, informal teacher leadership should be promoted at schools.

The recent understanding of teacher leadership has shifted towards a more informal approach than a position-based approach to teacher leadership (Poekert, 2012). Within this informal conception, all teachers are recognized as leaders (Carver & Meier, 2013; Frost, 2019). Teacher leaders naturally emerge as informal leaders (Riveros et al., 2013). Leadership is no longer tied to titles, positions, or roles. Since all teachers has the potential to exercise leadership, the challenge is to find ways to support and empower all teachers to perform leadership roles. Therefore, researchers are exploring the antecedents of teacher leadership in order to cultivate these factors and promote informal teacher leadership. Although researchers explore different antecedents, to the best of my knowledge, all of these studies are correlational, rather than experimental. Therefore, it is not possible to establish a causal link between these antecedents and teacher leadership with correlational studies since experimental studies are only ways to provide evidence of causality (Antonakis et al., 2010). This study fills that gap, by providing experimental evidence between these antecedents and teacher leadership.

Theoretical Foundation

Numerous antecedents influence the enactment of teacher leadership. One of these antecedents is collaborative school culture. Culture is defined as a pattern of shared basic assumptions (Schein, 1985). There is a strong relationship between teacher leadership and school culture (Yusof et al., 2016). Kiliç (2014) found a negative relationship between unsupportive school climate and the development of teacher leadership. Öztürk (2015) found a positive relationship between culture and teacher leadership. Cansoy and Parlar (2017) have found that school culture predicted teacher leadership. A positive school culture nourishes the leadership traits among teachers (Sawchuck, 2011). A supportive school culture has certain characteristics. Collaboration is one of the key characteristics of a supportive school culture (Bolam et al., 2005) and is central to this teacher-leadership initiative (Riveros et al., 2013). Enabling collaboration among teachers leads to the emergence of teacher leadership (Demir, 2014) because collaboration is the primary means by which teachers influence others (LeBlanc & Shelton, 1997). When teachers function individually within their schools, it becomes much harder for them exercise leadership (Lieberman & Miller, 2004). Teachers influence each other to implement new ideas through collaborative relationships (Hargreaves, 1994). Collaborative culture also promotes trust (Copland, 2003). Trust allows teachers to work collaboratively (Hipp & Huffman, 2007). Trust enables teachers to exercise leadership because it casts the idea of influencing each other as legitimate and acceptable (Frost, 2003). Demir (2015) found that high trust in the culture promotes teacher leadership. Culture is a pattern of expectations and teachers respond to cultural expectations (Bursalioglu, 2011). If there is a trust among teachers and teachers see leadership as legitimate dimension of teacher professionalism (Frost & Durrant, 2002), they can respond to these cultural expectations by exercising leadership. In sum, teacher leadership depends on cooperation among colleagues (Silva et al., 2000). In fact, collaboration is so essential to teacher leadership that Harris and Lambert (2002) include collectivism into their definition of teacher leadership, which 'as a set of behaviours and practices that are undertaken collectively.' When there is a supportive culture, teachers are more likely to exercise leadership. A supportive culture which nourishes collaboration and trust is an important antecedent of teacher leadership.

Another antecedent of teacher leadership is teacher self-efficacy. Teacher self-efficacy has attracted considerable attention from scholars in the educational literature (Liu et al., 2021) and studies on teacher self-efficacy have been increasing exponentially (Klassen et al., 2011). Self-efficacy is defined as an individual's belief in their capability to produce desired outcomes (Bandura, 1977). Within the educational setting, a teacher's efficacy belief is a judgment of his or her capabilities to bring about desired outcomes

(Tschannen-Moran & Hoy, 2001). Researchers tried to understand both the antecedents and the effect of teacher-self efficacy. Studies have found that teacher self-efficacy is an important antecedent of numerous different educational outcomes, such as persistence, enthusiasm, commitment (see Tschannen-Moran & Hoy, 2001; Zee & Koomen 2016 for a review). Positive teacher self-efficacy beliefs also lead to improved job satisfaction, commitment and lower levels of stress (Aloe et al., 2014). Teacher self-efficacy could be perceived as another important antecedent of teacher leadership. Tschannen-Moran and Hoy (2001) who wrote one of the most influential papers on teacher self-efficacy claimed that "teacher efficacy is a simple idea with significant implications" (p. 1). It is surprising that to the best of my knowledge that the relationship between teacher leadership and teacher self-efficacy has never been explored directly. There are studies who suggest a potential relationship between teacher leadership and teacher self-efficacy. For instance, Cho and Shim (2013) found that teacher self-efficacy is linked to leadership aspirations. Cho and Shim (2013) also found that teachers with low self-efficacy tended to assimilate the goals proposed by their schools. It can be predicted that teachers with low self-efficacy is less likely to exercise leadership. Furthermore, teacher self-efficacy is related to collaboration. Gümüs, Bulut and Bellibas (2013) have found that instructional leadership promotes collaboration among teachers. Teacher collaboration in turn fosters teachers' self-efficacy (Bellibas & Liu, 2017). Calik et al. (2012) suggested that (collective) teacher self-efficacy determines teachers' effectiveness in school. One of these effectiveness could be teacher leadership and the impact of teacher self-efficacy on teacher leadership should be tested experimentally.

Years ago, Harrison (1972) suggested in his influential *Harvard Business Review* article that expertise is a source of power (Harrison, 1972). This is even truer for teachers. When teachers exercise leadership, they can draw upon their professional knowledge and experience (Leithwood & Jantzi, 1998; Lieberman & Miller, 2004). Hunzicker (2017) interviewed teacher leaders and concluded that "the progression from teacher-to-teacher leader builds from a solid foundation of pedagogical knowledge and skills" (p. 3). Deep knowledge of teaching and learning gives teachers credibility among their peers (Carver, 2016) which enhances their ability to influence other teachers (Collinson, 2012). Therefore, the first priority toward fostering teacher leadership should be to develop pedagogical expertise (Collinson, 2012). Collinson (2012) interviewed 81 exemplary teachers and concluded that teachers' own professional learning along with their teaching skills helped them become leaders. Similarly, Carver (2016) interviewed 89 graduates of Great Lakes Academia, two-year teacher leadership programme, and found that teachers emerged as leaders as they acquired greater expertise. Teachers were uncomfortable with the subject matter lacked confidence to exercise leadership (Klinker et al., 2010). As Crowther (2009) suggests teacher leaders first model pedagogical excellence. Paredes-Scribner and Bradley-Levine (2010) even found that area expertise is as a stronger determinant of leadership than organizational and management skills. As can be inferred, subject expertise is an important antecedent of teacher leadership and needs to be tested experimentally.

Leadership is a function of bidirectional and mutually influential interactions and negotiations (Smylie & Denny, 1990). When teachers exercise leadership, they question the status quo or challenge existing practices (Carver, 2016). Because, according to leadership characteristics, a leader is one who does something different and new from the existing one and changes the existing one (Cemaloğlu, 2007; Toytok, 2016). Silva et al. (2000) argue that teachers who lead "from within the classroom" need to be skilled in challenging the status quo. This is one reason some teachers avoid engaging in leadership because they do not want to deal with the resistance that stems from these challenges. Teachers who are unwilling to disturb traditional hierarchical structures have difficulties fulfilling their leadership roles efficiently (Brosky, 2011). Therefore, teachers who are open to authority, that is, expressing their ideas openly to those higher in the hierarchy, could be more skilled in promoting their own vision for learning and thus exercise leadership more effectively. Therefore, an openness-to-authority attitude could be an important antecedent of teacher leadership and needs to be examined experimentally.

Method

The Methodological Significance of The Study

The study adopted an experimental design. The use of experimental design in leadership literature is low (Podsakoff & Podsakoff, 2019). Several authors have called for more utilization of experimental designs within the leadership literature (Antonakis, 2017; Mueller, 2018). Since experiments have the power to provide evidence of causality between constructs (Campbell & Stanley, 2015; Falk & Heckman, 2009). Deeper results can be reached by combining the qualitative and quantitative data obtained in experimental studies with the mixed design method (Kıral & Kıral, 2011). The presence research contributes to the existing literature by providing causal evidence between teacher leadership and the four concepts under investigation. For instance, it is well established that there is a strong relationship between school culture and teacher leadership. However, since studies in the literature are mostly correlational, it is difficult to establish whether teacher leadership is the cause or the effect of a highly supportive school culture. In other words, teachers exercise leadership because they work in a supportive school culture or supportive culture enables teachers to exercise leadership. To the best of my knowledge, this study represents the first attempt to examine the effect of these antecedents on teacher leadership using an experimental design.

The Purpose and Hypothesis

The current study aims to test the impact of school culture, openness-to-authority, teacher self-efficacy and teacher expertise on teacher leadership belief, using an experimental design.

The present study tests four hypotheses:

Hypothesis 1: Participants will perceive teachers in a highly supportive school culture as more likely to exercise leadership, compared to teachers in a less supportive school culture.

Hypothesis 2: Participants will perceive teachers with a high level of openness-to-authority as more likely to exercise leadership, compared to teachers with a low level of openness-to-authority.

Hypothesis 3: Participants will perceive teachers with high self-efficacy as more likely to exercise leadership, compared to teachers with low self-efficacy.

Hypothesis 4: Participants will perceive teachers with high subject expertise as more likely to exercise leadership, compared to teachers with low subject expertise.

Participants

91 teachers who work at various state and private schools across Turkey participated in the study. Data were collected through online platforms. All participants were informed about the study and participation was voluntary. The sample size for the study was determined a priori using G*Power (t-test family, means-difference between matched pairs analysis) to achieve a power of 0.80 and an alpha error probability of .05, with a target medium-sized effect size of 0.3 (Faul et al., 2009). Based on a power analysis, a minimum sample size of 90 participants was required. The actual sample size (n=91) used in the study exceeded this minimum requirement.

75 participants (82.4%) were female, while 16 participants (17.6%) were male. In terms of teaching level, 14 participants (15.4%) were from preschool, 32 participants (35.2%) were from primary school, 27 participants (29.7%) were from middle school, and 18 participants (19.8%) were from high school. The

average age of the participants was 39.8 years (range=24–60, SD = 7.75), and they had an average of 16.3 years of teaching experience (range=1–42, SD = 8.00).

Procedures and Measures

The experiment adopted a within-participants design using a scenario-based approach. All participants responded to all scenarios and provided responses for all accompanying scales. Scenarios were used to manipulate the four concepts under investigation (see below). A scenario-based experimental approach was used effectively in previous studies within the leadership literature. Some notable examples are the studies carried out by Bauman et al. (2016) and Giessner et al. (2008).

Participants were presented with a total of eight scenarios, divided into four pairs. Each pair (two scenarios) assessed the impact of one of the four concepts (school culture, openness-to-authority, teacher self-efficacy and teacher expertise) on teacher leadership. Within each pair, the high and low value of the related construct (e.g., high self-efficacy vs low self-efficacy) was manipulated. In pair 1, teachers were presented with two scenarios describing a teacher working in a highly supportive school culture and less supportive school culture, respectively. In pair 2, teachers were presented with two scenarios describing a teacher with a high openness-to-authority attitude and a low openness-to-authority attitude, respectively. In pair 3, teachers were presented with two scenarios describing a teacher with high teacher self-efficacy and low teacher self-efficacy, respectively. In pair 4, teachers were presented with two scenarios describing a teacher with high subject expertise and low subject expertise, respectively. A sample scenario which describes a highly supportive school culture is "Imagine a teacher working in a school culture where there is high trust, collaboration, mutual support and frequent sharing among teachers. Teachers work towards a shared vision. Based on this context, what do you think is the likelihood of this teacher demonstrating the behaviors indicated in the following options?" A sample scenario which describes a less supportive school culture is "Imagine a teacher working in a school culture where there is low trust, little collaboration, little mutual support, and little sharing among teachers. There is also no shared vision. Based on this context, what do you think is the likelihood of this teacher demonstrating the behaviors indicated in the following options?"

Following the scenarios, they were asked "What is the likelihood that this teacher will..." and presented with 6 items (Cronbach's alpha = .94) taken from the micro-level leadership subscale of teacher leadership behaviour scale (Bolat, 2023). The scale assessed the extent to which teachers exercise leadership to influence their colleagues, with sample items including "I engage in pedagogical conversations with my colleagues to contribute to their development" and "I offer advice and suggestions to my colleagues." Participants provided responses on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Findings

Jamovi 2.3.12.0 was used for data analysis. To test all four hypotheses, a paired t-test was conducted to find a difference between the ratings of two scenarios in each pair (highly supportive school culture vs less supportive school culture; high level of openness-to-authority vs low level of openness-to-authority; high level of teacher self-efficacy vs low level of teacher self-efficacy; high level of teacher expertise vs low level of teacher expertise).

The mean score for the highly supportive school culture scenario was 4.38 (SD = 0.55), while the mean score for the highly supportive school culture scenario was 2.05 (SD = 1.02). This difference was statistically significant ($t(91) = 2.33, p < 0.01$). The mean score for the high level of openness-to-authority scenario was 4.13 (SD = 0.83), where the mean score for the low level of openness-to-authority was 2.14 (SD = 0.98). This difference was statistically significant ($t(87) = 1.98, p < 0.01$). The mean score for the high level of teacher self-efficacy scenario and the low level of teacher self-efficacy were 4.28 (SD = 0.72) and 1.97 (SD = 1.01), respectively. This difference was statistically significant ($t(86) = 2.32, p < 0.01$). The mean score for the high teacher expertise scenario was 4.29 (SD = 0.68), whereas the mean score for the low level of teacher expertise was 2.04 (SD = 0.86). The difference was significant ($t(87) = 2.26, p < 0.01$) (See Table 1 and Table 2).

Table 1
Mean differences

	N	Mean	SD	SE
HC	91	4.38	0.559	0.0586
LC	91	2.05	1.029	0.1079
HO	87	4.13	0.835	0.0895
LO	87	2.14	0.983	0.1054
HSE	86	4.28	0.724	0.0781
LSE	86	1.97	1.017	0.1097
HE	87	4.29	0.685	0.0734
LE	87	2.04	0.868	0.0931

HC: High Culture, LC: Low Culture, HO: High Openness, LO: Low Openness, HSE: High Self-Efficacy, LSE: Low Self-Efficacy, HE: High Expertise, LE: Low Expertise

Table 2
Paired Samples T-Test

	statistic	df	p	Mean difference	SE difference
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Table 2
Paired Samples T-Test

HC	LC	Student's t	18.0	90.0	< .001	2.33	0.129
HOtA	LOtA	Student's t	14.8	86.0	< .001	1.98	0.134
HSE	LSE	Student's t	17.8	85.0	< .001	2.32	0.130
HE	LE	Student's t	16.9	86.0	< .001	2.26	0.134

HC: High Culture, LC: Low Culture, HOtA: High Openness to Authority, LOtA: Low Openness to Authority, HSE: High Self-Efficacy, LSE: Low Self-Efficacy, HE: High Expertise, LE: Low Expertise

There was a statically difference in every pair of scenarios. These results clearly reveal that teachers who work in a highly supportive culture, who have a high level of teacher self-efficacy, teacher expertise and openness-to-authority attitude are perceived to be more likely to exercise leadership, compared to their counterparts.

Discussion, Conclusion, and Suggestions

The current study examined the impact of school culture, openness-to-authority, teacher self-efficacy, and teacher expertise on teacher leadership. The study employed an experimental design to provide evidence of causal link between these four concepts and teacher leadership. In that regard, the study added a unique perspective to the existing literature on teacher leadership because the utilization of experimental designs is low in the leadership literature (Podsakoff & Podsakoff, 2019).

It is fairly well established within the school leadership literature that there is a positive relationship between teacher leadership and school culture (Kılınc 2014; Öztürk, 2015; Cansoy & Parlar, 2017) and teacher expertise and teacher leadership (Carver, 2016; Collinson, 2012). However, these studies did not provide a causal link. School culture and teacher expertise could be the effect or the antecedent of teacher leadership. The relationship could be bi-directional.

The current study has provided causal evidence that school culture and teacher expertise are important antecedes of teacher leadership. When teachers work in a supportive culture and have deep knowledge of subject matter, they are more likely to exercise leadership. This is consistent with the findings of Paredes-Scribner and Bradley-Levine (2010) who found that area expertise is a stronger determinant of teacher leadership.

There are fewer studies on the relationship between teacher leadership and openness-to-authority, and teacher self-efficacy. However, several studies suggest a potential link between teacher leadership and teacher self-efficacy (Cho & Shim 2013), and openness-to-authority (Brosky, 2011; Silva et al., 2000). For instance, Wang and Xia (2022) found that openness-to-authority in the context of principal leadership is important. This could even be truer for teacher leadership.

The findings of the current study are consistent with the existing research on school culture, openness-to-authority, teacher self-efficacy, and teacher expertise. The current study went beyond these findings and added to the existing literature on teacher leadership, by providing a causal relationship

between these concepts and teacher leadership. To the best of my knowledge, this is the first study that establishes such a relationship between these concepts and teacher leadership.

The study has certain limitations that need to be addressed. Firstly, although the use of scenario-based approaches within experimental design is a well-established procedure, it has certain weaknesses. It may not reflect actual behavior (Lonati et al., 2018). Future studies should assess the impact of these antecedents on teacher leadership, utilizing a between-subjects experimental design where the actual behaviors of participants are assessed. Secondly, the study was conducted online, which may add bias in the selection of participants. Online research may reach a certain demographics but exclude others due to numerous reasons, such as internet access, interest in social platforms and etc., which limits the generalizability of the findings. The same study needs to be replicated in the face-to-face settings to ensure a more diverse group with a diverse population. Lastly, the sample in the study were predominantly women, which again limits the generalizability of the findings. Future research should include a more balanced representation of genders. Addressing these limitations in future studies will strengthen both the validity and the generalizability of the study's findings.

Some suggestions can be made for future studies. In order to better understand teacher leadership and its antecedents, it is recommended to test the impact of additional antecedents on teacher leadership through experimental designs. By incorporating other possible antecedents, researchers can understand better the factors that enhance teacher leadership. Furthermore, the current study was an online experiment. Future studies need to conduct longitudinal studies which employ field experiments rather than online experiments for a more comprehensive understanding. For instance, teachers could be offered a semester-long training program, and the effects of such interventions can be assessed over an extended period of time. Similarly, the current study was carried out at the teacher level. Similar experiments can be conducted at the school level. For instance, year-long interventions can focus on fostering a supportive culture and the impact of supportive cultures on teachers could be assessed. In sum, by conducting longitudinal face-to-face field experiments and interventions, researchers can contribute to teacher leadership and school improvement.

Some suggestions can be made for practitioners. Teacher leadership is an effective strategy for school improvement and a moral imperative for fostering teachers' agency. School leaders can improve teacher leadership by providing professional development activities and specialized training programs aimed at enhancing teachers' self-efficacy, subject expertise, and openness to authority attitudes. When these qualities are enhanced, they are more likely to exercise leadership. In addition to professional development activities, school leaders should build a supportive school culture that encourages teachers to exercise leadership. By fostering a supportive environment that promotes trust, knowledge sharing and collaboration, school leaders can enable all teachers to engage in leadership.

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