

The relation between school leadership from a distributed perspective and teachers' organizational commitment. Examining the source of the leadership function.

Abstract

Purpose. In this study the relationship between school leadership and teachers' organizational commitment is examined by taking into account a distributed leadership perspective. The relation between teachers' organizational commitment and teachers' perceptions of the quality and the source of the supportive and supervisory leadership function, participative decision-making, and the cooperation within the leadership team context variables are inquired.

Research Methods. A survey was set up involving 1522 teachers from 46 large secondary schools in Flanders (Belgium). Because the data in the present study have an inherent hierarchical structure, that is teachers are nested into schools, hierarchical linear modeling techniques are applied.

Findings. The analyses reveal that 9% of the variance in teachers' organizational commitment is attributable to differences between schools. Teachers' organizational commitment is mainly related to the quality of the supportive leadership, the cooperation within the leadership team, and participative decision-making. Who performed the supportive leadership function plays only a marginally significant positive role. The quality of the supervisory leadership function and the role of the leadership team members in this function were not significantly related to teachers' organizational commitment.

Implications. The implications of the findings are that in order to promote teachers' organizational commitment teachers should feel supported by their leadership team and that this leadership team should be characterized by group cohesion, role clarity, and goal orientedness. Recommendations for further research are provided.

Keywords: distributed leadership, organizational commitment, hierarchical linear modeling

Article type: research article

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Introduction

Teachers' organizational commitment is crucial for organizational effectiveness (Dee, Henkin, & Singleton, 2006). Hence, it is important to identify the determinants and predictors influencing teachers' commitment to the school. In this respect, a substantial body of evidence suggested that teachers' organizational commitment is affected by school organizational factors, like school leadership (Hoy, Tarter, & Bliss, 1990; Koh, Steers, & Terborg, 1995; Nguni, Slegers, & Denessen, 2006). However, most of these studies adopted a single-person leadership approach in which leadership is a quality that exists in one person, the school leader, and the effect of this one 'superhero' on organizational commitment is examined. During the past decade these traditional person-centered leadership models are more and more left in favor of distributed leadership models (Bush & Glover, 2003; Goleman, 2002; Gronn, 2002a, 2002b; Leithwood & Riehl, 2003). Leadership is being increasingly perceived as an emergent property of a group or network of interacting individuals (Gronn, 2002a). In this context, leadership is no longer a one-person business, but is stretched over a number of individuals and the task is accomplished through the interaction of multiple leaders (Spillane, 2006; Spillane, Halverson, & Diamond, 2001; 2004). This is particularly the case in large secondary schools where principals no longer orchestrate the leadership role in a solo way. Other members of the school team have to take part in the social interactions and perform leadership functions as a conjoint activity (Firestone, 1996; Firestone & Martinez, 2007). This implies that in these schools the principal should distribute leadership functions across the members of the leadership team and work closely with these individuals. Moreover, leading a school should not be restricted to those at the top of the organization;

teachers should also be involved in the leadership of the school (Copland, 2003; Elmore, 2000; Harris, 2008; Lashway, 2003).

The present study is an empirical analysis of distributed leadership. Our study aims to analyze different components of distributed leadership and to explore which components influence teachers' organizational commitment the most. Special attention is paid to the distribution of leadership among different sources, more specifically the members of the leadership team. We investigate whether the role of the principal is different from the role of assistant principals and the role of teacher leaders in supporting and supervising teachers, and whether these differences in leadership roles influence teachers' organizational commitment. We also examine the influence of teachers' perceptions concerning participative decision-making and the level of cooperation in the leadership team. Moreover, context variables are taken into account. We aim to investigate this at the teacher level and the school level, because teachers' commitment to the school might differ from teacher to teacher and from school to school.

Before answering these questions, we first outline the theoretical framework used in this study by defining organizational commitment. Next, we pay attention to the studied antecedents of organizational commitment. More specifically, the quality of two key leadership functions (i.e., supportive and supervisory leadership), who performs these two leadership functions (i.e., principal, assistant principals, and teacher leaders), teachers' participative decision-making, and the cooperation within the leadership team. Finally, the relation between context variables and teachers' organizational commitment are discussed.

Theoretical Framework

1.1 Organizational Commitment

Mowday, Steers, and Porter (1979, 1982) defined organizational commitment as the relative strength of an individual's identification with and involvement in a particular

organization. They stated that organizational commitment consists of three characteristics, namely (a) identification, or a belief in and acceptance of organizational goals and values; (b) involvement, or a willingness to exert effort on behalf of the organization; and (c) loyalty, or a strong desire to maintain membership to the organization. These characteristics imply that members of an organization wish to be active players in the organization, have an impact on what is going on in it, feel that they have high status within it, and are willing to contribute beyond what is expected of them (Bogler & Somech, 2004).

Previous research indicated that organizational commitment is seen as an effective route to school success for two reasons. First, teachers' commitment is highly important for the nexus between teachers and students. For example, Firestone and Pennell (1993) and Rosenholtz (1985) pointed out that organizational commitment is related to student achievement. Although, the direct relation between organizational commitment and student outcomes is not always straightforward, it is an important indirect variable for student achievement. Marks and Louis (1997) stated that teacher commitment to the school affects pedagogical quality and student academic performance indirectly through school organization for instruction. Also, teachers' organizational commitment is an important indicator of a strong school culture (Cruise & Louis, 2009), which is considered as an important mediating variable for student learning and high academic achievement. Recent studies (Heck & Hallinger, 2009) have stressed the importance of mediating variables between leadership and student outcomes. Heck and Hallinger (2009) have argued that leadership effects on learning are brought about indirectly through their impact on people, structures and processes over time. Organizational commitment of teachers is one of these people-related key variables. Second, organizational commitment can be considered as an important outcome variable itself. Higher organizational commitment results in more effort and an increased dedication to attain organizational goals, higher job and career satisfaction, self-efficacy, and organizational

citizenship behavior (Dee, et al., 2006; Firestone & Pennell, 1993; Kushman, 1992; Rosenholtz, 1989; Somech & Bogler, 2002). In contrast, a negative association has been found between organizational commitment and withdrawal behavior, like teachers' intention to leave, turnover, burnout or absenteeism (Schappe, 1998; Shapira & Rosenblatt, 2009). To conclude, organizational commitment is a hallmark of organizational effectiveness, which underscores the need to identify factors contributing to this organizational outcome.

1.2 School Leadership as an Antecedent of Organizational Commitment

Previous studies extensively paid attention to the antecedents of organizational commitment (Meyer & Allen, 1997). In general, empirical research has indicated that leadership has a direct effect on employees' organizational commitment (Koh et al., 1995; Nguni et al., 2006; Ostroff, 1992; Park, 2005). Two of the foremost models in the field of educational leadership are transformational and instructional leadership (Hallinger, 2003). Previous studies found that both leadership models, and more specifically an integrated leadership, combining transformational and instructional leadership, can have positive effects (Hallinger, 2003; Marks & Printy, 2003). Derived from a combination of the transformational and instructional leadership model (Bass, 1985; Burns, 1978; Hallinger & Murphy, 1985), we distinguish two core functions of successful leaders in the present study (Author et al., 2009a): (a) the supportive leadership function, which is related to the leaders' role in fostering and setting a collective school vision and clear goals, motivating and helping teachers, stimulating teachers' professional learning; and (b) the supervisory leadership function, which is related to the principal's role in formally controlling and monitoring teachers in schools (Bamburg & Andrews, 1990).

In the present study we examine whether these two leadership functions are related to teachers' organizational commitment. Previous research indicated that the supportive leadership function is likely to have a positive effect on teachers' organizational commitment

(Littrell & Billingsley, 1994; Singh & Billingsley, 1998). Louis (1998) and Rosenholtz (1989), for example, suggested that teachers are more committed to the school when principals offer feedback, encouragement, and acknowledgment. Other studies indicated that the supervisory leadership function is related to teachers' organizational commitment as well (Ebmeier, 2003). For example, Somech (2005) found a positive relation between directive leadership, which is characterized by monitoring and supervising teachers, and organizational commitment. Also, Robinson et al. (2008) claimed that staff welcomed leaders' involvement in teacher evaluation and classroom observation because it resulted in useful feedback, which could be related to teachers' organizational commitment. Conversely, Firestone and Pennell (1993) claimed that as feedback becomes less direct (i.e., comes from other sources than students) its influence on teachers' commitment becomes less clear, and as feedback becomes more evaluative teachers feel less committed. To conclude, previous studies showed that the quality of the supportive leadership function can be related to teachers' organizational commitment. For the quality of the supervisory leadership function the literature is less unidirectional and, therefore, more research is required. Furthermore, an important question is, is it only the quality of the leadership functions which is crucial for teachers' organizational commitment? Or is it also important that leadership is distributed? This is handled in the following part.

1.3 Distributed Leadership as an Antecedent of Organizational Commitment

The effect of leadership on teachers' organizational commitment has mainly been examined from a traditional, single-person leadership perspective. Most research focused on the quality of the leadership functions; not who performed the leadership functions. From a distributed leadership perspective, it is no longer solely the school principal who performs these functions; other members of the leadership team can be involved in supporting and supervising teachers as well. Previous studies focusing on distributed forms of leadership

emphasized conceptual development and descriptions of these practices. Analytical studies, focusing on the knowledge base concerning the effects of distributed leadership, are only recently emerging (e.g., Heck & Hallinger, 2009; Leithwood & Mascall, 2008; Leithwood, Patten, & Jantzi, 2010; Marks & Printy, 2003).

In the following part we first provide a state of the art concerning the importance of distributed leadership in general. Next, we focus on the operationalization of distributed leadership. This operationalization is needed to investigate the relation between the different components of distributed leadership and teachers' organizational commitment.

1.3.1 The Importance of Distributed Leadership: A State of the Art.

In general, researchers assume that distributing leadership is normatively 'a good thing'. Previous studies indicated that when leadership is not restricted to one leader, schools are more effective, and school improvement and organizational change are more likely to occur (Harris, Leithwood, Day, Sammons, & Hopkins, 2007). Harris (2005, p. 259) stated: "most recent literature on change and school improvement suggests that the form of leadership most often identified with improved learning outcomes is one that is distributed or shared (Fullan, 2001; Hopkins, 2001)." Also, Hargreaves and Fink (2006) claimed that sustainable leadership is leadership that is spread or distributed. This is confirmed by empirical research of Heck and Hallinger (2009) who found direct effects of distributed leadership on change in the schools' academic capacity and small, but significant indirect effects on student growth rates in math. Similarly, Marks and Printy (2003) stated that the influence of integrated leadership (i.e., transformational leadership coupled with shared instructional leadership) on the quality of pedagogy and student achievement is substantial. In contrast, Leithwood and Jantzi (1999a, 2000a) came to the conclusion that teacher leadership, as one form of distributed leadership, had no significant total effect on students' engagement, whereas principal leadership effects, although not strong, did reach statistical significance. However, in more recent studies,

Leithwood and his colleagues (e.g., Leithwood, Harris, & Hopkins, 2008; Leithwood & Mascall, 2008; Louis, Leithwood, Wahlstrom, Anderson, Michlin, Mascall, et al. 2010) extended their focus to ‘collective or total leadership’, which refers to the combined influence of different sources of leadership (e.g., teachers, staff teams, assistant principals, principals). In these recent studies they came to the conclusion that there are modest, but significant indirect effects of collective or distributed leadership on student achievement, through the effect on staff performance. However, Silins, Mulford, and Zarins (2002) found that the influence of distributed leadership did not extend to student engagement or to student participation. Similarly, other researchers are more skeptical about the effects of distributed leadership and indicated that in the current traditional hierarchies of leadership in schools, power is expected to stay at the top of the school and that this formal hierarchical structure is crucial (Mayrowetz, Murphy, Louis, & Smylie, 2007). Moreover, renegotiation of institutional roles can lead to role conflict and confusion over who should take final decisions, which can be confusing for teachers (Liontos & Lashway, 1997; Neuman & Simmons, 2000; Oswald, 1997; Smith & Piele, 1997; Smylie & Brownlee-Conyers, 1992). This could imply that leadership performed by members of the leadership team other than the principal leads to less committed teachers.

To conclude, although proponents of distributed leadership have interpreted the available empirical results as suggesting that distributed leadership is strongly related with better outcomes, the evidence for this is somewhat mixed. Thus, the field of distributed leadership is characterized by ambiguity and conflicting findings. Clearly, more research on the potentially positive or negative relation between distributed forms of leadership and teachers’ organizational commitment is needed. Especially, research examining the differential role of the principal, assistant principals, teacher leaders, and teachers in performing leadership functions and the relation of these different sources of leadership and

teachers' organizational commitment should elaborate the research concerning distributed leadership.

1.3.2 Operationalization of Distributed Leadership

In order to examine the relation between leadership from a distributed perspective and teachers' organizational commitment, it is crucial to clearly operationalize distributed leadership. While distributed leadership is a hot topic in the educational management literature, it remains an unclear and divergent concept, lacking a coherent conceptual base (Harris, 2005; Spillane, 2006). Previous studies operationalized distributed leadership from different perspectives. For example, in the study of Heck and Hallinger (2009) and the study of Louis, Dretzke, and Wahlstrom (2010) distributed leadership is considered as a form of participative or collaborative decision-making in which administrators, teachers, students, and parents are involved. Leithwood and Mascall (2008) examined potential sources of influence (e.g., principals, district-level administrators, teachers with designated leadership roles). These different studies each focus on one aspect of distributed leadership. In our study we combined the different operationalizations of distributed leadership, in order to develop a more comprehensive understanding of distributed leadership (author et al., 2009a, 2010), which is a main strength of our study. Based on a literature review, we distinguish between (a) the different sources in the leadership team who perform leadership functions, and (b) the participation of teachers. Moreover, we added (c) the cooperation within the leadership team as a component of distributed leadership, in order to focus on the concerted action of distributed leadership (Gronn, 2002a). We discuss each component of our operationalization more in depth.

(a) *Different sources in the leadership team who perform leadership functions.* In Flanders (Belgium) different sources of leadership in large secondary schools (i.e., minimum 600 pupils) are grouped in a leadership team and can perform supportive and/or supervisory

leadership functions. This leadership team consists of a principal, assistant principal(s), and teacher leader(s). These leadership teams can differ considerably across schools, concerning the amount of members in the team and the development activities, which is similar to the school context in other countries (Fletcher-Campbell, 2003; Harris, Muijs, & Crawford, 2003). For example, in some schools the leadership team only consists of one principal and one assistant principal; whereas other schools opt for an extensive leadership team with a large amount of assistant principals and teacher leaders. Research examining and comparing the influence of the different actors in the leadership team on teachers' organizational commitment is scarce. However, it could be hypothesized that principals play a dominant role in the school culture and teachers' attitude (Engels, Hotton, Devos, Bouckenooghe, & Aelterman, 2008; Krüger, Witziers, & Slegers, 2007) and, therefore, have a high impact on teachers' organizational commitment. It is also plausible that assistant principals or teacher leaders, who have no formal authority over other teachers, are responsible for mentoring colleagues and providing professional support (Wasley, 1991), and, hence, influence teachers' commitment to the school. This is in line with the study of Leithwood and Mascall (2008) who found that teachers in formally designated roles are significantly related to teachers' capacity, motivation, and work setting. Thus, we assume that each different actor of the leadership team performs leadership functions and each have a different impact on teachers' organizational commitment. Based on previous studies we cannot predict which actor has the strongest relation with teachers' organizational commitment. Therefore, in the present study we examine the differential impact of the different sources of the leadership team in performing the leadership functions.

(b) *Participative decision-making of teachers.* As outlined above, distributed leadership should not be restricted to those at the top of the organization. Instead it should be a distributed practice among the whole school (Copland, 2001; Elmore, 2000; Neuman &

Simmons, 2000). Hence, also teachers should be involved in leading the school. Therefore, we added a second perspective to distributed leadership: the participation of teachers in school decision-making. As Leithwood, Mascal, and Strauss (2009, p. 7) stated: “participative leadership is among the lines of leadership research closely related to our meaning of distributed leadership”. Similarly, Heck and Hallinger (2009), Muijs and Harris (2006), and Louis et al. (2010) claimed that shared or participative decision-making, where teachers are given responsibility to make decisions on behalf of the school, is a component of distributed leadership. Previous studies found that participative decision-making of teachers has a positive impact on organizational outcomes. For example, Robinson, et al. (2008) came to the conclusion that leadership that not only promotes but directly participates with teachers in formal or informal professional learning is highly related with student outcomes. Similarly, other researchers found a positive relation between participation of teachers and their commitment to the school (Bogler, 2001; Byrne, 1999; Davis & Wilson, 2000) because teachers claim that they want to be heard and respected with regard to school decisions (Maeroff, 1988). However, other scholars indicated that organizational commitment is not directly associated with participative decision-making (Bogler & Somech, 2004; Louis, 1998; Nir, 2002; Somech, 2005). These findings indicate that the relation between participative decision-making and organizational commitment is at present still unclear and more research is needed to unravel this relationship.

(c) *Cooperation within the leadership team.* As Gronn (2002a) and Spillane (2006) indicated, studying leadership from a distributed perspective should not be restricted to the division of leadership functions among the members of the leadership team. In other words, distributed leadership does not solely focus on ‘what’ is distributed by whom, but also on ‘how’ it is distributed. Similarly, Mehra, Smith, Dixon, Robertson (2006), stated that team performance is not simply a matter of having more leaders. It also matters whether or not the

leaders synchronize their actions through reciprocal influence. Although, the centrality of this ‘conjoint activity’ (Gronn, 2002) at the level of the leadership team is crucial, previous empirical research on distributed leadership examining the cooperation at level of the leadership team is scarce. Therefore, in the present study we chose to take into account the concerted action of the leadership team. Based on a literature review, Senior and Swailes (2007) suggested that effective teams are characterized by shared aims and objectives, mutual trust and dependency, open expression of feelings and disagreement, and decision-making by consensus (Mullins, 2005). Moreover, effective teams have a collective, synergetic effect (Luthans, 1995) and are characterized by cooperation, coordination, and cohesion (Buchanan & Huczynski, 2004). Finally, effective teams have clear membership boundaries (Hackman, 2002). In the present study we cluster these characteristics into three categories: group cohesion, goal orientedness, and role clarity, and define this as “cooperation within the leadership team”. In the following part we briefly focus on these different aspects of cooperation within the leadership team.

- Group cohesion. Group cohesion is a process whereby a sense of ‘we-ness’ or togetherness emerges to transcend individual differences and motives (Buelens, Van Den Broeck, Vanderheyden, Kreitner, & Kincki, 2006). It reflects the openness of the team members, their mutual trust, communication, and cooperation (Holtz, 2004). This plays an essential role in team effectiveness (Bennett, Wise, Woods, & Harvey, 2003; Macbeath, 2005; McGarvey & Marriott, 1997).
- Goal orientedness. This refers to a clearly formulated vision and mission which is shared by all members of the leadership team. Previous research revealed that the most successful groups are those in which the members share a common vision

and the organization's goals (Bennett et al., 2003; Briggs & Wohlstetter, 2003; Neck & Manz, 1994).

- Role clarity. Another factor which influences the effectiveness of leadership teams is the presence of clear role divisions and clear management structures. These should be known and accepted by the members of the leadership team and the teachers. In contrast, role ambiguity, which occurs when people do not know what is expected of them will lead to team ineffectiveness (Buelens et al., 2006; Chrispeels, Castillo, & Brown, 2000; Chrispeels & Martin, 2002; Oswald, 1997; Sanders, 2006; Wise, 2001).

Several studies in the organizational management literature have shown that group cohesion among employees influences their organizational commitment (Wech, Mossholder, Steel, & Bennett, 1998). Role clarity is also reported to be positively associated with commitment to the organization (Mathieu & Zajac, 1990; Tao, Takagi, Ishida, & Masuda, 1998). Likewise, a shared vision and consensus among staff regarding the school goals (as congruent with the own goals) has a positive impact on the employee's organizational commitment (Meyer & Allen, 1997). But, most research concerning group cohesion, role clarity, and consensus on the organization's goals does not focus on the perceptions of teachers concerning the cooperation within the leadership team leading the school. However, it could be hypothesized that teachers prefer a leadership team which is characterized by goal orientedness, group cohesion, and role clarity. We assume that teachers who believe that their leadership team works cooperatively, implying that all leaders work towards the same goals, that each member has clear roles, and that there is a cohesive team, are committed to the school as organization. In contrast, where teachers believe that the leaders each work on their own, without trusting each other, or each going in a different direction and having a different vision and with ambiguous roles, might lead to less committed teachers. More research is

required in this domain. Therefore, the relation between teacher's perceptions on how the members of the leadership team cooperate is examined in the present research.

1.4. Context Variables and Organizational Commitment

Next to distributed leadership variables, teachers' organizational commitment can be influenced by context variables. We first focus on a demographical variable: years of job experience. Based on a previous research (Author et al., 2009b; Brunetti, 2001) we assume that teachers with more job experience tend to be less committed to the school, compared to teachers' with less job experience.

Furthermore, we pay attention to structural school variables which are related to distributed leadership, more specifically the school size, the size of the leadership team, and educational stream. Concerning the size of the school, we assume that leadership is more distributed in larger schools, and thus might be related to teachers' organizational commitment. However, although many researchers have assumed that context variables influence organizational commitment (Meyer & Allen, 1997) other researchers have suggested that the influence of context variables diminishes when perceptions of the respondents on school leadership are included in predictive models (Bogler, 2005; Culver, Wolfle, & Cross, 1990). Given this inconsistent view, we include context variables in our analyses and explore whether they are related to teachers' organizational commitment.

Based on the theoretical framework described above, certain questions concerning the relation between teachers' perceptions of leadership from a distributed perspective, context variables, and teachers' organizational commitment, remain unanswered. Therefore, the aim of the present study is to assess which component of distributed leadership and which context variable is strongest related with teachers' organizational commitment.

2. Research Questions

In the present study we aim to examine whether the quality of leadership is related to teachers' organizational commitment. Previous studies consistently showed that the principal played an important role. In this study we examine this from a distributed leadership perspective, in which different formal leaders are involved in leading the school (i.e., principals, assistant principals, and teacher leaders). We focus on two crucial leadership functions, more specific support and supervision. Also, we analyze whether the source of the leadership functions is related to teachers' organizational commitment. In other words, do we have to know who supports or supervises teachers? Should this be the principal, or the assistant principal, or the teacher leaders? Or is it irrelevant for teachers' organizational commitment to know the source of the leadership functions? Hence, for both the supportive and the supervisory leadership function we examine whether the principal, the assistant principal, or the teacher leader is the main actor in providing these functions.

Because leadership is not restricted to individuals in formal positions, we analyze additionally whether teachers' voice in school decision making and whether cooperation between the leaders in the school are related to teachers' organizational commitment.

Based on these research aims, the following research question is put forward in the present study: Which of the distributed leadership components (i.e., the quality and the sources of the supportive and supervisory leadership functions, participative decision-making, and the cooperation within the leadership team) are mainly related to teachers' organizational commitment, taken context variables into account (i.e., years of job experience, school size, size of the leadership team, educational stream)? In Figure 1 the research question is presented.

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3. Method

3.1 Sample

Random sampling was used to select 46 secondary schools in Flanders (Belgium) with minimum 600 pupils. These schools were selected from a list of 360 secondary schools provided by the Flemish Ministry of Education. In the study, the mean school size is 977 pupils (*SD* 468; minimum 600, maximum 2930). The number of members in the leadership team is minimum 3 and maximum 23, with a mean of 11 (*SD* 4.3), which shows that there exist major differences between schools in Flanders concerning the amount of members in the leadership teams. The questionnaires were administered to all teachers of the second stage (i.e., 14–16 year-old pupils). 1522 teachers completed the questionnaire with less than 10% missing data, representing a response rate of 64 %. The sample included 41.9% male and 58.1% female teachers, which is similar to the male-female division in the Flemish population of school members (respectively 43% and 57%). The age of the teachers ranges from 22 to 65, with a mean age of 39 (*SD* 10.7). The mean length in the current job was 13 years, ranging from 1 month to 40 years (*SD* 10.6).

3.2 Research Instrument

In a previous study we developed the Distributed Leadership Inventory (DLI: Author et al., 2009a). This instrument was designed to measure the quality and the distribution of the supportive and supervisory leadership function among the different members of the leadership team, and the cooperation within the leadership team. In the development of the DLI mainly scales with valid and reliable scores were combined into one instrument. To avoid theoretical overlap the factorial constructs were retested. Moreover, as the scales used for the DLI originally focused on the single-person leadership of the principal, whereas the DLI focuses on the leadership functions performed by the members of the leadership team (i.e., the principal, assistant principals, and teacher leaders) the validity of the scores on the subscales were retested. Internal validity of the DLI-scores was first tested by conducting exploratory factor analyses on the results of data of a first stratified randomly selected sub-sample ($n =$

951). As no orthogonality across components was assumed, principal axis factoring with promax rotation was adopted in SPSS. In order to extract the number of latent factors parallel analyses in R were employed (Horn, 1965). Next, to examine the stability of the exploratory factor structure, confirmatory factor analysis using AMOS was conducted on the data of the second stratified randomly selected sub-sample ($n = 951$). The reliability of the scores on the final version of the DLI was also determined. The final version of the questionnaire and the results of the factor analyses and the reliability analysis are presented in Appendix.

For the purpose of the present study also participative decision-making and organizational commitment are investigated. Demographic (e.g., years of job experience) and structural school variables (e.g., school size, educational stream, size of the leadership team) are included in the questionnaire as well. Next to the questionnaire, the principals of the sample schools were consulted in order to gather basic information about the organizational structure of the school and to explain the research goals. Below we outline the content of the DLI and the scales we added to the DLI for the purpose of the present investigation.

3.2.1 Measurement of Leadership Functions

In the first part of the DLI respondents were asked to rate the individual leadership functions of the principal, the assistant principals, and the teacher leaders. For each group of members of the leadership team the items are rated on a five-point Likert scale ranging from 0 (never) to 4 (always). To measure the supportive leadership function the following scales are used: strength of vision (De Maeyer, Rymenans, Van Petegem, van den Bergh, & Rijlaarsdam, 2007), supportive behavior (Hoy & Tarter, 1997), providing instructional support, and providing intellectual stimulation (Leithwood & Jantzi, 1999b). To measure the supervisory leadership function a scale was developed based on the instructional leadership theory concerning supervising and monitoring teachers (Blase & Blase, 2002; Hallinger, 2003; Southworth, 2002).

In order to investigate the quality of the leadership functions performed by the different members of the leadership team, we could opt to just focus on the average score of the principal, the average score of the assistant principal, and the average score of the teacher leaders. However, this option does not allow us to examine the quality of the leadership function independent of the source of the leadership function. In our study we aimed to examine what is the most important predictor: the quality of the leadership functions (without taking into account who performs this function) or the extent to which the leadership functions are performed by a particular actor (i.e., principal, assistant principal, teacher leader). Hence, we calculated two variables for each individual teacher: (a) the quality and (b) the source of the leadership functions.

(a) In order to examine teachers' individual perceptions of the quality of the supportive and supervisory leadership functions we focused for each item on the highest rated members of the leadership team (i.e., the principal, the assistant principals, or the teacher leaders). A mean score was calculated for all these maximum values of the items for the supportive and the supervisory leadership scale and labeled as 'quality of support' and 'quality of supervision'. This 'quality' score of the leadership functions provides information concerning the amount to which an individual teacher feels supported or supervised by a member of the leadership team. The score varies from 0 to 4, and a higher score indicates that the highest rated member of the leadership team is more strongly involved in the leadership function, and thus the more a teacher feel supported or supervised.

(b) To receive a more general view of teachers' individual perceptions of the source of the leadership functions, we calculated for each item the percentage to which each member of the leadership team (i.e., principal, assistant principals, or teacher leaders) had the same score as the 'quality' score. For each member of the leadership team this score varies between 0 (i.e., this member of the leadership team never has the same score as the quality score) and 1

(i.e., the member of the leadership team always has the same score as the quality score).

Hence, a higher score for a member of the leadership team implies that this member is more strongly involved in the performance of the leadership function.

3.2.2 Measurement of Participative Decision-Making

The subscale of Leithwood and Jantzi (1999b), developing structures to foster participation in school decisions, was applied to investigate the participation of all school members in school decision-making. The items were rated on a five-point Likert scale ranging from 0 (strongly disagree) to 4 (strongly agree).

3.2.3 Measurement of Cooperation within the Leadership Team

In the DLI the respondents were asked how they perceived the cooperation at the level of their leadership team. The subscales of role ambiguity (Rizzo, House, & Lirtzman, 1970), group cohesion (Litwin & Stringer, 1968), and the degree of goal consensus (Staessens, 1990) were used. The items were rated on a five-point Likert scale ranging from 0 (strongly disagree) to 4 (strongly agree).

3.2.4 Measurement of Organizational Commitment

The final part of the questionnaire is based on the organizational commitment questionnaire developed by Mowday et al. (1979). The items were rated on a five-point Likert scale ranging from 0 (strongly disagree) to 4 (strongly agree).

4. Data Analysis

In order to analyze the data we first examine some descriptive statistics. Next, we produce a correlation matrix for the (distributed) leadership variables. This correlation matrix gives us some first insights in how our main research variables are related. It is also used to explore the threat of multicollinearity.

Furthermore, in the present study, teachers ($n = 1522$) are nested within 46 Flemish secondary schools. Therefore, the problem under investigation reflects a typical hierarchical

structure. Teachers are physically organized in schools, but also share common perceptions and attitudes (Hoffman, 1997), which is assumed to influence their commitment to the school. The observations of individual teachers are not completely independent of what teachers share in their school setting; they have a common history and share common experiences by belonging to the same group (Hox, 2002). Thus, as Goldstein (1995, p. 1) stated “the group and the individuals belonging to the group both influence and are influenced by group membership”. Therefore, it can be expected that teachers within the same school will be more homogenous in their organizational commitment than teachers from different schools. Because both the data structure and the hypotheses are multilevel in nature, hierarchical linear modeling (MLwiN 2.02) is applied to explore the relation between the quality and the source of the supportive and supervisory leadership function, the participative decision-making, the cooperation within the leadership team and context variables, and the organizational commitment of teachers within schools. Hierarchical linear modeling avoids the dependency problem of teachers clustered in schools, aggregation bias, misestimated standard errors, and heterogeneity of regression problems that may compromise the results of ordinary least squares regression analyses of data in which (typically) one or more individual level characteristics are aggregated to the group level (Goldstein, 1995; Hox, 2002; Raudenbush & Bryk, 2002).

Considering the aim of the study, different models are tested using a forward stepwise HLM (Raudenbush & Bryk, 2002). First, the unconditional model, in which no independent variables are included, was tested. Second, we added teachers’ perceptions concerning the leadership variables (model 1a and model 1b), and context variables (model 2a and 2b) as fixed effects, which means that the corresponding variance components of the slopes are fixed at zero (Hox, 2002). A dummy variable was created for educational stream (general education 1, technical and/or vocational education 0), and all leadership and context variables were

centered around their grand mean (Raudenbush & Bryk, 2002). Finally, the assumption of a fixed linear trend was verified for each significant explanatory variable by allowing the coefficients to vary randomly across schools and across teachers (model 3). Therefore, the variance-covariance matrices for between school and within teachers were estimated. At that point, complex variance is only reported if significant.

The forward stepwise hierarchical linear modeling technique enables us to deduce the additional value for each consecutive model. Since parsimonious models are preferable (Hox, 2002; Raudenbush & Bryk, 2002), only significant predictors ameliorating the model are retained. Model improvement is assessed by studying the decrease in the deviance value compared to the previous model. In this respect, the difference in deviance is used as a test statistic having a chi-square distribution, with the difference in number of parameters as degrees of freedom. The parameters of the hierarchical linear models were estimated using Iterative Generalized Least Squares estimations (IGLS). The complete set of models allowed us to deduce which variables are significantly related to teachers' organizational commitment and at which level the variance occurs. Finally, in order to compare the power of the obtained significant effects, standardized regression coefficients, which can be considered as effect sizes in terms of standard deviation units, were calculated for the final model.

5. Results

5.1 Descriptive Statistics

Table 1 presents the descriptives statistics for the study variables. An examination of the means of the subscales revealed that, compared to the midpoint (i.e., 2) of the scale with a range from 0 to 4, teachers feel highly committed to the school ($M = 2.96$). The results of our study also reveal that, according to the teachers' responses on subscales with a range from 0 to 4, teachers feel highly supported ($M_{\text{quality support}} = 2.92$) and supervised ($M_{\text{quality supervision}} = 2.88$). Teachers believe that this support and supervision is mainly provided by the principal

($M_{\text{principal support}} = .78$; $M_{\text{principal supervision}} = .84$). This implies that in 78% of the cases teachers believe that principals are the sources for providing support; in 84% of the cases teachers gave the maximum score to the principals for supervision. However, for the supportive leadership function, other members of the leadership team are also involved ($M_{\text{assistant principal support}} = .70$; $M_{\text{teacher leader support}} = .61$). Thus, in 70% of the cases teachers believe that assistant principals are also important sources for providing support, whereas in 61% of the cases teacher leaders were perceived as an important source of supporting teachers. This suggests that supporting teachers is a leadership function which is distributed among the different members of the leadership team. Conversely, supervising teachers is a more centralized function mainly performed by the school principal and to a lesser extent by the assistant principals ($M_{\text{assistant principal supervision}} = .64$). This implies that in 64% of the cases the assistant principal is also perceived as an actor in supervising teachers. The teacher leaders are even more limited in their involvement of supervising teachers ($M_{\text{teacher leader supervision}} = .36$). Only in 36% of the cases teachers perceive their teacher leaders as an important source for supervising teachers. Finally, the lowest average score was ascribed to cooperation within the leadership team ($M = 2.68$) and participative decision-making ($M = 2.44$). Thus, compared to the midpoint (i.e., 2) of the scales with a range from 0 to 4, teachers perceive that they can only moderately participate in school decision making and that they are lead by a leadership team that works moderately in a cooperative way.

An examination of the correlations, as shown in Table 1, indicate that there is a positive significant correlation between the leadership variables and teachers' organizational commitment, except for the supportive and supervisory leadership of the teacher leaders. Furthermore, the results show that participative decision-making and cooperation within the leadership team are highly intercorrelated ($r .69$). This was also the case for the quality of the supportive leadership function and the quality of the supervisory leadership function ($r .59$).

Given the magnitude of these correlations, collinearity diagnostics were conducted in SPSS. All tolerance variables were found higher than .20, which indicates that multicollinearity among the investigated variables is not problematic (Field, 2005).

<<INSERT TABLE 1 AROUND HERE>>

5.2 Hierarchical Linear Models

To explore the relation between the quality of the supportive and supervisory leadership function, the source of the leadership functions (i.e., principal, assistant principals, and teacher leaders), participative decision-making, the cooperation within the leadership team, and teachers' organizational commitment, taking context variables into account, we applied hierarchical linear modeling. The results are presented in Table 2.

<<INSERT TABLE 2 AROUND HERE>>

Unconditional model. Since no exploratory variables are included in the unconditional two-level model, the intercept (2.98) of this model represents the overall mean of the organizational commitment of all teachers in all schools. In general, we can conclude that all teachers in all schools report a high commitment to their school. Both variances at school and teacher level (respectively: $\chi^2 = 12.796$, $df = 1$, $p < .001$; $\chi^2 = 738.328$, $df = 1$, $p < .001$) are significantly different from zero, providing justification for applying hierarchical linear modeling. Furthermore, the analysis involved the estimation of the total variance of the dependent variable, namely 0.484, which is the sum of the two variance components (0.044 + 0.440). The proportion of variance attributed to between school differences is calculated $[0.440 / (0.440 + 0.044)]$ and the results indicate that 9% of the variance in organizational commitment can be attributed to differences between schools. 91% of the variance can be attributed to differences between individual teachers. This implies that differences between teachers within schools largely exceed differences between schools. Although the extent of the school level effects appeared to be limited, the results of the unconditional model allowed

us to determine that there was statistically significant variation in teachers' organizational commitment among the schools we sampled.

Model 1. In model 1a the leadership variables were included in the fixed part of the model. Model 1a points out that by adding the significant leadership variables as fixed effects, the deviance of the model decreases significantly ($\chi^2 = 868.806$, $df = 10$; $p < .001$). The results reveal that all variables have a positive significant influence on teachers' organizational commitment, except for the variables related to the supervisory leadership. This suggests that teachers' perceptions of the quality of the supportive leadership function; the roles of the principal, the assistant principals, and the teacher leaders in supporting teachers; participative decision-making; and the cooperation within the leadership team are positively related to organizational commitment. Conversely, teachers' perceptions of the quality of the supervision in the school, and their perceptions of who mainly supervises teachers (i.e., principals, assistant principals, and teacher leaders) are irrelevant for teachers' organizational commitment. Considering the non-significant effect of the supervisory leadership variables, we omitted these variables from further analyses in model 1b. Comparing the deviance of model 0 and 1b reveals that it is significantly different from zero ($\chi^2 = 866.888$, $df = 6$; $p > .001$). Furthermore, because we aim for the most parsimonious model with only significant predictors, we did not opt for model 1a, but for model 1b.

Model 2. Model 2a retained significant results from Model 1b, and context variables are imported as additional explanatory variables. The results reveal that 'years of job experience' is significantly related with teachers' organizational commitment. It appears that teachers with more job experience report being less committed to the school than teachers with less job experience. No significant results are found for the other context variables (i.e., school size, size of the leadership team, and educational stream). Comparing the deviances of model 1b and 2a reveals that model 2a has a significantly better fit than model 1b ($\chi^2 = 59.311$,

$df = 4; p < .001$). However, by adding the context variable, support mainly provided by the teacher leaders is no longer significant, which is in line with the results of the correlations presented in Table 1. Therefore, we eliminated the non-significant context variables and ‘support of teacher leaders’ in model 2b. Because the difference in deviance in model 1b and 2b is significantly different from zero ($\chi^2 = 37.768, df = 2; p > .001$) and we aim for the most parsimonious model with only significant predictors, we opt for model 2b (instead of model 2a).

Model 3. In the final model random variance at both school and teacher level is allowed. Compared to model 2b, model 3 results in a significant model improvement ($\chi^2 = 70.017, df = 2; p < .001$). The intercept of 3.025 is now considered as the overall mean organizational commitment of teachers with a mean score on all the significant independent variables included in the model. The random part of the model reveals complex variance at the teacher level for ‘participative decision-making’ and ‘cooperation within the leadership team’. More specifically, the variance can be considered as a linear function of participative decision making and cooperation within the leadership team. Our results show that there is a negative covariance between intercept and slope. This indicates a reduction in variability in teachers’ organizational commitment within schools. In this respect, it appears that differences in the organizational commitment of teachers within schools decrease as teachers’ individual perceptions of participative decision-making and individual perceptions of the cooperation within the leadership team increases. This implies that differences in organizational commitment between teachers within a school become smaller if teachers can highly participate in school decision-making and if teachers believe that a highly cooperative leadership team leads the school. For the other explanatory variables the modeling of the random part did not reveal complex variance at school or teacher level.

Finally, we calculated the proportion of within school variability and between school variability explained by the models. The proportion variance explained for model 1a, 1b, 2a, 2b, and 3 is between 72.7% and 77.3% at school level, and between 42.3% and 43.9% at teacher level (cf. Table 2). This implies that our main research variables, which are teachers' individual perceptions about the quality of the leadership functions, the sources of the leadership functions, participative decision-making, and cooperation within the leadership team, especially account for school-level differences. In other words, although the examined (distributed) leadership variables are individual perceptions of teachers, they actually appear to assess school-related characteristics, leading to the relatively high proportion of explained variance at school level.

<<INSERT TABLE 3 AROUND HERE>>

Because we aimed to compare the magnitude of the different significant variables, standardized regression coefficients were calculated. There is no single approach to the interpretation of these standardized regression coefficients. In general the interpretation is as follows: < 0.10 small effect; 0.30 medium effect; > 0.50 large effect (Cohen, 1988). The standardized regression coefficients, represented in Table 3, show that the 'quality of support' and 'the cooperation within the leadership team' are the strongest predictors of teachers' organizational commitment compared to the other significant variables. 'Participative decision-making' and 'years of job experience' are, compared to 'quality of support' and 'cooperation within the leadership team', to a lesser extent related to teachers' organizational commitment. 'Support of the principal' and 'support of the assistant principal' are weakly related to teachers' organizational commitment.

6. Discussion

Organizational commitment of teachers is a key mechanism for organizational effectiveness and plays an (indirect) role in student outcomes (Dee, et al., 2006; Rosenholtz,

1985). This study aims to examine the relation between leadership and teachers' commitment to the school. The present study investigated this relation by taking distributed leadership as a starting point. Next, to the quality of two key leadership functions (i.e., supportive and supervisory leadership), we examined which source of the leadership team (i.e., principal, assistant principal, and/or teacher leaders) is mainly involved in the performance of the leadership functions and whether differences in these sources have an impact on teachers' organizational commitment. Because distributed leadership is more than dividing tasks among different members in a school, we added two important components of distributed leadership: participative decision-making and the level of cooperation between the members of the leadership team. Hence, we also examined the relation between the participative decision-making of teachers and the cooperation within the leadership team, and teachers' organizational commitment. Also, the relation between context variables (i.e., years of job experience, school size, size of the leadership team, and educational stream) and teachers' organizational commitment is studied. Hierarchical linear modeling was applied to data of 1522 teachers of 46 large secondary schools in Flanders.

The results of this study indicated that teachers feel committed to their school, which corroborates the findings of Nguni et al. (2006) and Tsui and Cheng (1999). They found that respectively Tanzanian teachers and teachers from Hong Kong tended to report that they were committed to the school. Furthermore, our study showed that supervising teachers is the leadership function with the highest centralization; supporting teachers is more distributed among the different members of the leadership team. This confirms the findings of Heller and Firestone (1995), Leithwood et al. (2007), and Spillane (2006), who suggested that to whom leadership is distributed depends from activity to activity or from function to function. Next, our results showed that the sample teachers in general believed that they can only moderately participate in decision-making, which is in line with the study of Bogler and Somech (2004).

Finally, according to teachers, the leadership team is a rather cohesive group with clear roles and shared goals. Thus, concerning the perceptions of teachers on the conjoint activity of the leadership team, our results indicated that the leadership team in general works moderately cooperatively. Because to our knowledge no previous studies have focused on teachers' perceptions of the cooperation within the leadership team, this is an interesting finding.

Although much research has focused on distributed leadership, previous research has addressed only bits and pieces of the relation between distributed leadership and organizational outcomes. In our study we took an integrative framework into account, which sharpened our understanding of which dimensions of distributed leadership influenced teachers' organizational commitment. The results of the hierarchical linear modeling revealed that the variance in teachers' organizational commitment is significantly different from zero at the school level. The null model revealed that the variance in teachers' organizational commitment can partly be explained by belonging to a specific school (namely 9%). 91% of the variance in teachers' organizational commitment is related to the individual teacher. Hence, schools appear to play a rather limited role in teachers' reported organizational commitment. Teachers' organizational commitment seems to be mainly an individual matter. This finding is in line with previous research of Park (2005) and Tsui and Cheng (1999) who found that teacher commitment did not vary much among schools. Nevertheless, our results showed that the school level added significantly to what the individual teacher level explained for teachers' organizational commitment, which provides justification for the use of hierarchical linear modeling techniques.

Based on the fixed part of the hierarchical linear models we conclude that teachers' individual perceptions of the quality of support (independent of the member of the leadership team who provides this support) and the cooperation within the leadership team are of prime

importance for the degree to which teachers will identify with and get involved in the school.

We will briefly elaborate these results in the following part.

We found that the quality of the support teachers receive is related with organizational commitment. This implies that a supportive relationship between teachers and school leaders, which is characterized by providing a clear school vision, translating this vision to teachers, and setting directions for teachers by providing professional development, contributes positively to the commitment of teachers to the school. This importance attributed by teachers to the quality of support is in line with previous findings (Nguni et al., 2006; Singh & Billingsley, 1998). However, these previous studies only focused on principal leadership. Based on our results, we can extend these studies by stating that this should not by definition be the principal who provides this support. Instead it is the quality of support, independent of the source of the supportive leadership function, that is crucial for teachers' organizational commitment.

What is striking in our results is that, compared to the variable 'quality of support', the effect of the different sources of the leadership function (i.e., the different members of the leadership team: principal, assistant principals and teacher leaders) is very limited. Although the support of the principal and the support of the assistant principal in our study are significantly related to organizational commitment, the magnitudes are nearly negligible. The support of the teacher leaders is not even significantly related to organizational commitment. This is an interesting finding, which nuances the finding of Leithwood and Mascal (2008) who found that teachers with designated leadership roles were perceived to have a rather strong influence. Also, Silins and Mulford (2004) stated that teacher leadership is an important predictor in organizational learning. In contrast, in our study, the influence of teacher leaders, who are closest to the teachers, is not fundamentally stronger than that of the principals or the assistant principals. Furthermore, one could expect that principals, who play

a key role in school culture and teachers' attitude (Engels, Hotton, Devos, Bouckennooghe, & Aelterman, 2008; Krüger, Witziers, & Slegers, 2007) with their dominant leadership position in the school, to have a much higher influence on teachers' organizational commitment. It is interesting to notice that this was not the case; principals do not appear to have a more decisive impact on teachers' organizational commitment than other members of the leadership team. This is in line with the study of Leithwood and Jantzi (2000b) in which they concluded that neither source of leadership, principal or teacher leaders, does stand out in influencing student engagement. To conclude, our study indicated that the quality of the support is mainly related to organizational commitment, and is therefore crucial for teachers. Who provides this support seems to be less important. This is in line with Robinson et al. (2008) who suggested that what matters is the frequency of leadership practices rather than the extent to which they are performed by a particular leadership role.

Similar to Leithwood and Jantzi (2000b) who stated that there is no advantage in encouraging widely distributed forms of leadership, one might assume that, in our study, distributed leadership is of minor importance for teachers' organizational commitment. However, distributed leadership is more than delegating and dividing leadership functions. In our definition, distributed leadership is also operationalized as the level of cooperation in the leadership team. Our findings suggest that teachers who believe that their school is run by a cooperative leadership team (characterized by group cohesion, clear and unambiguous roles, and goal orientedness) feel committed to the school. This implies that it is important for teachers that their school is not led by a solo-leader working on an island. Instead, the school should be led by a leadership team that works together in a cohesive and open way. This is partly an empirical corroboration of Gronn (2002a) and Spillane (2006) who claimed that the concerted action, conjoint activity, and the practice aspect of distributed leadership are crucial. Similarly, Leithwood and Mascall (2008) refer to McMahon and Perritt (1971) who

claimed that organizational effectiveness may have less to do with power equalization (less hierarchical distribution of influence) and more to do with perceived concordance, or agreement across roles in what is the control structure. Our results also corroborate the study of Marks and Printy (2003) who found that leadership should be carried out by people working in collaboration; they should have a synergetic power. This result is also a confirmation of Mehra et al. (2006) who found that synchronized actions through reciprocal influence in leadership teams is important. An effective cooperation implies clear roles and cohesion among the members of the leadership team. These are important preconditions. This is related to Lontos and Lashway (1997) who stated that renegotiation of institutional roles can lead to role conflict and confusion over who should take final decisions, which can be confusing for teachers. Based on our results we believe that a good cooperation within the leadership team is necessary in order to have committed teachers. Distributed leadership can be important when the members of the leadership team work together in a collaborative way. This does not imply that 'power' should be restricted at the top of the school (Mayrowetz et al. 2007). This 'power' can be distributed and become less hierarchic. We assume that an important precondition is the coordination of this distribution, which is characterized by permanent communication and openness between the members of the leadership team. One could suppose that a 'strong' leader could be necessary in order to coordinate this cooperation at the level of the leadership team; a leader who supports his colleagues to take part in leading the school, but who also guards the 'bigger picture'. This can be related to the concept of shared instructional leadership of Marks and Printy (2003).

Next, our results showed that the extent to which teachers influence school decision-making also affected their organizational commitment, which is in line with earlier research of Kushman (1992) which concluded that involving teachers more in school decision making is an important working condition predicting organizational commitment. This suggests that

teachers who believe they have many opportunities to participate in school decision-making report feeling more committed to the school. However, having the opportunity to participate in school decision-making is not as important to teachers as their perceptions concerning the cooperation within the leadership team that runs the school or the quality of support. A first possible explanation for this finding is the teaching culture itself, which is still characterized as rather individualistic (Little, 1990; Van Veen, Sleegers, Bergen, & Klaasen, 2001).

Another explanation may be that most teachers define their work in relation to students and teaching (restricted orientation), and not to the school organization (extended orientation) (Hoyle, 1980; Van Veen, Sleegers, Bergen, & Klaasen, 2001), and consequently participation in the school decisions does not have a major positive impact on teachers' organizational commitment. This explanation could imply that leading the school is still perceived as a function of the school leaders, not the teachers, and thus puts into question the assumption that everyone should be a leader. An other explanation may be that participation is perceived as an added task to the normal workload of teachers and extra duties are attached to participative decision-making (Reyes, 1992), which lead to an excessive burden (White, 1992; in: Park, 2005), and thus reduce the positive impact it is proposed as having on organizational commitment. More research is needed to untangle these possible explanations.

Furthermore, our results suggest that the quality of the supervision of teachers is not significantly related with teachers' organizational commitment, which is in line with Firestone and Pennell (1993), but does not confirm the study of Ebmeier (2003), Robinson et al. (2008), and Somech (2005). This can be explained by the fact that we limited our focus to formal supervision of teachers (i.e., formal teacher evaluation process), whereas the other studies focus on a broader type of supervision. Apparently, in our study teaching in a school where teachers receive extensive formal evaluation or teaching in a school where a formal supervisory culture is lacking, is not vital for teachers' organizational commitment. Moreover,

for the supervisory leadership function, our study revealed that in terms of organizational commitment it is irrelevant whether teachers are mainly supervised by the principal, the assistant principals, or the teacher leaders. A possible explanation for this finding may be the restricted operationalization of ‘supervisory leadership’, which is characterized by clear and accepted guidelines and rules about who should supervise teachers. This formalization could imply that teachers accept the decisions by those who control and monitor their practices.

The results of the present study indicate that the relation between organizational commitment and context variables is limited, which is in line with previous research (Bogler, 2005; Culver, Wolfle, & Cross, 1990). Only teachers’ job experience significantly affected organizational commitment in a negative way. This result supports the view of Brunetti (2001) who stated that more experienced teachers feel less committed to the organization than less experienced teachers.

The random part of the hierarchical linear model indicated complex variance at the teacher level for the cooperation within the leadership team and participative decision-making. This suggests that when individual teachers in a school believe that their school is being led by a cooperative leadership team and that there is a strong participative culture in the school, they tend to be committed to their school in a similar manner. In contrast, when teachers reported that there is less cooperation in the leadership team and limited opportunities to participate in school decision-making, we found more variance in teachers’ organizational commitment.

7. Conclusion

The main contribution of this study is the analysis of teachers’ perceptions concerning school leadership from a distributed leadership perspective and the relation with teachers’ organizational commitment in large secondary schools. However, there were several limitations in our study. A first limitation pertains to the operationalization of distributed

leadership. In our study we used a feasible operationalization of distributed leadership, composed of three components: (a) the source of the supportive and supervisory leadership functions; (b) participative decision making; and (c) the cooperation at the level of the leadership team. Although this operationalization is broader than most operationalizations used in previous studies, it was not without limitations. In our study, we focused only on the quality of two core leadership functions (i.e. supportive and supervisory leadership functions) and the formal source of these leadership functions (i.e., the principal, assistant principals, and teacher leaders). Further research is needed to investigate the effect of other leadership functions (cf. Heller & Firestone, 1995) or certain subject matters (Spillane, 2006) and the distribution across actors with no formal leadership designation (e.g., informal leaders, pupils, parents). Second, we examined the distribution of leadership in 46 schools, which is a rather select sample of schools, compared to the population ($N = 360$). The findings from our study should be cross-validated with another, larger, hierarchical sample. Furthermore, we only focused on large secondary schools. The influence of distributed school leadership in smaller secondary schools or primary schools, which do not have a formal leadership team, could also be studied in further research. Next, our study revealed that the studied predictors are not strongly related to teachers' organizational commitment. This implies that teachers' organizational commitment cannot be fully explained leadership from distributed perspective and certain context variables. Other variables, such as school climate or school culture, might be considered as relevant predictors of organizational commitment as well and should be examined in further research. In line with this, we have to note that we only examined the relation between distributed leadership and teachers' organizational commitment as outcome variable. We did not focus on teachers' job performance or student outcomes. This could be studied in future research. Nevertheless, previous studies revealed that organizational commitment is a critical variable in the life and operation of every organization (Dee, et al.,

2006). Next, we only analyzed the direct relation between the distributed leadership perspectives and organizational commitment. However, in line with Hallinger and Heck (2010) who examined collaborative leadership as a process of reciprocal interaction, future research should analyze the causal and/or reciprocal relations between the different distributed leadership variables and teachers' organizational commitment more in depth. Finally, there are also limitations to the research instrument used in the present study. Our analysis relied only on the perceptions of teachers with respect to leadership variables. However, using only a single source of information may bias the results. Also, the quantitative nature of the research instrument has its limitations. In future research the research methodology should be extended by examining in-depth information through qualitative research methods, such as interviews or observations.

Despite these limitations, the current study contributes to the educational leadership literature by investigating the relationship between school leadership and teachers' organizational commitment. This research points towards relevant theoretical, methodological, and practical implications for both practitioners and researchers. An important theoretical implication is the novelty of the research findings. A great number of researchers have investigated the correlates of organizational commitment, including school leadership. However, research inquiring how school leadership from a broad distributed leadership perspective is related to teachers' organizational commitment in large secondary schools was scarce. Due to our integrative operationalization of distributed leadership our study contributes to the knowledge of which components of distributed leadership are mainly related to teachers' organizational commitment.

A main methodological implication is that hierarchical linear modeling was applied to allow for the nesting of teachers within schools. The application of hierarchical linear modeling techniques offers efficient regression coefficients estimates, correct standard errors,

confidence intervals, and significance tests, which are generally more conservative than models using single-level analysis, which ignore the presence of clustering (Goldstein, 1995). Due to applied hierarchical linear modeling, the present study informs our understanding of individual perceptions of teachers on distributed leadership components and the relation with their organizational commitment, while also considering the group effect.

Drawing on the results found in the current study, some practical recommendations for encouraging teachers' organizational commitment are suggested here. Our study clearly indicated that the quality of supportive leadership is quite important in predicting teachers' commitment, while who provides this leadership is not important. Thus, at least one school leader should support teachers, give them positive feedback. In order to do so, school leaders should be approachable, visible, and focus on direct communication with teachers. This implies that in large schools the personal contact between leaders and teachers should receive sufficient attention. All school leaders must realize that leadership is not solely located in the principal's office, because a lack of support negatively influences the organizational commitment. Following Macbeath (2009) we believe that supporting teachers should be part of an organizational culture where taking on this responsibility is a shared norm. This awareness may be achieved through development and training programs focusing on the primordial leadership task of supporting teachers. These programs should focus on all school leaders as their target audience; not only the school principal, but also assistant principals and teacher leaders.

Next, based on the significant place given by teachers in this study to the cooperation within the leadership team, school leaders should not be ego-centric leaders each protecting their own power. In contrast, they need the competence to work collaboratively towards the same goals and to act in concert. The leadership team must be a cohesive group, working in an atmosphere of trust and openness. This implies that school leaders need to invest in the

perceptions of teachers concerning the cooperation within the leadership team members by defining and explicating clear roles for the different team members, developing open communication where all members can speak freely and share the same school goals, and work together in a cohesive way. Obviously this has again implications for school leaders' preparation programs and in-service training, which should not only focus on managerial tasks or on leadership functions, but also on the competence to stimulate leaders to be team players.

Finally, school leaders should be aware that teachers' organizational commitment is influenced by teachers' opportunity to participate in school decision-making. Although this relation is much smaller in magnitude compared to the quality of support and cooperation within the leadership team, school leaders should realize that when teachers are offered a change to participate in decision-making processes, their organizational commitment is intensified. This has practical implications for school leaders. They should set up ways for allowing teachers to participate in school decision-making. But next to providing the participative structures, school leaders need to encourage teachers to participate in school decision-making. This can be done by providing time to meet, building teaching-networks, and providing a follow up of these networks. Moreover, this has implications for teachers. Teachers should be aware that they are no longer only teachers in their own classroom.

To conclude, the main finding of our study is that teachers should receive sufficient support from the leadership team; this should not by definition be the principal, the assistant principal, or the teacher leader. Teachers want someone of the leadership team to set a clear school vision, translate this vision, and provide opportunities for professional development. Receiving support is crucial, but who provides this support is of less importance.

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Appendix

The Distributed Leadership Inventory

Scale	Items
Leadership function	<p>To what amount is (1) the principal; (2) the assistant principals; (3) the teacher leaders involved in the following statements?</p> <p>(never/0; always/4)</p>
Support	<p>... premises a long term vision</p> <p>... debates the school vision</p> <p>... compliments teachers</p> <p>... helps teachers</p> <p>... explains his/her reason for criticism to teachers</p> <p>... is available after school to help teachers when assistance is needed</p> <p>... looks out for the personal welfare of teachers</p> <p>... encourages me to pursue my own goals for professional learning</p> <p>... encourages me to try new practices consistent with my own interests</p> <p>... provides organizational support for teacher interaction</p>
Supervision	<p>... evaluates the performance of the staff</p> <p>... is involved in summative evaluation of teachers</p> <p>... is involved in formative evaluation of teachers</p>
Based on	<p>Strength of Vision (De Maeyer, Rymenans, Van Petegem, van den Bergh, & Rijlaarsdam, 2007)</p> <p>Supportive Behavior (Hoy & Tarter, 1997)</p> <p>Providing Instructional Support (Leithwood & Jantzi, 1999b)</p> <p>Providing Intellectual Stimulation (Leithwood & Jantzi, 1999b)</p>

Validity & reliability	<p>Modified model:</p> <ul style="list-style-type: none"> principal: $\chi^2 = 353.840$ ($df = 64$; $p < .001$), CFI = 0.960, TLI = 0.952, SRMR = 0.042, RMSEA = 0.069 assistant principals: $\chi^2 = 361.794$ ($df = 64$; $p < .001$), CFI = 0.957, TLI = 0.948, SRMR = 0.047, RMSEA = 0.070 teacher leaders: $\chi^2 = 390.001$ ($df = 64$; $p < .001$), CFI = 0.943, TLI = 0.931, SRMR = 0.044, RMSEA = 0.073 <p>Cronbach's α support: .91 (teacher leaders); .93 (principals, assistant principals)</p> <p>Cronbach's α supervision: .79 (teacher leaders); .83 (principal); .85 (assistant principals)</p>
Calculation of new scores	<p>Quality of support</p> <p>Quality of supervision</p> <p>Support of the principal</p> <p>Support of the assistant principal</p> <p>Support of the teacher leader</p> <p>Supervision of the principal</p> <p>Supervision of the assistant principal</p> <p>Supervision of the teacher leader</p>
Scale	<p>Items</p> <p>(strongly disagree/0; strongly agree/4)</p>
Participative decision-making	<p>Leadership is delegated for activities critical for achieving school goals</p> <p>Leadership is broadly distributed among the staff</p> <p>We have an adequate involvement in decision-making</p>

	There is an effective committee structure for decision-making
	Effective communication among staff is facilitated
	There is an appropriate level of autonomy in decision-making
Based on	Developing Structures to Foster Participation in School Decisions (Leithwood & Jantzi, 1999b)
Validity & reliability	Modified model: $\chi^2 = 57.403$ ($df = 9$; $p < .001$), CFI = 0.970, TLI = 0.950, SRMR = 0.032, RMSEA = 0.075 Cronbach's α : .81
Scale	Items (strongly disagree/0; strongly agree/4)
Cooperation within the leadership team	There is a well-functioning leadership team in our school The leadership team tries to act as well as possible The leadership team supports the goals we like to attain with our school All members of the leadership team work in the same strain on the school's core objectives In our school the right man sits on the right place, taken the competencies into account Members of the management team divide their time properly Members of the leadership team have clear goals Members of the leadership team know which tasks they have to perform The leadership team is willing to execute a good idea It is clear where members of the leadership team are authorized to
Based on	Group Cohesion (Litwin & Stringer, 1968) Role Ambiguity (Rizzo, House, & Lirtzman, 1970)

Goal Orientedness (Staessens, 1990)	
Validity & reliability	Modified model: $\chi^2 = 138.098$ ($df = 35$; $p < .001$), CFI = 0.978, TLI = 0.972, SRMR = 0.026, RMSEA = 0.056 Cronbach's α : .93
Scale	Items (strongly disagree/0; strongly agree/4)
Organizational commitment	My school inspires me to do the best I can I'm proud to be a part of this school team I really care about the fate of this school I find that my values and the organization's values are very similar I regularly talk to friends about the school as a place where it is great to work I'm really happy that I chose this school to work for
Based on	Organizational Commitment Questionnaire (Mowday, Steers, & Porter, 1979)
Validity & reliability	Modified model: $\chi^2 = 152.077$ ($df = 43$; $p < .001$), CFI = 0.978, TLI = 0.972, SRMR = 0.0306, RMSEA = 0.054 Cronbach's α organizational commitment: .91

Figures

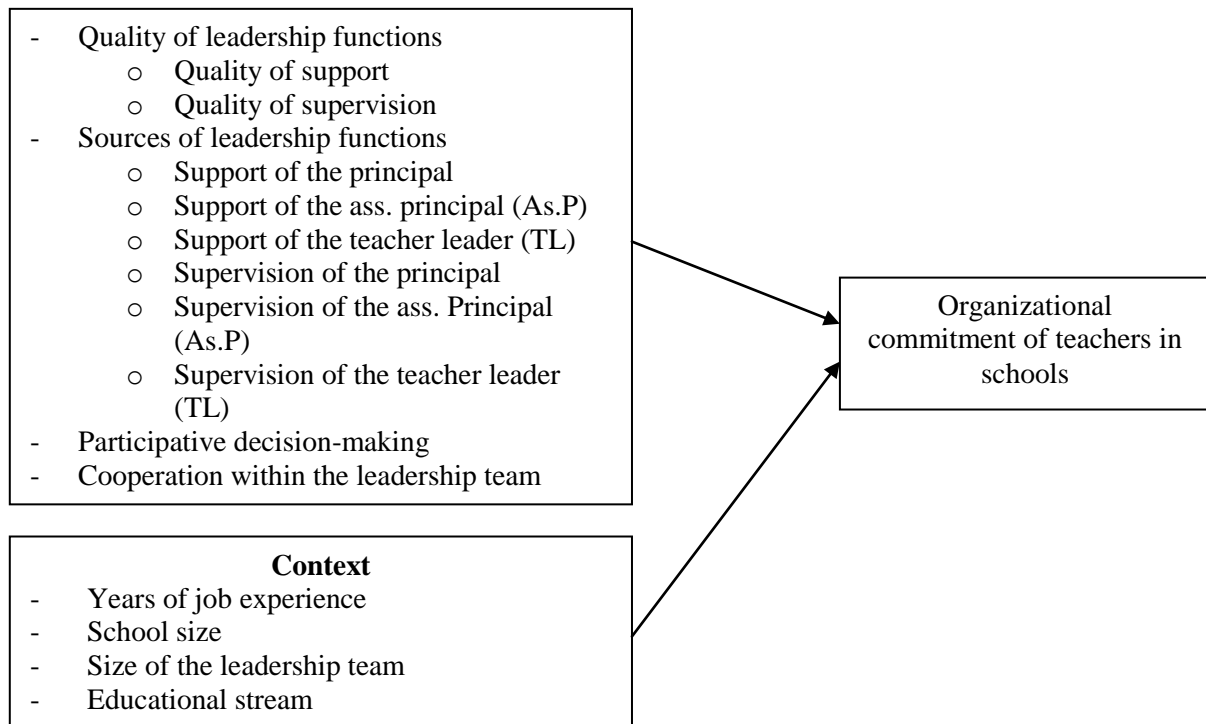


Figure 1

Research Questions

Tables

Table 1

Means, Standard Deviations, and Correlations of Teachers' Scores for the Study Variables (n = 1522)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Organizational commitment	2.96	0.71	1										
Quality of leadership functions													
2. Quality of support	2.92	0.67	.552***	1									
3. Quality of supervision	2.88	0.90	.347***	.592***	1								
Source of leadership functions													
4. Support of the principal	.78	0.27	.229***	.104***	.183***	1							
5. Support of the assistant principal (As.P)	.70	0.30	.103***	-.059*	.035	.050*	1						
6. Support of the teacher leader (TL)	.61	0.31	-.010	-.143***	-.148***	-.171***	.123***	1					
7. Supervision of the principal	.84	0.29	.116***	.066**	.094***	.523***	-.094***	-.078**	1				
8. Supervision of	.64	0.40	-.010	-.064**	-.194***	-.140***	.486***	.170***	-.167***	1			

the assistant principal (As. P)													
9. Supervision of the teacher leader (TL)	.36	0.38	-.078**	-.115***	-.358***	-.181***	.092***	.461***	-.187***	.289***	1		
10. Participative decision-making	2.44	0.66	.561***	.518	.368***	.343***	.104***	-.018	.188***	-.039***	-.088***	1	
11. Cooperation within the leadership team	2.68	0.66	.607***	.578	.422***	.317***	.145***	-.011	.201***	-.026***	-.131***	.690***	1

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 2

Model Estimates of the Two-level Analyses of Teachers' Organizational Commitment

Parameter	Null model (M0)	Model 1a (M1a)	Model 1b (M1b)	Model 2a (M2a)	Model 2b (M2b)	Model 3 (M3)
FIXED						
Intercept	2.983 (0.036)***	3.021 (0.029)***	3.019 (0.028)***	2.996 (0.041)***	3.027 (0.029)***	3.025 (0.029)***
<u>Teacher level:</u>						
Coop. leadership team		0.319 (0.032)***	0.320 (0.032)***	0.317 (0.032)***	0.320 (0.032)***	0.310 (0.032)***
Part. decision-making		0.193 (0.029)***	0.192 (0.029)***	0.172 (0.029)***	0.179 (0.029)***	0.171 (0.029)***
Quality of support		0.322 (0.030)***	0.309 (0.026)***	0.304 (0.026)***	0.299 (0.025)***	0.309 (0.026)***
Quality of supervision		-0.016 (0.021)	-	-	-	-
Support of principal		0.164 (0.065)*	0.144 (0.057)*	0.174 (0.057)**	0.152 (0.056)**	0.125 (0.056)*
Support of As. P		0.114 (0.054)*	0.118 (0.047)*	0.122 (0.047)**	0.128 (0.046)**	0.107 (0.044)*
Support of TL		0.118 (0.050)*	0.092 (0.044)*	0.070 (0.044)	-	-
Supervision of principal		0.033 (0.056)	-	-	-	-
Supervision of As. P		0.009 (0.044)	-	-	-	-
Supervision of TL		-0.055 (0.045)	-	-	-	-
Years of job experience				-0.008 (0.001)***	-0.008 (0.001)***	-0.008 (0.001)***
<u>School level:</u>						
School size ¹				-0.053 (0.051)	-	-
Number leadership team				-0.005 (0.006)	-	-
Educational stream				0.046 (0.046)	-	-
RANDOM						
School-level variance ($\sigma^2_{\mu 0}$)	0.044 (0.012)***	0.010 (0.004)**	0.010 (0.004)**	0.010 (0.004)**	0.012 (0.004)**	0.011 (0.004)**
Teacher-level variance	0.440 (0.016)***	0.253 (0.009)***	0.254 (0.009)***	0.247 (0.009)***	0.247 (0.009)***	0.252 (0.016)***
Covariance intercept and slope						
$\sigma_{\epsilon 0 \epsilon}$ Cooperation within the LT						-0.031 (0.009)***
$\sigma_{\epsilon 0 \epsilon}$ participative decision making						-0.029 (0.009)**
Variance at						
School level	9%					
Teacher level	91%					
Proportion variance explained at						
School level		77.3%	77.3%	77.3%	72.7%	75%
Teacher level		42.5%	42.3%	43.9%	43.9%	42.7%

MODEL FIT						
Deviance	3135.380	2266.574	2268.492	2209.181	2230.724	2160.707
χ^2 (df)		868.806 (10)	866.888 (6)	59.311 (4)	37.768 (2)	70.017 (2)
p		<.001	<.001	<.001	<.001	<.001
Reference model		M0	M0	M1b	M1b	M2b

Note. Per cell: regression coefficient (standard errors); - = non-significant parameter deleted from model; * $p < 0.05$, ** $p < 0.01$; *** $p < 0.001$

¹The school size is the number of pupils divided by 1000.

Table 3

Standardized Regression Coefficients of the Significant Predictors

Significant predictor	Standardized regression coefficients
Cooperative leadership team	0.29
Participative decision-making	0.16
Quality of support	0.29
Supervision of principal	0.05
Supervision of As. P	0.05
Years of job experience	0.12