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## The Role of Departmental Leadership for Professional Learning Communities

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## Abstract

**Purpose:** Department heads play a pivotal role in the functioning of departments in secondary schools. However, quantitative research about the role of departmental leadership for the development of professional learning communities (PLCs) in subject departments in secondary schools remains scarce. As PLCs are seen as promising contexts for teachers' continuous professional development, it is highly relevant to study how department heads can facilitate PLC characteristics in their department. **Research methodology:** This study examines how two dimensions of departmental leadership (group- and development-oriented) relate to interpersonal PLC characteristics in departments. Survey data were collected from 248 experienced mathematics and French teachers in 62 departments in secondary schools in Flanders (Belgium). Two multilevel regression analyses were conducted with collective responsibility and reflective dialogue as dependent interpersonal PLC characteristics. We controlled for several demographic teacher variables and structural departmental variables. **Findings:** Our results nurture optimism about the potential of departmental leadership for interpersonal PLC characteristics. More specifically, teachers who perceive high group-oriented departmental leadership experience more collective responsibility in their department. Furthermore, teachers' perceptions of both group-oriented and development-oriented departmental leadership are significantly related to the reported frequency of teachers' reflective dialogues. **Implications:** This study suggests that department heads play a critical role in facilitating interpersonal PLC characteristics in departments. As a result, department heads need to be carefully selected and adequately supported. As this article is one of the first to offer a quantitative perspective on this matter, it offers an instrument for future studies and informs policy about departmental leadership practices.

**Keywords:** professional learning community, departmental leadership, secondary education, multilevel analysis, empirical paper

## The Role of Departmental Leadership for Professional Learning Communities

### **Introduction**

Education is changing on a global scale, driven by factors such as the impact of technology and the changing societal expectations of students, teachers, and education systems. In order to be responsive to these changes and to provide students with the best possible education, interest in career-long teacher learning and development has grown remarkably over the past decade (Cochran-Smith, 2016; Richter, Kunter, Klusmann, Lüdtke, & Baumert, 2011).

In this regard, the potential of professional learning communities (PLCs) for improving instruction and student learning is being increasingly recognized by researchers (Stoll, Bolam, McMahon, Wallace, & Thomas, 2006; Vangrieken, Dochy, Raes, & Kyndt, 2015). Overall, a PLC is defined as a group of teachers committed to systematically collaborate and engage in supportive interactions to enhance the instruction that all students receive (McLaughlin & Talbert, 2007; Stoll et al., 2006; Wahlstrom & Louis, 2008). In secondary education, PLCs are frequently studied at the departmental level because secondary schools are large organizations and it is more likely that teachers working in the same or a similar field will have common interests and interact with each other (Huberman, 1993; Melville & Wallace, 2007). Accompanying the increased support for PLCs is a growing awareness that it is not self-evident for teachers to engage in this kind of profound collaboration and, by extension, for a PLC to develop (OECD, 2014). As such, it is not surprising that stakeholders in the field of education seek to identify processes that support the development and creation of strong PLCs.

There is no doubt in the literature that leadership is essential for PLCs to develop successfully (Stoll et al., 2006). Research in this field has traditionally focused on understanding how school leadership is related to strong PLCs, given that it is well-established that school leadership has a strong influence on teachers and the learning

environment in schools (Leithwood, Harris, & Hopkins, 2008; Stoll et al., 2006). However, the literature increasingly emphasizes the significance of having distributed forms of leadership, whereby leadership is not restricted to one person in the school (Muijs & Harris, 2003; Mulford & Silins, 2003; Spillane, 2006). In particular, teacher leaders such as department heads hold ideal positions in which to provide leadership (York-Barr & Duke, 2004). Previous research emphasized that department heads can contribute to the performance of their departments in much the same way that school leaders contribute to the overall school performance (Busher & Harris, 1999). Moreover, departmental leadership is considered more critical for the creation of departmental subcultures than senior leadership (Ghamrawi, 2010). For these reasons, it is important to investigate the contribution of departmental leadership to the development of PLCs.

Historically, research covering departmental leadership has a strong qualitative tradition, which continued in the 2000s (Peacock, 2013). However, there are few studies on departmental leadership that have collected quantitative data from a large number of individuals and that have empirically investigated how formally appointed department heads can influence the PLC in their department. As a consequence, the exact nature of the relationship between different types of formal departmental leadership and PLCs is not well understood or investigated. The goal of this study is to quantitatively demonstrate how departmental leadership can contribute to the development of PLCs in departments in secondary education.

One of the main problems facing empirical research on PLCs is the conceptual and empirical fog surrounding the concept (DuFour, 2004). In their comprehensive review on this topic, Slegers, den Brok, Verbiest, Moolenaar, and Daly (2013) wrote (p. 119): “Many studies on PLCs differ significantly on the dimensions and capacities used to conceptualize them. [...] As a consequence of this variation, there is limited conceptual clarity and focus.”

Based on this review, the present study focuses on the interpersonal PLC dimension as this dimension is incorporated in the vast majority of studies concerning PLCs (Slegers et al., 2013). Rather than using a composite scale for the interpersonal PLC dimension, our study discerns several separate interpersonal PLC characteristics as outcome variables, which results in fuller understanding of how departmental leadership can facilitate different aspects of PLCs.

Furthermore, departmental leadership is a multidimensional construct. Two key instructional departmental leadership roles that emerge from the research literature are used in this study. First, group-oriented departmental leadership is aimed at stimulating collaboration, coherence, and a collegial environment in the department (Au, Wright, & Botton, 2003; Busher & Harris, 1999); second, development-oriented departmental leadership relates to the improvement of learning and teaching in the department (Arzu Hernandez, 2013; Busher & Harris, 1999). We develop a scale to measure these two roles, because to our knowledge, there are no existing quantitative scales in this area. By investigating multiple leadership behaviors and separate interpersonal PLC characteristics, we acknowledge that the importance of each departmental leadership style can vary for each PLC characteristic. Uncovering these different influences could inform leadership practices and research. We control for several demographic teacher variables (gender, teaching experience, position) and structural departmental variables (subject, grade composition, disciplinary composition) in this study.

## **Theoretical Framework**

### **Professional Learning Communities**

**Defining Professional Learning Communities.** Career-long professional development is a central topic in the recent educational literature (Cochran-Smith, 2016), and comes as a result of the increasing complexity of the teaching profession and the growing demands and expectations placed on education (Darling-Hammond, Chung Wei, Alethea,

Richardson, & Orphanos, 2009). While the traditional model of teachers' professional development focuses on training and is characterized as deficit-oriented and unconnected to the lives and work of teachers (Clarke & Hollingsworth, 2002), the idea that teachers can learn from and with each other in the workplace, has gradually achieved broad acceptance over the past decades (McLaughlin & Talbert, 2007).

In recent publications, teacher collaboration has been widely regarded as a powerful tool for teachers' professional development, improved student learning, and school improvement in general (Cordingley, Bell, Thomason, & Firth, 2005; Harris & Muijs, 2005; Meirink, Imants, Meijer, & Verloop, 2010; Sjoer & Meirink, 2016; Vescio, Ross, & Adams, 2008). In this regard, the concept of PLCs has gained considerable momentum (Vescio et al., 2008). The essence of a PLC lies in a collaborative work culture characterized by systematic collaboration and supportive interactions. Teachers in a PLC strive to improve their instruction with the ultimate goal of teaching all students in the best possible way (DuFour, 2004; Stoll et al., 2006).

Because the concept of PLCs has been a hot topic in the educational literature for a considerable amount of time, it has become a ubiquitous umbrella to cover a number of different dimensions (DuFour, 2004; Vangrieken et al., 2015). Based on the work of Mitchell and Sackney (2000), three dimensions of PLCs were identified in a seminal conceptual study (Slegers et al., 2013). The personal dimension covers the ability of individuals to construct knowledge and use recent scientific insights to expand their knowledge. Second, the interpersonal dimension refers to learning and collaborating as a team, grounded on shared expectations and a focus on learning. Third, the organizational dimension constitutes the structural and cultural conditions that support the personal and interpersonal dimension. Because the interpersonal dimension recurs in the vast majority of studies covering PLCs and can be considered a common denominator in the multiplicity of descriptions (Bolam et al.,

2005; Olivier, Hipp, & Huffman, 2003; Slegers et al., 2013; Stoll et al., 2006), its characteristics can be considered core features of PLCs, and therefore this study focuses on the interpersonal aspect of PLCs.

**Interpersonal PLC Characteristics.** Bryk, Camburn, and Louis (1999) distinguish between interpersonal PLC characteristics that involve behavioral aspects and characteristics that have a more mental focus. The behavioral aspects refer to interactions that are considered normal and expected in strong PLCs, to the extent that they become deeply embedded in the general functioning of the team (Little, 2003). A first characteristic is reflective dialogue, which implies that teachers engage in reflective and in-depth conversations about educational matters, such as instruction, curriculum, and student achievement (Stoll et al., 2006; Wahlstrom & Louis, 2008). A second behavioral characteristic refers to teachers sharing their teaching and allowing their colleagues to enter their classrooms. This deprivatized practice enables observation of each other's practices and methods (Hord, 1997; Wahlstrom & Louis, 2008).

The mental dimension of the interpersonal PLC characteristics points to the central importance of collective responsibility in PLCs. Teachers accept their share of responsibility for general operations, improvement, and student learning, rather than considering this the sole responsibility of the leadership team (Printy, 2008; Stoll et al., 2006). While some scholars also consider shared norms to be a PLC characteristic, its position as a separate characteristic is contested in the literature and empirical validations (Author et al., 2016; Bryk et al., 1999; Lomos, Hofman, & Bosker, 2011; Wahlstrom & Louis, 2008). Hence, we have limited the focus of this study to collective responsibility as the mental PLC characteristic.

**The Unit of PLC in Secondary Schools.** Previous studies about PLCs have focused on PLCs at the school level or department-based PLCs. The latter approach appears to be adopted most frequently with regards to secondary schools. Internationally, departments are

seen as the most important organizational units in secondary schools that regulate teachers' behavior (Visscher & Witziers, 2004) and affect their work, whom they work with, and how their work is perceived by others (Brown, Rutherford, & Boyle, 2000; Siskin, 1997; Siskin & Little, 1995). Huberman (1993) pointed out the illogical reasoning behind expecting teachers of all grades and different subjects to collaborate in large secondary schools. As an alternative, he considers it far more likely that teachers within the same department will interact.

Describing departments as communities can provide a climate for teachers to openly exchange ideas about curriculum content and pedagogy and learn from each other. Hence, departments can have a crucial position in relation to teachers' professional learning; teachers tend to perceive their departments to be more than the administrative units into which secondary schools are divided (Brown et al., 2000; Melville & Wallace, 2007).

Nevertheless, several nuances are required because building a PLC is by no means easy and PLCs that are fully developed seem limited in number (Bolam et al., 2005; Verbiest, 2008). Visscher and Witziers (2004), for instance, showed that collaboration in many of the departments they studied in the Netherlands was aimed at efficiency, rather than improving instruction and learning. Furthermore, previous studies have established that teachers only occasionally observe each other's teaching practices (OECD, 2014), but talk about educational matters far more frequently (Lomos et al., 2011). However, these conversations do not always transcend the level of safe talk (Little, 2003; Sjoer & Meirink, 2016). As such, more knowledge is needed on how to support the development of PLCs to enable them to reach their full potential (Sjoer & Meirink, 2016).

### **Departmental Leadership**

**The Central Role of Teacher Leadership.** The significance of leadership for the working and learning environment in schools cannot be underestimated (Leithwood et al.,



2008). However, the traditional view of “single-person” leadership with one school leader at the top of the organization has been challenged due to expanding leadership roles (York-Barr & Duke, 2004) and is no longer a reality in many schools (Muijs & Harris, 2003; Mulford & Silins, 2003; Spillane, 2006). Instead, distributed leadership has become a widely accepted organizational phenomenon among both practitioners and educational management researchers (Author et al., 2009). As such, leadership is often stretched over a group of individuals (Spillane, 2006), with collective action, empowerment, and shared agency as core principles (Gronn, 2000).

According to Coleman and Earley (2005), teacher leadership is one of the most important elaborations of distributed leadership. Similarly, the recent review by Wenner and Campbell (2016), which built on the seminal review by York-Barr and Duke (2004), found that teacher leaders were potentially some of the most influential leaders in schools. Teacher leadership can be seen as a limited form of distributed leadership where, formally or informally, teachers take on leadership roles (Harris & Muijs, 2005). In an attempt to recapitulate the numerous definitions of teacher leadership, York-Barr and Duke (2004) describe the essence of teacher leadership as capitalizing on teachers’ unique instructional expertise about teaching and learning to improve both the instruction and the culture in schools, with the ultimate aim of enhancing student learning. In turn, Wenner and Campbell (2016) found five recurring themes concerning teacher leadership: leadership beyond classroom walls; in support of professional learning in schools; involved in policy and/or decision making at some level; aimed at improving student learning and success; and working towards improvement and change for the whole school. These definitions illustrate the important role that teacher leaders can play in stimulating teacher learning as well as enhancing student learning. As such, the ultimate goals of teacher leadership are very compatible with those of PLCs.

In writing about teacher leadership, many authors distinguish between formal and informal teacher leadership positions. The former appoints teachers with assigned responsibilities that are part of the organizational structure of the school, while the latter is more fluid and covers classroom-related activities (Katzenmeyer & Moller, 2009; Muijs & Harris, 2006; York-Barr & Duke, 2004). In this study, the focus is on secondary school teacher leaders with formally appointed responsibilities as head of their department and on their contribution to the development of a PLC in the department.

**Departmental Leadership Roles.** The work of department heads has been universally acknowledged as central to the development of successful departments (Brown & Rutherford, 1998; Ghamrawi, 2010; Peacock, 2014; Sammons, Thomas, & Mortimore, 1996; Weller, 2001). Department heads are seen as being responsible and accountable for the quality of teaching and learning in their departments (Poultney, 2007). In addition, the literature states that departmental leaders play a pioneering role in the development of teachers (Weller, 2001) and improvements to teaching in the department (Peacock, 2014).

As is well documented in the literature, the role of department heads is multifaceted (Ghamrawi, 2010); the wide variety of tasks carried out by department heads was first documented as early as in the 1920s (Peacock, 2013). More recent studies paint a similar picture, although diverse classifications are used. Busher and Harris (1999), for instance, put forward four dimensions of the work of a department head: bridging and brokering; a liaison and representative role; improving staff and student performance; and engaging a group of staff to cohere and develop a group identity. The two former roles reflect interactions with stakeholders external to the department, while the latter two roles are important for the internal functioning of the department. A recent study in Malaysia described department heads' competency levels in terms of five duties derived from the literature: interpersonal

relationships, department administration, curriculum development, supervision and mentoring of teachers, and professional development (Onn, 2010).

Faced with this multidimensional role, department heads are forced to prioritize (Brown & Rutherford, 1998). Although administrative duties take up a large portion of department heads' time, they perceive working with teachers and contributing to improvement and change as very important (Collier, Dinham, Brennan, Deece, & Mulford, 2002). In his literature review, Peacock (2013) found that not only do department heads think that their work should mainly focus on their instructional role, but school leaders and teachers share similar opinions.

Due to the focus of this study on PLCs in departments, we build on instructional departmental leadership roles that relate to the internal functioning of the department. First, the most-cited way of conducting instructional departmental leadership is a group-oriented method (i.e. improving and promoting a collegial environment and collaboration regarding core instructional matters such as planning, instruction, and assessment) (Au et al., 2003; Busher & Harris, 1999; Peacock, 2013; Printy, 2008). Second, department heads engage in development-oriented leadership, through planning, monitoring, and coordinating the improvement of learning and teaching in their department (Arzu Hernandez, 2013; Weller, 2001).

**Group-oriented Departmental Leadership.** The relevance of a group-oriented role for PLCs is illustrated by the fact that coaches in PLCs define their main responsibilities as guiding departmental meetings, forming the group, and motivating teachers to participate in the collaboration of the PLC (van der Want, Meirink, den Ouden, & Bruns, 2015). Busher and Harris (1999) explicitly link this role to generating, shaping, and managing collaborative departmental cultures by empowering others and encouraging collaboration. Similarly, Brown et al. (2000) reported that department heads play a central role in defining collegial sub-

cultures and ensuring that all members engage in collaborative behaviors. For instance, department heads can support teachers in exchanging ideas, developing material, and discussing practices (Schelfhout, Bruggeman, & Bruyninckx, 2015), or stimulate conformity in practice between teachers in a department (Vlaams Verbond van het Katholiek Secundair Onderwijs, 2009). Hence, we expect more collaborative behaviors in departments with group-oriented heads.

Furthermore, Louis and Kruse (1995) found that teachers in schools with a genuine sense of community and group identity will experience greater collective responsibility because individuals see themselves as part of a larger system in which all the pieces work together (Conzemius & O'Neill, 2001). Similarly, we hypothesize a similar relationship in departments; namely, that teachers in departments with a head who is focused on group processes will experience more collective responsibility.

**Development-oriented Departmental Leadership.** The development-oriented efforts of department heads can focus on students and the educational core by monitoring students' work, the attainment of local standards, and prescribed levels of student performance (Busher & Harris, 1999; Dinham, 2007; Peacock, 2013). In addition, they can lead teachers' learning by taking on a mentoring and coaching role, supporting the development of teachers in their department (Collier et al., 2002; Peacock, 2013). The latter role can be carried out by being aware of professional development opportunities (Vlaams Verbond van het Katholiek Secundair Onderwijs, 2009), sharing the latest developments and ideas for pedagogical content (Dinham, 2007; Schelfhout et al., 2015), and assisting new teachers (Dinham, 2007).

Studies focusing on school leaders have found that providing intellectual stimulation to teachers and encouraging individual improvement can foster feedback asking (Oude Groote Beverborg, Slegers, & van Veen, 2015), in addition to collaboration between teachers (Geijssels, Slegers, Stoel, & Krüger, 2009; Minckler, 2014). Based on this, we presume that a

similar relationship will emerge for departmental leadership and that department heads who focus on development will stimulate teachers' participation in collaborative behaviors.

Furthermore, a strong emphasis on student learning and improvement is one of the founding principles of PLCs. Modeling desired behavior and attitudes congruent with a professional community has been identified as one of the most effective departmental leadership practices (Benedict, 2009). As a consequence, it is expected that department heads can contribute to a collective feeling of responsibility among teachers (Louis & Kruse, 1995; Schelfhout et al., 2015; Stoll et al., 2006).

### **Control Variables**

In addition to the departmental leadership variables that were the primary focus of our study, several control variables at the teacher and department levels were entered in our research models because we believe these characteristics could also be significantly related to interpersonal PLC characteristics. As for the demographic teacher-level variables, we controlled for gender because a relationship between gender and teacher collaboration has previously been suggested (Richter et al., 2011). Furthermore, teacher experience is taken into account, given that more experienced teachers might resist newer forms of professionalism such as learning in collaboration (Ben-Peretz & McCulloch, 2009). Finally, we controlled for teacher position (teacher or department head) because we assume that perceptions about PLC characteristics will differ according to the role teachers assume within the department.

With regard to control variables at the department level, it is common to take subject matter into account when studying departments because the subject is a fundamental part of teachers' identity (Siskin, 1997), and meaningful subject-matter differences have been found in teachers' collaboration and departments (Grossman & Stodolsky, 1995; Spillane, Diamond, & Jita, 2003; van Veen, Slegers, Bergen, & Klaassen, 2001). Furthermore, departmental

structures can vary in configuration. Because these structural aspects can influence the cultural norms and values established in the department (Busher & Harris, 1999; Turner & Bolam, 1998), we control for two important structural department variables (grade composition and subject composition).

### **Research Design**

Based on this literature review, the following research question is put forward in the present study: “How do departmental leadership roles (i.e., group- and development-oriented leadership) relate to each of the interpersonal PLC characteristics in departments, taking departments’ structural characteristics and teachers’ demographic characteristics into account?” The research design for investigating this research question is outlined below.

### **Context of the Study**

In the Flemish community in Belgium, where this study is set, teacher collaboration is increasingly expected of teachers. For instance, “being a member of the team” is explicitly designated as a core responsibility in the formalized professional profile for teachers (Department of Education, 2007). In addition, interaction between teachers in PLCs is viewed as an important lever enabling broad and deep teacher learning (Vandenberghe & Kelchtermans, 2002). In this regard, the potential of departments to function as platforms for professional learning has been explicitly acknowledged and stimulated by important and high-impact stakeholders in the Flemish educational system (e.g. the agency of Catholic schools and the agency of public schools).

Regardless of school sector (private or public), there are no formal governmental regulations for schools on how collaboration between teachers should be organized (Vangrieken, Dochy, & Raes, 2016). An important incentive for subject-related collaboration in departments, however, is external evaluations by the Inspectorate that focus on whether the

minimum goals prescribed for certain subjects have been attained (Eurydice, 2015).

Nevertheless, a considerable range of organizational differentiation is present in the realm of departments (e.g., size, combined subjects, focus). In part, this might be explained by the high level of school autonomy that characterizes the Flemish educational system (Eurydice, 2013); however, scholars in other educational settings have pointed out similar organizational diversity in teams and departments in their respective countries (Busher & Harris, 1999; Scribner, Sawyer, Watson, & Myers, 2007; Visscher & Witziers, 2004).

Flemish department heads are not defined as part of the middle management of schools (Author et al., 2009). As such, they are teacher leaders with a non-hierarchical role and no formal authority over other teachers. While the content of the departmental leadership role is decided by individual schools and not prescribed by government regulations (Eurydice, 2013), the importance of various responsibilities these leaders can have is recognized by both stakeholders in the field (e.g. the agency of Catholic schools and the agency of public schools) and researchers (Author et al., 2009).

### **Background and Sample**

The focus of this study is on French and mathematics departments in Flanders, where French is the first foreign language taught in all secondary schools. Our choice for surveying mathematics and French teachers originates from multiple sources. First, previous studies related to PLCs have frequently used mathematics and language departments as objects of research (Lomos et al., 2011). Furthermore, mathematics and language teachers have previously been found to consider consultation with subject colleagues to be very important (van Veen et al., 2001), and heads of language and mathematics departments have reported a strong inclination towards facilitation and instructional leadership, rather than emphasizing their administrative role (Bliss, Fahrney, & Steffy, 1996). In addition, these subjects have a

high ratio of full-time staff in Flanders, which tends to supports stronger departmental practices (Turner & Bolam, 1998).

Due to the considerable variation in teams across schools, the focus of this study is limited to departments with a primarily instruction-related task, in which teachers collaborate on their core task of educating students. More specifically, we are interested in teams in which teachers discuss or collaborate in terms of (subject-related) content and instruction.

This definition was communicated to the 32 schools that participated in the study. These schools were selected using a stratified random sampling, taking the school sector and the five geographical regions of Flanders into account. By means of a brief survey, school leaders were asked to provide information on the structural characteristics of all departments in which French and mathematics teachers, respectively, participated and which suited this definition. Because the aim of the study was to broaden perspectives on the contribution of formally appointed heads to their department, only departments with a fixed head were included in this study. Of the 62 departments selected for further analysis, 30 focused on mathematics and 32 on French. The size of the departments varied from three to 21 teachers, with an average of nine teachers in each department ( $SD=4$ ). The structural configuration of the departments differed, as shown in Table 1.

<<Table 1. >>

Most departments were what Busher and Harris (1999) described as “unitary”, focusing on one subject (French or mathematics). Some departments were multidisciplinary but covered related subjects with regards to French (e.g., languages) or mathematics (e.g., sciences). These “federal” departments span several subject areas, but teachers are likely to work closely together due to the compatibility of subjects (Busher & Harris, 1999). There were 45 cross-grade departments in which teachers from all grades were involved, and 17 departments that united teachers from a certain cycle (e.g. grades 1 and 2).



All experienced French and mathematics teachers belonging to the 62 selected departments were asked to complete an online survey about their department and its department head. The demographic characteristics of the 248 participating teachers are outlined in Table 2.

<<Table 2. >>

### **Instruments**

To measure the interpersonal PLC characteristics in departments, we used three sets of items from the “Professional Community Index” (Wahlstrom & Louis, 2008). Three items assessed teachers’ perceptions of the presence of collective responsibility in their department (e.g., “Teachers in this team feel responsible to help each other improve their instruction”; with a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5)). Three items referred to the frequency of deprivatized practice (e.g., “How often in this school year have you had colleagues from this team observe your classroom?”), and five items referred to reflective dialogue (e.g., “How often in this school year have you had conversations with colleagues from the team about the development of a new curriculum?”), both measured on a five-point Likert scale ranging from never (1) to very often (5). Teachers were instructed to think about collaboration both during formal departmental meetings and informal interactions with members of the department. The fit of this three-factor model was assessed in the R package Lavaan (Rosseel, 2012) and was acceptable ( $\chi^2=87.75$ ,  $df=40$ ,  $p<.01$ ; CFI=.94; TLI=.91; RMSEA=.07; SRMR=.08). Reliability analyses indicate that the scales of collective responsibility ( $\alpha=.70$ ) and reflective dialogue ( $\alpha=.78$ ) are reliable (Kline, 1999), but the reliability of the scale of deprivatized practice is very low ( $\alpha=.44$ ). Closer analysis indicates that removing the item “How often in this school year have you invited someone from this team to help teach your class(es)?” would increase the alpha to an acceptable value of .79. However, this would imply that the number of items in the deprivatized practice scale is

limited to two and that the mean of this new scale would be 1.09, which indicates that this type of deprivatized practice never occurs. After careful consideration, we decided to remove the scale of deprivatized practice from the analyses and to only incorporate the scales of collective responsibility and reflective dialogue as PLC characteristics. The fit of this two-factor model is good ( $\chi^2=31.53$ ,  $df=18$ ,  $p=.03$ ; CFI=.98; TLI=.96; RMSEA=.06; SRMR=.04).

To our knowledge, no scales exist to quantitatively assess how frequently department heads engage in group-oriented and development-oriented leadership, and we therefore designed a new scale. Based on the recommendation of Au et al. (2003), we used teachers' perception of the frequency of departmental leadership behaviors, rather than principals' views. The content for the survey items was informed by the existing international literature concerning these two roles and were further operationalized using policy documents and job descriptions for department heads. A first version of the scale was discussed with several stakeholders (researchers, teachers, and department heads) to assess the fit with the Flemish context and the expected occurrence of each leadership practice.

This resulted in a list of 14 items that were rated on a five-point Likert scale (never (1) to very often (5)) by the teachers in the research sample. Nine of these items were withheld in the final scale after correlation analyses (Table 3). We randomly divided our sample into two groups with SPSS22 and used the first sample (N=124) to conduct an exploratory factor analysis (principal axis factoring, promax rotation). Table 3 shows that the nine items loaded on two factors, as expected. We used the second subsample (N=124) to conduct a confirmatory factor analysis. This resulted in a good fit between the hypothesized structure and the data ( $\chi^2=32.30$ ,  $df=26$ ,  $p=.183$ ; CFI=.98; TLI=.98; RMSEA=.04; SRMR=.05). The reliability of both scales is good (group-oriented:  $\alpha=.76$ ; development-oriented:  $\alpha=.83$ ).

## Data Analysis

The teachers in the sample (level 1) are nested in departments (level 2), which are in turn nested in schools (level 3). Given the hierarchical structure of nested variables, it would be advisable to take all three levels into account. However, the number of departments per school is small (on average two departments per school, with a maximum of five), which risks producing inaccurate estimates and standard errors. Because the unit for PLC characteristics is the department, we decided to only take the teacher and department level into account to investigate our hypotheses. Two two-level models were fitted in MLwiN 2.32, using collective responsibility and reflective dialogue as the dependent variables.

First, the unconditional null model, with only an intercept and no explanatory variables included, was used to check whether multilevel modeling was required over a single-level analysis since participating teachers are part of a larger department. The variance at the departmental level was significantly different from zero for both outcome variables. This supports the further use of multilevel modeling because there is a systematic between-group difference. The intraclass correlation was calculated ( $ICC = \sigma^2_{\mu 0} / (\sigma^2_{\mu 0} + \sigma^2_{e0})$ ), which represents the proportion of the total variance in the dependent variable that is explained by departmental membership. Second, the study variables related to departmental leadership were centered around their grand mean and added to the model. Third, the control variables at the teacher level were added, using dummy variables for gender and position (teacher/department head) and centering teachers' years of job experience around the grand mean. For the structural department characteristics, we used dummies for subject (mathematics/French), grade composition (cross-grade/grade-bound), and subject composition (unitary/multidisciplinary). In order to explore the proportion of variance explained by each model, the squared multiple correlation  $R^2$  is calculated. Because a two-level model was used, the proportion of explained variance was divided into the proportional reduction of error at

the teacher level ( $R^2_1$ ) and for predicting a group mean at the department level ( $R^2_2$ ) (Snijders & Bosker, 2012).

### **Results**

The means of the interpersonal PLC variables “collective responsibility” ( $M=3.91$ ,  $SD=.61$ ) and “reflective dialogue” ( $M=3.33$ ,  $SD=.71$ ) - the dependent variables of this study - are higher than the middle score of the scale. This finding indicates that, on average, experienced French and mathematics teachers perceive a high presence of collective responsibility in their departments and engage in reflective dialogue with colleagues from their department on a regular basis. The mean of the scale “group-oriented departmental leadership” is higher than the middle score ( $M=3.92$ ,  $SD=.67$ ), while the mean for “development-oriented departmental leadership” approaches the middle score ( $M=2.91$ ,  $SD=.89$ ). This demonstrates that on average, teachers think of their department head more as someone who frequently encourages them to cohere and collaborate, rather than someone who strongly focuses on staff and student development, which only occurs every now and then. However, “development-oriented leadership” has the largest standard deviation in this study, indicating that there is a rather large variation in teachers’ perceptions of this leadership behavior.

### **Collective Responsibility**

Table 4 presents the parameter estimates and standard errors for the two-level regression of collective responsibility on departmental leadership, teacher variables, and department variables. This model shows statistically significant variance at the department and teacher level. An intraclass correlation coefficient of .22 is found, which indicates that 22% of the difference between teachers’ judgment of collective responsibility is related to teachers’ department affiliation, and is attributable to differences between departments.

In the next model (Model 1), the departmental leadership variables are added as explanatory variables. Group-oriented leadership contributes significantly to the model ( $\chi^2=46.364$ ,  $df=1$ ,  $p<.001$ ), while development-oriented departmental leadership is not significant ( $\chi^2=3.250$ ,  $df=1$ ,  $p=.071$ ). This implies that the more teachers perceive their department head as a group-oriented leader, the more they report the presence of collective responsibility in the department. None of the teacher control variables that are added in Model 2 and the structural department variables added in Model 3, are significant. After controlling for these variables, the size of the regression coefficient for group-oriented departmental leadership remains stable. This demonstrates that the importance of this variable is not influenced by taking into account demographic variables or structural department variables.

The final model explains 37.0% of the variance in collective responsibility at the department level and 32.0% at the teacher level.

### **Reflective Dialogue**

In terms of reflective dialogue, Table 5 presents the parameter estimates and standard errors for the two-level regression of reflective dialogue on departmental leadership, teacher variables, and department variables. In the null model, variance at the department and teacher level is significant. The ICC of .24 shows that 24% of the variance in teachers' reported frequency of reflective dialogue is attributable to differences between departments.

In the first model, the departmental leadership variables are integrated into the model. Both group-oriented departmental leadership ( $\chi^2=22.518$ ,  $df=1$ ,  $p<.001$ ) and development-oriented leadership ( $\chi^2=4.491$ ,  $df=1$ ,  $p=.034$ ) have a positive significant contribution to the frequency of reflective dialogue. Thus, if teachers experience more group-oriented leadership from their department head, they also engage in reflective dialogue more frequently. Additionally, if teachers report a higher frequency of development-oriented leadership, they report more

reflective dialogue. Notably, the effect of group-oriented departmental leadership is larger than that of development-oriented leadership.

With regard to the demographic teacher variables (Model 2), “experience” also has a statistically significant relationship with reflective dialogue. Teachers with more experience report greater engagement in reflective dialogue than teachers with less experience ( $\chi^2=4.074$ ,  $df=1$ ,  $p=.044$ ). The structural department variables that are added in Model 3 are not significant. While it is important to take teachers’ experience into account in this model because it is a significant predictor for reflective dialogue, the size of the regression coefficients for the departmental leadership variables remain fairly unaffected by the addition of teacher and department variables. This confirms the importance of these leadership variables.

The final model accounts for 42.3% of the variance in reflective dialogue at the department level and 26.6% at the teacher level.

### **Discussion**

Leaders play a pivotal role in the functioning of schools. The literature on distributed leadership emphasizes the importance of replacing the one hero leadership concept with leadership that is dispersed through all levels of the school. As such, teacher leaders are considered among the most influential leaders in schools. However, systematic quantitative research about the role of teacher leaders is scarce. An important setting for research is secondary education, with its departmental structure. This study addressed this lacuna by studying the relationship between different departmental leadership styles and interpersonal PLC characteristics in departments, as perceived and reported by experienced mathematics and French teachers in Flanders. We can draw several conclusions from this study.

The study findings concerning the interpersonal PLC characteristics in French and mathematics departments suggest that Flemish teachers feel collectively responsible and

engage in regular reflective dialogues, which is a hopeful and important finding. This is in line with the idea that these departments have potential as collective platforms for professional learning (Brown et al., 2000; Lomos et al., 2011). However, deprivatized practice was not included in our study as a dependent variable because of the low internal consistency and very low mean score regarding its occurrence. This predominance of reflective dialogue over deprivatized practice mirrors other international findings (Bolam et al., 2005; Lomos et al., 2011; Meirink et al., 2010; OECD, 2014). It would be worth investigating further why experienced French and mathematics teachers do not seem to mind talking about teaching with colleagues from their department but are not inclined to participate in deprivatized practice.

Moreover, our multilevel analyses revealed intraclass correlations for collective responsibility and reflective dialogue that can be considered large in educational contexts (Hox, 2010). This implies that teachers belonging to the same department are more alike in terms of these characteristics than random teachers throughout the entire sample and that a substantial shared level of collective responsibility and reflective dialogue exists in departments. This finding is not unexpected given the operationalization of interpersonal PLC characteristics within departments, but it does confirm the need to take teachers' work context into account and to conduct multilevel analyses when quantitatively studying PLC variables.

Nevertheless, a large proportion of the variance in teachers' perceptions of these PLC characteristics remained attributable to differences between individual teachers within departments. Because the explained variance at the teacher level was limited for both outcome variables in the final models in our study, it would greatly improve our understanding of how collective responsibility and reflective dialogue can be stimulated if future research were to identify individual teacher variables related to these PLC characteristics.

A possible explanation for the high PLC characteristics and high ICCs might be that all departments involved in this study focused either on a single subject area (unitary department) or on related subject areas (federal department). Busher and Harris (1999) hypothesize that teachers in such departments work closely together and that the culture in these departments is substantially homogeneous. Contrarily, cultures in departments in which subject areas are allied together primarily for administrative convenience but share little in common are likely to be more heterogeneous, collaborate less, and might even result in conflicting identities within the department.

A second conclusion relates to departmental leadership behaviors. Our findings confirm the multidimensionality of department heads' roles (Ghamrawi, 2010; Onn, 2010; Peacock, 2014), given that department heads in the present study often displayed group-oriented leadership, while showing development-oriented leadership every now and then. This corresponds with the focus on group-related leadership in several Flemish policy documents and role descriptions. For instance, the agency for Catholic schools -one of the major stakeholders in Flanders- has described several possible duties of department heads. They included numerous referrals to group-oriented leadership (e.g., coordinating initiatives, promoting mutual alignment and/or complementarity, dealing with different beliefs and resistance, and working on positive relationships within the department), while only briefly mentioning development-oriented leadership (e.g., knowing about professional development opportunities or initiatives in the educational sector) (Vlaams Verbond van het Katholiek Secundair Onderwijs, 2009).

Furthermore, our findings are consistent with the idea that department heads may be more reluctant to monitor the quality of teaching and learning within their department due to a perceived contradiction with egalitarian norms and the focus on teacher autonomy typically present in schools (Turner, 1996; Wenner & Campbell, 2016). Moreover, group-oriented



departmental leadership is dominant over other leadership behaviors in the literature. In this regard, the review by Peacock (2013) showed that promoting collaboration and a collegial environment in the department was the most-cited effective leadership behavior of department heads in general, as well as the most successful way of engaging in instructional departmental leadership.

Third, our study shows that group-oriented departmental leadership increases teachers' perceptions regarding the presence of collective responsibility in the department and the frequency of reflective dialogue with colleagues. Thus, teachers who believe that their department head focuses on facilitating and stimulating collaboration experience more collective responsibility in their department and engage in more conversations than teachers who state that their department head has no such focus. Hence, encouraging collaboration and empowering others, can shape collaborative departmental cultures, as initially hypothesized (Au et al., 2003; Busher & Harris, 1999; Printy, 2008).

On the other hand, development-oriented departmental leadership was significantly related to reflective dialogue. This implies that teachers whose department head follows up on the development of teachers and students engage in more reflective dialogue than their colleagues whose department head does not. However, the regression coefficient was rather small, compared to the coefficient of group-oriented leadership. No significant relationship was found between development-oriented leadership and collective responsibility, which contrasts with what we expected, based on Schelfhout et al. (2015). A possible explanation lies in the scale used in this study to measure development-oriented leadership. The scale contained items about actions and behaviors focused on the development of teachers and students (e.g., coaching beginning teachers and following up on student development), but did not explicitly refer to communicating the focus on development and learning to teachers. As

such, it is understandable that this leadership characteristic relates more to the behavioral PLC characteristic (reflective dialogue) than the mental aspect (collective responsibility).

A fourth conclusion relates to the control variables. We find it surprising that the regression coefficients of most of the control variables are negligible and that the coefficients of departmental leadership remained largely unchanged after adding these control variables. This implies that PLC characteristics can emerge in departments with varying characteristics in terms of composition, and that the importance of departmental leadership is not affected by departments' structural or teachers' demographic characteristics. Although several authors have expressed doubts about the involvement of more experienced teachers in newer forms of professionalism (Ben-Peretz & McCulloch, 2009), the only significant control variable was teaching experience, which was positively related to reflective dialogue. Hence, our study should encourage teachers and schools to be optimistic about experienced teachers' willingness to engage in reflective dialogue with their colleagues and thus share the knowledge and skills they have acquired over the years.

In conclusion, our quantitative findings corroborated the ideas that emerged from previous qualitative studies that ascribe central importance to the department head in shaping PLCs. Teachers engage in more reflective dialogue and feel collectively responsible when the department is led by a group-oriented head. This is more important than the structural context of the department or the demographic teacher variables. Additionally, the study reveals that differences in reflective dialogues are, to a lesser extent, also related to development-oriented leadership.

### **Significance and Limitations**

The present study contributes to the knowledge base concerning departmental leadership by providing an instrument to measure teachers' perceptions about two roles of department heads (group-oriented and development-oriented departmental leadership). This instrument should

be validated in future studies in diverse educational contexts and can be expanded for other roles of department heads.

The results of this study also point towards practical implications for the improvement of schools. Secondary education has a departmentalized structure and department heads can greatly contribute to school improvement. The findings suggest that to increase the level of collective responsibility and the frequency of reflective dialogue in departments, schools need to invest in high-quality departmental leadership. In particular, the importance of having a department head who focuses on facilitating group processes has been demonstrated for collective responsibility and reflective dialogue, while development-oriented departmental leadership was found to play a more modest role in reflective dialogue. Hence, selecting or electing a department head should not be a purely administrative procedure, but rather requires several considerations if the aim is to develop the department as a PLC. Aspiring department heads should believe in the potential of collegial interactions and systematically encourage their colleagues to engage in collaborative activities aimed at improving teaching and learning. To this end, it can be important for department heads to support group dynamics, contribute to an atmosphere of trust among colleagues, and take on the organization of meetings. Moreover, department heads should receive sufficient preparation and support to acquire the specific interpersonal skills required to perform this kind of facilitative teacher leadership style, especially because they are acting as teacher leaders without formal authority over their colleagues.

Nevertheless, this study is subject to a number of limitations, revealing the need for more extensive research in this domain. First, variance in the PLC characteristics was only measured at the teacher and department level due to the possibility of confounding the department and school level, given the low number of departments per school in our sample. However, other research indicates that school variables such as overall leadership, school

climate, and consistency of approaches can promote or hamper strong PLC characteristics in departments (Sammons et al., 1996). Thus, it is advisable to replicate this study with a larger sample size in which the ratio between teachers, departments, and schools is taken into account. This would permit a three-level model in which PLC variables are allowed to vary at the teacher, department, and school-level to verify whether the significant relationships for departmental leadership are replicable on a larger scale and for other subjects (van Veen et al., 2001), as well as when a number of school level variables are included in the model. Furthermore, a three-level model would allow future scholars to investigate how specific departmental subcultures relate to school-wide change, vision, and collaboration; Siskin (1997) warned of a possibly challenging relationship.

A second limitation concerns the measurement of departmental leadership. To our knowledge, there are no existing scales to measure the departmental leadership tasks (i.e., group- and development-oriented leadership) that were the focus of this study. As a result, we developed our own scale to measure these variables quantitatively. It would be advisable to further assess the validity of the developed scales in a wide variety of contexts. Furthermore, the role of the department heads is complex and more functions are performed than those included in this study. Also, the tasks of department heads are bound to be influenced by variables such as size of the department, the ratio of full-time to part-time staff, and physical proximity (Turner & Bolam, 1998). Thus, the present study could be extended by investigating the relationship between contextual departmental variables and broader departmental leadership functions.

Third, all departments involved in this study were unitary or federal Flemish departments and were led by fixed department heads. Future research should investigate which variables influence the interpersonal PLC characteristics in departments with other

structural configurations (e.g. smaller departments), in other policy contexts (e.g. the United States or Asian countries), or those without a formal department head.

Fourth, we acknowledge the limitations of our quantitative research instrument in that it used self-reported measures. To extend the conclusions put forward in the present study, qualitative techniques such as interviews or participant observation could be used to obtain more in-depth responses about departmental leadership and PLC characteristics. Furthermore, the current cross-sectional nature of our study does not allow us to draw causal relationships. Longitudinal research would be worth pursuing to provide more insight about the direction of the relationships.

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**Tables**

Table 1.

*Structural departmental characteristics. (N = 62).*

	<b>French</b>	<b>Mathematics</b>	
<b>Multidisciplinary</b>	5	5	10
<b>Unitary</b>	27	25	52
	32	30	62



Table 2.

*Teacher sample description (N = 248).*


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Gender	Men: 23%
	Women: 77%
Age	$M_{\text{age}} = 43.2$ years ( $SD = 9.4$ years, range 27-62 years)
Years of teaching experience	$M_{\text{teaching experience}} = 20.0$ years ( $SD = 9.4$ years, range 6-40 years)
Years of experience in current school	$M_{\text{experience current school}} = 17.7$ years ( $SD = 9.0$ years, range 6-40 years)
Subject taught	Mathematics: 48%
	French: 52%
Position	Teacher: 83%
	Department head: 17%

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Table 3.

*Pattern matrix: exploratory factor analysis (principal axis factoring, promax rotation, N = 124)*

<b>Item description</b>	<b>F1</b>	<b>F2</b>
Encouraging vertical alignment and coordination between teachers of different grades	-.02	<b>.73</b>
Encouraging horizontal alignment and coordination between teachers of the same grades	-.14	<b>.94</b>
Promoting an atmosphere of openness and trust within the group	.24	<b>.54</b>
Organizing meetings (planning, preparation, chairing, monitoring reports)	.14	<b>.46</b>
Keeping track of annual planning of colleagues	<b>.73</b>	-.06
Following up on the academic and social development of students for the subjects involved in the department	<b>.92</b>	-.16
Actively seeking out training and professional development opportunities (internal or external) for colleagues	<b>.65</b>	.17
Assisting teachers in finding and developing the most appropriate teaching methods and materials	<b>.73</b>	.12
Coaching and assisting new teachers	<b>.52</b>	.22

Table 4.

*Multilevel regression of collective responsibility on departmental leadership, controlling for individual and department variables (N = 248).*

		<i>Null model</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	
<b>Fixed</b>	Intercept	3.927 (.051)	3.926 (.044)	3.904 (.050)	3.931 (.073)	
	Departmental leadership: group		.393 (.058)***	.382 (.059)***	.389 (.059)***	
	Departmental leadership: development		.081 (.045)	.081 (.045)	.080 (.045)	
	Teaching experience			.004 (.003)	.004 (.003)	
	Male (vs. female)			.073 (.076)	.056 (.076)	
	Department head (vs. teacher)			-.007 (.081)	-.008 (.081)	
	French (vs. mathematics)				-.148 (.084)	
	Grade bound (vs. cross- grade)				.103 (.097)	
	Multidisciplinary (vs. unitary)				.161 (.116)	
	<b>Random</b>	Level 2–department $\sigma^2_{\mu 0}$	.084 (.030)**	.060 (.021)**	.059 (.021)**	.047 (.019)*
		Level 1–teachers $\sigma^2_{e 0}$	.275 (.028)***	.198 (.020)***	.197 (.020)***	.197 (.020)***
<b>Model Fit</b>	Deviance	430.788	348.562	341.871	336.059	
	$\chi^2$		82.225***	6.691	5.812	
	Df		2	3	3	
<b>R<sup>2</sup></b>	R <sup>2</sup> <sub>2</sub>		.283	.291	.370	
	R <sup>2</sup> <sub>1</sub>		.281	.287	.320	

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

Table 5.

*Multilevel regression of reflective dialogue on departmental leadership, controlling for individual and department variables (N = 248).*

		<i>Null model</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	
<b>Fixed</b>	Intercept	3.373 (.062)	3.366 (.052)	3.405 (.058)	3.277 (.084)	
	Departmental leadership: group		.347 (.073)***	.337 (.075)***	.348 (.074)***	
	Departmental leadership: development		.120 (.056)*	.133 (.056)**	.120 (.056)*	
	Teaching experience			.008 (.004)*	.009 (.004)*	
	Male (vs. female)			-.172 (.095)	-.140 (.096)	
	Department head (vs. teacher)			-.027 (.104)	-.034 (.104)	
	French (vs. mathematics)				.174 (.096)	
	Grade bound (vs. cross- grade)				.155 (.111)	
	Multidisciplinary (vs. unitary)				-.035 (.132)	
	<b>Random</b>	Level 2–department $\sigma^2_{\mu 0}$	.121 (.042)**	.072 (.030)**	.058 (.027)**	.043 (.024)
		Level 1–teachers $\sigma^2_{e 0}$	.390 (.040)***	.330 (.034)***	.330 (.034)***	.332 (.034)***
<b>Model Fit</b>	Deviance	517.628	465.881	452.990	448.048	
	$\chi^2$		51.747***	12.891**	4.942	
	Df		2	3	3	
<b>R<sup>2</sup></b>	R <sup>2</sup> <sub>2</sub>		.293	.357	.423	
	R <sup>2</sup> <sub>1</sub>		.213	.241	.266	

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