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Examining Distributed Leadership and School Outcomes in Finnish Compulsory School

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Abstract This paper discusses distributed leadership (DL) as educational leadership structure and its relation to school outcomes in compulsory schools. School outcomes are defined as students' learning to learn abilities. This study tests two hypotheses. H1: DL is perceived as a continuum consisting of two ends (as delegation and as situation-based interaction between leaders and subordinates). H2: conceptualization of DL as situation-based interaction positively affects the outcomes of the school. The data are leadership inquiry and students' longitudinal learning to learn follow-up data from grades 3 to 6 or grades 6 to 9. The results indicate that DL does not appear as a unidimensional continuum. Educational leadership is formed from multiple dimensions, and DL is one part of the whole; thus, H1 was incorrect. The conceptualization of DL as situation-based interaction is not statistically satisfactorily related to outcomes of the school; therefore, H2 was also incorrect. The paper concludes that results of this study point to the meaning of local education policy as a means of steering the distribution of students between schools in order to maintain the small between-school differences in student outcomes.

Keywords: *distributed leadership, Finland, learning to learn, education policy*

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1. Introduction

The era of individual charismatic inborn heroic leadership is over - at least according to current leadership theory trends. One replacement for the individualized view has been distributed leadership (henceforth DL). The idea of distribution has been justified by referring to the complexity and incalculability of challenges in today's schools that cannot be successfully met by one principal alone. Further, the growing number of responsibilities and tasks related to the leadership in schools support the idea of distribution [1]. Consequently, distribution has been adopted as one approach in understanding the school reality [2]. However, it is not only about distributing the workload of the principal, but DL may also enhance the effectiveness of teachers [3], and have a positive effect on teachers' professional development, effective learning, and support the school in reaching its aims [4]. Moreover, a strong research base indicates the positive effect of DL on school outcomes and student learning (e.g. [1,5]). Yet these views have also been challenged (e.g. [6,7,8]), and one cannot claim that DL as such is a direct route to improvement in the schools' outcomes. Therefore, it is crucial to evaluate the way the leadership is distributed [5,9], and to ask what is it that is distributed and why, and further, who controls the whole process [5].

This article looks at DL and its essence as well as its relation to student outcomes in the Finnish context. Can DL be examined as a continuum consisting of two ends: DL as delegation and DL as situation-based interaction between leaders and subordinates? Moreover, how do the views on DL of principals, the leadership team and curriculum work group members affect the student outcomes of the school? This study consists of two data sets: a leadership inquiry conducted in 2014 targeted at principals and members of leadership teams and curriculum work groups (n = 157) in 34 comprehensive schools in one Finnish city, and longitudinal learning to learn assessment data gathered in 2013 and 2016 that consisted of follow-up from grades 3 to 6 (n = 1291) or grades 6 to 9 (n = 1150) in the same schools. The former data set is used in answering both questions and the latter data set for only the second question. Educational leadership and its relation to student outcomes has not been studied in the Finnish context before.

2. Distributed Leadership

DL is conceptually multifaceted and lacks one solid definition. Reference [10] describes it through three characteristics. First, DL emphasizes leadership as a feature of a group or a network. Second, DL makes

leadership available to different groups. Finally, it assumes the distribution of leadership for many, not only for a few. Reference [11] sees DL as a phenomenon with two extremes, one characterized as having lack of order caused by excessive distribution of leadership and the other based on domineering behavior. Reference [12] approaches DL through leader-plus and practice perspectives. The leader-plus suggests that other professionals in leadership positions, such as board members and educational specialists, can participate in school leadership along with the principal. This model focuses on how many people are involved in leadership and who these people are. The practice perspective observes the interaction: the mutual interaction of board members and educational specialists, and their interaction with the wider organization. The focus is on the situation-bound interaction between the leaders and the staff [12,13]. Through leader-plus and practice perspectives DL can be looked at on an axis that has the formal school structures on one end, comprising the management group, detailed responsibilities and duties of a few delegated by the principal. The other end of the axis consists of inner interaction within leadership and curriculum work groups, and the situation-bound interaction between the formal and informal structures of the school.

The distribution of separate leadership roles is the first step towards DL. Reference [11] states that such delegation of roles is the most common way DL has been realized in schools (cf. [14]), and the leadership team as a hierarchical structure is one example of a structure in which the leadership is restricted to a select few. Thus, in this view, the realization of DL results only at the level of role delegation if the leadership team forms an end to which the principal shares responsibilities [15]. However, reference [25] points out that when the subordinates are more knowledgeable substance-wise than their leaders in the decision-making processes, delegation improves the quality of the decisions made. Further, the delegation of roles increases the commitment of staff to the implementation of those decisions. By delegating less important tasks, the leader has more time to concentrate on the more important responsibilities. Consequently, in reference's [14] description, leadership in its plain form is target-oriented activity through which the subordinates perform only those tasks that have been dictated to them. Despite it being clear that formal leadership positions are formed around certain tasks, the key to successful leadership lies in the teachers' collective participation in development work [15]. The interpretation of DL as mainly delegating tasks to several individual positions within an organization is limiting - DL should be understood as being a dynamic interaction between leaders and subordinates [2].

In essence, DL is about teachers and their actions and choices and willingness to maintain change. Along with formal positions and structures, DL becomes visible through unestablished leadership and informal roles, activities, and mutual relationships between people [3,16]. That way, leadership finds its form in the interaction between leaders and subordinates, rather than in the actions of one or more leaders [15,17]. Moreover, reference [13] highlights that leadership has a different meaning when it is established through decision-making based on mutual interaction instead of through hierarchical processes. Further, it is more probable that interaction also leads to shared understanding of the organization (cf. [16]). The basis for research should be leadership practices as products of interactions between leaders and subordinates, and in various situations among the subordinates, not in individual actions due to the meaningfulness of the subordinates and their situations [17]. Additionally, the focus should be on the formal and informal organization of schools and the mutual relationships between them [12].

3. Distributed Leadership in the City's Schools

The Finnish city (henceforth the City) where this study was conducted has approximately 210 000 inhabitants and is among the largest cities in Finland. The 49 comprehensive schools in the City are centrally led in terms of local level education policy-making and its implementation. In general, the Finnish education system is decentralized and consequently, the municipalities as the local level authorities have considerable decision-making power concerning local educational arrangements. Therefore, municipalities differ in terms of their power relationships between the municipal educational administration and the schools; some municipalities allow schools to have more freedom while others, like the City, have relatively strong centralized guidance. The national level decentralization can be seen in curriculum work. The National Agency for Education provides the National Core Curriculum to guide local education organizers who in turn formulate their own municipal and school-level curricula based on the national level curriculum [18].

The City, following a local-level top-down model, has introduced DL as one of its key drivers for educational leadership. The Education Department of the City defines DL as the distribution of responsibilities and tasks, and as processes for sharing knowledge, experience, and interpretation. Further, DL is about creating a shared understanding of leadership. In addition, the guidelines for Quality Educational Leadership in the City, given in 2011, describe DL as being a part of pedagogical leadership along with engagement and interaction and the culture of professional sharing within the organization.

In the City's schools, DL is realized through leadership teams. The development and institutionalization of teamwork is one of the priorities described by the City's Education Department. The leadership teams consist of the principal and teachers or other members of the work community (2-6 depending on the school size), and they are responsible for the development of instruction, strategic decision-making, and long-term plans of action. The leading idea is that the leadership team members point at issues they believe require scrutiny and development at their school. The team also evaluates the curriculum realization and is responsible for its development accordingly. Moreover, its aim is to emphasize overall professional development and to

promote the utilization of the existing professional capacity of the school community.

The idea of DL in the City's schools expanded beyond the leadership teams during the recent national curriculum reform that started in 2014. The Education Department required every school to formulate its school-based curriculum and merge it with the general sections of the new National Core Curriculum [19]. Consequently, every principal established a temporary curriculum working group for a period of 18 months, and that group was responsible for engaging the whole school community, including students and parents, in the school-level curriculum work. The curriculum work group consisted of the principal, some leadership team members, and teachers (4-6 teachers including the leadership team members).

4. Aim, Research Questions, and Hypothesis

This study had two aims. First, it focused on the essence of DL. Second, this study aimed to test whether the views that principals, members of leadership teams, and curriculum work groups have on DL affect the student outcomes of schools in the City. In order to do that, the study combined two data sets, school- and student-level data: leadership inquiry and learning to learn assessment data, of which the leadership data have been reported more widely from the perspective of DL in reference [20]. The framework for the essence of DL is built on an interpretative continuum in which DL as delegation is placed at one end and DL as situation-based interaction at the other. In this study, the students' outcomes are looked at as developments in students' learning to learn abilities in verbal and quantitative reasoning between 2013 and 2016.

Research questions:

RQ1: Can DL be examined as a continuum consisting of two ends: DL as delegation and DL as situation-based interaction between leaders and subordinates?

RQ2: Do the views of principals, the leadership team, and curriculum work group members on DL affect the student outcomes of the school?

The following hypotheses were tested in this study:

H1: DL is perceived as a continuum consisting of two ends: DL as delegation and DL as situation-based interaction between leaders and subordinates.

H2: Conceptualization of DL as situation-based interaction between leaders and subordinates positively affects the outcomes of the school.

5. Data and Methods

5.1. School-level Data

The school-level data were drawn from the study by reference [20]. The data were collected in 2014 by asking principals and members of leadership teams and curriculum work groups of all schools in the City to fill out an electronic questionnaire about their leadership practices. The general educational leadership model of the City has not changed much since the data were collected, so we can consider the data to represent the situation of 2018 relatively well.

The Likert-scale and open-ended questions were drawn from the theoretical basis of DL introduced in this article. They received 193 responses from 49 schools. For the present study, upper secondary schools (four schools, n = 19) and basic education schools with fewer than three responses (11 schools, n = 17) were excluded from the data. The first hypothesis was tested about the factorial structure using the remaining 157 answers as such. To test the second hypothesis, we aggregated the answers to the school level (altogether 34 schools - 75% of all basic education schools in the City. Of them, 26 had students in grade levels 3 to 6 and 14 had students in grades 7 to 9 during the follow-up period).

5.2. Student-level Data

For the second hypothesis, school-level data were merged with longitudinal learning to learn assessment data from the same schools (see [21]). The original data consisted of 3 292 students who provided data in both 2013 and 2016 (follow-up from grades 3 to 6 or grades 6 to 9; ≈ 78% of the complete age cohorts of the City). Only students from schools with sufficient school-level data were included. This yielded 1 291 students from grades 3 to 6 (599 girls, 678 boys, 14 unknown) and 1 150 students from grades 6 to 9 (551 girls, 580 boys, 19 unknown). The mean age of the students during the first assessment was M = 9.83, Sd = .38 and M = 12.67, Sd = .43, respectively. They represented approximately 52 percent of the complete age cohorts of the City.

Table 1. Descriptive statistics of the variables used in modeling

Measure	*N*	*Min*	*Max*	*Mean*	*Sd*
Student level					
Thinking skills 2013	1106 | 1045	0 | 1	12 | 16	5.09 | 6.96	2.14 | 2.87
Thinking skills 2016	1148 | 1063	1 | 0	15 | 16	7.07 | 8.80	2.96 | 3.47
School level					
Thinking skills 2013 - School mean	26 | 14	3.79 | 2.50	6.66 | 7.81	5.09 | 6.96	.59 | .54
Thinking skills 2016 - School mean	26 | 14	5.40 | 4.00	8.41 | 9.99	7.04 | 8.78	.65 | .74
Collaborative leadership	26 | 14	2.73 | 2.73	4.87 | 4.25	3.67 | 3.66	.47 | .31
Delegation of leadership	26 | 14	3.00 | 2.94	4.40 | 4.20	3.82 | 3.66	.36 | .35

The values for grades 3 to 6 and 6 to 9 are separated by a vertical bar.
N = Number of respondents, *Min* = Minimum value, *Max* = Maximum value, *Sd* = Standard deviation.

5.3. School-level Measures

From the questionnaire used by reference [20], items were only included if they related to the definitions of DL as delegation of leadership and DL as situation-based interaction between leaders and subordinates. Originally, the scales had eight items for delegation and eight items for situation-based interaction, but preliminary analyses showed that one item for delegation and three items for situation-based interaction had poor measurement properties. After omitting these items, the reliability of the scales was good (delegation: $\alpha = .83$; situation-based interaction: $\alpha = .79$). During the first stage of the analyses, the individual items as factor indicators were used. To test our second hypothesis, mean scores of the scales for merging them with student-level data were calculated. Descriptive statistics are presented in Table 1.

5.4. Student-level Measures

This study focused on the development of verbal and quantitative reasoning and used only the cognitive link items of the larger learning to learn assessment battery consisting of cognitive tests and questionnaires. The link items were identical for all age groups, excluding age-specific additional items in each subtest. Five items measuring verbal proportional reasoning were adapted from the *Missing Premises* task of the *Ross Test of Higher Cognitive Processes* [22]. The students were given one premise and the conclusion, and they had to choose the second premise from among five alternatives that would make the conclusion valid. The items were scored dichotomously as correct or incorrect. Quantitative reasoning was measured with items from two subtests. Five items were adapted from the Hidden Arithmetical Operators task [23]. In each item, there were one to four hidden operators (e.g., [(5 a 3) b 4 = 6. In this task, letter a / b stands for: addition (+) / subtraction (-) / multiplication (·) / division (÷)?]). The items were coded dichotomously for a correct answer to all of the 1-4 operators in the item. Six items were from the Invented Mathematical Concepts Task, which was a modified group-version of Sternberg's Triarchic Test (H-version) Creative Number scale [24]. An arithmetical operator was conditionally defined depending on the value of the digits combined (e.g., if a > b, lag stands for subtraction, or otherwise for multiplication). The items with four multiple-choice alternatives were coded dichotomously for the whole equation. The dichotomously coded items from different subtests were summarized in an overall performance score. The reliability of the scale was acceptable ($\alpha = .648$ and $\alpha = .686$ for the two measurement points). The descriptive statistics for the different age groups in different measurement points are presented in Table 1.

5.5. Statistical Methods

Descriptive statistics were calculated using IBM SPSS 24 software, and Mplus 7.2 was used for other analyses. First, the factorial structure of the scales was tested by confirmatory factor analysis (CFA) of the original school-level data. For testing the second hypothesis, multilevel structural equation modelling was applied on the student-level data complemented by school-level aggregate variables using maximum likelihood robust (MLR) estimation. The criteria for model fit were *CFI* and *TLI* > .95 and *RMSEA* < .06 (good fit) and *CFI* and *TLI* > .90 and *RMSEA* < .08 (acceptable fit). In addition, χ^2 values are reported even though due to the large student-level sample size a statistically significant result does not necessarily mean a poor fitting model.

6. Results

The first hypothesis was that the items measuring DL as delegation and DL as situation-based interaction would represent opposite ends of one continuum. This was tested by running a unidimensional CFA model, but the model did not converge. Next, a two-factor model in which collaboration and delegation were separate dimensions was tested. This model fit the data, but the fit indices were not good enough (*CFI* = .894, *TLI* = .868, *RMSEA* = .079, χ^2 = 104.573, *df* = 53, *p* < .001). Therefore, we added three residual correlations for delegation items to run an acceptably fitting two-factor model (*CFI* = .950, *TLI* = .934, *RMSEA* = .056, χ^2 = 74.449, *df* = 50, *p* = .014). The correlation between the two factors was not statistically significant (*r* = .09, *p* = .399). Thus, the first hypothesis about the unidimensional structure of our scales was not correct. Instead, the items formed two separate uncorrelated scales.

Due to the use of school-level aggregate data to test the second hypothesis and the number of parameters to be estimated exceeding the school-level sample size, the analysis could not continue with the factors specified in the first stage. Therefore, school-level mean scores for DL as delegation and DL as situation-based interaction were calculated and merged with the student-level data. In this process, two-level regression models for predicting the 2016 thinking skills test performance were specified and were run separately for lower- and higher-grade levels. The intraclass correlation in the empty models was .023 for the lower grades and .031 for the higher grades, so little variance was explained by school-level factors. However, as the result is typical for Finnish schools, this step was to analyze whether it would be possible to find any explanations for the small between-school differences that were nevertheless observed here too.

To test the hypothesis, the 2013 test performance as an individual-level predictor and the school mean test score from 2013 as a school-level predictor were added, and further, collaboration and delegation as school-level predictors. Based on the factor analysis of the first stage, the covariance of collaboration and delegation were constrained to 0 and through that a degree of freedom for calculating model fit indices was obtained. The model, which fit the lower grade data excellently (*CFI* = 1.000, *TLI* = 1.025, *RMSEA* = .000, χ^2 = 0.145, *df* = 1, *p* = .704), is displayed (in Figure 1).

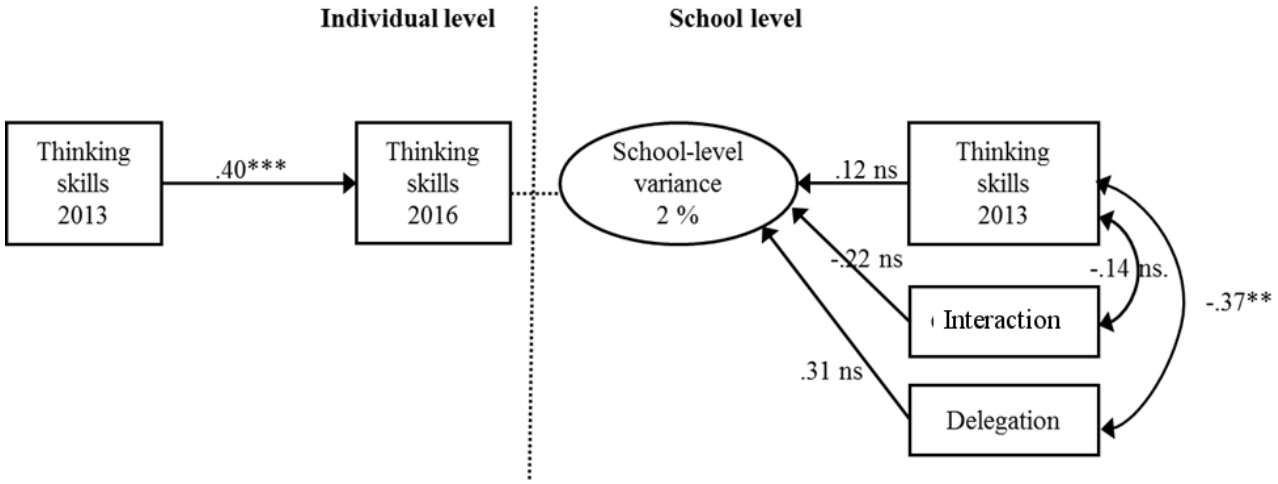

Figure 1. DL as delegation and DL as situation-based interaction in explaining school-level development of students' general thinking skills (standardized coefficients). ** $p < .01$.

The figure shows that DL as delegation was more common in schools in which the third-grade students' test performance was originally lower. The relationship between delegation and sixth grade performance was not statistically significant, indicating there was no change in this over time. DL as situation-based interaction was unrelated to performance at both measurement points. It has to be noted that the development of performance was mainly an individual-level phenomenon, so strong effects were not expected to emerge. The results showed that the second hypothesis was incorrect regarding lower grades.

Next, the hypothesis was tested by using data from higher grades. Due to the small school-level sample size of higher grades (n = 14), this was done by running two separate models, one with DL as situation-based interaction and one as DL as delegation as an additional school-level predictor. For calculating fit indices, the unstandardized individual-level regression coefficient was constrained between prior and later performance to .60 based on earlier studies utilizing the same data (see [21]). The models fit the data well (*CFI* = 1.000, *TLI* = 1.001, *RMSEA* = .000, $\chi^2 = 0.919$, $df = 1$, $p = .338$ for situation-based interaction; *CFI* = 1.000, *TLI* = 1.001,, *RMSEA* = .000, $\chi^2 = 0.930$, $df = 1$, $p = .335$ for delegation).

In the model with DL as situation-based interaction as a predictor, prior school-level mean test score seemed to predict school-level later performance ($\beta = .58$), but the result was not quite statistically significant ($p = .09$). The other school-level regression coefficients were close to 0, so DL as situation-based interaction was related neither to the original performance level of the students when they entered the lower secondary school nor to their test results at the end of the ninth grade. For delegation, the results were slightly different. Just as with lower grade students, delegation was related to lower original performance level of students when they entered the school at the beginning of the seventh grade ($r = -.43$, $p < .01$). However, its relationship with later performance was not statistically significant ($\beta = .35$, $p = .08$). In the higher grades, prior school-level performance was a strong predictor of later school-level performance ($\beta = .74$, $p = .05$). Together, the two models showed that the second hypothesis was incorrect in the higher grades.

7. Conclusion

This study looked at DL in practice in the schools in the City (RQ1), and further, examined whether the principals', leadership team's, and curriculum work group members' views on DL affected the outcomes of the school (RQ2). Thus, this study first investigated if DL can be examined as a continuum consisting of two opposite ends: delegation and situation-based interaction between leaders and subordinates. This question was tested with the first hypothesis (H1) and the result was that the hypothesis was incorrect. Instead of forming a unidimensional continuum, DL as delegation and DL as situation-based interaction seem to form two separate uncorrelated scales. Therefore, this indicates that DL, which has been defined as a theoretically multifold concept, is a multifold phenomenon in practice as well. In the literature, the process of capturing the essence or formulating a definition is a more stable process. The realizations and interpretations of it in practice show how it escapes, and does not easily fit into an exact theory-based model defining it as a traceable continuum with two (clear) opposite ends. The second question (RQ2) was tested with the second hypothesis (H2) stating that the conceptualization of DL as situation-based interaction positively affects the outcomes of the school. The analyses showed that no relationships nor any statistically significant results could be found, indicating that DL as situation-based interaction and student outcomes of the schools would somehow not be linked together in the lower grades from 3 to 6 nor in the higher from 6 to 9. Consequently, the second hypothesis was also incorrect. However, there were signs that DL as delegation was more common in schools in which the third-grade students' test performance was originally lower.

The results from this study are in line with what was observed by reference [26] who noticed that in contexts in which the variation between schools explained 12-20% of the variation in students' learning outcomes, the leadership covers one-quarter of that whole variation. In terms of local education policy, the City follows a strict neighborhood school principle that directs all children from the same area to their closest school and through that,

the municipality supports its policy of minimizing the opportunity for school choice. These factors have been interpreted in the Finnish context as one factor behind relatively low between-school variations. Generally in the City, the school explains 3-8% of the between-students' variation in the learning to learn test, the emphasis being closer to 3% depending on the task. Thus, the school effect is rather small in the City, and was even in the Finnish context where the school variation is small throughout the country. Consequently, as the school in the City plays such a small role in the students' learning to learn test results, the leadership inevitably also has a minor role in this context. Therefore, it would be interesting to conduct a similar study in a local environment where the between-school variation is larger, as not all the Finnish municipalities follow the neighborhood school principle as strictly as the City (see [21]). Further, not all the other municipalities in Finland follow similar centrally-led policy on educational leadership; therefore, a nationally wider scope would be well justified.

According to our results, it is challenging to seek a coherent continuum from one end to the other concerning the views on DL in practice. Educational leadership as such is formed from multiple dimensions and DL can be defined as one part of the whole. Therefore, one may assume that there is a combination of different leadership practices in use in schools. This poses questions for future research about operationalizing the concept in a more delicate way, and having a mixed-methods design combining questionnaire data with interviews. Moreover, the respondents have been principals and leadership team and curriculum work group members, and through that they all have had a pre-defined position within the school community, in addition to some level of understanding of DL due to the leadership training provided by the City. Hence, in order to get fuller picture of the phenomenon, teachers voices should be included as well, because that could provide more fruitful information about leadership distribution practices in school communities.

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