Effects of classroom organization on letter–word reading in first grade

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Abstract

Teacher organization is a crucial part of classroom functioning; however, its relation to student achievement has not been investigated as extensively as that of instruction. In this study, organization is defined as the amount of time teachers spend explaining the purpose and procedures of learning activities and daily routines. Data from first-grade classrooms (N=44) observed three times during the school year (fall, winter, and spring) are analyzed, along with students’ (N=108) literacy skills at fall and spring. Hierarchical Linear Modeling reveals that, controlling for students’ fall word reading and vocabulary skills, as well as amount of language arts instruction they receive, both amount and change in amount over time in classroom organization significantly predicts spring word reading skills. Specifically, children in classrooms observed in higher amounts of classroom time in organization at the beginning of the school year, followed by sharp decreases over the school year, demonstrated stronger letter and word reading skills by spring, and this was a main effect (p<.05). Practical and research implications are discussed.

Keywords: First grade; Hierarchical linear modeling; Literacy instruction; Classroom organization; Word reading

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Introduction

Early classroom environments contribute to many aspects of students’ academic success, including whether individuals learn to read. Recent work reveals that the amount, type, and timing of instruction in literacy all affect reading skill gains (Connor, Morrison, & Katch, 2004; Guthrie, Schafer, & Huang, 2001; Juel & Minden-Cupp, 2000). In addition, extensive work in classroom settings has established that organization, or how teachers organize their classrooms and prepare children for learning, shapes educational environments (Brophy, 1983; Taylor, Pearson, Clark, & Walpole, 2000; Wharton-McDonald, Pressley, & Hampston, 1998). However, the extent to which organization specifically relates to literacy achievement is less well understood. In this study, we describe teachers’ orienting and organizational behavior in 44 first-grade classrooms and examine associations with 108 students’ letter–word reading skill growth.

Conceptualizing organization

Organization is here defined as the amount of time teachers spend providing their students information about classroom events and instructional activities, including explaining purposes of the activities, procedures for their successful completion, and how to transition between and plan subsequent tasks. These orienting and organizing teacher actions do not directly target specific content. Rather, they precede or are interspersed with instructional activities. For example, the teacher may explain how to complete a phonological awareness activity (e.g., “you will first listen to me and then form the sounds I say into whole words”), where to find materials (e.g., “take your letter cards from the back shelf”), how to work with peers (e.g., “find your buddy and select a book”), and what to do once they have finished the activity (e.g., “put your journals in your backpack”). In contrast, explaining to children that the letter “b” makes the /b/ sound, or that /b/ /a/ /t/ blended together makes the word “bat,” are considered instruction. The key difference is that the goal of organization is to help students participate in the learning opportunity, whereas the goal of instruction is to help children learn the content being presented. Particularly relevant to the present conceptualization of organization is instructional clarity, where the teacher “describes objectives clearly, [and gives] clear directions,” (Evertson, Emmer, Sanford, & Clements, p. 180). Research has shown that classrooms where teachers are better at organizing for instruction, including instructional clarity, also have students who spend more time on-task and less time in disruptive, non-academic activities (L.M. Anderson, Evertson, & Emmer, 1980; Arlin, 1979; Bennacer, 2000).

The role of organization in first grade

Compared with students in later grades, younger students appear to require more extensive, explicit instruction in the “why and how” of classroom activities (Brophy, 1983; Brophy & Good, 1986). Kindergarten teachers expect their students to acquire academic, classroom conduct, and independent work skills over the school year,
reflecting that children need time to adjust to school environments (Hains, Fowler, Schwartz, & Kottwitz, 1989). Children accustomed to home or relatively less structured preschool settings may not initially realize how being one of many members of an elementary classroom necessitates procedures such as raising one’s hand before speaking, working quietly beside peers, and keeping the classroom in order. They may also be less familiar with participating in formal instruction and executing learning activities, two elements typical of first-grade environments (Entwisle & Alexander, 1998). The results of one study of first grade indicate that increased teacher organization in the beginning of the school year is related to increased time in instructional activities managed by individual children at the end of the year and decreased time in transitions (Cameron, Connor, & Morrison, 2005). This study extends those findings and asks whether amount and timing of organization is directly associated with students’ reading gains.

Pressley et al. (2001) recently created a comprehensive list of features of first-grade classrooms where students were highly engaged and where they demonstrated stronger literacy growth compared to classrooms elected as less effective. The major characteristics included: (1) excellent classroom management; (2) skills explicitly taught; (3) literature emphasis; (4) much reading and writing; match of accelerating demands to student competencies with a great deal of monitoring and scaffolding; (5) self-regulation encouraged; and (6) strong connections across the curriculum (p. 52–57). Of these six characteristics, two — excellent classroom management and self-regulation encouraged — align closely with our definition of teacher organization. This and other work reflect the importance of increasing time on-task, or time engaged in learning, and highlight the role of organization in maximizing the time spent in instructional activities, which is related to student literacy achievement (Brophy & Good, 1984; Connor, Son, Hindman, & Morrison, 2005; Fry & Lagomarsino, 1982; Guthrie et al., 2001; Limbrick, McNaughton, & Clay, 1992).

Timing of organization

In addition to overall amount per day, there are consequences for the time of year during which teachers invest substantial amounts of time in classroom organization. In an intervention study by Evertson, Emmer, Sanford, and Clements (1983), significant improvement, relative to a control group, was found for instructional clarity and student behavior for experimental group teachers ($N=23$). These teachers received the treatment (two workshops and an instructional manual designed to improve classroom functioning) at the beginning of the school year, whereas teachers in the control group ($N=18$) also received the treatment (manual and workshops), but not until December or February. Bohn, Roehrig, and Pressley’s (2004) examination of six elementary school teachers further showcases the need for organizational activities early in the school year. In their study, two teachers who spent more time establishing routines and procedures in the first 2 days of school were compared to four other teachers. Mid-year observational outcomes for the two teachers, deemed more-effective compared to the others, included greater student literacy achievement, as evidenced by higher-level reading and writing, and elevated student engagement. Taken together, these findings suggest that organizational behaviors concentrated early in
the school year, might promote better student behavior, as well as stronger literacy achievement.

Skills involved in reading

Improving students’ literacy skills is a critical task for American elementary school teachers (Howe, Scierka, Gibbons, & Silberglitt, 2003) especially when we consider that over one-third of children fail to reach basic levels of reading by fourth grade (NAEP, 2005). It is not surprising, then, that literacy instruction dominates the early elementary school day when compared to math or science instruction (Miller, Kelly, Zhou, & Campbell, 2005; Rice, Connor, & Thomas, 2006). The federal government reinforces the importance of reading for success in American society. The No Child Left Behind Act, implemented in 2002, has set the goal that every student reads at grade level by the time they finish third grade, and school districts have begun mandating specific amounts of daily language arts instruction (Lopez & Dubetz, 1999; www.just4kids.org, 2005).

In this study, we focus on two general sets of skills critical to early reading acquisition — oral language (i.e., vocabulary and comprehension) and decoding (Hoover & Gough, 1990). Decoding or letter–word reading involves recognizing the associations between how letters and letter combinations and their sounds, blending these sounds, and understanding how to decode unfamiliar text using the rules of phonics (Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2001). Phonological awareness, or the ability to consciously manipulate the sounds within words (phonemes), is central to this process and is highly predictive of reading success (Torgeson & Mathes, 1999). Decoding skills are necessary, and, in some studies, sufficient to predict literacy acquisition in English-speaking populations. Research with students at-risk for reading difficulties reveals that word reading skills are one of the strongest predictors of literacy acquisition (Chapman, Tunmer, & Prochnow, 2001). Moreover, reading in the early elementary years is a strong and stable predictor of concurrent and subsequent skill levels, prioritizing the task of helping all children learn to read in the primary grades (Aram, 2005; Whitehurst & Lonigan, 2001). Finally, children of high socioeconomic status (SES), parented by college-educated adults who provide books as well as rich reading and language experiences, have an advantage over their peers of low-SES backgrounds in a number of aspects that support literacy acquisition, including good phonological word reading skills (Juel, 1988; Snow, Burns, & Griffin, 1999).

Notwithstanding the foundational nature of letter–word reading, the importance of vocabulary and comprehension should not be underestimated. Fluent and proficient reading relies on a sound linguistic base including semantic, syntactic, and pragmatic knowledge (Adams & Snowling, 2001; Morrison, Bachman, & Connor, 2005). For example, knowing the meaning of words can help children comprehend what they are reading (R. C. Anderson & Freebody, 1981; Juel, 1988). For example, of several oral language skills, including expressive and receptive vocabulary, receptive vocabulary was the sole unique predictor of letter–word reading after controlling for age and intelligence in a study of fourth graders, suggesting it plays a special role in helping children access their word knowledge while reading (Ouellette, 2006). In the present study, we control for students’ receptive vocabulary skills while assessing the effect of classroom organization on word reading growth over the first-grade year.
Classroom influences on letter–word reading

Substantial efforts have identified effective language arts instructional techniques for improving students’ reading, specifically letter–word reading skills (Chapman et al., 2001; Hempenstall, 1997; National Reading Panel [NRP], 2000a; Pinnell, Lyons, DeFord, & Bryk, 1994). Studies demonstrate that explicit decoding instruction contributes to significant growth in word reading (NRP; Rayner et al., 2001). Other work reveals that the literacy areas in which children are instructed are those in which they make the most progress (Christian, Bachman, & Morrison, 2001). Finally, interactions among children’s skills and the amount, type, and timing of instruction they receive mean that what counts as good instruction for one child may not work as well for another child (Juel & Minden-Cupp, 2000). For example, students with relatively weaker word reading skills demonstrate greater gains when they receive substantial amounts of teacher-led instruction that make explicit the connections between letters and sounds, including rhyming, phonics, and alphabet activities (Connor et al., 2004; Walpole, Justice, & Invernizzi, 2004).

Rationale and hypotheses

Effective instruction and classroom organization interact with and depend upon each other. Considerable work has linked organization and instruction, as well as instruction and word reading, and the significance of organization for learning to read seems evident. Based on prior evidence, we take the theoretical position that organization encourages self-regulation (and subsequently, reading outcomes) by making classroom procedures and activities transparent so that students can take responsibility for their learning (Brophy, 1985; Pressley et al., 2001). Less is known about empirical relations between organization and the development of reading skills. The present observational study directly assesses the extent to which organization contributes to word reading.

Concretely, we examined whether the amount and timing of classroom organization uniquely predicted growth in letter–word reading in first grade. We posed the following research question and hypotheses:

What is the relation between amount of time in classroom organization, and when during the school year this time is spent, and students’ word reading skill growth? We hypothesize that both the overall amount of time spent and the specific timing, represented by slope (change in amount over the school year from fall to spring) of organization activities will account for growth in children’s word reading skills. We also expect that children with higher vocabularies and word reading skills in the fall will exhibit stronger word reading skills at the end of the year than will children with lower vocabulary skills.

Based on the extant research, we anticipate that after controlling for child characteristics and language arts instruction, students whose teachers spend more time in organization will demonstrate greater word reading skill growth than will students whose teachers spend less time in this activity. In addition, we predict that students in classrooms that concentrate more time in organization in the fall (i.e., negative slope) will demonstrate greater word reading growth, compared with students in classrooms that have consistent amounts of organization throughout the year (i.e., small or zero slope), or which increase the amounts of time in these activities over the course of the school year (i.e., positive slope).
Because good organization is intertwined with effective instruction, and both can be difficult to measure, we expect the unique contribution of organization to word reading to be relatively modest, especially after controlling for children’s literacy status at the beginning of the year. Finding effects for classroom practices is especially challenging when teacher practices are just one part of an entire community that promotes literacy, as in many school districts (including the one in this sample) serving primarily middle- to high-SES families (Raudenbush, 2004). However, in order to assess whether and the extent to which organization has a discernable, independent effect on end-of-year word reading, it is important to control for child and classroom characteristics, including beginning word reading, vocabulary, child SES, and number of classroom minutes spent in language arts instruction.

Method

Data were collected in three waves during a 3-year longitudinal study that investigated multiple sources of influence on children’s literacy development. Classroom observations took place in five schools in the same district, located in the urban fringe area of a large Midwestern city. The district reported using a whole language literacy curriculum. The area was home to a large private university and included considerable cultural and socio-economic diversity. Twenty-six teachers in 44 first-grade classrooms and 108 of their students participated. Parents of child participants also completed a questionnaire at the beginning of the study, where they provided information about demographic characteristics, including maternal education.

Participants and child measures

All children in the district were recruited to participate in the study until the target number of participants was reached. Recruitment efforts resulted in 108 child participants for the present study (1 to 5 per classroom). The demographic composition of the sample was comparable to that of the entire school district: 65 students were White (60%), 38 were Black or of mixed background (35%), 3 were Hispanic (3%), and 2 were Asian (2%). Forty-four percent, or 47 students, were girls. The average maternal education was a 4-year college degree with a standard deviation (SD) of 3.11 years, ranging from 3 to 23 years.

Children were assessed on a battery of language and literacy measures in the fall and again in the spring. The Peabody Picture Vocabulary Test-Revised (PPVT; Dunn & Dunn, 1987) and the Reading Recognition Subtest of the Peabody Individual Tests of Achievement-Revised (PIAT-R; Markwardt, 1989) were used to assess children’s receptive vocabulary and word reading skills, respectively. In the PPVT-R, children are presented with four drawings on a page and asked to point the picture of (a) ______. The words, which are stated by the examiner, represent nouns, adjectives, or verbs, and increase in difficulty as the child progresses. In the PIAT-R, children are asked to identify letters, sound–symbol correspondence, and read actual words. Descriptive statistics for fall and spring word reading and vocabulary raw scores are presented in Table 1; raw scores were used in all analyses.
Classroom observations

Each classroom was formally observed by a research assistant three times during the academic year (fall, winter, and spring) for an entire school day. Observers arrived in the morning, before school began, and concluded the observation when children left at day’s end. The range of time classrooms was observed was 6.1 to 6.8 h in the fall and winter, and 6.2 to 6.8 h in the spring. The average time spent in observations was 6.4 h at each time period. Observations were scheduled on days when there were no specials, such as art, gym, or music, and when the usual classroom teacher was present (i.e., no observations of substitute teachers were conducted). Researchers recorded every activity in which the majority of the class participated for 1 min or longer. In this study, we used number of minutes in an activity as variables, rather than proportions, because observations lasted all day and lasted consistent amounts of time. Thus, number of minutes spent in activities was an accurate representation of both the absolute and relative amounts of instruction provided.

The observation method was adapted from Durkin’s (1987) procedure requiring observers of kindergarteners to use pre-determined activity codes. In the present study, observers found from pilot work that keeping a written narrative in their own words was more efficient and reliable than trying to recall specific labels for activities while they were observing. Describing actual minute-by-minute activities also allowed for flexibility when narratives were later coded for content and type of instruction.

Training and observation procedures were designed to minimize observer bias. One week prior to the start of the fall observation period, two researchers observed for a half-day in a classroom not enrolling study participants. Observers compared written narratives documenting classroom activities and time in those activities at the conclusion of the pilot observation. Agreement between observers, calculated by dividing activity agreement minutes by agreement plus disagreement minutes, was at or above 95% for narrative (what activity occurred) and time (number of minutes it occurred) across activities. After the pilot observations, a single researcher observed in each classroom, and multiple observers conducted observations each year to minimize the influence of expectation on observer objectivity.

Coding the narratives

After data collection, two independent research assistants coded the narratives into categories, which included instructional and general (including organization) classroom activity. Inter-coder reliability on the nature of classroom activities, calculated by dividing coded agreement minutes by agreement plus disagreement minutes, was 86%. Of 19 main

<table>
<thead>
<tr>
<th>Scores</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall word reading</td>
<td>23.27</td>
<td>13.14</td>
<td>2–70</td>
</tr>
<tr>
<td>Fall vocabulary</td>
<td>83.85</td>
<td>15.71</td>
<td>48–119</td>
</tr>
<tr>
<td>Spring word reading</td>
<td>39.63</td>
<td>15.22</td>
<td>7–81</td>
</tr>
<tr>
<td>Spring vocabulary</td>
<td>91.91</td>
<td>15.58</td>
<td>57–126</td>
</tr>
</tbody>
</table>

Note. Vocabulary and word reading are raw scores on the PPVT-R and PIAT-R, respectively.

Table 1
Descriptive statistics for child variables (N=108)

activities, 12 were related to instruction, and the remaining 7 were common classroom activities that did not include academic instruction (e.g., organization, lunch/snack/nap, and discipline). Observation and coding procedures were designed to capture typical experiences for all the children in the classroom, and therefore are considered classroom-level variables when used in Hierarchical Linear Modeling (HLM; Raudenbush & Bryk, 2002).

Classroom activities

The variable of classroom organization, coded “orient-organize,” comprises time spent by the teacher orienting the students to a new assignment or organizing the class for upcoming events of the day or week. Organization emerged as an important activity in which many classrooms spent significant amounts of time, and included instructional clarity, namely giving explicit directions about activities and expectations, as well as what students should do after completing assignments, and what the class would do later in the day. Organization also encompassed time the teacher spent describing plans for the next day and plans for later in the week. Organization did not include explicit information or explanations about curriculum content. Instead, codes for organization focused on the procedures, goals, and purposes behind the academic content activities. We used number of minutes in organization for each measurement period (fall, winter, and spring) in analyses.

Language arts instruction was coded during all instructional activities related to literacy. Activities included explicit literacy instruction, teacher book-readings, independent work (e.g., Sustained Silent Reading), and discussions about language, literacy skills, or texts. Instruction in other content areas (including social studies, science, and math) was not included in language arts instruction.

Results

Analytic strategy

Because 108 children were nested in 44 classrooms, we used a multi-level modeling program, HLM 6.02 (Raudenbush & Bryk, 2002), which properly estimates standard errors when data measured at one level (child) share variance at another level (classroom). To describe classroom time in organization, we obtained two parameters estimated with a growth curve analysis, also using HLM: (a) amount of time in minutes per day, and (b) slope, or change over time, in minutes per month. Three observations were nested in each classroom; we therefore modeled the variables of organization and total language arts instruction in a two-level model depicted in the equations below, with observation at level 1 and classroom at level 2.

Level 1

\[ Y_{jt} = \pi_{0j} + \pi_{1j}M_{jt} + e_{jt} \]  

(1)

Level 2

\[ \pi_{0j} = \beta_{00} + r_{0j} \]
\[ \pi_{1j} = \beta_{10} + r_{1j} \]  

(2)
Y_{jt}$, the amount of time spent in organization (or language arts instruction) for classroom $j$ at time $t$, is calculated based on the systematic growth trajectory plus random error ($e_{jt}$) at level 1, with $M_{jt}$ as the month at time $t$ in which classroom $j$ was observed (centered at the winter). It was assumed that $e_{jt}$ was independently and normally distributed with a mean of zero and constant variance. $\pi_0$ depends upon the mean amount of time in organization for all classrooms ($\beta_{00}$), plus error for individual classroom $j$ ($\tau_{0j}$). Similarly, ($\pi_1$) is the mean change over time (i.e., change over the three observations or slope) in organization for all classrooms, plus error for classroom $j$’s slope. Together, the equations in (2) comprise (1), which represents the average growth trajectory. Thus two new variables — amount of time and change over time — are obtained.

Specifically, we used empirical Bayes residual variables, which are full maximum likelihood estimates of classroom parameters (i.e., fitted values) subtracted from the observed data (Johnson & Wichern, 2002; Raudenbush & Bryk, 2002). These variables represented each classroom’s difference from the average amount of time spent in organization and language arts instruction in the winter, and difference from the average slope (change over time) in organization centered in the winter. Fitted values are presented after the actual average of minutes spent in activities in Table 2. We used these modeled values as classroom-level predictors of the child-level word reading outcome, and chose winter centering to stabilize the models (Raudenbush & Bryk, 2002). Thus we could assess the independent effects of amount of time (min/day) spent in organization and slope of organization (change over time in min/month) on children’s word reading skill growth, while also considering language arts instruction amount (min/day). Equations are presented next for amount of time in organization.

Level 1

$$Y_{ij} = \beta_{0j} + \beta_{1j}(\text{ fall word reading})_{ij} + \beta_{2j}(\text{ fall vocabulary})_{ij} + r_{ij}$$ (3)
Level 2

\[
\beta_{0j} = \gamma_{00} + \gamma_{01} \text{ (organization amount)} + \gamma_{02} \text{ (total language arts instructions)} \\
\beta_{1j} = \gamma_{10} \\
\beta_{2j} = \gamma_{20} + \gamma_{21} \text{ (total language arts instruction)} + \upsilon_{2j}
\]

\( (4) \)

Spring word reading is the predicted outcome for child \( i \) in classroom \( j \), represented by \( Y_{ij} \). This outcome is comprised in Eq. (3) of the average spring decoding score (\( \beta_{0j} \)), plus the effect of child \( i \)’s fall word reading (\( \beta_{1j} \)) and fall vocabulary (\( \beta_{4j} \)) scores, plus Level-1 error for child \( i \) (\( r_i \)). Initially, child-level variables also included maternal education, but it was not a significant predictor of spring word reading, and so was not analyzed in the final model.

The average spring word reading score of \( \beta_{0j} \) is expressed at Level-2 in Eq. (4) as the grand mean for all classrooms (\( \gamma_{00} \)) plus the effect of organization amount in child \( i \)’s classroom (\( \gamma_{01} \)), plus the effect of total language arts instruction (\( \gamma_{02} \)). The effect of organization amount and change over time did not vary at the classroom level, so we fixed the error term in both models. Children’s fall word reading scores also did not vary at the classroom level, and so fall word reading was expressed as a fixed effect, as the average for all classrooms (\( \gamma_{10} \)). However, in preliminary analyses we found significant classroom-level variation in fall vocabulary scores; therefore, the effect of fall vocabulary is expressed as the mean for all classrooms (\( \gamma_{20} \)), plus the effect of total language arts instruction (\( \gamma_{21} \)), plus error for the individual classroom (\( \upsilon_{2j} \)). Finally, we tested a second model, substituting organization slope where organization amount appears.

We did not include amount and slope in organization in the same model because of multi-collinearity. That is, in the growth curve analyses, organization amount and change over time were significantly negatively correlated, \( r = -0.99 \), so we could not determine the independent effect of amount of organization on word reading, controlling for slope (and vice versa). Thus we ran two separate models consisting of the same predictors, except for the organization variable (we consider the meaning of this correlation in the discussion section). The following variables were significant unique predictors (\( p < .05 \)) in these two models of children’s word reading skills at the end of first grade: child-level variables of fall word reading and fall vocabulary scores, as well as classroom-level variables of amount of organization (min/day) and slope, or change over time (min/month) in organization. The interaction between amount of language arts instruction with child fall vocabulary interaction was marginally significant, \( p = 0.056 \), but because it was theoretically relevant, it was retained in the final model. Next we report the child- and classroom-level significant effects, using statistics from the model with organization amount.

**Child effects — vocabulary and word reading**

As hypothesized, children’s fall word reading and vocabulary scores significantly positively predicted their spring word reading scores (see Table 3). Children who scored higher in the fall on both word reading and vocabulary had higher spring reading scores than did their peers with lower fall scores. That is, a child who scored 1 SD above the fall
word reading mean of 23.27 earned a word reading score 11.04 points above the average spring word reading score, or about 51 instead of 40, t(102)=0.84, p<.01, d=0.73. Similarly, for every 1 SD scored above the average fall vocabulary score of 83.85, that child earned a word reading score in the spring 3.14 points above the mean, or about 43 instead of 40, t(102)=0.20, p<.01, d=0.21.

**Classroom effects — organization amount, change over time, and language arts instruction**

For the classroom-level predictors, we report the results of two separate models of word reading growth, one for amount of organization and another for slope, or change over time in organization. Results reflect effects above and below the overall mean amount and slope in organization. Both models include the interaction between amount of language arts instruction and child fall vocabulary.

**Amount of organization**

After taking into account child-level predictors, we hypothesized greater amounts of time each child’s classroom spent in organization would be associated with higher spring word reading scores. In support of this hypothesis, we found that an increase in minutes spent in classroom organization was associated with an increase in students’ word reading scores in the spring, controlling for fall score (see Table 3). Specifically, for a child with a fall word reading score equal to the average, being placed in a classroom spending 1 SD, or 4.34 min above the average number of minutes in organization in the winter (the mean was 22 min, so 26.3 min), was associated with a 1.30-point increase above the average spring word reading score, β=0.30, t (102)=2.20, p< .05; d=0.09.

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Table 3

Modeling the effect of amount of organization on word reading growth (N=108)

<table>
<thead>
<tr>
<th>Fixed effects</th>
<th>Coefficient</th>
<th>t-ratio</th>
<th>Approx. df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>For spring word reading score, β0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean word reading score, γ00</td>
<td>39.34</td>
<td>56.88</td>
<td>102</td>
<td>0.000</td>
</tr>
<tr>
<td>Effect of amount of time in organization, γ01</td>
<td>0.30</td>
<td>2.20</td>
<td>102</td>
<td>0.03</td>
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<tr>
<td>Effect of total language arts instruction, γ02</td>
<td>-0.01</td>
<td>-0.09</td>
<td>102</td>
<td>0.93</td>
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<tr>
<td>For children’s fall word reading score, β1</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Effect, γ10</td>
<td>0.84</td>
<td>15.08</td>
<td>102</td>
<td>0.000</td>
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<tr>
<td>For children’s fall vocabulary slope, β2</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effect, γ20</td>
<td>0.20</td>
<td>2.97</td>
<td>42</td>
<td>0.005</td>
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<tr>
<td>Interaction with total language arts instruction, γ21</td>
<td>0.01</td>
<td>1.96</td>
<td>42</td>
<td>0.056</td>
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</table>

Random effects

<table>
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<th>Standard deviation</th>
<th>Variance component</th>
<th>df</th>
<th>x²</th>
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</thead>
<tbody>
<tr>
<td>Fall vocabulary, μ2</td>
<td>0.21</td>
<td>0.04</td>
<td>41</td>
<td>55.00 a</td>
</tr>
<tr>
<td>Level-1, r</td>
<td>8.69</td>
<td>75.44</td>
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</tr>
</tbody>
</table>

*p=.07.

In a separate analysis modeling fall vocabulary, we found significant level-2 variation. We thus left this error random in the current model and accepted a marginal level of significance.
Although we prefer the model with winter centering, with its improved stability, we ran the same model with organization amount centered at the fall and found similar results. However, the modeled SD was larger for organization in the fall, at 10.82 versus 4.34 min in the winter. Therefore, in the fall, practicing about 11 min more than the fall average of 25 min was associated with an increase in decoding score even larger (by 0.32*10.82=3.46 points) than that found in the winter, $\beta=0.32$, $t (102)=2.32$, $p<.05$, $d=.23$. In other words, classrooms spending about 36 min in organization in the fall, decreasing to 26 min in the winter, had students with significantly higher decoding scores in the spring, controlling for fall score and total language arts instruction.

**Change over time in organization**

We then directly assessed the effect of change over time in organization, or slope in minutes per month, and found that it also significantly predicted spring word reading scores. This effect was negative, meaning a child in a classroom that started with high amounts of organization in the fall, which decreased as the year went on (i.e., negative slope), scored higher in spring word reading relative to students in classrooms with a flat or positive (i.e., increasing) slope (see Table 4). The spring outcome for the same child with an average fall reading score placed in a classroom that, instead of demonstrating the overall average change of $-0.92$ min per month, decreased time in organization 1.6 min per month (a negative slope, $-1.6$), scored 1.28 points above the mean spring word reading score, $t (102)=-1.88$, $p<.05$; $d=.08$.

**Language arts instruction**

Contrary to expectation, there was no significant main effect for amount of language arts instruction on spring word reading scores. Amount of language arts instruction did, however, interact with children’s fall vocabulary scores to impact word reading skill growth at a marginal level of significance, $t (42)=1.96$, $p=.056$. Specifically, as daily language arts instruction increased, students with higher fall vocabulary scores earned higher spring word reading scores, whereas students with lower initial vocabularies earned lower word reading scores at the end of the year. This interaction is shown in Fig. 1.

**Variance explained**

The amount of variance explained in the final model shown in Table 5 was assessed by considering level-1 variance for the fully unconditional model (no predictors), within-classroom (child-level predictors only) and fully conditional (child- and classroom-level predictors) models. Variance estimates for these three models are displayed in Table 5.

The amount of variance in spring word reading explained by the within-classroom model was 65.7%. The variance explained by the fully conditional model was 67.1%. Thus, adding the classroom-level variables of organization amount and total language arts instruction explained 1.4% of unique variance. A linear hypothesis test in HLM for the unique effect of organization amount was significant, $\chi^2=4.86$, $p=.03$, which demonstrated that including organization significantly improved the final model’s fit to the data.
Taking these results together, students in classrooms that spent greater amounts of time in organization, along with sharply decreasing amounts over time (a pattern produced by spending more time in organization early in the school year and then decreasing minutes in this activity over time) exhibited significantly greater spring word reading scores, controlling for fall status. This stands in contrast to students in classrooms spending less

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**Figure 1.** Fall vocabulary × language arts instruction interaction effect on spring word reading (organization amount model). All variables centered at the winter.
time initially in organization and that either maintained or increased the amount of time in organization activities over the course of the school year; these children demonstrated less growth in letter–word reading, on average. In addition, language arts instruction interacted with students’ fall vocabulary at a level of marginal significance, such that the effect of more time in language arts was associated with stronger decoding scores for participants with higher levels of fall vocabulary, and weaker scores for those with lower fall vocabulary levels.

The effect size of organization associated with spring word reading was small when considered one day or one month at a time. Actual classroom differences, however, likely accrued over the school year, reflecting varying patterns of organization with implications of greater magnitude. Fig. 2 depicts modeled fall-to-spring word reading trajectories for students with average fall word reading and vocabulary levels in classrooms exhibiting average, less effective, and more effective patterns of organization over 4 months. Average classrooms exhibited the mean change in organization per month ($-0.92$ min/month); students in these classrooms made average progress, gaining 16 points by spring. In contrast, students in less effectively organized classrooms, which decreased organization only $0.24$ min/month for 4 months, gained 11 points. Finally, students in more effectively organized classrooms, which decreased organization $1.6$ min/month for 4 months, gained 21 points. Remember that slope and amount of organization were strongly negatively correlated, so a classroom with a negative slope also practiced greater initial amounts of organization. Comparing these trajectories demonstrates that after 4 months of being in classrooms 1 SD above or below the mean rate of monthly change, students’ expected

<table>
<thead>
<tr>
<th></th>
<th>$r$ (child-level) variance component</th>
<th>$\mu$ (classroom-level) variance component</th>
<th>Deviance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully unconditional model (no predictors)</td>
<td>229.43</td>
<td>0.30</td>
<td>893.65</td>
</tr>
<tr>
<td>Child-level predictors only</td>
<td>78.62</td>
<td>0.04</td>
<td>789.00</td>
</tr>
<tr>
<td>Child- and classroom-level predictors, using organization amount</td>
<td>75.44</td>
<td>0.04</td>
<td>785.00</td>
</tr>
</tbody>
</table>
spring scores differed by 10 points, with the highest scores observed in classrooms with greater negative slopes (and higher initial amounts).

Discussion

We observed two patterns of organization: (a) teachers spending greater amounts of time in organization in the fall, who tended to provide substantially less time in organization by winter and spring, and (b) teachers spending less time in organization activities in the fall, who tended to spend the same or more time later in the year. Students in classrooms exhibiting pattern (a) demonstrated significantly greater gains in word reading skills than did students whose teachers exhibited pattern (b).

These results provide empirical support for the importance of establishing classroom rules and routines early in the year. There are a number of reasons the pattern of high amounts of organization in the fall with decreasing amounts by winter and spring might be associated with stronger reading outcomes. Most likely, children spend more time in academic learning activities in more organized classrooms than they do in less organized classrooms. The extant research clearly reveals that more time to learn is associated with greater learning (Guthrie et al., 2001; Limbrick et al., 1992). In addition, because the expectations for learning and behaving in the classroom are established early on, children may more quickly begin to take ownership of their learning so that later in the school year they can spend more time in independent instructional activities (Cameron et al., 2005), which have been associated with greater literacy gains (Connor et al., 2004). Teachers who demonstrate optimal organization patterns may also teach more effectively overall (Wharton-McDonald et al., 1998). However, it is not possible, with this correlational study, to disentangle these various explanations for the association between organization and student learning, and the effect is likely a combination of factors.

We found a marginally significant, but theoretically important, interaction between time spent in language arts and children’s fall vocabulary. Children who began first grade with stronger vocabulary skills demonstrated greater word reading skill growth in classrooms that spent more time in language arts activities. In contrast, for students with weaker fall vocabulary skills, language arts instruction had little or even a negative impact on their word reading skills. As discussed previously, the instruction practiced in these classrooms was typical of a whole language curriculum, which tends to be more effective for students with stronger vocabulary skills (Connor et al., 2004; Hempenstall, 1997). Such child X instruction interactions appear to be causally related to the wide variability in instructional efficacy found within and between classrooms (Connor, Morrison, Fishman, Schatschneider, & Underwood, 2007). Thus individualizing instruction rather than taking a one-size-fits-all approach should tend to promote student achievement. It is also possible that teachers who spend more time organizing their students’ learning opportunities are more likely to individualize instruction.

The small effect sizes reported for daily amounts of organization and for language arts instruction deserve attention. It was vital to include fall word reading and receptive vocabulary, but these two variables accounted for most of the variance in students’ spring word reading scores, leaving little left to be explained by classroom-level predictors (Raudenbush, 2004; Whitehurst & Lonigan, 2001). In addition, the observation system,
while reliable and incorporating three full day observations, certainly generated variables that included measurement error. Such error will reduce the effect sizes found. Moreover, computing effect sizes for continuous variables can be misleading, because the effect size depends on the metric used. In this case, the effect sizes for one minute per day of time spent in organization, or one minute of change per month, were quite small. However, assuming (rather reasonably) that patterns of organizational activity extended over the school year, these accumulated into larger differences in outcomes when we contrast students in organized versus less organized classrooms for the first four months of the school year. Thus there was a considerably larger practical effect of organization on student learning (see Fig. 2).

With regard to the language arts variable, this variable was comprised of all language arts activities, which was most likely too gross an indicator to harness the predictive strength of different types of literacy instruction. Other research with this sample has revealed greater effect sizes as well as child X instruction interactions (Connor et al., 2004). Because we were primarily interested in teachers’ organizing behaviors, it was beyond the scope of this study to assess the differential effects of specific language arts instructional types on word reading growth. Moreover, sample size limited the number of classroom predictors we could include in our models (Raudenbush & Bryk, 2002).

**Scientific and practical implications**

Despite limitations, this study provides evidence that teacher organization is independently associated with first-grade word reading. Analyses controlled for initial word reading and vocabulary, as well as language arts instruction, and form a basis for future investigation employing a more rigorous (i.e., experimental) design. Thus one future hypothesis to test is that teacher organization functions to create efficient and effective instructional time by improving child self-regulation, which then promotes reading achievement (Arlin, 1979; Brophy, 1983; Perry, Nordby, & VandeKamp, 2003). Intervention research on self-regulation has demonstrated that teaching students to monitor and manage their behavior helps maintain on-task and engaged classroom behavior and promotes social and academic competence (Rimm-Kaufman & Chiu, 2007; Rock, 2005). A large-scale intervention study that incorporates classroom- and child-level training — especially in student behaviors such as persisting at tasks, seeking help, and attending to instruction — would clarify the nature of relations among instruction, organization, self-regulation, and literacy achievement. Such an explicit and systematic research focus on organization as it relates to reading development, like that associated with reading instruction (NRP, 2000b), would help determine where to concentrate intervention and teacher preparation efforts.

Continued investigation of interactions among aspects of learning environments and child characteristics also appears warranted. Although our study reveals that more organization early in the school year, decreasing as the school year progressed, is uniformly related to growth in children’s word reading skills, we still do not know much about the effect of different types of organization (for example, organization for classroom processes versus instructional activities). These may have differential impacts on outcomes. In this study, all types of organization were identified as the same general activity, called “orient-
organize.” Future work will distinguish among organization subtypes and evaluate differential effects on student outcomes. For instance, most children likely benefit from organizational information about general classroom rules and procedures, but fewer students may require detailed information about upcoming activities, perhaps as a function of their self-regulation or academic skill levels.

Another direction for future inquiry lies in identifying sources of variation in organizational environments. Characteristics of the classroom or teacher may play a role in determining levels of organization (Wharton-McDonald et al., 1998). For example, in one study, teachers with more experience were flexible and consistent managers, whereas novices were more likely to continue with a lesson as planned even when children exhibited off-task behavior (Emmer & Stough, 2001). In addition, two unmeasured variables in this investigation — the number of students in a classroom, and students’ ability to self-regulate their behavior (Cameron et al., in press; McClelland et al., in press) — may influence the extent to which organizational practices are instituted. Teachers of many students may make a concerted, conscious effort to orient all their students early and indeed, teachers of larger classes appear to spend more time on rules and procedures compared to teachers of small classes (Blatchford, Moriarty, Edmonds, & Martin, 2002; Mosteller, 1995).

Implications for classroom management and teacher training follow recommendations from experts in the area (Brophy, 1988; Emmer & Stough, 2001; Evertson et al., 1983). Our findings reiterate the significance of spending time on organizational activities early in the school year and also show that teachers need support in their efforts to create and maintain effective learning environments (Hart, 1982; Walpole et al., 2004). Emmer and Stough (2001) advise formal training in classroom organization and management, but many teacher education programs do not offer specific courses in this topic (Gelman, McDuffie, & Visser, 2007). Again, random field trials to test the causal role of organization in enhancing student learning are needed. Set against the current national climate, which heavily emphasizes maximizing time spent in instructional activities, this study reflects organization as an additional crucial element of classroom functioning. Good classroom management appears to bolster instructional efforts and enhance achievement (Brophy, 1985; Perry et al., 2003; Wharton-McDonald et al., 1998). Moreover, in the present study, organization uniquely predicted students’ word reading skill growth even after taking into account the contribution of language arts instruction, implying a value-added effect of good classroom organization.

Conclusion

In this study we reported findings from an investigation of first-grade progress in word reading, a foundational skill important for literacy acquisition (Rayner et al., 2001). Children in classrooms where teachers spent more time in organization at the beginning of the school year, and sharply decreased the amount of time spent in this activity as the school year progressed, demonstrated stronger word reading skills at year’s end, relative to students in classrooms with less organization that did not decrease over the year. Moreover, organization predicted students’ word reading skill growth after controlling for the contribution of language arts instruction. Our findings add specificity to a long-accepted notion in education circles: Namely, an organized, consistent classroom setting, in which
assignments and expectations are clear at the beginning of the school year, provides greater opportunities for literacy learning and success for all students.

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