



Within-teacher differences in one-to-one teacher–student interactions in instrumental music lessons



Elisa Kupers^{a,*}, Marijn van Dijk^b, Paul van Geert^b

^a Department of Pedagogy and Educational Sciences, University of Groningen, The Netherlands

^b Department of Developmental Psychology, University of Groningen, The Netherlands

ARTICLE INFO

Article history:

Received 19 November 2013

Received in revised form 28 July 2014

Accepted 7 November 2014

Keywords:

Scaffolding

Teacher–student interactions

Complex systems

ABSTRACT

The aim of this study was to look at within-teacher differences in scaffolding behaviors and patterns over longer periods of time. We analyzed scaffolding on different levels of increasing complexity, ranging from frequencies of scaffolding behaviors to measures of the variability of the teacher–student scaffolding interactions. We tested whether the scaffolding behaviors and patterns were systematically different when the same teacher interacted with four different students, and whether these patterns changed over the course of 18 months. Overall, the findings confirm that differences in scaffolding patterns in the interaction with different children exist, especially between the high-performing student and the other below-average performing students. Specifically, the teacher–student interaction with the high-performing student showed higher levels of contingent scaffolding and more intra-individual variability in the interactional patterns. In general, little evidence was found for systematic increases or decreases of scaffolding quality and intra-individual variability measures over time.

© 2014 Elsevier Inc. All rights reserved.

1. Introduction

The aim of this paper is to investigate the differences in one-to-one scaffolding interactions of four students and one music teacher, in order to discover how differences in overall characteristics between students play a role in learning in the here-and-now. We conceptualized the student–teacher interactions on different levels, namely in terms of frequencies of teacher and student behaviors, in terms of one-lag sequences and in terms of the structure of the whole time series within each lesson.

1.1. Defining scaffolding

“The most important single factor in learning is what the learner already knows. Ascertain this and teach him accordingly” (Ausubel, 1968, p. iv).

This assumption summarizes a fundamental principle of teaching, which is that the teacher adapts his or her instruction to the level of the student. This principle is central to constructivist teaching in general and scaffolding in particular. In learning, based on the theory of Vygotsky (1978), scaffolding refers to temporary support by an adult to help the child complete a task that is just beyond the current level of the child (Granott, Fischer, & Parziale, 2002; Wood, Bruner, & Ross,

1976). After successful scaffolding, the support can be toned down so that the child can function independently at a higher level.

Attention for the concept of scaffolding in educational research has been increasing over the past decades, but its use tends to be overgeneralized (Puntambekar & Hubscher, 2005). The problem is that the term is increasingly being used as a synonym for ‘support’ (such as hints and feedback by the teacher), while the original definition of scaffolding is more specific and describes how teachers *adapt* their support or level to what the student is showing at one particular moment in time. This also implies that not all teacher–student interactions can be called ‘scaffolding’. For the remainder of this article, we will use the term scaffolding when referring to interactions where the teacher adapts his or her level to the student, and the more neutral term ‘interactions’ in cases where the transactions might be either adaptive or non-adaptive.

The focus of the current study is on contingency, which is a central mechanism in scaffolding. Contingency implies that the teacher adapts his or her teaching level to the performance level of the student, and that, as a result, the student’s level increases (Van de Pol, Volman, & Beishuizen, 2009; 2010; Van Geert & Steenbeek, 2005). This teaching level can be conceptualized as the assignments that the teacher gives, the type of support that the teacher provides through asking questions, etcetera. Importantly, the levels of these ‘scaffolds’ are assigned in the same way that a level of skills or knowledge is assigned to the student’s response to these tasks. The levels of the student and the teacher are dynamically coupled (Van Geert & Steenbeek, 2005) and there is an optimal distance between the two. If this distance is too large, the student will not be able to pick up the instruction, but if the distance is too small,

* Corresponding author at: Grote Rozenstraat 38, 9712 TJ Groningen, The Netherlands
E-mail addresses: w.e.kupers@rug.nl (E. Kupers), m.w.g.van.dijk@rug.nl (M. van Dijk), p.l.c.van.geert@rug.nl (P. van Geert).

the student will not be able to learn anything new. This optimal distance is not a fixed property, but can be different for different students (Steenbeek & van Geert, 2006). The process of scaffolding also implies a coupling of timescales: Long-term learning and teaching outcomes emerge out of moment-to-moment interactions, and these same long term outcomes or 'distal factors' restrict the range of future real-time interactions (Van Geert & Steenbeek, 2005).

1.2. Individual differences in educational interactions

Many studies show that contingent scaffolding is related to positive learning outcomes, such as improved metacognitive skills (Azevedo, Cromley, Winters, Moos, & Greene, 2005; Mercer, Dawes, Wegerif, & Sams, 2004) and improved cognitive representations (Murphy & Messer, 2000). This effect can disappear if the teacher's scaffolding of a smaller group of students is detrimental to the on-task behavior of the other students who are left more to their own devices (Van de Pol, 2012).

Although scaffolding appears to be an effective teaching method in general, there are large differences in the extent to which teachers actually apply contingent scaffolding in everyday educational practice. Research has shown that these differences can be attributed to the varying levels of teachers' expertise (Borko & Livingston, 1989; Meyer, 2004) or individual teacher's attitudes (Suk Lee, Baik, & Charlesworth, 2006). The role of individual differences between students in teacher-student interactions has received much less attention. Pat El, Tillema, and Koppen (2012) found that individual differences in the students' sense of autonomy, competence and relatedness mediated the relationship between the instructional behaviors of the teacher and the motivation of the student. In a multiple-case study on dynamic assessment (a concept closely related to scaffolding), Ensing, Van Geert, Van der Aalsvoet, and Voet (2014) found that interaction patterns in kindergarten were different when the teacher interacted with two different children. More specifically, the children differed in the way they (tried to) elicit help from their teacher.

In sum, scaffolding centers around mutual adaptations between teacher and student that occur in the here and now of learning and teaching. Because of the coupling of the timescale with long-term development, we expect that differences in distal factors, such as student characteristics, are related to different patterns in teacher-student interactions.

1.3. Analyzing educational interactions from a dynamic point of view

Learning processes on the micro-level timescale are often characterized by complexity and nonlinear growth (Jörg, Davis, & Nickmans, 2007; Steenbeek & van Geert, 2013). Therefore, there is a need for research designs focusing on individual processes, i.e. the real-time processes that occur between a particular teacher and student(s), with dense observations over time (Kupers, Van Dijk, McPherson, & Van Geert, 2014). These dense measurements allow us to analyze not only the *content* of the teacher-student interaction, but also at its temporal *structure*, for instance in terms of intra-individual variability over time (see also Mainhard, Pennings, Wubbels, & Brekelmans, 2012).

According to complexity-based theories of development and learning, intra-individual variability is a fundamental characteristic of development. Variability allows a system (for instance, the teacher-student dyad) to explore different ways of adapting to one another. This exploration is necessary in finding a new, optimal state (van Dijk & van Geert, *in press*; Thelen & Smith, 1994). Long before the introduction of complexity-based theories, Skinner (1950; 1981) pointed at intra-individual variability as a core principle of learning. According to Skinner, behavior spontaneously varies over time. The variations that are reinforced through the environment are more likely to re-occur in the future (operant conditioning).

The empirical literature on variability and learning shows that an increase of variability (or disorder) is often an indicator of a developmental transition. For instance, children showed more variability in the number of errors they made just before discovering a new strategy to address a matrix-completion task (Siegler & Svetina, 2002). Research that addresses variability in real-life classroom settings (contrary to laboratory settings) is relatively scarce (Mainhard et al., 2012).

1.4. The current study

Because research on patterns in teacher-student interactions is scarce, our study will provide a first exploration of how to measure the relevant characteristics of microgenetic interaction patterns (including contingency and intra-individual variability) over time. This study tests whether several structural microgenetic measures allow us to differentiate between four students of a single teacher with highly different overall characteristics (e.g. students with varying levels of overall progress). Through this closer look at the differences in patterns at the micro-level, future studies will be able to better understand how interactional patterns within the lesson can contribute to different outcomes on the long term (Kupers, Van Dijk, McPherson, & Van Geert, 2014).

The aim of this study is to reveal the most important characteristics of the interaction patterns over time, such as the extent to which the interaction patterns are variable, and whether these patterns differ between students. One way of studying these structural aspects over time is by specifying the interaction in a state space, which is a collection of all the possible states of a system (Lewis, Lamey, & Douglas, 1999). The data of each teacher-student dyad can be plotted in a State Space Grid (SSG) (Lewis et al., 1999). The degree of movement across the SSG is an indicator of the variability of the interaction within one lesson.

Our study is conducted in the context of individual violin lessons, which is a highly relevant context for studying scaffolding, as learning to play a musical instrument requires many complex skills that have to be 'scaffolded'. Furthermore, individual music lessons provide continuous one-to-one communication, and therefore much opportunity to observe uninterrupted patterns of dyadic interaction.

1.5. Research questions

Main question: Are there systematic differences between the interactions of one teacher with different students?

The relevance of studying differences between students in interactional patterns is twofold. First, the pre-existing differences between students are expected to play a role in how the teacher might shape effective scaffolding. Second, different levels of overall progress emerge out of the repeated micro-level interactions.

We look at the within-teacher differences at levels of increasing complexity. At the most simple level (L1), we want to know whether the teacher and student behaviors are different for the different dyads. At the second level (L2), we will look at differences between interaction sequences, e.g. whether the teachers' *responses* to student performances differ and whether there is a difference in the extent to which these responses are contingent. And at the third (most abstract) level (L3), we will investigate differences in the *structure* of the interaction with different students with measures of intra-individual variability.

Sub questions:

1. Are there differences between students in the level of the teacher assignments during the lessons, and in the level of student performance on these assignments (L1)?
2. Are there differences between students in the amount of contingent sequences during the lessons (L2)?
3. Are there differences between students in the structure of the interaction patterns (L3)?

Download English Version:

<https://daneshyari.com/en/article/6845000>

Download Persian Version:

<https://daneshyari.com/article/6845000>

[Daneshyari.com](https://daneshyari.com)