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**The Situated and Distributed Nature of Teacher Effectiveness
Challenging Current Theories of Education Accountability and the Presuppositions they Carry**

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It feels as though we are at a point of inflection in theories of education accountability. The well-publicized limitations of value-added modeling (Amrein-Beardsley, 2012; Scherrer, 2011, 2014) have accountability systems bending away from the use of a single measure and embracing more robust systems that employ multiple measures of teacher “effectiveness”: value-added estimates, classroom observations, assessments of pedagogical content knowledge, portfolios, parent surveys, and so on. While these attempts are an improvement to systems that use a single measure, there remains one dubious presupposition: All of these measures presuppose that effectiveness is a general, portable trait possessed by individuals.

Rather than viewing effectiveness as a general, portable trait of an individual teacher, I suggest viewing effectiveness as being situated in a specific environment and as being distributed between individual teachers and the meditational structures that are a part of that environment. Theories of education accountability crafted from this perspective will be in better accord with what we know about human behavior in complex social environments. Below I describe the thrust of this suggestion.

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Situated Effectiveness: Effective at Teaching what?

Current accountability discussions presuppose that an effective teacher is effective at all aspects of his or her craft. But evidence would suggest otherwise. For example, Lockwood et al. (2007) found that effectiveness of teaching mathematics was situated in specific *types* of content (rather than the entire discipline). The researchers took a widely used standardized assessment and separated the questions into two subscales: (1) questions that ask students to execute procedures and (2) questions that ask students to problem solve.² They then investigated achievement outcomes for each subscale separately. In so doing, the researchers were able to differentiate a teacher's "effectiveness" at teaching mathematical procedures and his or her ability at teaching mathematical problem solving. They found that the two achievement outcomes lead to distinctly different teacher effects. In fact, Lockwood and colleagues reported that the variation of effectiveness within teachers *across subscales* was greater than the variation *across teachers*.³ This suggests that a teacher's effectiveness depends on *what types of questions* appear on a specific assessment (and, therefore, not a general trait). For instance, a teacher can be "effective" at teaching mathematical procedures and "ineffective" at teaching mathematical problem solving, and vice versa. Instead of being generalizable, estimates of teacher effectiveness are situated within a specific assessment.⁴

Findings from a study by Loeb, Soland, and Fox (2014) also illustrate the situated nature of effectiveness. Similar to the Lockwood et al. (2007) study, Loeb and colleagues separated student achievement outcomes into two subgroups. Instead of investigating a teacher's effectiveness at teaching a specific type of *content*, however, they investigated a teacher's

² The internal consistency reliability estimates of the subscales (.90) were nearly as high as the estimates for the full test (.94).

³ This finding held constant across a range of model specifications.

⁴ The same situated nature of effectiveness has also been found on Language Arts assessments (see Grossman, Cohen, Ronfeldt, & Brown, 2014).

effectiveness at teaching a specific type of *student*: The researchers measured a teacher's effectiveness at teaching English learners (ELs; students whose first language is not English) and compared it to his or her effectiveness at teaching non-English learners (non-ELs; students whose first language is English). They found some teachers are relatively more "effective" with ELs than with non-ELs and vice versa. This suggests that a teacher's effectiveness depends on *what type of student* he or she is asked to teach (and, therefore, not a general trait).

These findings begin to uncover the situated nature of effectiveness and beg the question, *how else is effectiveness situated?* We turn to literature from other fields to help build a theory that will help us investigate this question.

Situated Effectiveness: Effective at Teaching where?

As noted above, one presupposition of current measures of teacher effectiveness is the notion that effectiveness resides in an individual. Evidence from social science research on expertise leads to different conclusion. These studies suggest that, rather than being situated in an individual, effectiveness is situated in a specific context. For example, Huckman and Pisano (2006) studied the performance of surgeons as they moved from one hospital to another. The researchers found that surgeons' effectiveness was not stable from one context to another, even after controlling for type of procedure and type of patient. That is, surgeons' performance depended on *where* they were working. This lack of portability suggests that effectiveness does not necessarily travel across settings with an individual; rather, effectiveness is situated within a specific context.

This phenomena is gaining attention in the field of education (see Resnick & Scherrer, 2012). Early findings from studies that employ new statistical techniques that study the complex social interactions of teachers and their surrounding environments suggest that a teacher's

effectiveness, similar to a surgeon's effectiveness, depends on *where* he or she works, and thus is not necessarily a portable, individual trait.

Distributed Effectiveness: Effective Teaching with whom?

The notion that effectiveness does not necessarily reside in an individual is nicely captured in a study by Groysberg, Lee, and Nanda (2008). These researchers studied the performance of “expert” Wall Street research analysts when they left their current firm to go work at a comparable firm. The researchers found that the performance of the analysts significantly decreased when they switched firms. Similar to the Huckman and Pisano study discussed above, these findings suggest that effectiveness is situated in a specific context. But the Groysberg et al. study had an interesting twist. They found that the negative effect of switching firms was buffered when analysts moved with other team members. Thus, the Groysberg et al. study not only suggests that effectiveness is situated in a specific environment, but that it is also distributed among the actors in that environment.⁵

This phenomena is difficult to study in education—it is not common for teams of teachers to move to comparable schools at the same time. But advances in social network analysis have allowed for studies that illustrate how a teacher's effectiveness depends on *who* he or she works with (e.g., Moolenaar, 2012; Penuel et al., 2012).

Conclusion

Part of our job as educational researchers and policy makers is to develop conceptual systems that provide coherent explanations of the phenomena of our field (Greeno, 1997), and we need to reach agreement about the meanings of such terms as “effectiveness.” Acknowledging the situated and distributed nature of effectiveness forces us to ask, “Effective *at what, with whom,*

⁵ In the learning sciences this phenomena is known as distributed cognition (Hutchins, 1996) or distributed intelligence (Pea, 1993).

and *where*?” Current measures of teacher “effectiveness” shed no light on these questions, and are becoming less meaningful as we learn more about the situated and distributed nature of effectiveness. A principal aim of educational policy ought to be that of developing measures of effectiveness at a grain size other than the individual. In theories of education accountability, we should reorient the notion of effectiveness from something that is possessed by an individual to something that is achieved by a community.

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