**Supplemental Materials**

**Self- and Peer-Grading of Formative and Summative Assessments in 3rd through 12th Grade Classrooms: A Research Synthesis and Meta-Analysis**

**by C. E. Sanchez et al., 2017, *Journal of Educational Psychology***

**http://dx.doi.org/10.1037/edu0000190**

**Supplemental File A**

**Developmental and Attitudinal Influences on Self- and Peer-Grading**

**The Influence of Development on SPG**

Children’s understanding of intelligence and ability undergo changes during their development and these shifts in the conceptualization of ability may change how students grade themselves or peers. Children’s notion of global ability shifts to a normative conception of ability based on academic criteria as they develop ([Nicholls, Patashnick, & Mettetal, 1986](#_ENREF_62); [Räty, Kasanen, & Snellman, 2002](#_ENREF_70)). For example, young children include social behavior, work habits, and conduct in their definition of intelligence ([Stipek, 1981](#_ENREF_83); [Stipek & Tannatt, 1984](#_ENREF_84)). As children get older, the educational context changes in regards to increased normative feedback and social comparisons to their peers ([Räty et al., 2002](#_ENREF_70)). Accordingly, children’s definitions of ability begin to more closely reflect the school’s conception of ability, which involves the differentiation of ability and effort ([Nicholls et al., 1986](#_ENREF_62)). For example, in a study of students’ perceptions in 4th through 11th grades ([Evans & Engelberg, 1988](#_ENREF_29)), older students exhibited superior understanding of grading practices compared to younger students. This may suggest that student and teacher grading may become more highly correspondent as children grow.

The development of metacognitive abilities affects a student’s ability to participate in SPG. Research suggests that young elementary school children have difficulty in the accurate use of rating scales: younger children (5-6 years of age) may be more likely to engage in extreme responding when using rating scales that are less objective ([Chambers & Johnston, 2002](#_ENREF_20)) and may typically engage in dichotomous thinking ([Gelman & Baillargeon, 1983](#_ENREF_36)). Particularly for self-grading, this difficulty is perhaps related to development of second-order reflection in their own thought, or metacognitive awareness, which would make it challenging for younger children to engage in accurate self-grading ([Kuhn, 2000](#_ENREF_55)). Additionally, children also demonstrate difficulty with metastrategic abilities needed to apply and monitor plans in consistent and task-appropriate ways when engaging in both self- and peer-grading. The acquisition of these skills is gradual and undergoes multiple developmental transitions ([Zelazo & Frye, 1998](#_ENREF_106)).

**SPG in higher education.** In addition, the nature of SPG changes as students advance to higher education, due to the large differences in the cultures of these educational institutions. School demands and classroom contexts greatly shift in college. Students are required to take greater responsibility for their own learning, which includes increased demands for independent work, expanded critical thinking, and deeper understanding of course work in higher education. Thus, issues of SPG become more complex as a student advances to the higher education setting ([Sebba et al., 2008](#_ENREF_81)). Specifically, demands at the college level require a more sophisticated student to exhibit a deeper understanding of the goals of assessment and to make judgments about the assessment criteria ([Hovardas et al., 2014](#_ENREF_49)). This suggests that SPG operates in a very different learning and evaluative context with different actors playing different roles in college. Thus, changes in children’s developmental abilities and educational context warrant a separate examination of SPG practices in college as compared to primary and secondary schools.

**Incidence and Barriers to Implementation**

Despite the benefits associated with SPG and increased emphasis on its implementation, it still may be underutilized in the primary and secondary school setting. In Hong Kong, 70% of teachers and 63% of student respondents reported a low incidence of SPG practices in classrooms ([Liu & Carless, 2006](#_ENREF_59)). In a Canadian survey, 73% of teachers reported using SPG “a little” or “none” of the time ([Noonan & Duncan, 2005](#_ENREF_63)). We could not find any surveys describing SPG use that had been conducted in the United States in our literature search.

Indeed, implementation of SPG is a complex task, especially for primary and secondary school teachers. In primary school classes, it involves coordination at many levels: student-teacher relations, classroom conditions, curriculum delivery, and professional development for staff ([Klenowski, 1995](#_ENREF_52)). These levels must adapt to the goal of the student as an active evaluator. [Brown and Harris (2013)](#_ENREF_15) attribute the limited use of SPG to the emphasis on the externally and teacher-controlled summative results that are generally reported to students, their parents, and their community.

Resistance to SPG also stems from issues of reliability and accuracy. A common teacher concern regards students’ inflated perception of accomplishment and the inclusion by students of effort in determining the grade, factors which potentially affect the validity of grading ([Ross, 2006](#_ENREF_72)).

Implementation of SPG also places additional demands on teachers and students. SPG requires a teacher to invest time to establish transparent grading standards. Educational standards are often written for teachers, making it more difficult and time-consuming for teachers to translate these standards into a form that students can understand. Students in high school and college describe the SPG process as very demanding due to the difficult nature in assigning a grade ([Stallings & Tascoine, 1996](#_ENREF_82)). In addition, students often have to develop a sense of perceived expertise before they can fully meet the requirements for correcting their own or others’ work. Taken together, these efforts all should enhance learning but, despite the many potential benefits of SPG, they also suggest numerous barriers exist for its successful implementation.