# Play-responsive teaching on numbers in Swedish preschools

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*This presentation is about play-responsive teaching (PRT), a theoretical and didactic theory on teaching in play without removing the essential characteristics of play. This study examines PRT in the context of early mathematics education, specifically the teaching of cardinality. Based on an analysis of 73 video documentation of activities where preschool teachers try to implement PRT, three different categories of sequences emerged in the activities: play, mathematics teaching, and play-responsive mathematics teaching. Each category varies in length, order, and extent in each activity. The interplay and combination of how these sequences vary during the activities may be important for the implementation of play-responsive mathematics teaching in preschool.*

**Introduction**

Early mathematics influences later academic performance where studies focused on relations between early mathematics teaching and young children’s learning are needed (Björklund & Palmér, 2019). This study explores play-responsive teaching (PRT) in Swedish preschools, focusing on early numeracy with a special focus on cardinality. Cardinality is a key concept to master early on, as it relates the patterns in counting, numbers, and arithmetic (Paliwal & Baroody, 2020). The research question focused on in this paper is: What characterises the activities when teachers intend to implement play-responsive teaching with a focus on cardinality?

**Play-Responsive Teaching (PRT)**

PRT is a theoretical and didactic theory that promotes play, teaching, and learning (Pramling et al., 2019). In PRT, teaching is seen as a collaborative project between teachers and students, where both contribute to the content and structure of the activity. It is important to organise play and activities within PRT without turning play into non-play. Play is characterised as a shift between, *as if* and, *as is*. Through as if (fantasy) and as is (reality), the children can move between reality and fantasy and, in this way, develop understanding in real life and in play. Also, *responsiveness* is central and means that teaching has an educational goal that the teacher adapts based on the children's responses. PRT emphasises double responsiveness, where the teacher responds to the children's reactions and takes appropriate actions. Teaching also requires participants to achieve *intersubjectivity*, which means they adjust their perspectives to create a shared understanding of the activity, which is an ongoing process. *Alterity* is crucial in PRT, referring to new directions and insights that arise when participants offer new or different perspectives. Thus, alterity makes it possible to expand and challenge experiences and thus must be understood in relation to the double responsiveness.

**Method**

This educational design research involved one researcher and three teachers, selected based on their prior participation in a study on early numeracy. The teachers attended lectures, workshops, and read articles on PRT. The teachers and the researcher jointly planned the study activities to be implemented in preschools based on previous research on cardinality and PRT. Each activity evolved through cycles and was adjusted based on joint evaluations. Content analysis (Hsieh & Shannon, 2005) was used to analyse 73 video documentations of the activities. The concepts as if and as is, responsiveness, alterity, and intersubjectivity were used as codes from PRT. Additionally, the codes numerical identification, quantity, ordinality, subitising, numeral words, finger patterns, one-to-one correspondence, and body language were used as codes regarding cardinality.

**Results**

Three categories of sequences emerged in the activities: play, mathematical teaching, and play-responsive mathematics teaching. Each category varies in length, order, and extent in each activity. In the category *play,* cardinality is seldom focused on. In the category *mathematics teaching*, the sequences meet a specific mathematical need of a child but not as part of the play. In the category  *play-responsive mathematics teaching, narratives are most often used to merge play and mathematics education,* where the teacher seamlessly incorporates mathematical elements into play.

## References

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