



# ¿ES LO MISMO? BILINGUAL CHILDREN COUNTING AND MAKING SENSE OF NUMBER

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# FOCUS

1. How are students able to use language as a resource to learn mathematics?
2. How can we incorporate new understandings about the connections between mathematics and language into our teaching practice?



Image retrieved from the People's Portfolio

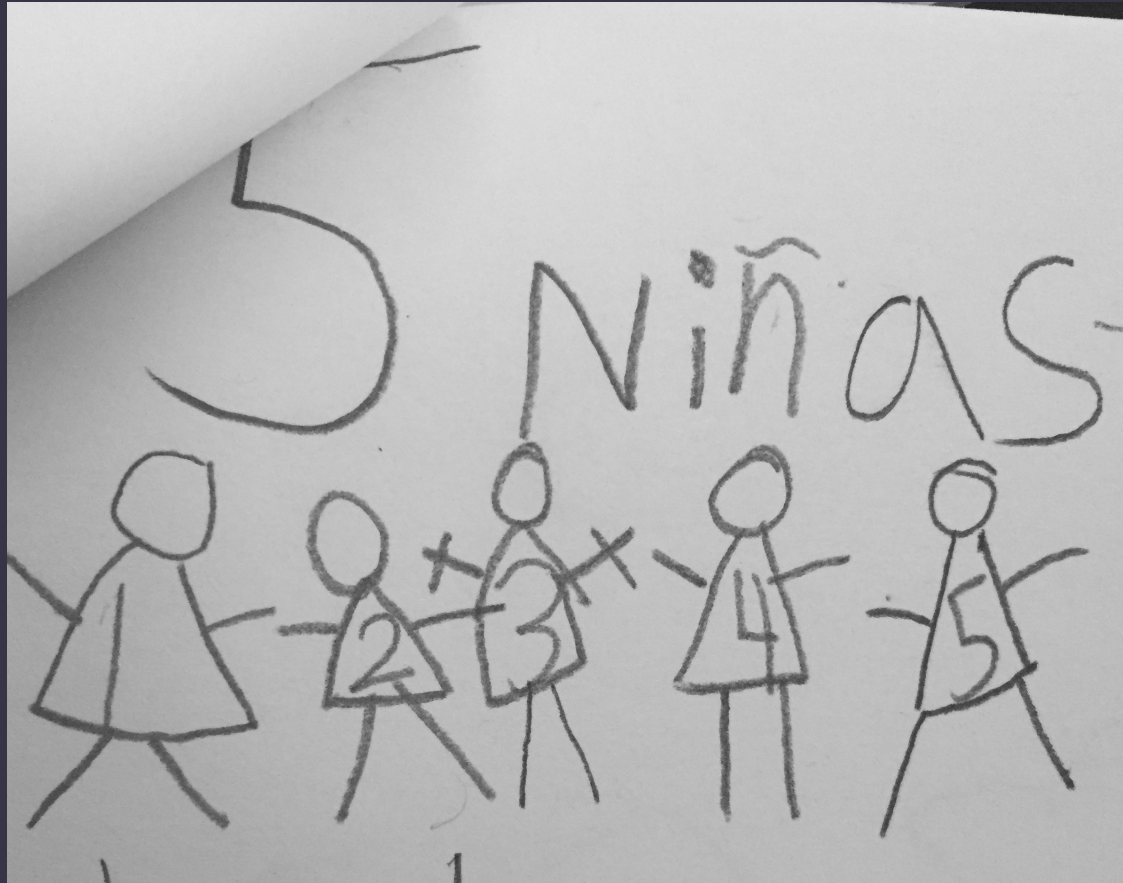
All mathematics education is happening in a context of linguistic diversity (Barwell et al., 2018)

As teachers we play a key role in the experiences children have in schools and in the access that they have to high quality mathematics education (Civil et al. 2019)

Diverse linguistic practices can act as a barrier in schools particularly for children who are minoritized (Garcia, 2017)

Language is a key issue in providing equitable mathematics education (Celedón-Pattichis et al., 2018; Bartell et al. 2017)

# Latinx & Multilingual Children



- All groups of people are inherently heterogenous
- Not all Latinx children speak Spanish or are bilingual in English
- Umbrella terms such as multilingual and Latinx can help us remember that even though there are differences in our experiences they are interconnected

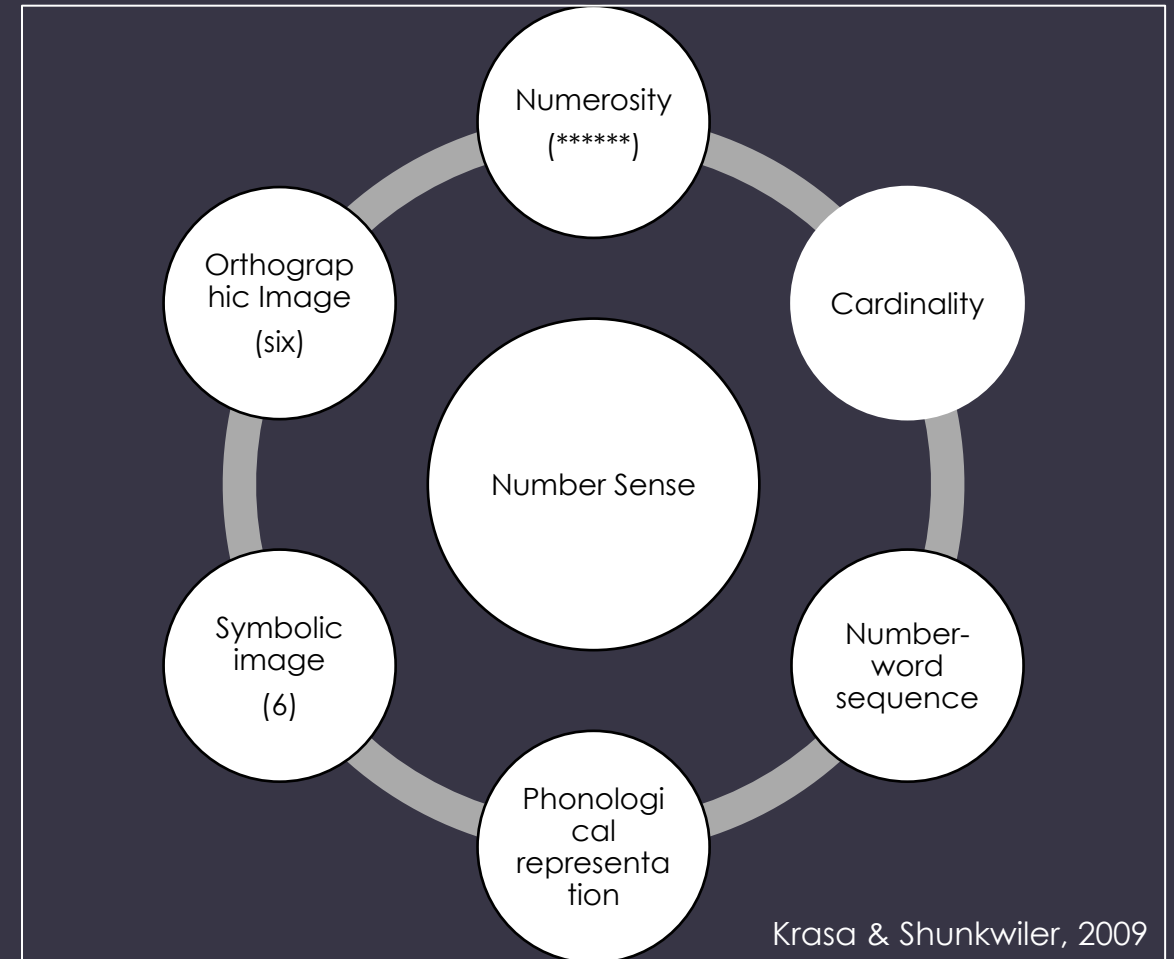




IS IT THE SAME?

# Number sense

- Key for students' mathematics learning
- Number sense is a confidence with quantities and their mental manipulation that comes from significant and meaningful experiences with quantities, their symbolic representations, and how they connect to each other
- Language is central to number sense development



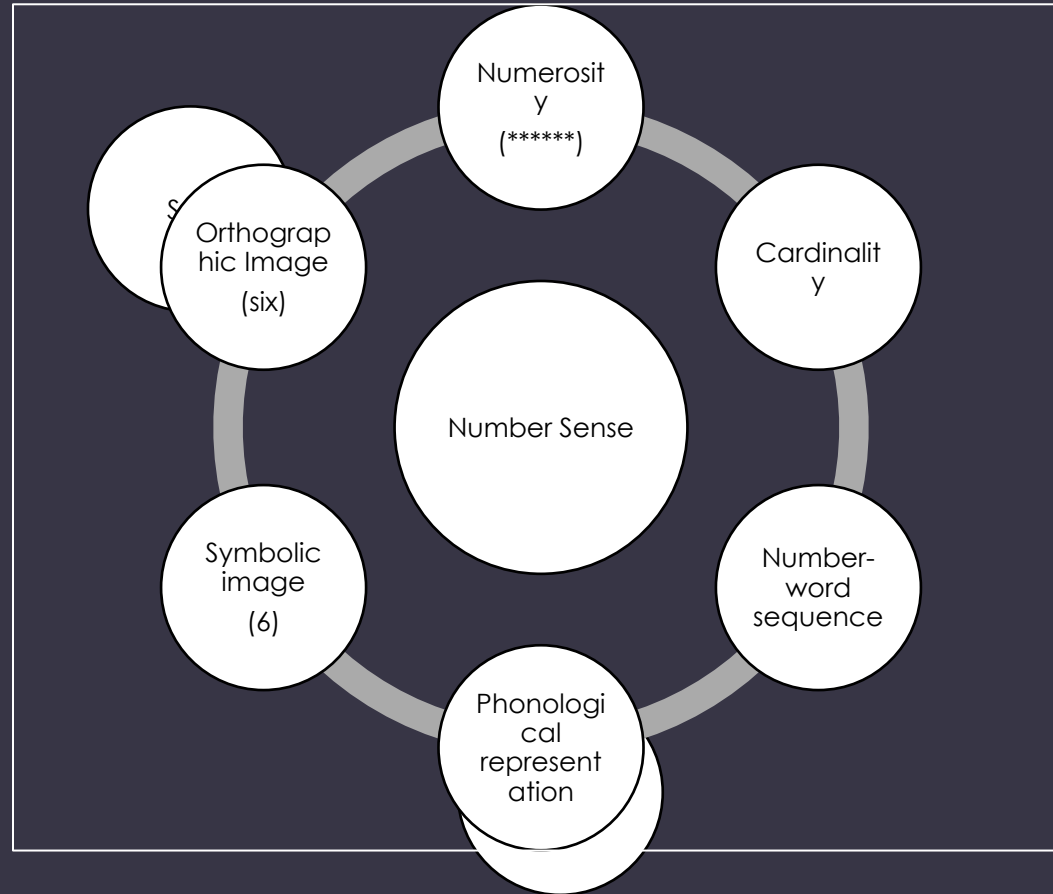
# Journal Entry

*As the children went to their desks and started getting chairs down, they found the different amounts of play money Ms. Dominguez had placed on top of their desks (1 to 3 bills). Some of them simply looked at them or moved them to the corner of their desks, but most children showed them to each other, commenting cheerfully in Spanish or English about how many bills they got. The children chose to add their new bills to the stacks of play money they had collected on previous days and then count them before moving on to other morning activities. That morning, Nicolas was the first to show me his stack of play money and we counted it together by ones in Spanish and English. Later in the morning Gabriel asked me to count with him. While we counted his stack of play money in English, Fernando and Abby also counted theirs in different ways, sitting at a table nearby, letting me know every so often how many they had. After a while Abby was very excited to report that, "Fernando tiene treinta y seis." When I asked how would she say it in English, she whisper-yelled, "Thirty-six." I then asked, "¿y ¿es lo mismo?" [Is it the same?]. In response, Abby, Nicholas, Fernando, and Gabriel all yelled "Si!" [Yes].*

# Interpretation

- If the children were not bilingual the questions about equality would not have been possible
- Develop a metacognitive awareness of how counting works
- New ways to think about quantity
- Need to think differently about number sense
- Translanguaging gives us a background to understand the use of Spanish and English together for the purpose of learning => The children are not simply translating

# Number sense



# Translanguaging

- Translanguaging refers to the “multiple discursive practices in which bilinguals engage in order to make sense of their bilingual worlds.” (p. 45).
- “Language is not a simple system of structures that is independent of human actions with others, of our being with others. The term *languaging* is needed to refer to the simultaneous process of continuous becoming of ourselves and of our language practices, as we interact and make meaning of the world. [...] Languaging both shapes and is shaped by context.” (p. 8)
- Adopting translanguaging as a framework for understanding the language practices of multilingual people allows us to unveil the ways in which language practices are complex and ingrained in contexts that relate to identity and nationality and carry power dynamics.

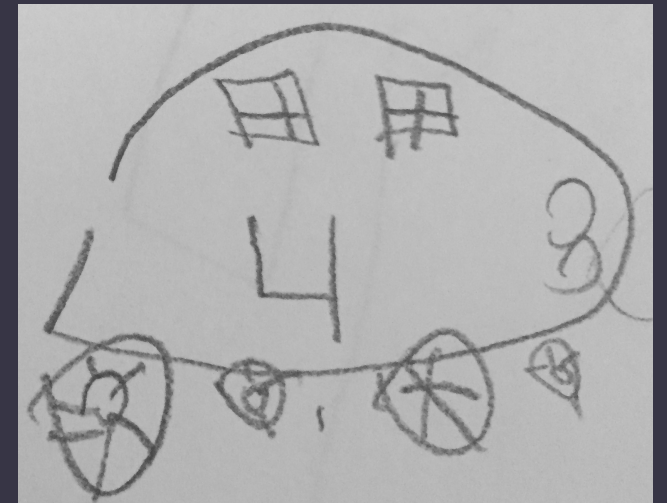
(Garcia & Wei, 2014)



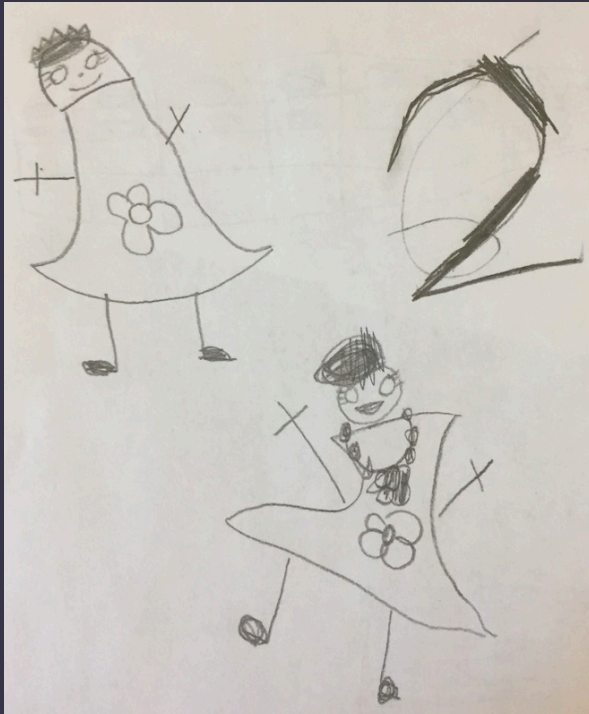


# How can we humanize Latinx children's mathematics learning?

- Center mathematics instruction around children, their knowledge of language, and their understanding of number
- Believing that being multilingual is an advantage for learning is key:
  - It allows us to notice how students use their linguistic resources to learn mathematics and allows us to teach differently
  - It provides opportunities for teacher and students to access funds of knowledge
  - It creates more humane mathematics



# How can we humanize Latinx children's mathematics learning?



- Provide freedom and choice
  - When using language
  - During activities
  - In collaboration
- Learning is a communal endeavor
  - Allow the children to collaborate
  - Collaborate with other community members
- Mathematics teaching and learning are not homogeneous universal practices, but instead are profoundly influenced by who we are and who our students are, our previous experiences, and our current contexts. Mathematics is fundamentally a human experience and as such, reflects our identities and experiences of the world.

# QUESTIONS