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Are Robots Animate or Inanimate? Children's pronoun use provides insight to categorization challenge

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Are robots animate or inanimate?
Children’s pronoun use provides insight into categorization challenge

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Introduction

Children have been shown to attribute a unique constellation of animate and inanimate characteristics to robots [1-5].

In this study we measured children’s pronoun use to assess their implicit understanding robots (e.g. new ontological category [5]).

Predictions:

1. Children will use more gendered pronouns (particularly male) with the robot compared to the puppet.

2. Researcher’s pronoun use will influence participant’s pronoun use more for the robot than the puppet.

Method

Participants (N=90)

5 years (N=30, M=5.5 SD=.28; 50% girls)

7 years (N=30, M=7.4 SD=.32; 50% girls)

9 years (N=30, M=9.4 SD=.24; 50% girls)

Figure 1. Robot (A) and Puppet (B).

Procedure

Participants were presented with an autonomous robot (“Pleo”; www.pleoworld.com) and a stuffed animal puppet (“Kasey”) in a counterbalanced order (Figure 1). The procedure included, in order:

• **Familiarization Period.** Participants were familiarized through five introductory activities with the entity (e.g., feeding with a leaf, petting, playing tug-o-war).

• **Free Play.** Participants played on their own with the entity for up to 5 minutes.

• **Attribution Interview.** Assessed participant’s attributions to the entity (17 randomly-ordered questions)

The procedure was then repeated for the other entity.

Measure

• **Pronoun Use.** We coded gendered (he/him, she/her) and neuter (it) pronoun use by the participant and researcher during the Familiarization phase and Attribution Interview.

Results

Prediction 1:

• Children used proportionately more gendered pronouns for both entities.

  • Robot (M=.82, SD=.25, t(89)=12.180, p<.001)

  • Puppet (M=.79, SD=.28, t(88)=9.974, p<.001).

• Children used significantly more male-gendered pronouns with the robot, t(88)=8.210, p<.001.

• Children used significantly more female-gendered pronouns with the puppet, t(88)=8.399, p<.001.

Figure 2. Children’s Pronoun Use with Robot and Puppet.

Conclusions

• **Children implicitly conceptualize the robot and puppet in gendered-terms** (robot as male, puppet as female), which is remarkable given that both entities are objects.

• Children took a cue from the researcher in interpreting the puppet in gendered terms, as both male- and female-gendered pronoun use positively predicted male- and female-gendered pronoun use in children.

• For the robot, children only showed sensitivity to the researcher’s female-pronoun use, perhaps because it was inconsistent with their conceptions of the robot as male.

• Using an implicit measure (pronoun use), this research provides important insight on how children conceive of personified robots as a new ontological category – that is, in-between animate and inanimate.

References

5. Severson & Carlson (2010). Neural Networks, 23, 1099-1103

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