

Children's action errors: A diary study in their natural environment

Matthew J. Jiang¹, Koeun Choi², Chantel Raimer¹, Heather L. Kirkorian¹, Emma Tolkin¹, Anneliis Sartin-Tarm¹, Karl S. Rosengren¹

¹University of Wisconsin – Madison, ²Rutgers University – Newark

Background

Children often exhibit behaviors with goals that are not afforded by their physical environment. These action errors have been examined in naturalistic settings and in the lab. For example, children exhibit **scale errors**, when they attempt to fit into an object much too small for their body. Research conducted via parent surveys found that scale errors appear to be exhibited between the ages of one and three years (Ware, Uttal, & DeLoache, 2010).

Another category of action errors is known as **grasping errors**. A grasping error occurs when a child interacts with a picture as if it were a real object (e.g., attempting to pick up grapes in a photograph; DeLoache, Pierroutsakos, Uttal, Rosengren, & Gottlieb, 1998). Most infants in lab samples perform errors with pictures, and younger children perform these errors more than older children.

A relatively newer area of research examines action errors in the context of digital media (i.e., **media errors**; Pierroutsakos & Troseth, 2003). Our study expands on the current knowledge about scale and grasping errors, by studying them in the context of child development and investigating how children interact with digital media in their daily lives.

The goal of the current study was to examine these three types of errors in children between the ages of 10 and 30 months using a parental diary approach.

Error Examples

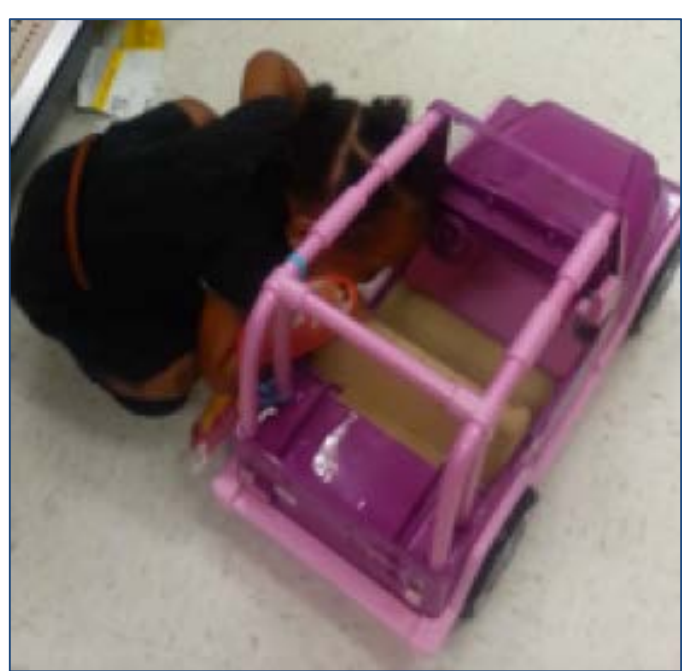


Figure 1. Scale error – child trying to fit in toy car



Figure 2. Grasping error – child trying to grab food out of magazine

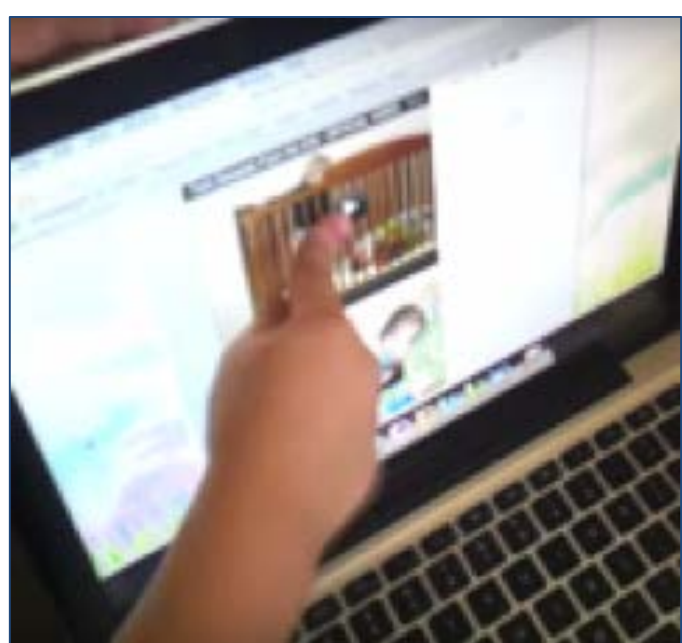


Figure 3. Media error – child trying to use computer as touch screen

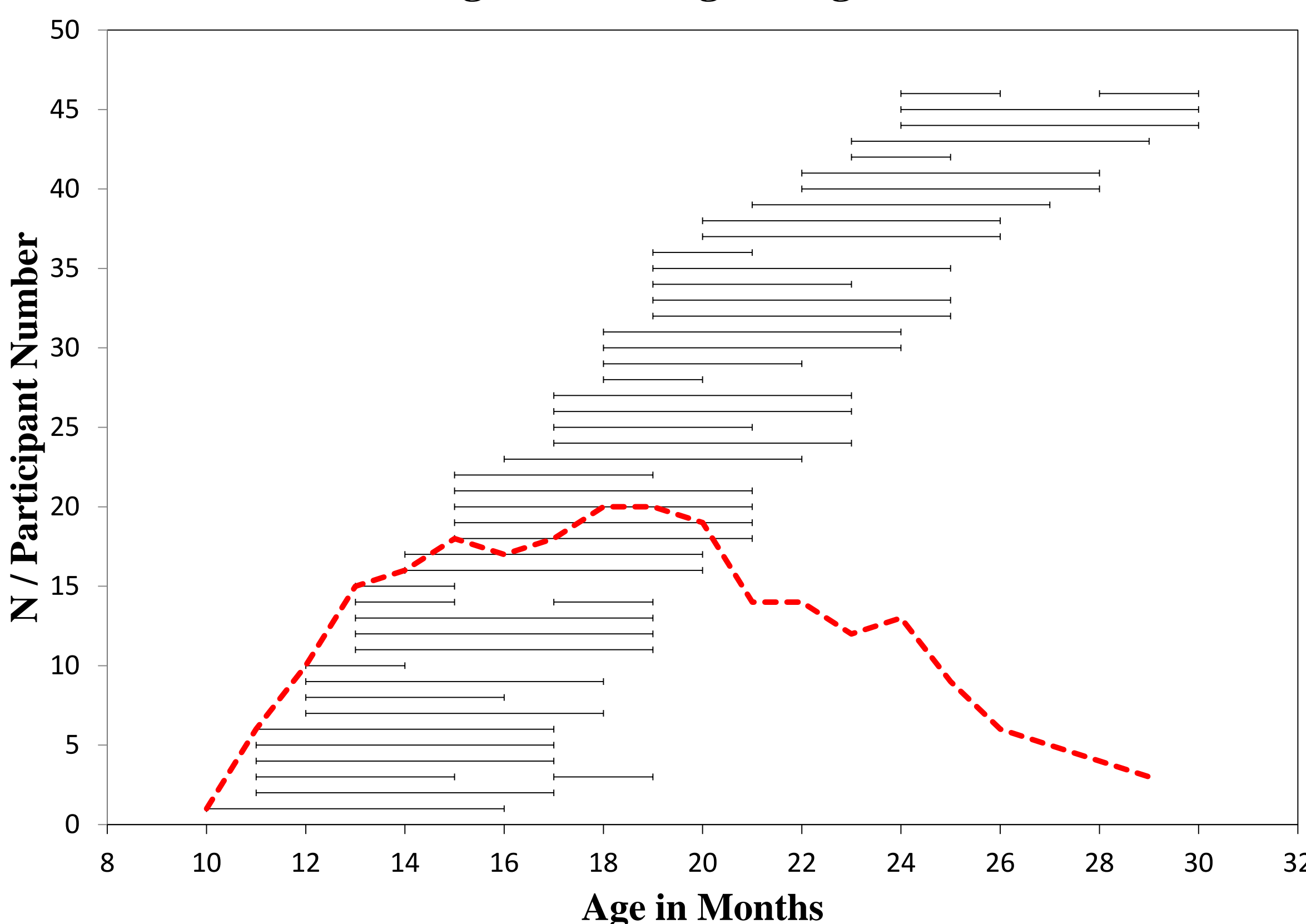
Method

For the study, participants were recruited in person and online ($N = 46$, 41 mothers and 7 fathers; one family had both mother and father participate). The mean age of parents at the start of the study was 33.7 years.

Children had a mean age of 18.6 months at the start of the study (range 12-27 months), 14 (30%) were female, and the majority were White/Caucasian (83%) and non-Hispanic (87%). Parents completed 3 two-month packets recording any observed action error. See Study Timeline.

Sample Characteristics

Fig. 4. Child Age Ranges



| Variable | Mean (SD) | [Range] | Corr. w/ # Action Errors | Corr. After Dropping Outlier |
|-----------------------------|-------------|-----------|-----------------------------|---------------------------------|
| Action Errors (#/packet) | 2.3 (3.3) | [0-22] | | |
| Child Age (mos) | 18.6 (4.2) | [12-27] | 0.04 | -0.31* |
| Outside Care (hrs/wk) | 30.7 (13.3) | [0-55] | 0.11 | 0.02 |
| Parent Age (yrs) | 34.0 (3.6) | [23-42] | -0.33* | -0.18 |
| Parent Education (yrs) | 20.0 (3.0) | [12-27] | -0.02 | -0.14 |
| Subjective SES (1-10 scale) | 7.2 (1.3) | [3-10] | 0.06 | 0.16 |
| Surgency | 5.2 (0.6) | [3.9-6.3] | -0.18 | -0.38* |
| Negative Affect | 3.1 (0.7) | [1.6-5.1] | 0.03 | 0.21 |
| Effortful Control | 4.6 (0.6) | [3.2-5.9] | -0.16 | -0.08 |
| ASQ Overall Average | 50.2 (6.3) | [26-58] | 0.09 | 0.17 |
| Screen Devices (# in home) | 4.3 (1.6) | [4-9] | 0.02 | 0.33* |
| Screen Time (min/day) | 51.7 (43.5) | [2-167] | -0.05 | 0.19 |

Table 1. Correlations between ASQ, ECBC/IBQ, number of action errors, and participant demographic data
*significant correlation at $p < .05$; remain significant after controlling for # hrs/wk in outside care

Study Timeline

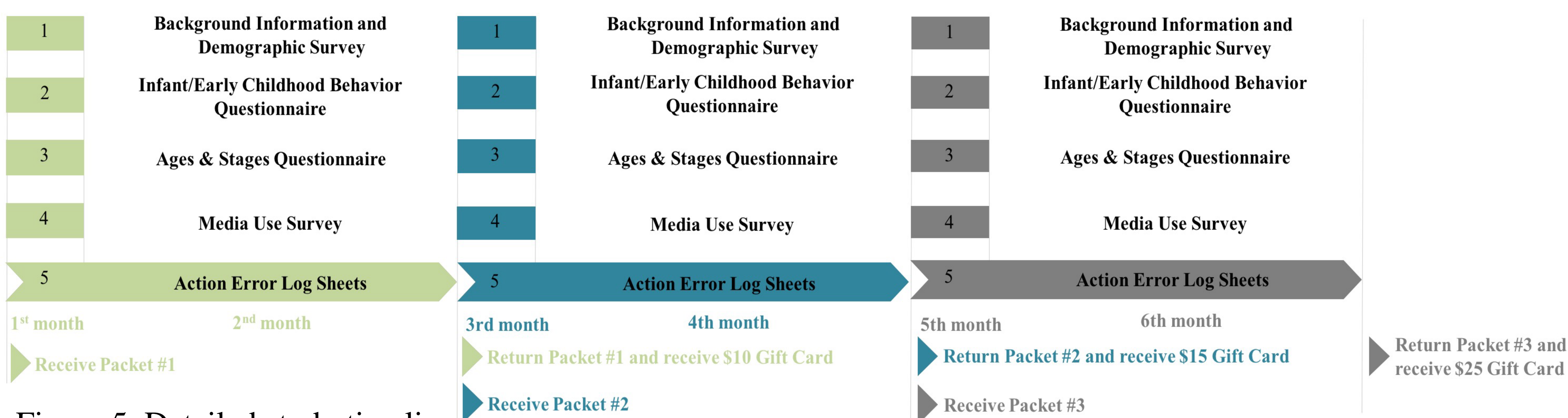


Figure 5. Detailed study timeline

Results

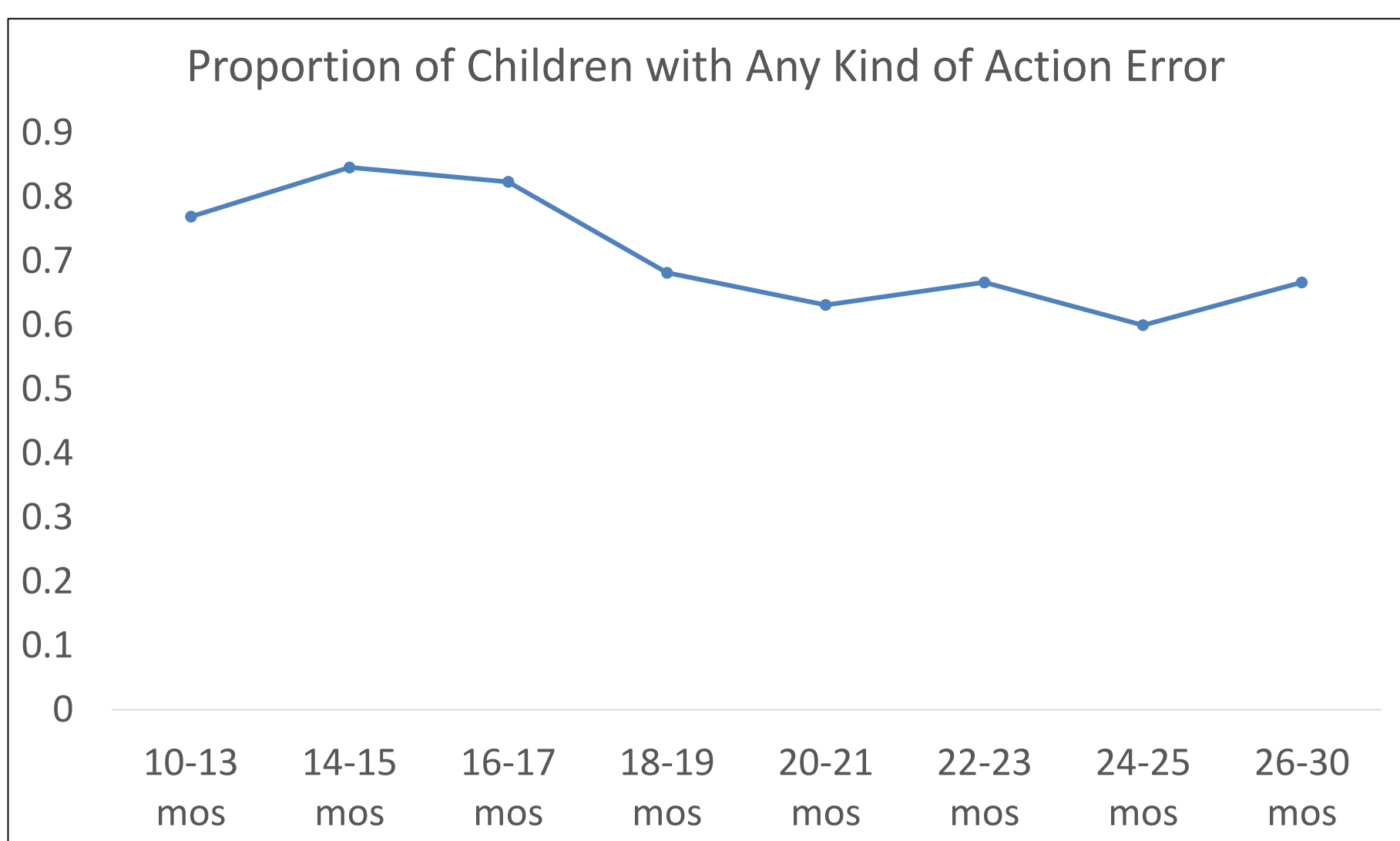


Fig 6. Proportion of children who had any type of error in a given packet

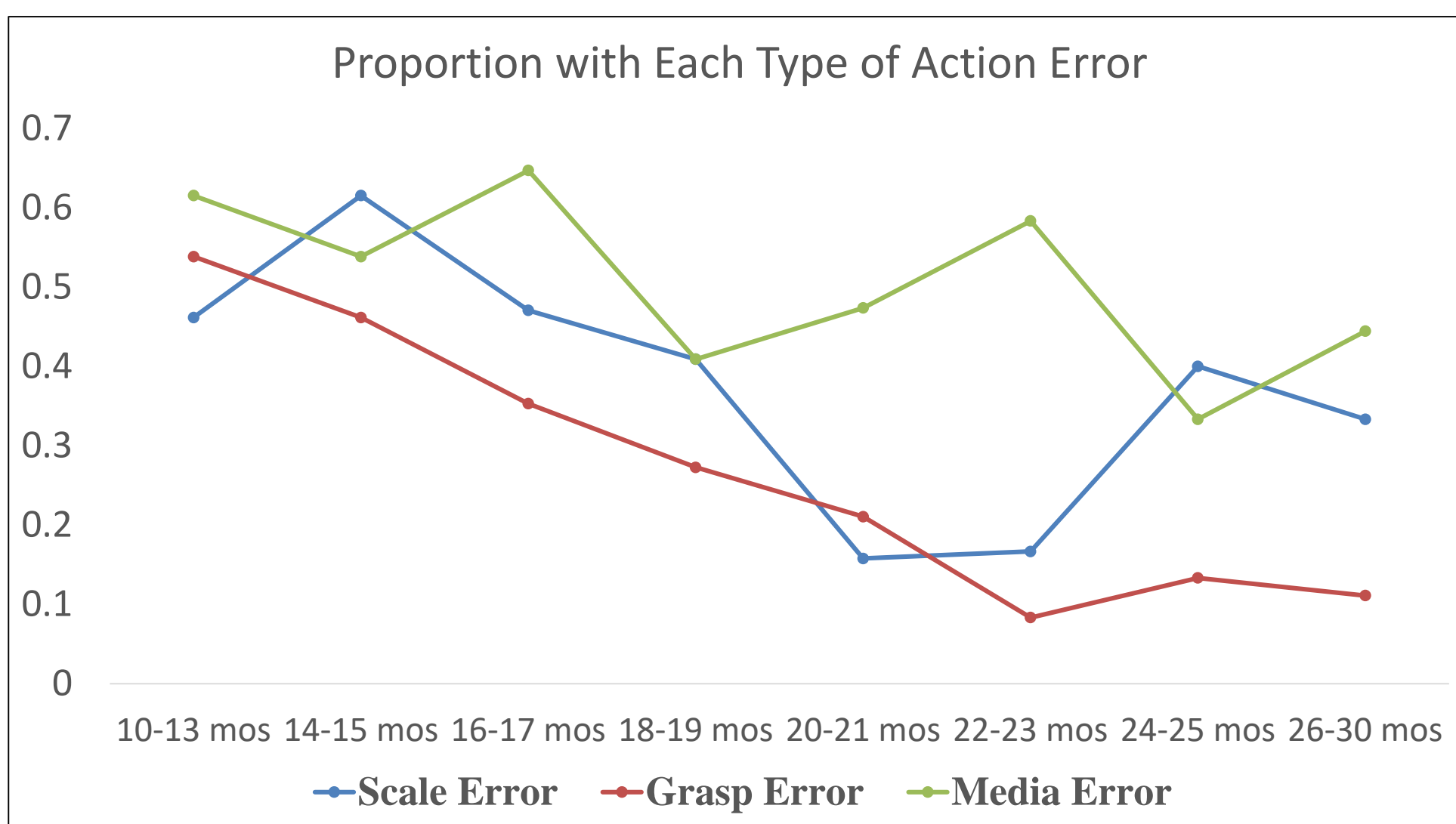


Fig 7. Proportion of children who had each general type of action error in a given packet

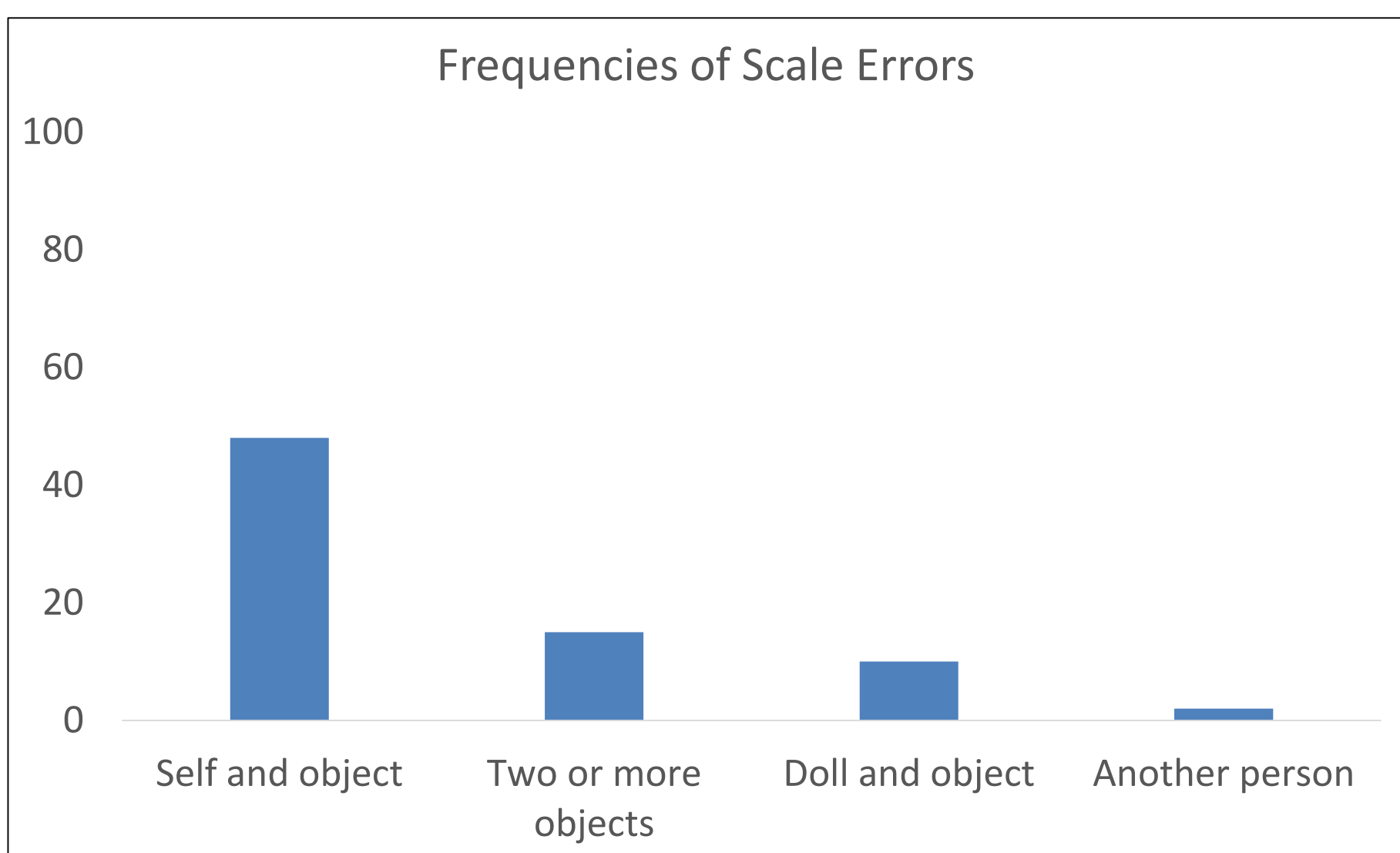


Fig 8. Frequencies of different scale error subtypes

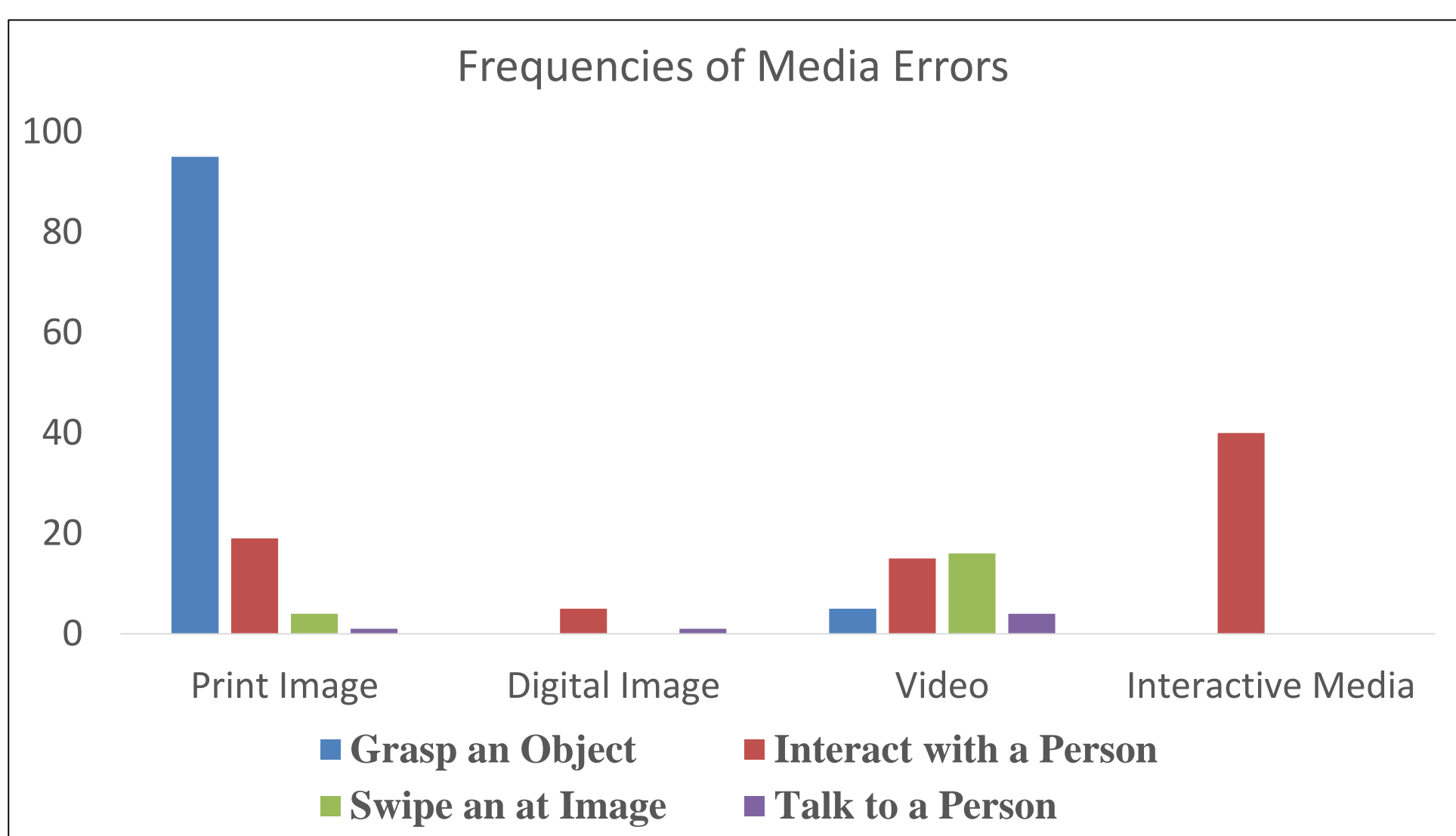


Fig 9. Frequencies of different media error subtypes

Conclusions

This is one of the first studies to systematically investigate the relation between these three types of action errors and to explore in detail action errors that involve digital media. All three types of action errors are common among children between 10 and 30 months. Overall, the frequency of action errors declined with age, suggesting that children may be learning based on exploration and actions on objects in the environment.

References

DeLoache, J. S., Pierroutsakos, S. L., Uttal, D., Rosengren, K. S. & Gottlieb, A. (1998). Grasping the nature of pictures. *Psychological Science*, 9, 205 - 210.
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Acknowledgments

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