AN INDIVIDUAL COMPARISON OF SOCIAL PLAY WHILST AUTISTIC CHILDREN PLAY WITH DIGITAL AND NON-DIGITAL TOYS

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Language Statement

The DART group respect the right of everyone to choose the language that suits them.

We use a mix of identity-first and person-first language to talk about autism.

Our language policy is under constant review and we welcome feedback.

For more information and resources see www.dart.ed.ac.uk/language

Concerns vs. opportunities

Previous work

- Increased interaction on tablet apps compared to non-digital equivalents (Hourcade *et al.* 2010; CHI)
- Increased play on tangible toy vs. LEGO bricks (Farr, Raffle, Yuill. 2010; *Autism*)
- Enforced collaboration could enhance interaction in digital environments (Ben-Sasson, Lamash, Gal, 2013; *Autism*)

Current study

- Seven autistic children with learning disabilities (age 12 – 15), from 2 schools
- All children completed the ADOS (module 1 or 3), and teachers completed a range of social communication measures (e.g. SRS, VABS)
- Observed playing with digital and non-digital toys in a free-play setting
- At each school, children either had 1 toy/pair (enforced collaboration), or 2 toys/pair (optional collaboration)
- Used measures of social play & social attention to compare digital and non-digital interactions

Digital vs. non-digital

CODE-A-PILLAR

BRIO MAGNETIC TRAIN

Digital vs. non-digital

CODE-A-PILLAR

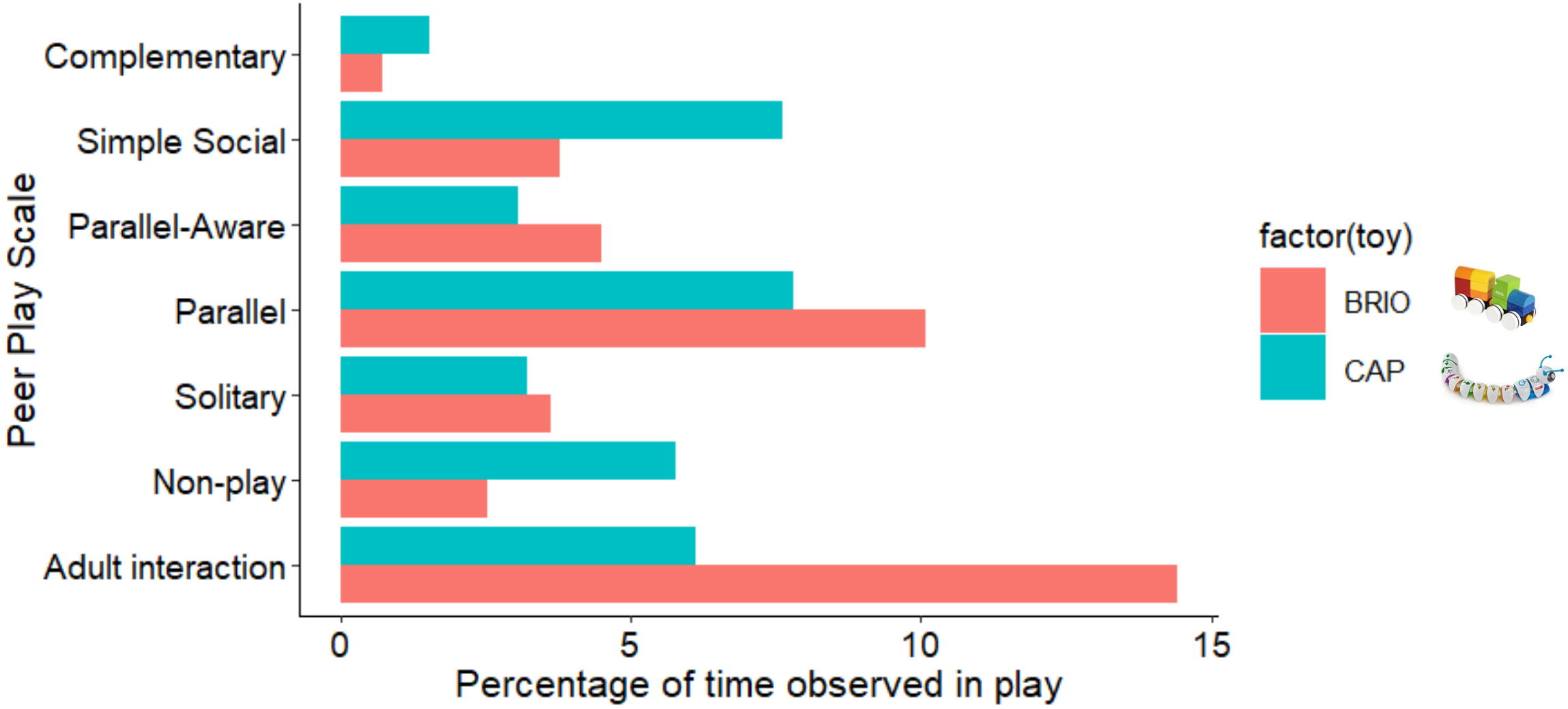
BRIO MAGNETIC TRAIN

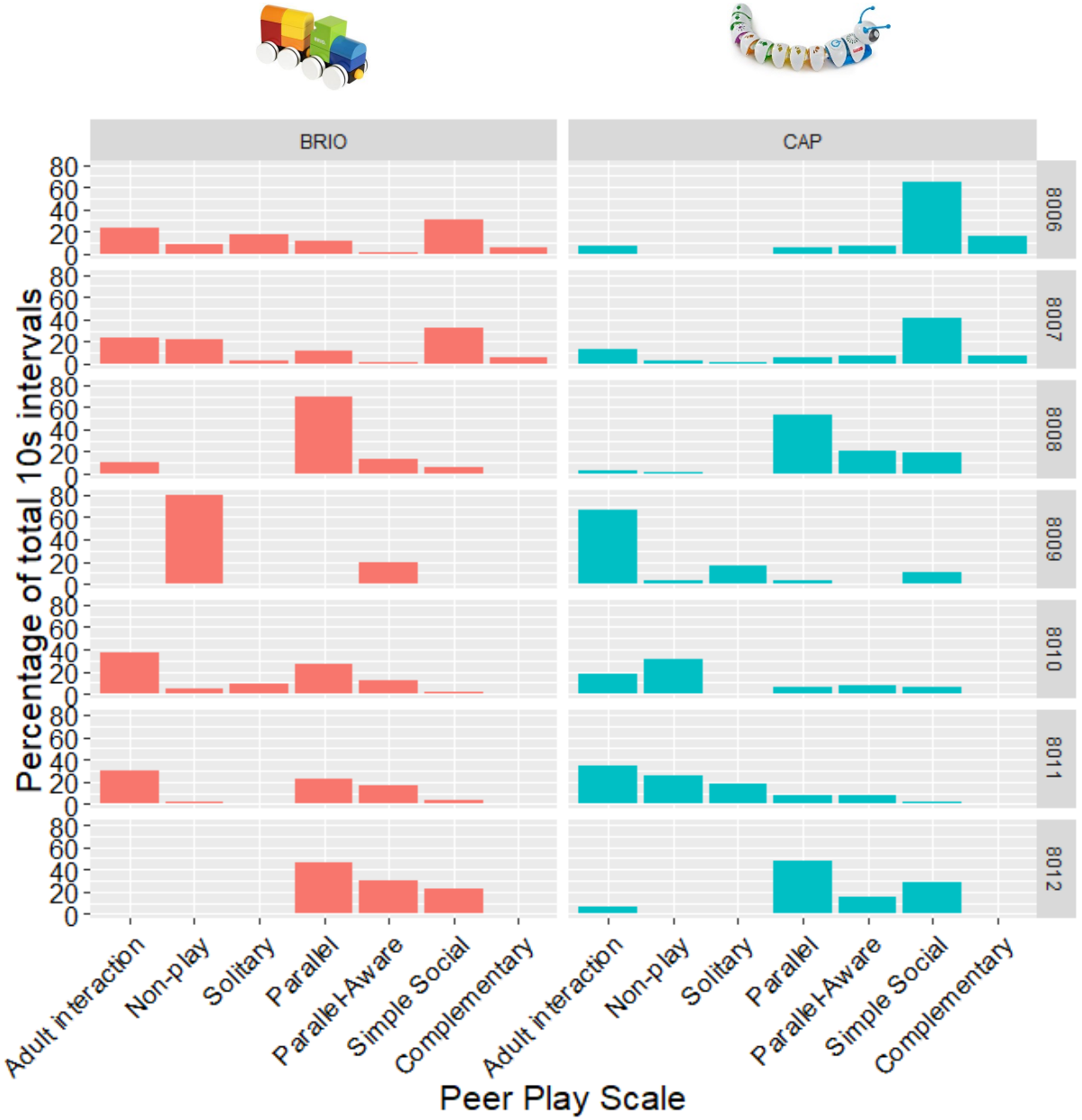
Peer Play Scale (Howes & Matheson, 1992)

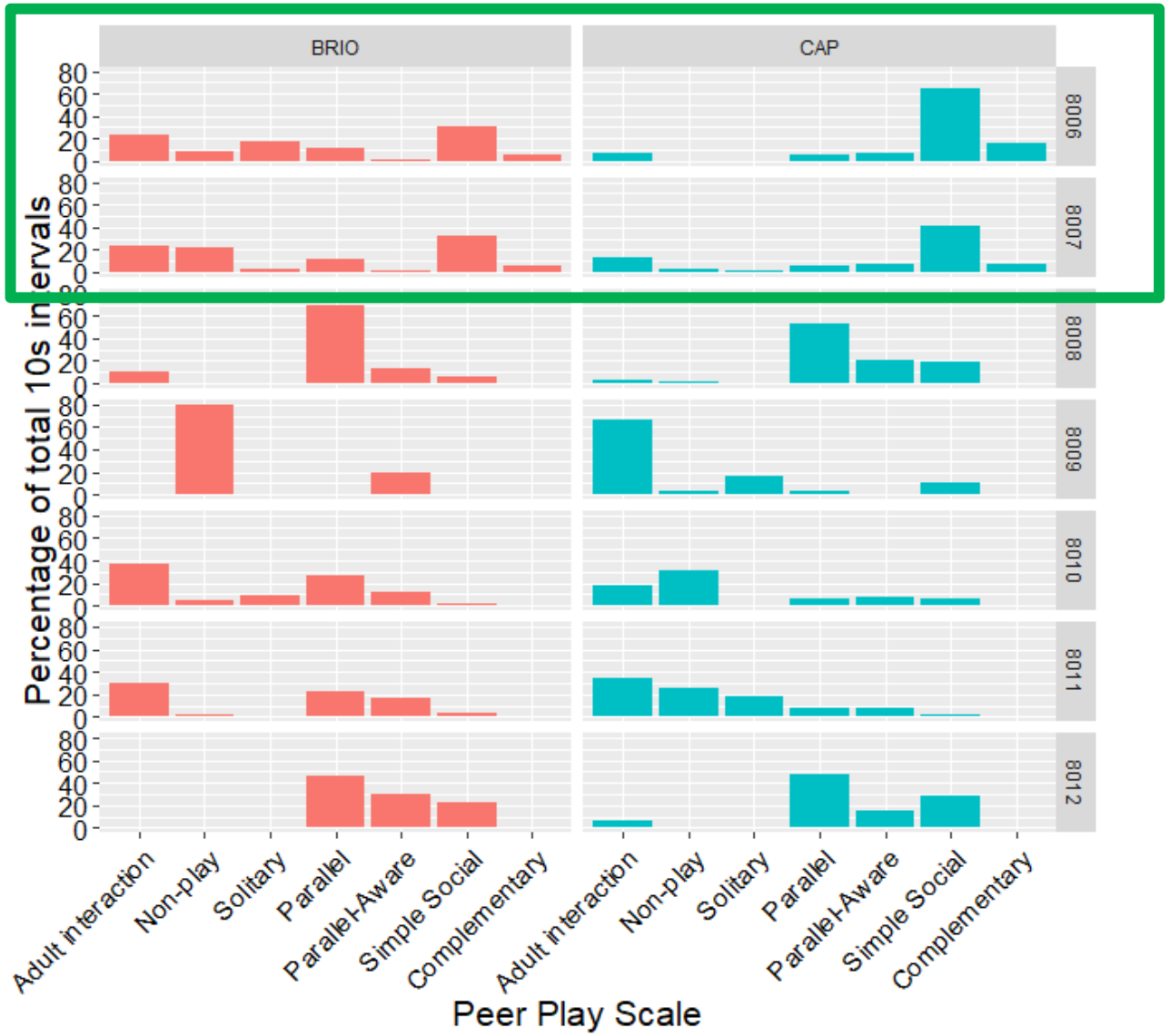
Level of play	Description
Interaction with adults	Asking, talking, playing with an adult
Non-play	Lacking characteristics of social-cognitive play categories
Solitary	Playing alone, no eye gaze or mutual interest
Parallel	Engaging in same activity but not acknowledging each other
Parallel-Aware	Involved in similar activities and engaging in EC/awareness
Simple Social	Engaging in same activity, and interacting/talking/turn-taking
Complementary & Reciprocal	Engaging in turn-taking sequence with child-led role delegation
Social Pretend	Engaging in imaginative play, with object substitution/make-believe

Joint engagement (Bakeman & Adamson, 1984)

Level of engagement	Description
Adult engagement	Child interacting with an adult (talking, playing, etc)
Unengaged	Child appears to be uninvolved with any specific person, object, or event.
Onlooking	Child is observing peer's activity. The child may be looking attentively but is not otherwise participating in any way
Person engagement (peer / adult)	Involves the child interacting with peer / adult with no object at hand.
Object engagement	Involves the child just attending to an object or event that the other person is not involved in.
Supported joint engagement	Child and peer are busy with the same game/object/event, but child shows no clear confirmation of peer's participation.
Coordinated joint engagement	Child and peer are actively involved with the same game / object / event.


Peer Play Scale
Complementary
Simple Social
Parallel-Aware
Parallel
Solitary
Non-play
Adult interaction
0
5
10
15
Percentage of time observed in play
factor(toy)
BRIO
CAP


BRIO
CAP
8006
8007
8008
8009
8010
8011
8012
Percentage of total 10s intervals
0
20
40
60
80
Adult interaction
Non-play
Solitary
Parallel
Parallel-Aware
Simple Social
Complementary
Peer Play Scale


BRIO
CAP
8006
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Adult interaction
Non-play
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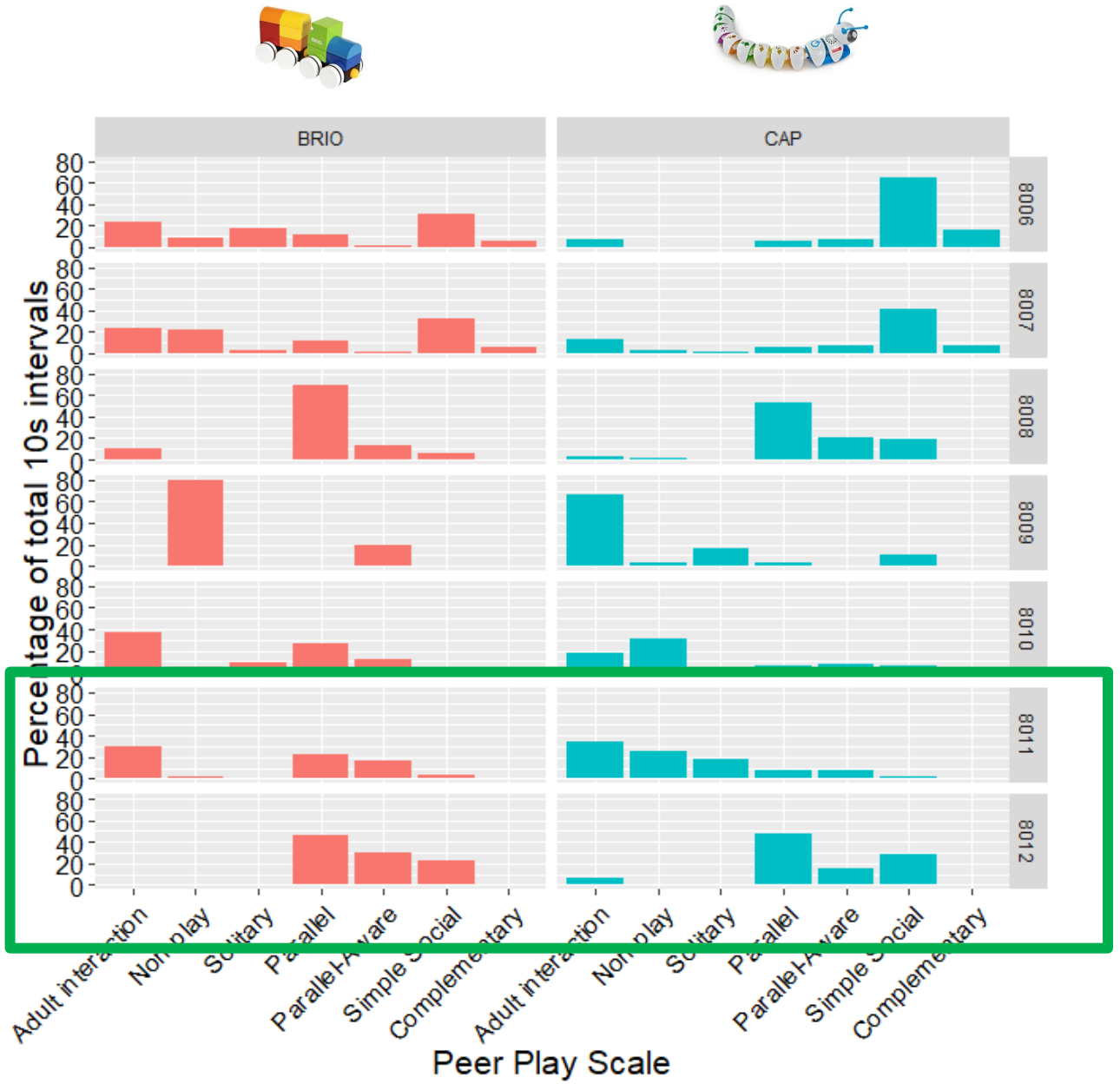
Complementary
Peer Play Scale


BRIO
CAP
8006
8007
8008
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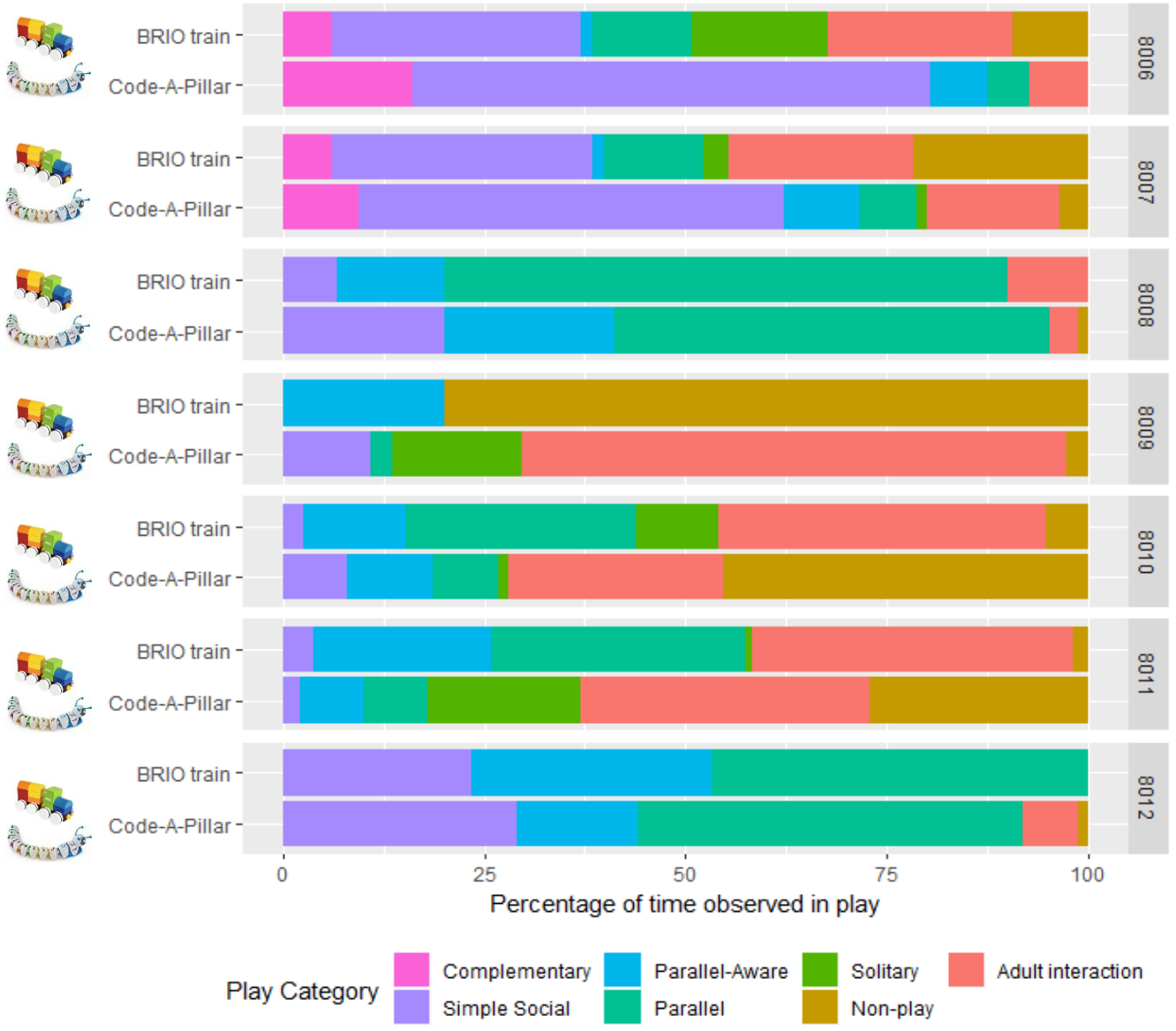
8010
8011
8012
Percentage of total 10s intervals
0
20
40
60
80
Adult interaction
Non play
Solitary
Parallel
Parallel-Aware
Simple Social
Complementary
Peer Play Scale


BRIO train
Code-A-Pillar
8006
8007
8008
8009
8010
8011
8012
0
25
50
75
100
Percentage of time observed in play
Play Category
Complementary
Simple Social
Parallel-Aware
Parallel
Solitary
Non-play
Adult interaction


BRIO train
Code-A-Pillar
8006
8007
8008
8009
8010
8011
8012
0
25
50
75
100
Percentage of time observed in play
Play Category
Complementary
Simple Social
Parallel-Aware
Parallel
Solitary
Non-play
Adult interaction

Individual effect sizes for social play

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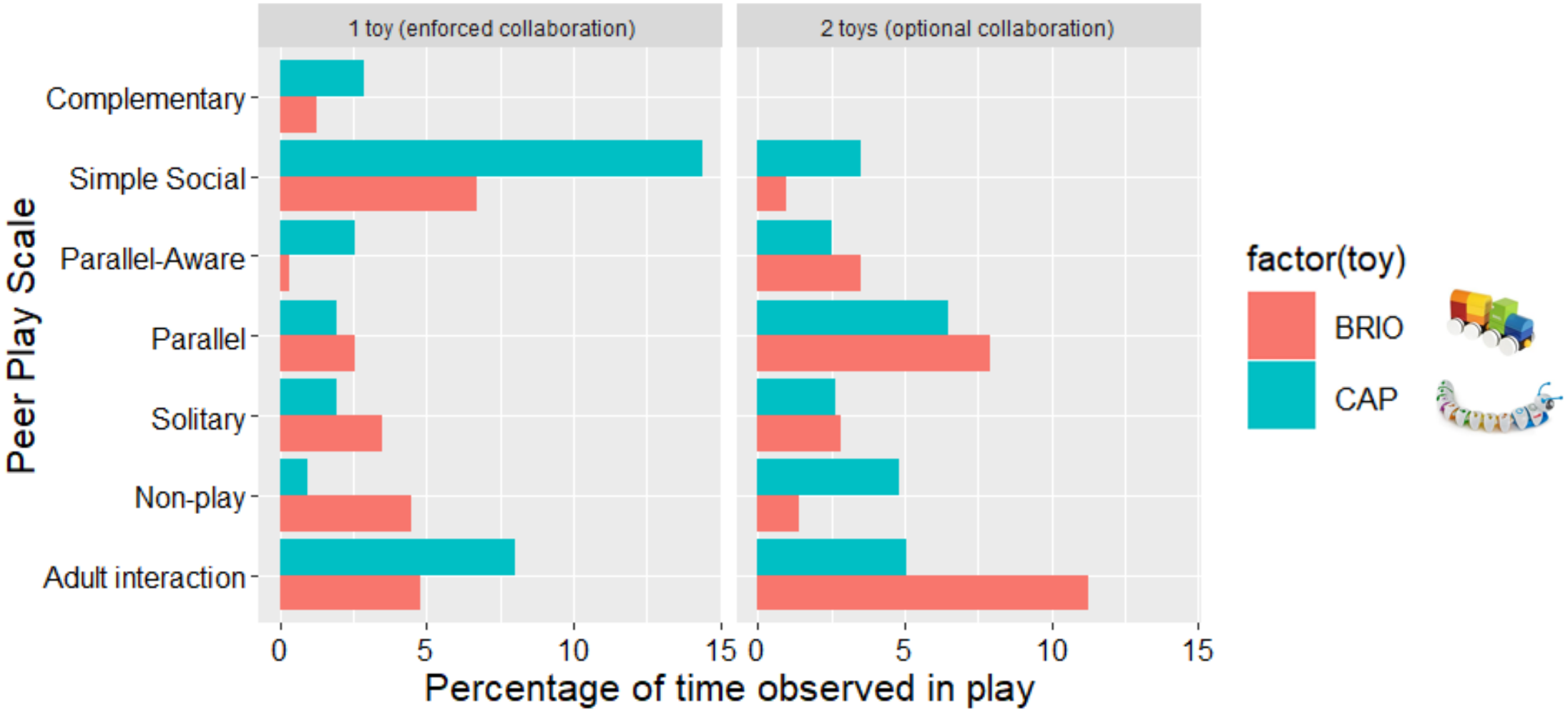
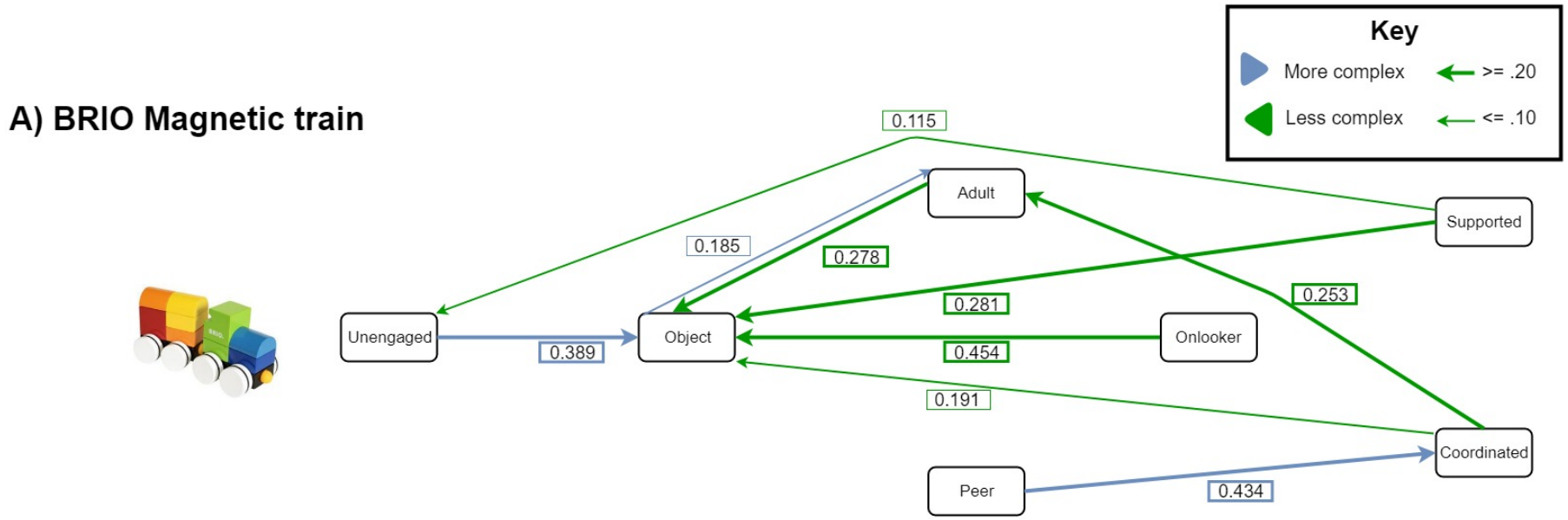
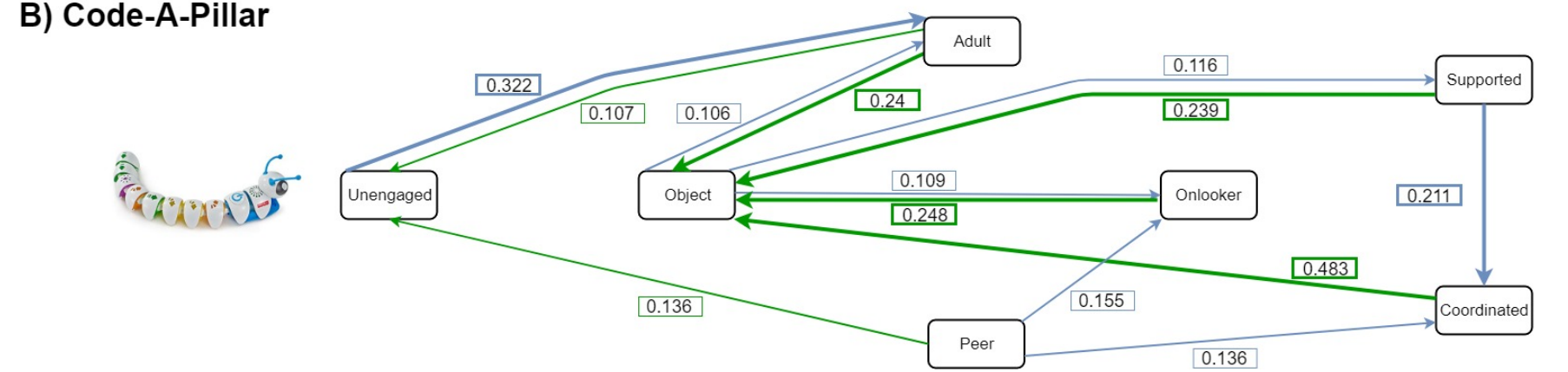
Participant ID	Median Social Play (*n* = non-digital)	Social Play in Digital sessions	Percentage Points Exceeding Median
8006	20 (1)	36	100%
8007	21 (1)	38, 5, 2	33%
8008	2 (1)	7, 10	100%
8009	0 (1)	4	100%
8010	5 (4)	6	100%
8011	4 (3)	2	0%
8012	7 (1)	10, 15	100%


1 toy (enforced collaboration)
2 toys (optional collaboration)
Peer Play Scale
Complementary
Simple Social
Parallel-Aware
Parallel
Solitary
Non-play
Adult interaction
0
5
10
15
Percentage of time observed in play
factor(toy)
BRIO
CAP

A) BRIO Magnetic train



B) Code-A-Pillar



Summary

- In 5 out of 7 autistic children, we observed *increased* social play when playing with Code-A-Pillar
- More “pathways” to social engagement when children played with Code-A-Pillar
- Children engaged in *more* social play when they had 1 toy/pair, but between-subjects comparison limits our interpretation
- No evidence that technology is detrimental to social play in autistic children

Want more information?

www.dart.ed.ac.uk – for information about the projects discussed here, other projects from our group

www.asdtech.ed.ac.uk – for information and news about autism and technology, links to research papers, ongoing projects and app reviews, a monthly digest to receive latest updates