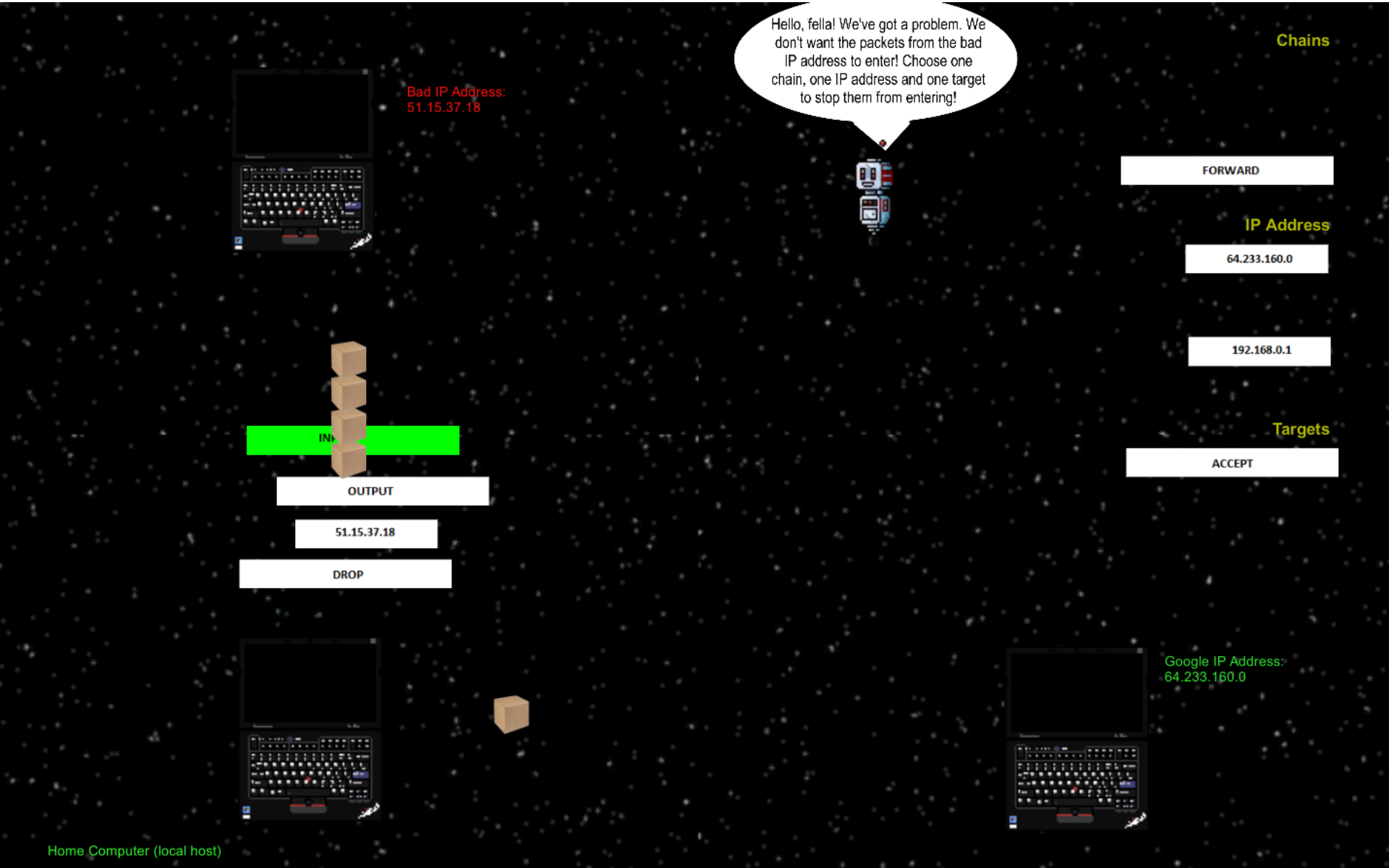
Permission Impossible
by Sibylle Sehl

Early lab test done as part of an MSc project

Is this screen usable?



Lab test of Security Game

1. Informed Consent
2. Pre-questionnaire
3. Play the game
4. Post-questionnaire
5. Post discussion with participants (mini focus group)

Designing computer-based rewards with and for children with Autism Spectrum Disorder and/or Intellectual Disability

by Aurora Constantin, Hilary Johnson, Elizabeth Smith, Denise Lengyel, Mark Brosnan, *Computer in Human Behavior* 2017

Research project website: http://go.bath.ac.uk/social-stories

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Full length article

Designing computer-based rewards with and for children with Autism Spectrum Disorder and/or Intellectual Disability

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ABSTRACT

Children with Autism Spectrum Disorder (ASD) tend to have an affinity for digital technologies, often preferring computer-assisted learning to human-assisted learning. Many children with ASD are also diagnosed with Intellectual Disabilities (ID), yet design studies involving children with ASD and ID are scarce. Rewards can have a positive impact on children's learning and motivation, but little is known about the nature and impact of rewards for children with ASD, and/or ID. Digital technologies are well placed to provide task-based rewards, and in combination with a better understanding of the reward preferences of children with ASD and/or ID this has significant potential to enhance learning. This paper presents two robust participatory design (PD) studies involving children with: i) ASD; ii) ID; and iii) both ASD and ID. The studies aimed to identify: i) the reward preferences of children with ASD and/or ID (RQ1) and ii) how rewards might develop throughout a task as the child progresses (RQ2). Results revealed a number of reward categories that were common to all children, as well as children's preferences for how rewards could develop as they progress through computer-based tasks, for the first time. Original implications for designing computer-based rewards embedded within digital intervention/educational technologies for children with ASD and/or ID, are discussed.

- RQ1: *What are the preferred rewards of children with ASD, ID, or ASD and ID?*

- RQ2: *As a characteristic of children with ASD is a preference for sameness and repetition, how might digital rewards adapt or develop (if at all) as children progress through a task?*

ASD=Autism Spectrum Disorders; ID= Intellectual Disabilities

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Multi-methods approach

Study	Aims	Methods	Participants
Study 1 (3 x 60 minutes sessions)	To identify what kinds of reward children liked. 2. To collect, discuss and prioritize ideas for rewards. 3. To explore the design space and refine the reward requirements.	Testing existing apps Brainstorming Prototyping	3 children with ASD
Study 2 (1 x 60 minutes session)	1. To discover what types of reward children with ASD and/or ID prefer. 2. To explore how rewards could be developed and presented in a technology-based intervention.	Questionnaire Card sorting Prototyping	12 children (4 with ASD & ID, 4 with ASD, and 4 with ID)

Participants

- 15 children with ASD & ID, ASD, and ID
  - aged 11-13 (Mean: 12)
  - 10 were male
  - fluent in English
  - communication skills at the level expected of a typically developing child aged 6-9 years.
- recruited through a special school for children with ASD and/or ID, located in south of England

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Protocol – Study 1

1. Informed consent from parents
2. Informed assent from children
3. Session 1 – Testing existing apps (Story Maker & ISISS)
4. Session 2 – Brainstorming
5. Session 3 – Prototyping
6. Researchers analysed data
7. Interviewer shows participant report and discusses

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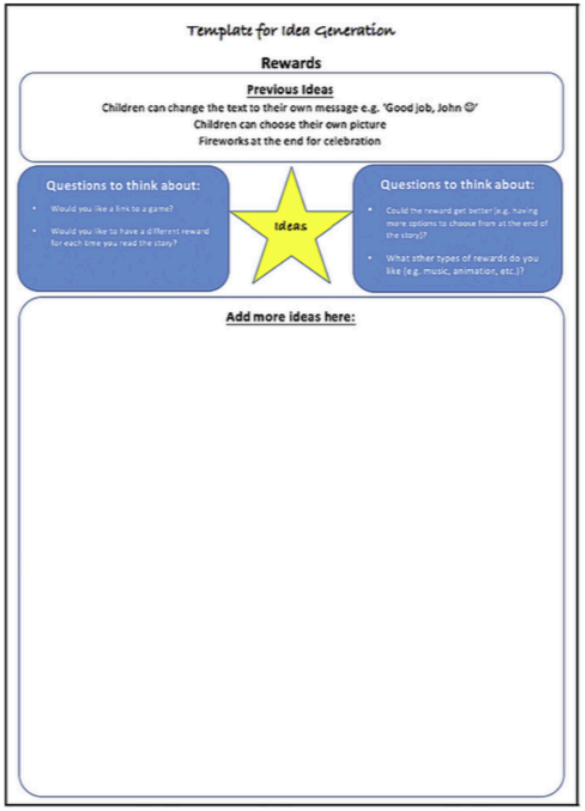
Study 1 - materials



Support materials for Idea generation: [*left*] worksheet;
[*right*] images to support children in generating ideas on "rewards" topic.

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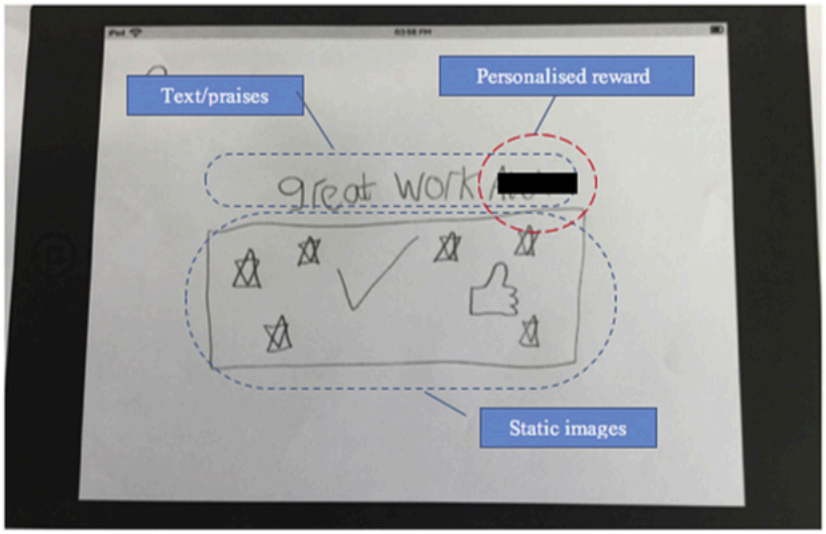
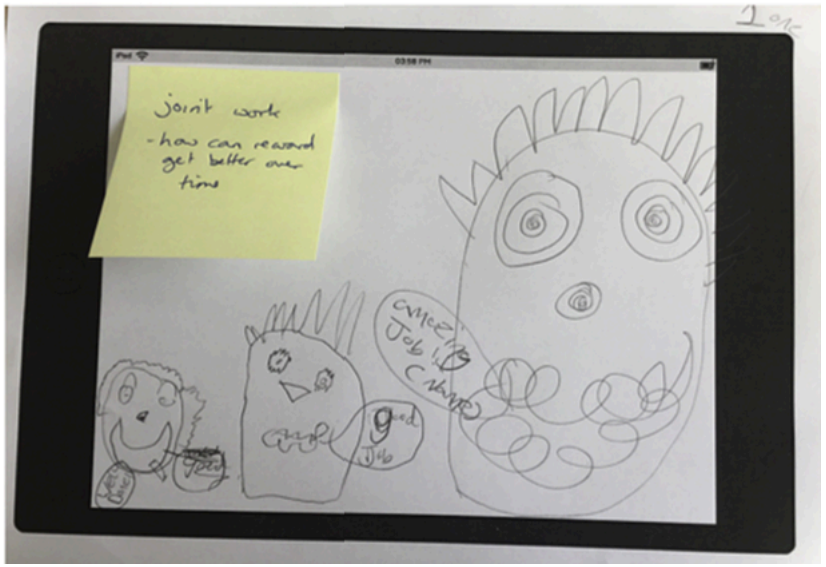
Study 1 - outcomes





Children prototypes: [*left*] Example of a prototype manually coded [*right*] rewards that develop

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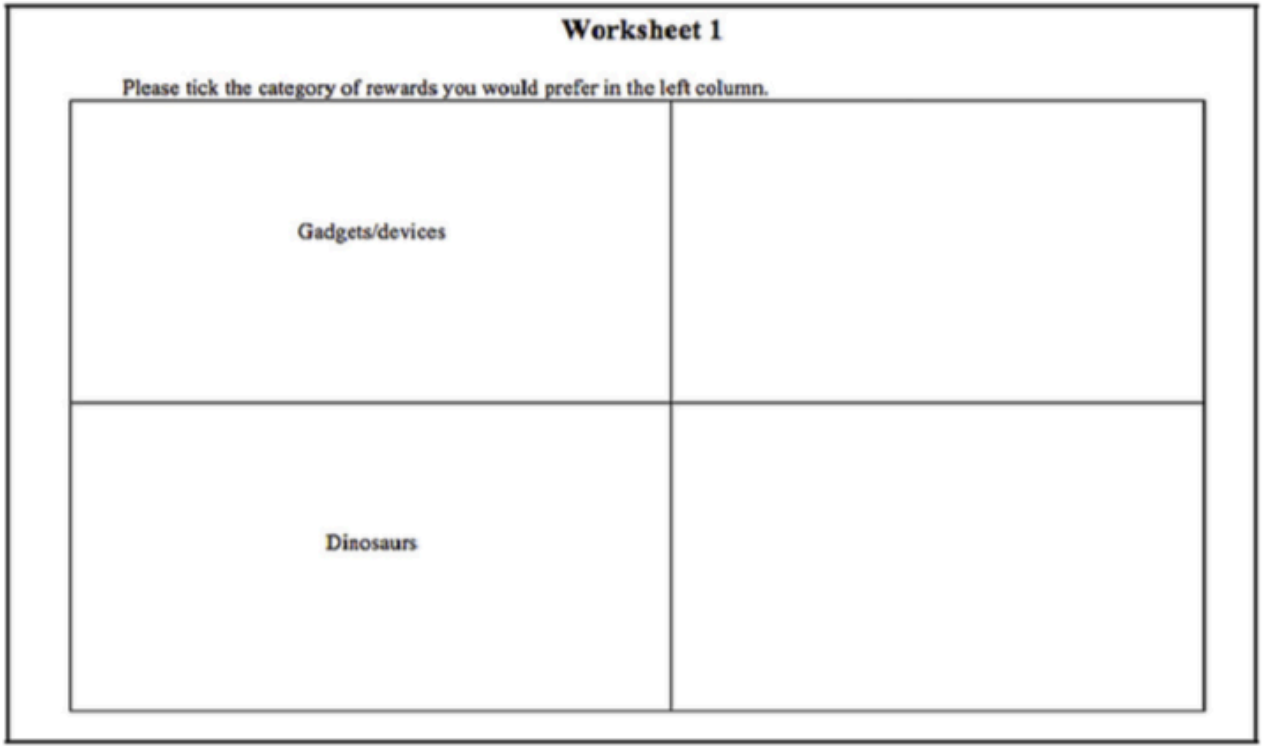
Protocol – Study 2

1. Informed consent from parents
2. Informed assent from children
3. Activity 1 – identify the children's favourite reward topics (started from 9 topics outlined by South et al. 2005)
4. Activity 2 – select an instance from the favourite topic categories
5. Activity 3 – build a reward that develops
6. Researchers analysed data

South, M., Ozonoff, S., & McMahon, W. M. (2005). Repetitive behavior profiles in AS and high-functioning autism. J of Autism and Dev Disorders, 35(2), 145-158

Study 2 - materials



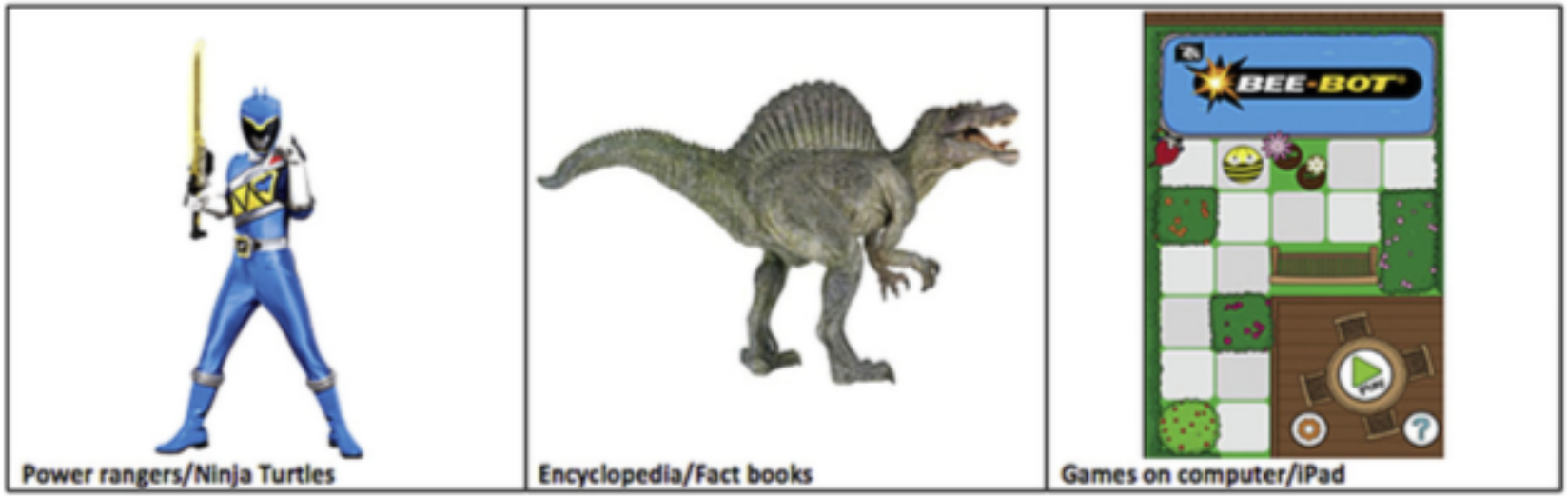
Worksheet 1

Please tick the category of rewards you would prefer in the left column.

Gadgets/devices	
Dinosaurs	

Excerpts from a worksheet containing a list of the 9 categories of rewards Activity 1: “Selecting the favourite topic categories of rewards”

Study 2 - materials



Examples of reward instances
Activity 2: “Selecting an instance from the favourite topic categories”

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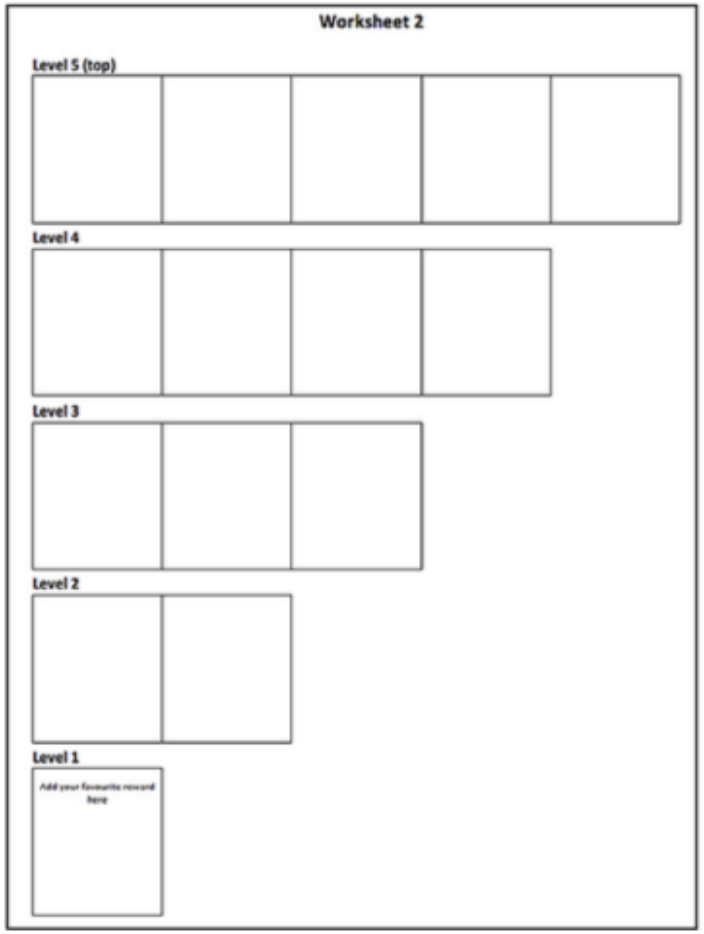
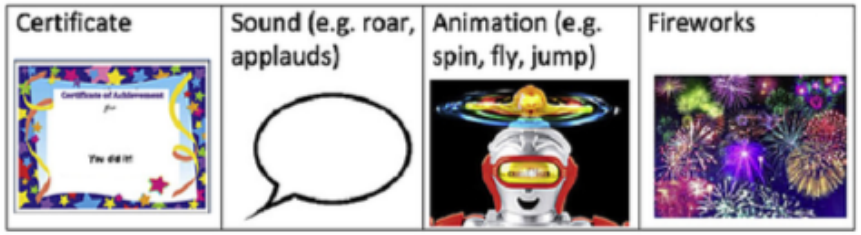
Study 2 - materials





[*left*] worksheet for a reward that develops; [*right*] visual representations of the features to be used for developing the reward levels – taken from study 1

Activity 3: "Building a reward that develops"

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Study 2 - outcomes

Activity 1 - Selecting the favorite topic *category* of rewards (PR/NJ=Power Rangers/Ninja Turtles, ND=Natural Disasters, JA=Japanese Animations, GC=Games on Computer, D=Dinosaurs, E/FB-Encyclopedias/Fact Books, S/P= Space/Physics, G/D=Gadgets/Devices, HF=Historical Events, ✓ =stands for a favorite category).

Part.	PR/NT	ND	JA	GC	D	E/FB	S/P	G/D	HE	Others
G2_1	✓	✓	✓	✓	✓			✓		Dragons
G2_2		✓		✓		✓	✓	✓	✓	Horse riding
G2_3				✓	✓			✓		Pets
G2_4	✓	✓					✓	✓	✓	Pirates
Total G2	**2**	**3**	**1**	**3**	**2**	**1**	**2**	4	**2**	**N/A**
G3_1	✓	✓	✓	✓	✓		✓	✓		Drama performing
G3_2	✓			✓			✓	✓	✓	Starwars
G3_3	✓		✓	✓	✓	✓	✓	✓		Cats & dogs
G3 4		✓			✓			✓	✓	Spiders
Total G3	**3**	**2**	**2**	**3**	**3**	**1**	**3**	**4**	**2**	**N/A**
Total	**5**	**5**	**3**	**6**	**5**	**2**	**5**	**8**	**4**	**N/A**

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Study 2 - outcomes

Activity 2 - Card Sorting (favorite topic *instances)* (a=fist image instance, b=second image instance, o=other instance selected by the child from Internet, ✓=instances that are 'liked').

Part.	PR/NT	ND	JA	GC	D	E/FB	S/P	G/D	HE	Others	Most liked
G1_1		✓a	✓a&b	✓a&b	✓a&b		✓a&b	✓a	N/A		Dinosaurs
G1_2	✓b	✓b	✓b	✓a			✓a		N/A		Not sure
G1_3				✓a&b	✓a&b		✓a	✓a	N/A	Drawnimal (iPad game)	Angry Birds
G1_4	✓a		✓a			✓a		✓a	N/A		Not sure
Total G1	**2**	**2**	**3**	**3**	**2**	**1**	**3**	**3**	**N/A**	**N/A**	**N/A**
G2_1	✓a	✓a	✓a	✓a	✓a			✓a		Dragons	Dinosaurs
G2_2		✓a		✓a		✓a	✓a	✓a	✓a	Horse riding	Books
G2_3				✓a	✓a			✓a		Pets	Pets
G2_4	✓a	✓o		✓a			✓a	✓a	✓a	Pirates	Ninja turtles
Total G2	**2**	**3**	**1**	**4**	**2**	**1**	**2**	**4**	**2**	**N/A**	**N/A**
G3_1	✓a	✓a	✓a	✓a	✓a		✓a	✓a		Drama performing	iPad
G3_2	✓a			✓a			✓a	✓a	✓a	Starwars	Starwars
G3_3	✓a		✓a	✓a	✓a	✓o	✓o	✓a		Cats & dogs	iPad
G3_4		✓a			✓a			✓a	✓a	Spiders	Spider
Total G3	**3**	**2**	**2**	**3**	**3**	**1**	**3**	**4**	**2**	**N/A**	**N/A**
Total	**7**	**7**	**6**	**10**	**7**	**3**	**8**	**11**	**4**	**N/A**	**N/A**

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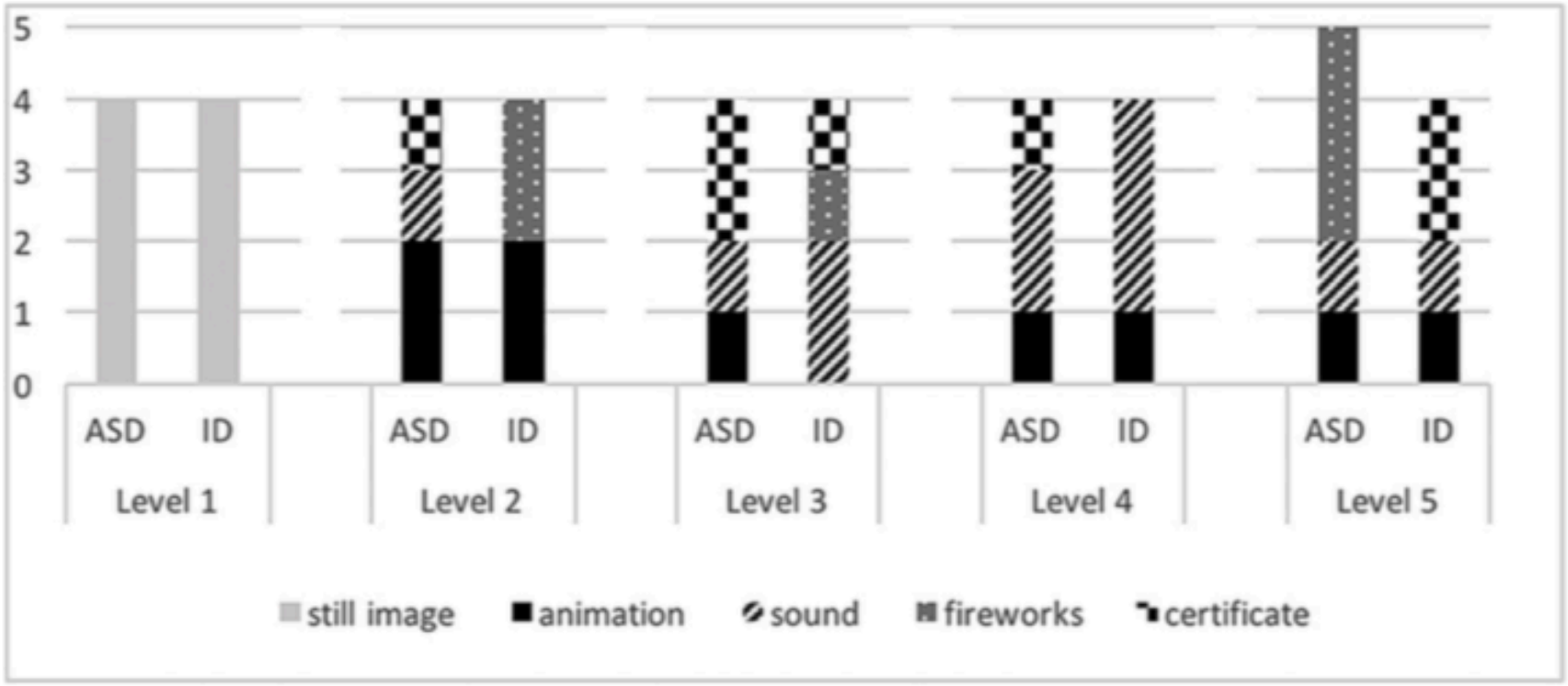
Study 2 - outcomes



Feature preferences in the Activity 3: "Building a reward that develops" activity.

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Summary - contributions

- **Theoretically** - raises a series of theoretical questions to be addressed about:
  - the role of sameness and difference in reward stimuli to be interacted with by children with ASD and/or ID
  - the role of rewards in behavioural interventions
- **Methodologically** - by adopting a robust, informed and flexible approach, it is possible to include children with ASD, and/or ID in a PD process.
- **Empirically** - provided data, currently very scarce, about three different groups of children offering novel solutions to design rewards to be embedded within digital technologies
- **Practically** - design suggestions and implications, supported by an albeit limited evidence base, for utilizing specific categories of reward to be included within digital technologies.

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