‘Whose toy is it anyway?’: Exploring implicit associations with regard to gender-stereotyped toys in young children

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Abstract

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Reference

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ABSTRACT

This study set out to explore young children’s implicit gender-toy associations with regard to cars and dolls using the Preschool Implicit Association Test. Of interest was the finding that almost half of the sample demonstrated almost neutral gender-toy associations, while a play session with a gender atypical toy did not prove to be an effective way of changing stereotypic associations. Possession of a doll and neutral parental attitudes towards the toys of the study seemed to characterise boys who held rather neutral gender-toy implicit associations. While for girls, the time between 3 to 5 years old seems to be crucial in shifting from neutral to stereotypic associations. Children’s actual choice of a toy to win at the end of the study was not predicted neither by their implicit associations nor by parental toy choices. Brief parental accounts revealed that social norms, personality traits, home environment and play habits may contribute in shaping children’s implicit associations.
1. INTRODUCTION

Gender identity & use of gender stereotypes in childhood

In his ‘Cognitive developmental theory’, Kohlberg (1966) tried to draw a parallel between the cognitive changes that children experience during development and their efforts to actively construct a social understanding of the world. ‘Gender constancy’ is an integral part of the theory and it refers to children’s gradual understanding, that comes along with cognitive advances during development, of the fact that gender is a constant, unchangeable characteristic of the individual. ‘Gender constancy’ is a process that requires the child’s progression through three distinct stages (Figure 1) (Martin & Ruble, 2004).

![Figure 1: A model of phase changes in the rigidity of children’s gender stereotypes as a function of age: Learning-Consolidation-Flexibility (Martin & Ruble, 2004).](image)

The sense of a ‘gender identity’ appears around the age of 2, when children begin to realize that they belong to a certain gender category (Rouyer, 2008). In the following years, they demonstrate a preference for their own gender (‘own gender bias’) and they actively build up their own understanding of the gender category they belong to judging from their own preferences, social experiences, interactions and information given or modeled by other individuals (Arthur et al., 2008). During this learning phase, children begin to form gender schemata which are dynamic gender-related mental representations that contain information associated with each gender category. These schemata are influenced by factors such as stereotype knowledge, gender norms, social desirability, as well as children’s personal attitudes, skills and self-efficacy beliefs (Bussey & Bandura, 2004). Children pay more attention and are more likely to remember information that is consistent with their
already existing schemata. Information that is not congruent with their developing gender schemata can be rejected, modified or processed at a slower rate (Frawley, 2008; Duffy & Keir, 2004). Moreover, children organize their behavior according to their existing gender schemata in order to maintain a balance between what they think and what they do.

Around the age of 5, children realize that gender is a stable characteristic of great importance for the organization of the social world (Liben, 2000). They start to rigidly use it as a point of reference to organize their social understanding, to guide their behavior and to interpret others’ behaviors (Miller et al., 2009). They engage in gendered play activities (Golombok et al., 2008) and they mock, correct or question the ‘gender identity’ of peers who play with cross gender toys (Langlois & Downs, 1980). Finally, around the age of 7, children comprehend that ‘gender identity’ cannot be modified by changes in appearance or behavior (‘gender consistency’). They become aware of the existence of gender stereotypes, as well as the discriminatory behaviors that accompany them, and this leads to more flexibility and more tolerance with regards to within gender variability (Trautner et al., 2005). A manifestation of the emergence of this kind of flexibility during development can be found in children’s shift of gendered perceptions with regards to toys. For example, even though preschool children tend to categorize certain toys as gender specific, as they grow up the same children perceive the same toys as gender neutral (Shojaee, Cui, & Shahidi, 2016).

**Car/Doll- Gender Associations**

Ruble et al. (2006) advocate that even before they complete their third year of life, some children have already developed a concrete understanding of which toys are associated with each gender. Cars and dolls could probably be considered as the prototypes of gender-stereotyped toys with the former being associated with boys and the latter with girls. Using a preferential looking paradigm, Serbin et al. (2001) managed to show that children’s preference for ‘own-gender’ toys appears along the same time as the acquisition of ‘gender identity’ and it is established by the age of 18 months. In that study, girls –but not boys- were also able to associate dolls with female faces and cars with male faces. However, in a naturalistic observation study Todd et al. (2017) found that preference for ‘own-gender’ toys could be observed in children as young as 9 months of age during independent play in a nursery context; more than a year before the acquisition of a ‘gender identity’. Gender differences do exist in young children’s gender-toy schemata. For example, both preschool boys and girls believe that dolls are a girl’s toy. Nevertheless, with regard to cars, only boys
perceive them as a boy’s toy with girls thinking that it could be used by both genders (Shojaee, Cui, & Shahidi, 2016).

At this point, we would like to draw the reader’s attention to the observation that all the studies mentioned in the previous paragraph have used female dolls in their experimental paradigms. This might suggest a methodological gap in up-to-date research, since gender is an obvious characteristic on a doll. When also considering the information presented in the previous section regarding ‘own gender bias’, it is safe to assume that female dolls will be instantly perceived as a girl’s toy by both genders and that it will be avoided by boys. This is a gap that the current study tried to fill by matching the doll’s gender to the participant’s gender in the experimental paradigm.

**Shaping gender-toy stereotypes**

In preschool children, schemata referring to gender categories are not conceived as abstract concepts, but they are rather understood via the child’s primary caregivers. From a ‘Social Learning Theory’ perspective, parental beliefs and modeled behaviors are the main determinants of children’s gender related beliefs and behaviors (Emolu, 2014). Considering that a lot of parents come from traditional cultural contexts and are themselves the products of rather stereotyped socialization processes, it would be safe to assume that they explicitly or implicitly contribute to their children’s gender typed behaviors through reinforcing feedback or modeling (Shojaee, Cui & Shahidi, 2016). Fulcher (2011) proposes that parental attitudes play a more important role than behaviors in shaping children’s gendered professional aspirations. In the same way, parental approval of gender appropriate toys and rejection of toys that do not correspond to the child’s gender are considered as principal determinants of children’s toy preferences (Freeman, 2007).

Eagly and Wood’s (1999) ‘Socio-cultural theory’ posits that between-gender psychological differences result from between-gender differences in social roles. From this perspective, a girl’s interest in playing with dolls could stem from women’s nurturing role in society, while a boy’s interest in cars would result from the more practical role endorsed by men in society. Nevertheless, the categorization of certain toys as ‘male’ or ‘female’ may trigger the formation of toy-gender associations. These associations carry gendered social representations that cannot be verbalized by younger children. Though qualitatively different from those of older children and adults, these social representations evolve gradually as children grow up and influence their attitudes, thoughts and behaviors. For
example, Weisgram, Fulcher and Dinella (2014) demonstrated that explicitly labeling toys as directed to a single gender category affected preschool children’s toy interests. Children demonstrated the same preference towards own-gender labeled toys even when they were presented with novel, unknown objects.

Apart from parental and social factors that seem to play a role in children’s gendered toy preferences, qualitative research has been helpful in revealing that toy properties may also influence children’s preferences. According to Mertala et al. (2016), 6 to 8-year-old girls chose their toys based on their personal (whether the doll represents something in the girl’s real life) and material (how many accessories come with the doll) values. However, for boys it was the realistic aspect of the toy that played an important role in their choice (how much the car and the child’s interaction with it resembles to real life routines).

As it can be understood by the reader, the factors that are involved in the formation of children’s gender-toy stereotypes are multiple and the relations among them are dynamic and ever changing. In an attempt to investigate the influence of toy properties, as well as that of parental and social factors in children’s implicit gender-toy associations, one of the main purposes of the current research was to explore whether parental attitudes and parental toy choices can be related to children’s gender-toy stereotypes, as well as to their actual behavior: their choice of a toy to win in the end of the study. Our hypothesis was that children and parents would present similar toy choices and that the children whose parents presented neutral or positive attitudes towards all the toys of the study would present more neutral gender-toy implicit associations. Thus, we expected children whose parents displayed a negative attitude towards the gender atypical toy and a positive attitude towards the gender typical toy to hold rather stereotypic gender-toy associations.

We were also interested in exploring whether children with more neutral toy-gender associations and children with stereotypic associations presented any differences regarding their possession of a car/doll toy, the frequency and the familiar context in which they played with these toys, as well as their play activities. We expected that children who were in possession of a gender atypical toy and whose play activities also included gender atypical choices would hold rather neutral gender-toy associations.

Furthermore, we were curious about parental views on the influence of toy properties (such as car color or doll gender) and that of social factors (social norms) in their children’s gender-toy stereotypes and toy preferences. For that reason, we decided to also provide
parents with the opportunity to mention other factors that they have observed and may have not been raised by research.

Implicit Associations

‘Implicit gender associations’ is a term used to refer to these cognitive associations among gender categories and particular characteristics or attitudes that children implicitly begin to form as soon as they establish a ‘gender identity’ during their second year of life or even before (Todd et al., 2017). These associations can either be stereotypic (a category is associated with a trait) or evaluative (a category is associated with a positive or negative valence) in their nature and can be learned via basic learning processes such as modeling, reinforcement or punishment (Baron et al., 2014).

Most researchers investigating gender relevant implicit associations in adult populations use the Implicit Associations Test (IAT), a computerized classification task during which respondents are presented with the two gender categories, each one combined with a valence dimension or an attribute (Greenwald, Nosek & Banaji, 2003). Cvencek, Greenwald and Meltzoff (2011) developed a child friendly version of the task, the Preschool Implicit Associations Test (PSIAT). In their study, children as young as 4 years old demonstrated strong positive implicit attitudes towards their own gender, with girls demonstrating stronger attitudes than boys. In a recent study Dunham, Baron and Banaji (2016) found that this difference in the strength of implicit ‘own gender biases’ between boys and girls remains stable across the lifespan and is also present in adult samples.

‘Balanced Identity Theory’ (Greenwald et al., 2002) provides a theoretical account of how implicit associations are formed among three implicit constructs: social categories, the self and positive/negative valence. According to the theory’s balance congruity principle, the association of two independent implicit constructs with the same third construct should enforce a link among them. More precisely, the implicit attitude towards one’s own gender group will be the multiplicative product of one’s identification with the group and one’s self-esteem (Figure 2).
This need for a cognitive-affective balance can influence the formation of implicit gender-stereotype associations. For example, if a girl learns that the gender category ‘girls’ is associated with the attribute ‘doll’, she will inevitably develop an implicit association between the ‘self’ and ‘doll’ in order to maintain her ‘gender identity’ (‘self’- ‘girl’), her in-group positive attitude (‘girls’- ‘good’) but most importantly her positive self-esteem (‘me’- ‘good’). Alternatively, and according to trait aggregation theory (Can & Sanver, 2007), it could be that it is the girl’s strong in-group identification and her identification with the doll that will eventually lead her to generalize her own reference to all girls (Figure 3). Even though the theory does not assume nor provide any empirical evidence about causal relations between the concepts, it is safe to assume that the maintenance of the implicit association between the self and a positive valence (self-esteem) will be the driving force in the formation of implicit stereotypes and attitudes for the sake of preserving a balanced identity (Cvencek, Greenwald and Meltzoff, 2016). The balanced identity concept has repeatedly found empirical support in adult samples (Nosek et al., 2002b). However, support for parallel predictive associations in children as young as 5 years old emerged quite recently (Cvencek et al., 2015).
If the maintenance of a positive self-esteem is the driving force in the formation of an ‘implicit associations network’, it is safe to assume that every concept that is contradictory to the ones among which implicit associations have already been established will be perceived as a menace to the child’s self-esteem and will be instantly rejected. Therefore, a ‘me’- ‘doll’ implicit association link will be impossible to be formed for a boy that holds a strong implicit ‘boy’- ‘car’ association. Within the theory’s framework, links with menacing concepts can only be established if the concept in question is divided in two sub-concepts of which at least one does not posit a menace to the established network.

The primary goal of this research was to explore young children’s implicit gender-toy associations using the PSIAT. For children with strong implicit stereotypes (‘doll’- ‘girl’/’car’- ‘boy’ type), a secondary goal of the study was to find out whether they could obtain PSIAT scores that were closer to 0 (indicating more neutral gender-toy associations) after exposing them to a play situation that could be considered as atypical of their own gender. For children holding more neutral gender-toy associations, no change was expected after the play session since, theoretically, associations with the gender atypical, as well as typical, concepts had already been established at some point during their development.

Baron et al. (2014) advocate that direct or indirect exposure to information that is contradictory to existing stereotypes and attitudes could be an effective way to induce change at a cognitive level. We attempted to achieve that through the composition of two play scenarios, one for doll play and one for car play, in order to provide a common play context for participants in each experimental condition. The doll play scenario was supposed to set the context for empathic and caring pretend play with the doll, while the car scenario was targeting planning and gross motor skills by proposing a navigation plan with friends on a ‘city carpet’.

In more concrete terms and with regards to participants in the experimental group (play with a gender atypical toy), for male participants, we created a ‘male doll’ sub-concept for the ‘doll’ concept by providing a male doll. This small amendment was meant to allow male participants to establish an implicit ‘me’- ‘doll’ link that would enable them to engage in pretend play with the doll, even though the play scenario that was provided was gender atypical. In the case of female participants, we created the sub-concept ‘road trip with
female friends’ for the concept ‘car’. The sub-concept was introduced to female participants via the play scenario that was written for the car play situation. This sub-concept could theoretically facilitate the formation of a ‘me’- ‘car’ implicit association.

Changing young children’s stereotypic associations may initially seem of minimal importance to the reader. However, it is of crucial importance for children’s global development. For instance, girl’s non-engagement in car play, which can foster spatial and gross motor skills, can lead to an underdevelopment of those skills. As a matter of fact, men’s better than women’s performance in spatial tasks is a real gender difference and it is considered as one of the main reasons for which women are not interested in STEM professions (Petersen & Hyde, 2014). On the other hand, doll play is known for fostering nurturing and empathic skills in children. It is safe to assume that boys who do not engage in this kind of play will have more difficulty in developing those skills during childhood. As a matter of fact, Li and Wong (2016) discovered that boys who played more with gender-neutral toys manifested better comforting skills during a ‘crying baby’ situation than boys who mostly played with masculine toys.

**Changing Implicit Associations: Is it possible? And what about behavior?**

As mentioned above, direct or indirect exposure to stereotype contradictory information can be effective in introducing change in children’s cognition (Baron et al. 2014). Such information can be provided to children by parents, teachers, professionals, media or even social network websites (for older children).

Pike and Jennings (2005) have demonstrated that presenting 6 and 7-year-old children with stereotype incongruent television commercials can lead to a shift in their gender-toy implicit associations. After watching the commercials, children perceived as gender neutral the same toys that they had initially evaluated as typical of a gender category. However, no behavioral measure was included in the study. With regards to behavior, little is known about child populations. A meta-analysis of experimental studies that attempted to change implicit biases in adult samples concludes that even though short-term change in implicit attitudes is possible, it has absolutely no impact on actual behavior (Forscher et al., 2017). However, whether the same could be true for children is open for exploration and it is a question that this study tried to answer.
‘Spontaneous stereotyping’ refers to “behavioral manifestations of automatically activated social stereotypes under conditions of little cognitive control (e.g. owing to a lack of cognitive resources, attention, or time)” (Banse et al., 2010, p.299). The mere definition of ‘spontaneous stereotyping’ suggests a link between implicit association activation and behavioral manifestation of stereotypes. Using an implicit association’s task that included the behavioral ‘spontaneous stereotyping’ measure of choosing which toys to give to an atypical/typical boy or girl, Banse et al. (2010) examined the differences in ‘spontaneous stereotyping’, ‘stereotype knowledge’ and ‘stereotype flexibility’ between 5 and 11-year-old children. Even though 11-year-olds showed greater ‘stereotype flexibility’ than 5-year-olds, they both presented comparable results with regards to ‘stereotype knowledge’ and ‘spontaneous stereotyping’.

The aforementioned findings provide support for the developmental trajectory proposed by cognitive accounts in that there was a significant difference in ‘stereotype flexibility’ between 5 and 11-year-olds. However, the finding that ‘stereotype knowledge’ and ‘spontaneous stereotyping’ have already reached ceiling levels by the age of 5 insinuates that ‘stereotype knowledge’ may continue to implicitly influence overt behavior & ‘spontaneous stereotyping’ regardless of the developmental advances in ‘stereotype flexibility’.

The developmental trajectory of implicit associations also suggests that they emerge quite early in development and remain stable across the lifespan (Cvencek, Greenwald & Meltzoff, 2011; Dunham, Baron & Banaji, 2016). Thus, if implicit associations do influence spontaneous stereotyping behavior, both will be less malleable to change as children grow up. Therefore, if there is an optimal moment in development to change them this should be early childhood (Rudman, 2004; Bigler & Liben, 2006). Yet, the assumption that change would be easier to introduce at a later stage in development, once the cognitive advances in global flexibility have taken place, remains viable.

For that reason, while also taking into consideration the developmental trajectory of stereotype formation (Martin & Ruble, 2004), we decided to test this hypothesis in children of approximately 3.5 to 6.5 years of age. We expected that change in stereotyped implicit associations would be achieved after the play session with an atypical toy for younger children and that they would choose the gender atypical toy at the end of the experimental session. We expected no pre-post play session difference in implicit associations of 5 and 6-
year-olds and we anticipated that they would choose the gender typical toy at the end of the experimental session.

2. METHOD

2.1. Participants

The participants of this study were 15 children (4 boys and 11 girls) aged from 41 months to 76 months old (M=58.27, SD= 11.29) and of multiple nationalities (Danish, Polish, Guinean, Swiss, French, German, Italian, Canadian, Hellenic, Peruvian, Chilean, American, Croatian and Kosovar). Children were recruited in a recreation center situated in Geneva (Switzerland). Each year, more than 1500 children of more than 100 different nationalities visit the center, a sample that is quite representative of the cultural and socioeconomic variability of Geneva’s population. During their visit to the center, the researcher informed the parents about the purpose of the study and asked whether they would be interested in participating. Parents that showed interest in the study were asked for their email addresses. A follow-up email was sent to those parents, containing an information sheet, as well as instructions for the day of the experiment (Appendix A). The study was approved by the University of Geneva’s ethics committee and all parents signed a written informed consent for their child’s participation in the experiment (Appendix B).

2.2. Design

This study adopted a 2x2 mixed ANOVA design (Figure 4). The ‘within-subjects’ factor was time (pre- & post-play session), while the ‘between-subjects’ factor was group (control & experimental). Children in the control group (N=6) had a play session with a gender typical toy (M=10.92 minutes, SD= 4.21minutes), while children in the experimental group (N=9) had a play session with a gender atypical toy (M=11.17 minutes, SD=3.51 minutes). There was no difference in sex ratio, $\chi^2(1) = 0.511$, $p > .05$, or age at testing, $t(13) = .472,p > .05$, between the children of the control and those of the experimental group.
2.3. Materials & Procedure

For Children

2.3.1. Pre-School Implicit Association Test (PSIAT) (Cvencek, Greenwald, & Meltzoff, 2011)

The PSIAT is a child friendly version of the classic Implicit Association Test (IAT) (Greenwald, McGhee, & Schwartz, 1998) adapted by Cvencek, Greenwald and Meltzoff (2011) for use with children as young as 4 years old. Similar to the adult version, the PSIAT is a categorization task that measures the strength of associations between implicit concepts. The original version of the PSIAT task includes an adapted keyboard and the use of pictures, as well as simultaneous presentation of words with their sound recordings.

In this study, children were seated at a desk facing a computer screen with the adapted keyboard placed on the desk between the child and the screen. An adjustable height chair was also used to achieve optimal positioning. The adapted keyboard had two large response buttons that were color coded (purple and orange). Similarly, an orange stripe was presented on the left side of the screen and a purple stripe was presented on its right side. Colors were used as facilitators for children to identify which response button they should press in order to provide the right answer. For example, if children believed that a stimulus belonged to the purple side, they should press the purple button.
During the task, picture stimuli of the four concepts of interest (boys, girls, cars and dolls) were presented in the middle of the screen. Four pictures were used for each concept. In the PSIAT version for girls, pictures of girl superhero dolls were used as stimuli for the doll concept. Respectively, boy superhero dolls were used for the task’s boy version. The decision to match the doll’s gender with the participant’s gender was taken after identifying in the aforementioned literature the experimental gap of only using girl doll’s pictures.

Following instructions by Greenwald et al. (2003), the PSIAT in this study consisted of 7 blocks (practice and test) and a total of 144 trials. In single discrimination blocks children were asked to simply classify pictures of either toys or children. In combined discrimination blocks the two conceptual categories (gender & toys) were combined. Visual reminders of the four concepts (boys, girls, cars, dolls) were continuously present on the computer screen in the form of a separate collage for each concept (Figure 5).

![Figure 5: Pictorial Representation of a PSIAT stereotype incongruent trial (boy's version). In this case, the child should press the orange button for the right question. Pressing the purple button would constitute a false answer and a red question mark would appear under the car’s picture in the middle of the screen. The child would be able to continue to the next trial once he understood that the right answer corresponds to the orange button for this trial.](image)

In a stereotype congruent trial, boy picture stimuli were paired with car stimuli, while girl picture stimuli were paired with doll stimuli. In a stereotype incongruent trial, boy picture stimuli were paired with boy dolls, while girl pictures were paired with car stimuli. Visual reminders of paired concepts were presented at each colored stripe on the left and right side of the screen. A pictorial example of a PSIAT stereotype incongruent trial can be found in Figure 5. Each trial was introduced with a short beep sound and the time interval between the trials was 500ms. The test was administered in French, following the instructions
provided by the creators of the task (Appendix C). At the end of this task, the participant receives a PSIAT score (d-score) that is calculated on the basis of both practice and test blocks and which ranges from -1 to +1.

2.3.2. Play Session Scenarios

Two play scenarios were written and used for the play session between the pre-test and post-test PSIATs (Appendix D). At this point, it is important to mention that these play scenarios were not used as a strict script that should be necessarily followed by children in their play, but rather as a general play framework in order to ensure that all children will have the same kind of play session.

A common play scenario was created for girls and boys who would play with a doll. As with the PSIAT stimuli, a female superhero doll was used with girls and a male one with boys. In this scenario, the experimenter introduced the doll to the child and described a normal day in his/her life using routines that could be represented by the child in pretend play such as take a walk with the doll, change its clothes, or put the doll to sleep.

Similarly, a common play scenario was used for girls and boys who would participate in the car play session condition. In this case, the same car (simple structure, wooden toy, neutral color) was used with boys and girls, as well as a city play mat. The experimenter introduced the car to the child and demonstrated how the car could be deconstructed and reconstructed. In this scenario, the experimenter invited the child to imagine a day in his/her life as an adult who sets out for a road trip with his/her friends. Along the way, the child had to engage in play routines such as wash the car, change a tire, or find the way to his/her destination. Pictures of the toys used for the play session can be found in Figure 6.

![Toys](image)

*Figure 6: Toys used in the play session (depending on child’s gender and experimental condition).*

2.3.3. Behavioral Measure-Toy Choice
Once the post-test PSIAT was completed, the experimenter presented children with two of the toys that were used for the play sessions: the superhero doll (male or female depending on the child’s gender) and the car. While holding each toy at each hand, the experimenter gave the following instruction (translated from french): ‘At the end of the study we are going to conduct 2 lotteries; one for each toy. This means that we will have 2 jars; one will contain the names of the children who want to win the doll and the other will contain the names of the children who want to win the car. Then, we will pick one paper from each jar and the child whose name is written on it will win the toy! However, you can only put your name in one jar. Therefore, you must show me which toy you want to win. Can you point at the toy you want to win using your finger?’.

Once they had made their choice, children were thanked for their participation to the study and were offered a chocolate and a certificate of participation. Finally, the experimenter escorted children to their parents in the waiting room. After checking the parents’ questionnaires (see below) for any missing information, the experimenter also thanked the parents for their participation and accompanied them to the exit.

For Parents

2.3.4. Pre-School Activities Inventory (PSAI)

The PSAI (Golombok & Rust, 1993) is a parental report questionnaire that measures gender-typed play behavior in young children (Appendix E). It was included in this study in order to examine whether children’s play behavior, as perceived by their parents, could be associated with their gender-toy implicit associations. The questionnaire contains 24 items which are distributed in three sections: toy preference, play activities and character traits. Parents are asked to report the frequency that best corresponds to their child for each item on a scale ranging from ‘never’ to ‘very often’. Each item receives a score from 1 to 5 and a final global score is calculated. Negative scores represent stronger engagement to masculine play activities, while positive scores represent more feminine play habits. In their article, Golombok and Rust (1993) report a mean score of 61.66 for boys and 38.72 for girls on a population of 2,161 children. The PSAI has been also used in Cvencek, Greenwald and Meltzoff (2011) in order to measure gender-typed play behavior in 4-year-olds.

2.3.5. Behavioral Measure-Toy Choice
The same question that was posed to children at the end of the experiment was also posed to parents in a written form (Appendix F). Pictures of the two toys (car and boy/girl superhero doll depending on their child’s gender) were presented to parents on a piece of paper. A short text informing the parents about the drawing of lots at the end of the study was placed above the two pictures. One check box was placed under the picture of each toy and parents had to check the box of the toy in the lottery of which they wanted their child to participate.

2.3.6. Attitude Scale

An attitude scale was constructed specifically for the needs of this study (Appendix G). The scale contained a total of 12 items measuring parental attitudes towards each one of the 3 toys used in this study. The same 4 items were presented for each one of the 3 toys along with its picture at a random order within the scale. However, the scale -and hence the order of items- was the same for all parents (Lavrakas, 2008).

These items were:

- ‘I like this toy’
- ‘I would be happy if my child was playing with this toy’
- ‘I think that playing with this toy would be beneficial to all children’
- ‘When I see my child playing with a similar toy, I try to draw his/her attention to a different toy’

Five answers were provided (‘Strongly Disagree’, ‘Disagree’, ‘Neutral/Indecisive’, ‘Agree’, ‘Strongly Agree’) and parents had to check the answer that best corresponded to them. Each item received a score from -2 to +2 and a final score was calculated for each toy. Reliability analysis for each toy revealed alpha values of ~0.85 (for car, a= 0.86; for girl-doll, a=0.85; for boy-doll, a=0.86). These a-values exceed the acceptability threshold of 0.7 (DeVellis, 2003). Thus, we were able to use the participants’ composite attitude scores for each toy in our main analysis. Composite scores ranged from -8 to +8. Positive scores indicated positive attitudes and negative scores negative attitudes, while scores closer to 0 represented more neutral attitudes towards the toys.

2.3.7. Supplementary Questions
Parents were asked to respond to a questionnaire containing items of a more qualitative nature (Appendix H). The purpose of it was to explore, through the parent’s perspective, factors that have been previously identified in research as contributing to the formation of gender-toy schemata and find out whether they might also be related to children’s implicit associations and toy choices. In this questionnaire, parents had to indicate whether their child was already in possession of a doll or a toy car, its gender or color respectively, as well as the frequency at which he/she played with it and with whom. If the child did not have a toy car or a doll, parents were asked to indicate the reason for that. Parents were also asked to indicate whether the child had any siblings and their gender. At the end of the questionnaire, we asked the parents to provide us with any additional information that they as helpful in understanding their child’s toy preferences with the expectation to identify new factors that have not been raised by research until this point; a limited space was purposefully left blank to allow room for their answers.

3. RESULTS

3.1. Descriptive Statistics & Analysis of Variance (ANOVA)

Implicit associations scores (d-scores) were calculated based on children’s response latencies in the stereotype congruent condition in comparison to their response latencies in the stereotype incongruent condition (Greenwald et al., 2003). Exclusion criteria for outliers as established in Greenwald et al. (2003) were respected, except for the “greater than 35% error rate” criterion which was not respected for the group of 3-year-olds. The reason for that is that the task had never been tested before with children younger than 4 years old, therefore a slightly higher error rate can be expected. Otherwise, all participants had less than 10% of their responses answered in less than 300 milliseconds and an average response latency within 3 standard deviations of the total sample’s mean. For this study, positive PSIAT scores indicate stronger car-boy/girl-doll implicit associations, while negative PSIAT scores demonstrate stronger boy-doll/girl-car implicit associations. Average response latencies and percentage of correct responses for boys and girls can be found in Table 1.

Table 1

Mean response speed (in milliseconds) and correct response rate of male and female participants in PSIAT testing toy-gender stereotypes.

<table>
<thead>
<tr>
<th>Age Groups</th>
<th>3-year-olds</th>
<th>4-year-olds</th>
<th>5-year-olds</th>
<th>6-year-olds</th>
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</table>
Average scores and standard deviations for each age group, as well as for the total sample can be found in Table 2. No significant difference in pre intervention d-scores was found between male (M=.318, SD=.630) and female (M=.193, SD=.453) participants, $t(13) = -.428, p > .05$. Similarly, no significant difference was found in post-intervention d-scores between male (M=.641, SD=.423) and female (M=.379, SD=.371) participants, $t(13) = -1.166, p > .05$.
In order to determine whether there were significant differences in d-scores among the age groups, two one-way ANOVAs were conducted. For pre intervention d-scores, no significant between age group differences were observed $F(1, 11)= 2.190, p>.05$. Similar results were observed for post intervention scores $F(1, 11)= 2.923, p>.05$. Average PSIAT scores and 95% CIs for each age group in pre and post intervention scores can be found in Figure 7. Even though the aforementioned age and gender differences did not reach statistical significance, there seems to be a tendency for average d-scores to increase with age; a trend that is more evident in post intervention d-scores.

![Figure 7: Average pre- (left) and post-intervention (right) d-scores for each age group.](image)

Since no significant gender or age differences in PSIAT scores were found a priori and considering the small sample of our study, we decided to test intervention effects without adding these variables to our statistical model. D-scores were entered as the dependent variable in a 2 (Group: Control & Experimental) x 2(Time: Before & After Intervention) mixed design ANOVA. Data were a priori tested, and all relevant assumptions were satisfied. There was no statistically significant difference in d-scores between the experimental group and the control group as a result of the play session $F(1, 13) = 0.99, p = 0.34$, partial $\eta^2= 0.07$. In order to exclude the influence of retest effects, we decided to use pre-intervention d-scores in subsequent analysis.

### 3.2. Exploratory Two-step Cluster Analysis

Even though most of our participants did display positive pre-test PSIAT scores (N=9), there were also children (N=6) who had negative d-scores which were much closer to 0 (indicating more neutral gender-toy associations). A two sample t-test revealed that negative d-scores (M= -0.270, SD= 0.204) were significantly different from positive d-scores (M= 0.558, SD= 0.276), $t(13)= 2.160, p < .01$. For this reason, we decided to explore whether female and
male participants who displayed positive d-scores (stronger girl-doll/boy-car associations) differed in their characteristics from those that displayed negative d-scores (stronger boy-doll/girl-car associations). For that purpose, we conducted two 2-step Cluster analyses, one for each category of associations, using the information that was collected from parental questionnaires. For both analyses, the Log-likelihood was chosen as a distance measure and the number of clusters was determined automatically by SPSS using the Bayesian Information Criterion (BIC). The variables that were included in these cluster analyses can be viewed in Table 3. For the sake of brevity, we will concentrate on the variables which, according to the results of the cluster analysis, were different among children with positive d-scores and children who obtained negative d-scores.

Table 3

List of variables included in the two 2-step cluster analyses

<table>
<thead>
<tr>
<th>Gender</th>
<th>Possession of a toy-car</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color of the toy car</td>
</tr>
<tr>
<td></td>
<td>Frequency of play with toy-car</td>
</tr>
<tr>
<td></td>
<td>Play Conditions with the toy-car</td>
</tr>
<tr>
<td></td>
<td>Possession of a doll</td>
</tr>
<tr>
<td></td>
<td>Gender of the doll</td>
</tr>
<tr>
<td></td>
<td>Frequency of play with doll</td>
</tr>
<tr>
<td></td>
<td>Play Conditions with the doll</td>
</tr>
<tr>
<td></td>
<td>Existence of siblings</td>
</tr>
<tr>
<td></td>
<td>Choice of toy at the end of the experiment</td>
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<td></td>
<td>Parental toy choice</td>
</tr>
</tbody>
</table>

For positive PSIAT scores the sample was 9 children. The cluster analysis produced 2 clusters, one for boys (N=2) and one for girls (N=7). With regards to cluster intra-cohesion and inter-separation, the Silhouette Coefficient was 0.4, indicating a fair cluster quality. For negative d-scores, the cluster analysis again produced 2 clusters for a sample of 6 children, one for boys (N=2) and one for girls (N=4). The Silhouette coefficient was 0.5, indicating a good cluster quality. Figure 8 presents descriptive information on the quantitative variables included in cluster analyses.

Interestingly, girls with negative d-scores were a year younger than girls with positive PSIAT scores and their parents displayed more positive attitudes towards all the toys of the study. Contrary to boys with positive PSIAT scores, boys with negative d-scores were all in
possession of a doll with which they were no longer playing as much. Furthermore, parental attitudes of boys with negative d-scores towards all toys were more neutral than those of boys with positive PSIAT scores. With regards to our behavioral measure, all children with negative d-scores chose the same toy that their parents had chosen for them. Half of the children with positive PSIAT scores made a choice that was incongruent to that of their parents.

**Figure 8**: Mean scores and standard deviations (in parenthesis) of ratio data included in cluster analyses.

### 3.3. Regression Analyses

Due to our sample’s small size, the choice of predictors was based on the conclusions drawn from the results of cluster analyses.

We conducted a multiple linear regression to predict children’s initial PSIAT scores based on Age (in months), Gender, PSAI scores, Parental Attitude towards girl-doll, Parental Attitude towards boy-doll, Parental Attitude towards car, as well as Possession of a doll and Possession of a car. Overall, a significant regression equation was found $F(8, 6)= 5.555$, $p=0.025$, with $R^2=0.881$. Gender was coded 1=Female, 2=Male, Possession of doll/car was coded 1=YES, 2=NO and PSIAT scores were ranging from -1 to +1 (Table 4). The only statistically significant predictor was the Possession of a doll ($p<.05$), while Age, Parental Attitude towards girl-doll and Parental Attitude towards boy-doll were marginally significant ($p<.08$).

A second multiple linear regression was conducted in order to predict the Children’s Toy Choice based on Gender, PSIAT score, Parental Toy Choice, Parental Attitude towards girl-doll
and Possession of a doll. A non-significant regression equation was found $F(5, 9)= 1.439$, $p=0.299$, with $R^2=0.444$. None of the predictors could individually, nor collectively, predict Children’s Toy Choice.

<table>
<thead>
<tr>
<th>Beta-coefficients, standard errors and p-values from multiple regression analysis with age (in months), gender, PSAI scores, parental attitudes towards girl-doll/boy-doll/car and possession of a doll/car as predictors for initial PSIAT scores.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unstandardized Beta values</strong></td>
</tr>
<tr>
<td>Intercept (Constant)</td>
</tr>
<tr>
<td>Age (months)</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>PSAI</td>
</tr>
<tr>
<td>Parental Attitude girl-doll</td>
</tr>
<tr>
<td>Parental Attitude boy-doll</td>
</tr>
<tr>
<td>Parental Attitude car</td>
</tr>
<tr>
<td>Possession doll</td>
</tr>
<tr>
<td>Possession car</td>
</tr>
</tbody>
</table>

### 3.4. Thematic Analysis

A total of 10 parents provided texts containing additional information for their child’s play behavior for a total of 11 children (1 parent provided the same text for both children who participated in the study. The QDA Miner software was used to analyze the brief texts. Parents’ observations with regards to their children’s play behaviors revolved around 4 major themes for each of which parents provided specific examples (Figure 9). Observations designated to the theme ‘Social Norms’ mainly involved change of the child’s toy preferences after corrections made from peers at school or by observing the behavior of a family member (ex. ‘Before she joined the nursery, she was playing with all toys. One day, some boys at school told her that girls are not supposed to play with cars. That was it. She never plays with cars when other children are present, and she asks for only feminine toys; sometimes she plays with cars when alone at home, but not as she used to.’). ‘Personality traits’ were brought by two parents as an explanation for their child’s preferences. For example, a girl’s ‘boyish’/adventurous personality and toy preferences were perceived as a result of identifying more with the father figure in the family. Both traits mentioned in this
theme refer to girls. ‘Family Environment’ was brought up by some parents as an explanation for their child’s behavior. Under the ‘Play Habits’ category some parents brought up their children’s preference for construction/logic games as an explanation for their more neutral toy preferences.

Analysis of thematic proximity in parental commentaries revealed that ‘Home’, ‘Boy/Girl sections in toy stores’ and ‘Construction/Logic games’ were more semantically related to boys. ‘Nursery’, ‘Macho heroes in video games’, ‘Girly’, ‘School’ and ‘Construction/Logic games’ were closer to the ‘Girl’ construct. However, it must be mentioned that the aforementioned thematic similarities were rather weak, with alpha values ranging from 0.2 to 0.3.

4. CONCLUSION

At first glance, the results of this study seem difficult to interpret. Contrary to Pike and Jennings (2005), in our study the brief exposure to anti-stereotypic information did not prove to be successful in changing stereotypic implicit associations in children. This could be due to the different nature of the interventions or to the age of the children that participated in each study. Pike and Jennings (2005) used television commercials to challenge 6 and 7-year-old children’s stereotypes, while we used a play session with a gender atypical toy in children of 3.4 to 6.3 years old. Interestingly, there are theoretical accounts assuming that change in implicit associations could be easier to achieve after the
age of 7, when children’s developmental advances allow for more flexibility in their understanding of gender categories (Baron et al., 2014).

Even though the play scenarios introduced children to a gender atypical play situation, it seems that they were not successful in creating non-menacing toy sub-concepts that would allow the formation of implicit associations between the self and the gender atypical toy, thus leading to post-test PSIAT scores that would be closer to (indicating more neutral gender-toy associations) (‘Balanced Identity Theory’, Greenwald et al., 2002). As mentioned in the introduction, simply presenting children with information that challenges their gender stereotypes runs a quite important risk. Considering that this type of information is contradictory to the information that children encounter in their everyday lives, they might simply not pay attention to or quickly discard that contradictory information (Frawley, 2008; Duffy & Keir, 2004). In our case it is also possible that children might simply have judged the experimental situation, which was atypical of their own gender, as an exceptional situation in which they should simply adapt their play behavior according to the play scenario that was presented to them. This could have a positive effect on ‘stereotype flexibility’, but it would be completely unsuccessful in changing stereotypic gender-toy associations, or reducing ‘spontaneous stereotyping’, prejudice or gender typing behaviors (Banse et al., 2010). Furthermore, the fact that we used dolls that were congruent with the child’s gender did not seem to influence the study’s findings. Therefore, the assumption that in previous studies the child’s own gender bias could have interfered with the study’s results does not seem valid.

Before we proceed with further conclusions that can be drawn from our analysis, we would like to draw the reader’s attention to the fact that almost half of the study’s sample obtained negative PSIAT scores. Thus, even retrospectively, it should be stated that nowadays many children do not seem to bear stereotypic gender-toy implicit associations. The results of the current study revealed that mean negative PSIAT scores for both boys and girls were closer to 0 and significantly different from positive PSIAT scores. According to the experimenter’s point of view, high negative PSIAT scores also indicate strong stereotypic associations that simply go towards the opposite sense. The fact that negative PSIAT scores were closer to zero allows us to assume that children who obtained them may already implicitly hold more neutral representations of gender typed toys. A finding that could provide partial support for this claim is that for boys with negative PSIAT scores, parental attitudes towards all the toys of this study were also more neutral. Since parental attitudes
towards the boy/girl dolls were significant predictors of children’s implicit associations, it is possible that parental neutral attitudes may also contribute to the formation of neutral implicit gender-toy associations in young boys.

A finding of great interest regarding PSIAT response latencies is that 3-year-old girls needed more time to respond and had a lower success rate than 4, 5 and 6-year-olds. In fact, it seems like there is a sort of linear progression with age, with response times decreasing and success rates increasing across the four age groups. The same trend is also observed for response latency and success rate variability which seems to be smaller among older children. The observation that post-intervention PSIAT response latencies are smaller than pre-intervention latencies could be explained by practice effects. It is true that for the group of 4-year-olds, post-intervention response latencies are closer to those observed in Cvencek, Greenwald and Meltzoff (2011) for the same age group. However, in their study the PSIAT tested implicit attitudes towards gendered items and involved a smaller number of trials. Cvencek, Meltzoff and Baron (2012) consider that 3 to 6-year-old children’s attention can be sustained during the PSIAT, since no words are included and thus the working memory workload is reduced. It is our assumption, that the PSIAT task requires children’s focused attention, which is characterized by sustained and active engagement with a task (Gaertner, Spinrad, & Eisenberg, 2008). Ruff and Capozzoli (2003) have demonstrated that focused attention increases in duration and frequency until the age of 4. This developmental trajectory of focused attention could explain the high PSIAT response latencies and error rates that were observed in 3 and 4-year-olds that participated in this study. It is possible that the PSIAT is a more suitable task for children that have completed their fourth year of life.

Even though a trend for increasing mean PSIAT scores with increasing age is evident, especially in post-intervention PSIAT scores, between group differences did not reach statistical significance. The same was true for between gender differences in pre- and post-intervention PSIAT scores, even though boys obtained slightly higher PSIAT scores than girls. These results could be explained by the small sample of this study. In fact, with regards to age differences, the only group that had a mean negative PSIAT score was the group of the 3-year-old girls. The statistical non-significance of this finding can be counterbalanced by one of cluster analyses’ results; the finding that girls with negative PSIAT scores (~4 years old) were almost one year younger than girls with positive PSIAT scores (~5 years old). Additionally, by also taking into consideration parental accounts of parents who observed a
significant change in their girls’ toy preferences when they entered nursery school, it becomes safe to assume that this period between 3.5 and 5 years old is a sensitive period during which social norms and stereotypic play behaviors observed at school can have a negative impact on a girl’s otherwise neutral gender-toy associations. However, the same assumption cannot be made for boys.

As far as boys are concerned, possession of a doll with which they used to interact at a younger age seems to play an important role in developing more neutral gender-toy implicit associations (negative PSIAT scores) even if they don’t play with it anymore. This observation can be also supported by the results of the regression analysis, in which the possession of a doll was the only significant individual predictor of PSIAT scores. On the contrary, possession of a car was not related in the same way with girls’ implicit gender-toy associations. However, possession of a toy car could be related to previous research findings suggesting that young girls explicitly perceive toy cars as gender neutral toys (Shojaee, Cui, & Shahidi, 2016). Finally, according to parental ratings in the Pre-School Activities questionnaire, boys with negative PSIAT scores seem to engage less in typical masculine play activities than boys with positive PSIAT scores.

The fact that Age, Gender, PSAI scores, Parental Attitudes towards the toys of the study and Possession of a toy car/doll were all together able to explain approximately 88% of the variance in PSIAT scores strengthens our awareness of the existence of multiple factors that dynamically interact and influence a child’s implicit understanding of gender-toy associations during development. The finding that out of all these factors, only the possession of a doll was able to significantly predict PSIAT scores individually, provides support for the claim, at least for boys, that contact and interaction with an atypical toy during the first years of life can indeed produce more neutral implicit gender-toy associations, even if children’s toy preferences and play behavior are influenced by social norms later on in development, once they enter school.

With regards to the results of thematic analysis, the finding that parents consider Social Norms, especially those that are learned upon entry to nursery school, as important in explaining their children’s play activities and toy preferences does provide support for previous research suggesting that behavioral manifestations of gender prejudice appear as early as the age of 3 years old (Martin & Ruble, 2010). The use of Personality Traits by parents to explain their girls’ play and toy preferences is a very interesting finding that may
bring to surface the influence of sexism not only on children’s play behavior but also on parental perceptions of it (Brown & Stone, 2016).

Gender, PSIAT scores, Parental toy choice, Parental attitude towards the girl-doll and Possession of a doll could not significantly predict children’s Toy Choices. All together, they were able to explain 44% of the variance in children’s behavior. Even though implicit associations do play a crucial role in structuring children’s social understanding, alone, they are not able to explain children’s actual behavior. More concretely, the fact that a child has developed more neutral toy-gender implicit associations does not mean that he/she will go for the gender atypical toy when given the option. Interestingly, even Gender was not found to be a significant predictor of children’s choices. When trying to predict or change children’s behavior on the basis of social structures, such as gender stereotypes, we researchers often forget one of its most important qualities; adaptability. With regards to implicit gender-toy associations, future research should examine children’s toy choices in various contexts in order to potentially identify those that could possibly allow room for gender atypical choices.
REFERENCES


Bonjour XXXXX,

En ce qui concerne comment il faut préparer votre petit pour l'expérience, il faut juste lui dire que les gens à l'Université ont quelques nouveaux jouets et qu'ils ont besoin de l'aide des enfants pour voir s'ils sont beaux. Il faut lui dire qu'elle/il va jouer un jeu à l'ordinateur et qu'il/elle va aussi jouer avec une jeune dame dans une salle de jeu et que vous l'attendrez dans une salle à côté.

Rassurez-le qu'il/elle pourra vous rejoindre à n'importe quel moment il/elle le souhaite pendant ce temps.

_Le BabyLab se situe au sein de l’université de Genève à Unimail, 40 Boulevard du Pont-d'Arve, 1211 Genève 4. Dans la salle 3131._

_Accès en transports publics : Tram 15: arrêt Uni Mail, tram 12 ou bus 1: arrêt Pont-d’Arve._

Je vous attendrai au laboratoire!

Cordialement,

XXXXX
INFORMATION AUX PARTICIPANTS ET CONSENTEMENT DE PARTICIPATION

**Information aux participants**

Pendant la première année de leur vie, les enfants commenceraient à établir une association entre un jouet et un genre, comme par exemple les voitures avec des garçons et les poupées avec des filles. Tout au long de leur développement ces associations continueraient à influencer le comportement des enfants et la façon dont ils traitent les informations qu’ils reçoivent. L’objectif de cette étude est

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**APPENDIX B**

| Responsable(s) du projet de recherche : | • **Edouard Gentaz**  
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• **Paulina Buffle**  
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• **Eleni Kalogirou**  
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d’observer ces associations chez les enfants d’âge préscolaire et d’étudier l’influence qu’une séance de jeu pourrait avoir sur celles-ci.

Lors de la première partie de l’expérience, nous demanderons à votre enfant de classer des images de jouets (voitures, poupées) et des images de visages d’enfants (garçons, filles). Cette tâche sera réalisée sur un ordinateur. Puis, dans une deuxième partie de l’expérience, nous inviterons votre enfant à jouer, selon des consignes que nous lui donnerons, soit avec une voiture (par exemple : imagine un trajet) soit avec une poupée (par exemple : imagine que tu dois lui donner un bain). Après cette séance de jeu, votre enfant sera invité à refaire la tâche informatisée réalisée lors de la première partie. La durée de l’expérience est estimée à 30 minutes.

Pendant que votre enfant réalisera les tâches décrite ci-dessus, nous vous demanderons de compléter 3 questionnaires qui porterons notamment sur les habitudes de jeux de votre enfant et votre attitude envers 3 jouets utilisés dans le cadre de cette étude.

Courant du mois décembre 2018, nous organiserons un tirage au sort et votre enfant aura la possible de gagner un jouet. Si votre enfant est tiré au sort nous vous contacterons pour vous avertir.

L’expérience ne présente aucun risque pour votre enfant. Il sera libre d’arrêter à tout moment de l’expérience.

Les résultats globaux de l’étude seront disponibles à partir du 30 décembre 2018 et vous pouvez contacter Madame Eleni Kalogirou (eleni.kalogirou@etu.unige.ch) pour en être informé. Aucun résultat individuel ne pourra être transmis en raison de l’anonymisation des données.

L’intégralité des données (excepté vos coordonnées et la liste de correspondance entre le code attribué à votre enfant et son identité) sera conservée pendant 5 ans à la Faculté de psychologie et des sciences de l’éducation, sous la responsabilité de Professeur Edouard Gentaz.

Consentement de participation à la recherche

Sur la base des informations qui précèdent, je confirme mon accord pour la participation de mon enfant à la recherche « A qui appartient ce jouet ? Un essai de modifier les associations implicites stéréotypées selon le genre chez les 4, 5 et 6 ans », et j’autorise :
• l’utilisation des données à des fins scientifiques et la publication des résultats de la recherche dans des revues ou livres scientifiques, étant entendu que les données resteront anonymes et qu’aucune information ne sera donnée sur mon identité ;

□ OUI  □ NON

• l’utilisation des données à des fins pédagogiques (cours et séminaires de formation d’étudiants ou de professionnels soumis au secret professionnel).

□ OUI  □ NON

J’ai choisi volontairement de permettre à mon enfant de participer à cette recherche. J’ai été informé·e du fait que je peux retirer mon enfant en tout temps sans fournir de justifications et que je peux, le cas échéant, demander la destruction des données concernant mon enfant jusqu’à 30 juin 2018.

Ce consentement ne décharge pas les organisateurs de la recherche de leurs responsabilités. Je conserve tous mes droits garantis par la loi.

Prénom Nom

Adresse e-mail :

Signature : Date :

ENGAGEMENT DU CHERCHEUR

L’information qui figure sur ce formulaire de consentement et les informations que j’ai données au participant décrivent avec exactitude le projet.

Je m’engage à procéder à cette étude conformément aux normes éthiques concernant les projets de recherche impliquant des participants humains, en application du Code d’éthique concernant la recherche au sein de la Faculté de psychologie et des sciences de l’éducation et des Directives relatives à l’intégrité dans le domaine de la recherche scientifique et à la procédure à suivre en cas de manquement à l’intégrité de l’Université de Genève.

Je m’engage à ce que le participant à la recherche reçoive un exemplaire de ce formulaire de consentement.

Prénom: **Eleni**  Nom: **Kalogirou**

Signature :

Date :
APPENDIX C

I. First block – single task  **PRACTICE**

a. Screen orientation: left: cars    right: dolls

b. “Now it’s time to play our game! You’re going to play a sorting game on the computer. What’s going to happen is pictures are going to show up here (point to middle of screen) in the middle of the screen, and it’s going to be your job (point to participant) to tell the computer what kinds of pictures they are, and you do that by pressing these buttons (point to both keys).”

c. “For this first part, some of the pictures are going to be **car** pictures like these (point to car label). So if you see one of these **car** pictures in the middle of the screen (point to middle), **this color** (point to left color on screen) tells you to push **this button** (point and push left key), just like that. And some of the pictures will be **doll** pictures like these (point to doll label). So if you see a **doll** picture in the middle (point to middle), **this color** (point to right color on screen) tells you to push **this button** (point and push right key).”

d. “We’re going to start with some practice first so you can get used to this. But a little bit later in the game, there are going to be some times where I ask you to go as fast as you can, and the computer will measure how fast you can do it. But I’ll tell you when those parts are so you’re ready for them.”

e. “The last thing is: **the way you play this game** is to always use both hands (hold up hands in front of you)—so you **always** keep one hand right here by this button (demonstrate left hand placed on left key), and your other hand right here by this button (demonstrate right hand placed on right key). That way, you’re **always** ready to push the buttons. Okay, should we give it a try? **This is just practice.**”

f. First feedback
   Give positive feedback (e.g., “**All right!**” “**Great job!**”)

II. Second block – single task  **PRACTICE**

a. screen orientation: left: boys    right: girls

b. “Let’s go to the next part. Look! Now there are different pictures on the screen. There are pictures of boys (point to boys) and there
are pictures of girls (point to girls). So this time, if you see a picture of a boy (point to boys) in the middle of the screen (point to middle), then push this button (point to left key). And if you see a picture of a girl (point to girls) in the middle of the screen (point to middle), push this button (point to right key)."

c. “All right. And this is still practice. Get ready!”

d. Second feedback
  Give positive feedback (e.g., “All right!” “Great job!”)

III. Third block – first combined task **PRACTICE**

a. screen orientation: left: boys & cars  right: girls & dolls

b. “So now look. This time, you’re going to play two games at the same time! (hold up two fingers) It’s going to be a little bit trickier. That means each button (point to both buttons) is going to be for two things (hold up two fingers).”

c. “For this part, you’re going to push this button (demonstrate pushing left key) for boys and for car pictures (point to boys and math), and you’re going to push this button (demonstrate pushing right key) for girls and for doll pictures (point to girls and reading).”

d. “Because this part is a little bit harder, we’re going to do some more practice, okay? Are you ready?”

e. Third feedback
  Give positive feedback (e.g., “All right!” “Great job!”)

IV. Fourth block – first combined task **TEST**

a. screen orientation: left: boys & cars  right: girls & dolls

b. And now look. This time nothing changed on the screen (point to pictures). So that means you’re going to do the exact same game again this time.
But now, try and go as fast as you can. All right. Are you ready to give it a try and go fast? Here we go!”

c. Fourth feedback
“Good job! That was really fast!” “This is just telling me how fast you went. That’s great!”
i. “Now we’re moving on and you’re already halfway done with this game!”

V. Fifth block – single task **SWITCH PRACTICE**

a. screen orientation: left: girls right: boys

b. “Take a look at the screen (point). Do you see something different this time?”
i. If child does not respond quickly: “Did anything change on the screen?”
ii. If child still does not know: “Did anything change with these pictures? (point to both pictures)”

c. “That’s right! The faces switched sides (point to pictures). For this part, you’re going to push this button (point to left key) for girls (point to girls), and this button (point to right key) for boys (point to boys). This is just a practice part, so you can get used to that. Here we go!”

d. Fifth feedback
i. “Good job!”
ii. “There’s just two more parts.”

VI. Sixth block – second combined task **PRACTICE**

a. screen orientation: left: girls & cars right: boys & dolls

b. “Look—the math and the reading pictures came back (point to both car and reading), so that means you’re going to play two games (hold up two fingers) at the same time again. For this part, you’re going to push this button (point to left key) for girls and car pictures (point to girls and cars), and you’ll push this button (point to right key) for boys and doll pictures (point to boys and dolls).”

c. “This is a little tricky, so we’re going to do a practice round. Are you ready? Here we go!”

d. Sixth feedback
i. “Very good!”
ii. “Now this is going to be the very last part of the game.”

VII. Seventh block – second combined task TEST

   a. screen orientation: left: girls & cars  right: boys & dolls

   b. “Look—it’s the exact same game that you just played (point to pictures). But this time, try and go as fast as you can again! Are you ready to go fast? Here we go!”

   c. Seventh feedback
      i. “Good job! That was really fast! You did it!”
      ii. “That’s showing just how fast you went (point to response time number). That’s awesome!”
      iii. “Look—you’re all done with the game! You finished the whole thing. Good job!”
APPENDIX D

Scenario de jeu avec une poupée pour filles & garçons

Maintenant je veux te présenter Will/Cindy ! Will/Cindy a 3 ans et il/elle est un super héro/une super héroïne! Chaque journée il/elle travaille sans arrêt pour sauver le monde! Mais aujourd’hui c’est la journée de son repos. Cette journée il/elle aime faire toutes les choses que les autres enfants font et tu dois prendre soin de lui/elle. Il/Elle se réveille et tu dois l’aider à se laver le visage et à se brosser les dents. Après, vous prenez ensemble votre petit déjeuner. Aujourd’hui Will/Cindy a envie d’aller au parc avec toi! Vous jouez dans le bac à sable, vous courez et jouez aux balançoires. À midi, vous mangez des crêpes. Après vous lavez vos mains et vous décidez d’aller à l’Aquarium. Vous passez tout l’après midi là regardant les poissons et un grand requin qui fait peur à Will/Cindy. Tu vois, même les super-héros ont peur et il faut les réconforter. Après cette journée magnifique, vous retournez à la maison. Tu prépares du lait chaud pour Will/Cindy et tu l’aides à le boire. Puis, tu dois l’aider à prendre un bain, à laver ses cheveux et à brosser les dents. Après cette journée fatigante, tu l’aides à porter son pyjama et à se mettre au lit. Tu viens pour lui raconter une histoire et lui embrasser. Tu éteignes la lumière et tu lui dis bonne nuit.

Scenario de jeu avec une voiture pour filles & garçons

Maintenant il faut imaginer que tu as grandi et que tu as ta propre voiture! Aujourd’hui tu as décidé à faire une excursion avec tes amis! Tu ouvres la porte et tu entres. Tu mets la ceinture de sécurité et tu démarrres le moteur de la voiture. Tu regardes le signe du gaz et c’est rouge! Il faut arrêter à la première station-service que tu verras! Elle est où? Peux-tu amener ta voiture là-bas? (l’enfant amène la voiture à la station-service) Bon! Maintenant il faut sortir de la voiture et mettre du gaz ! Ouf, c’est bon, tu peux continuer ton trajet maintenant. Mais la voiture me semble un peu sale, peut-être tu peux passer par le lave-auto? Tu as plein de temps! Tu arrives à le trouver sur la carte de la ville (tapis de jeu)? (l’enfant amène la voiture à lave-auto). C’est amusant quand tu es dans la voiture et tu vois les brosses de la fenêtre!!! Maintenant, la voiture est propre. Mais le moteur ne démarre pas!!! Oh
non, tes amis t’attendent! Il faut ouvrir le capot de la voiture (l’enfant prétend d’ouvrir le capot). Peux-tu voir ce qui s’est mal passé? Je suis sûre que tu peux le réparer? Tu l’as réparé ? Trop bien ! Démarres-toi le moteur, il faut passer par la maison de tes amies pour les prendre avec toi ! Comment tu peux aller là ? (L’enfant amène la voiture à la maison). C’est bon ? Tous et toutes tes amies sont là ? Et bon, vous êtes partis!
APPENDIX E

English Version

Pre-School Activities Inventory

Name: ___________________________  Age: ___________________________  years ___________________________ months
Sex: M/F (delete as appropriate)

Instructions

This inventory is about the everyday activities of preschool children. It is in three sections: toy preferences, activities, and characteristics. Each question asks how frequently the child plays with particular toys, engages in particular activities or shows particular characteristics. There are five possible answers: (N) Never, (HE) Hardly Ever, (S) Sometimes, (O) Often, or (VO) Very Often. Answer each question by circling the response which best describes the child.

E.g., N HE O VO

Please answer all of the questions. If you are unsure about which response best describes the child for any of the questions then please answer according to the response which seems most appropriate.

(KEY: N = Never, HE = Hardly Ever, S = Sometimes, O = Often, VO = Very Often)

PART 1: TOYS: Please answer these questions according to how often the child played with the following toys during the past month.

1. Guns (or used objects as guns) ................................................. N HE S O VO
2. Jewellery ................................................................. N HE S O VO
3. Tool set ................................................................. N HE S O VO
4. Dolls, doll’s clothes or doll’s carriage ................................................. N HE S O VO
5. Trains, cars or airplanes ................................................................. N HE S O VO
6. Swords (or used objects as swords) ................................................................. N HE S O VO
7. Tea set ................................................................. N HE S O VO

PART 2: ACTIVITIES: Please answer these questions according to how often the child engaged in the following activities during the past month.

1. Playing house (e.g., cleaning, cooking) ................................................................. N HE S O VO
2. Playing with girls ................................................................. N HE S O VO
3. Pretending to be a female character (e.g., princess) ................................................................. N HE S O VO
4. Playing at having a male occupation (e.g., soldier) ................................................................. N HE S O VO
5. Fighting ................................................................. N HE S O VO
6. Pretending to be a family character (e.g., parent) ................................................................. N HE S O VO
7. Sports and ball games ................................................................. N HE S O VO
8. Climbing (e.g., fences, trees, gym equipment) ................................................................. N HE S O VO
9. Playing at taking care of babies ................................................................. N HE S O VO
10. Showing interest in real cars, trains and airplanes ................................................................. N HE S O VO
11. Dressing up in girlish clothes ................................................................. N HE S O VO

PART 3: CHARACTERISTICS: Please answer these questions according to how often the child shows the following characteristics:

1. Likes to explore new surroundings ................................................................. N HE S O VO
2. Enjoys rough and tumble play ................................................................. N HE S O VO
3. Shows interest in snakes, spiders or insects ................................................................. N HE S O VO
4. Avoids getting dirty ................................................................. N HE S O VO
5. Likes pretty things ................................................................. N HE S O VO
6. Avoids taking risks ................................................................. N HE S O VO

NOW PLEASE CHECK THAT YOU HAVE ANSWERED ALL THE QUESTIONS

Recensement des activités préscolaires

INSTRUCTIONS

Ce recensement concerne les activités quotidiennes des enfants en âge préscolaire. Il est formé de trois sections : préférences pour les jouets ; activités ; traits caractéristiques. Chaque question demande à quelle fréquence l’enfant joue avec un certain jouet ; mène-t-il une certaine activité ou montre-t-il certains traits caractéristiques. Il y a cinq réponses possible : (J) jamais ; (R), rarement ; (P) parfois ; (S) souvent ; (TS) très souvent. Pour chaque question, veuillez encercler la réponse qui décrit au mieux l’enfant.

Ex : J R S TS

Veuillez s’il vous plaît répondre à toutes les questions. Si vous hésitez entre deux réponses, veuillez choisir celle qui vous semble la plus pertinente.

(Légende : J = Jamais ; R = Rarement ; P = Parfois ; S = Souvent ; TS = Très Souvent)

Partie I : JOUETS. Veuillez indiquer à quelle fréquence l’enfant a joué avec chacun de ces jouets au cours du dernier mois.

1. Pistolets/fusils (ou a utilisé des objets comme pistolets/fusils) J R P S TS
2. Bijoux J R P S TS
3. Caisse à outils J R P S TS
4. Poupées, habits de poupée et poussettes pour poupées J R P S TS
5. Trains, voitures, avions J R P S TS
6. Épées (ou a utilisé des objets comme épées) J R P S TS
7. Service à thé J R P S TS

Partie II : ACTIVITÉS. Veuillez indiquer à quelle fréquence l’enfant a mené chacune de ces activités au cours du dernier mois.

1. Jouer à la maison (cuisiner, nettoyer...) J R P S TS
2. Jouer avec des filles J R P S TS
3. Jouer à être un personnage féminin (ex. une princesse) J R P S TS
4. Jouer à être un personnage masculin (ex. un soldat) J R P S TS
5. Se battre J R P S TS
6. Jouer à être un membre de la famille (ex. un parent) J R P S TS
7. Faire du sport et jouer au ballon J R P S TS
8. Grimper (sur les barrières, les arbres, les équipements sportifs...) J R P S TS
9. Jouer à s’occuper de bébés J R P S TS
10. Montrer un intérêt dans les vrais trains, voitures et avions
11. Se déguiser avec des habits très « fille »

Partie III : TRAITS CARACTÉRISTIQUES : veuillez indiquer à quelle fréquence l’enfant montre chacun de ces traits caractéristiques.

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VEUILLEZ SVP CONTRôLER D’AVoIR RÉPONDU À TOUTES LES QUESTIONS
À la fin de l’étude, votre enfant aura la chance de participer à un tirage pour un de ces deux jouets. Au tirage de quel jouet aimeriez-vous que votre enfant participe? S’il vous plaît, veuillez cocher la case de la photo du jouet que vous préférez.

Exemple :  

[ ]
Girl Version

Choix de jouet

Code :......................................................................................................................................

INSTRUCTIONS

À la fin de cette expérience, votre enfant recevra un de ces deux jouets. Au tirage de quel jouet aimeriez-vous que votre enfant participe? S'il vous plaît, veuillez cocher la case de la photo du jouet que vous préférez.

Exemple :  

![Exemple de jouet]
APPENDIX G

Échelle d’Attitude

Instructions
Cette échelle nous permettra de mieux comprendre vos pensées et vos sentiments envers certains jouets. Pour chaque question, veuillez cocher la case de réponse qui correspond mieux à vous. S’il vous plaît veuillez répondre le plus honnêtement possible à toutes les questions. Si vous hésitez entre deux réponses, veuillez choisir celle qui semble la plus pertinente.

Exemple:

- Fortement en désaccord
- En désaccord
- Neutre ou indécis
- En accord
- Fortement en accord

1. J’aime bien ce jouet.

- Fortement en désaccord
- En désaccord
- Neutre ou indécis
- En accord
- Fortement en accord

2. Je serai content-e si mon enfant jouait avec ce jouet.

- Fortement en désaccord
- En désaccord
- Neutre ou indécis
- En accord
- Fortement en accord

3. Je pense que jouer avec ce jouet serait bénéfique pour tous les enfants.

- Fortement en désaccord
- En désaccord
- Neutre ou indécis
- En accord
- Fortement en accord
4. Quand je vois mon enfant jouer avec un jouet similaire, j’essaie souvent d’attirer son attention vers un autre jouet.
   - Fortement en désaccord
   - En désaccord
   - Neutre ou indécis
   - En accord
   - Fortement en accord

5. Je serai content-e si mon enfant jouait avec ce jouet.
   - Fortement en désaccord
   - En désaccord
   - Neutre ou indécis
   - En accord
   - Fortement en accord

6. J’aime bien ce jouet.
   - Fortement en désaccord
   - En désaccord
   - Neutre ou indécis
   - En accord
   - Fortement en accord

7. Je pense que jouer avec ce jouet serait bénéfique pour tous les enfants.
   - Fortement en désaccord
   - En désaccord
   - Neutre ou indécis
   - En accord
   - Fortement en accord

8. Quand je vois mon enfant jouer avec un jouet similaire, j’essaie souvent d’attirer son attention vers un autre jouet.
   - Fortement en désaccord
   - En désaccord
   - Neutre ou indécis
   - En accord
   - Fortement en accord
   o Fortement en désaccord
   o En désaccord
   o Neutre ou indécis
   o En accord
   o Fortement en accord

10. Je serai content-e si mon enfant jouait avec ce jouet.
    o Fortement en désaccord
    o En désaccord
    o Neutre ou indécis
    o En accord
    o Fortement en accord

11. Quand je vois mon enfant jouer avec un jouet similaire, j’essaie souvent d’attirer son attention vers un autre jouet.
    o Fortement en désaccord
    o En désaccord
    o Neutre ou indécis
    o En accord
    o Fortement en accord

12. Je pense que jouer avec ce jouet serait bénéfique pour tous les enfants.
    o Fortement en désaccord
    o En désaccord
    o Neutre ou indécis
    o En accord
    o Fortement en accord
APPENDIX H

Quelques questions supplémentaires

Code :.............................................................................................................................................

Âge de l’enfant : ..........ans et ............. mois

Genre de l’enfant: ............................................

Nationalité(s) de l’enfant : ...........................................................................................................

INSTRUCTIONS

Pour chaque question, veuillez cocher la case de réponse qui correspond mieux à votre enfant.

Exemple :

- OUI
- NON

Veuillez s’il vous plaît répondre à toutes les questions. Si vous hésitez entre deux réponses, veuillez choisir celle qui vous semble la plus pertinente.

1. Est-ce que votre enfant possède au moins une poupée ?

- OUI
- NON

2. Si ‘NON’, pourriez-vous indiquer une raison ?

- Je n’ai jamais pensé acheter une pour lui/elle
- Mon enfant n’a jamais demandé pour une
- Je ne pense pas que cela soit approprié au genre de mon enfant
- Autre : ...............................................................

3. Si ‘OUl’, cette/ces poupée(s) est/sont :

- Masculine
- Féminine
4. Si ‘OUI’, à quelle fréquence estimez-vous qu’il/elle joue avec sa/ses poupée(s) pendant au moins 10 minutes ?

- Impossible d’estimer
- Pas du tout
- 1 à 3 fois par semaine
- 4 à 6 fois par semaine
- Chaque jour de la semaine

5. Si ‘OUI’, la plupart du temps votre enfant joue avec sa/ses poupée(s) quand elle/il est :

- Seul-e
- Avec les parents
- Avec autres adultes
- Avec ses frères et/ou sœurs
- Avec ses amies ou autres enfants

6. Est-ce que votre enfant possède au moins une voiture (jouet) ?

- OUI
- NON

7. Si ‘NON’, pourriez-vous indiquer une raison ?

- Je n’ai jamais pensé acheter une pour lui/elle
- Mon enfant n’a jamais demandé pour une
- Je ne pense pas que cela soit approprié au genre de mon enfant
- Autre : .................................................................

8. Si ‘OUI’, cette/ces voiture(s) est/sont :

- Rose
9. Si ‘OUI’, à quelle fréquence estimez-vous qu’il/elle joue avec sa/ses voiture(s) pendant au moins 10 minutes ?

- Impossible d’estimer
- Pas du tout
- 1 à 3 fois par semaine
- 4 à 6 fois par semaine
- Chaque jour de la semaine

10. Si ‘OUI’, la plupart du temps votre enfant joue avec sa/ses voiture(s) quand elle/il est :

- Seul-e
- Avec les parents
- Avec autres adultes
- Avec ses frères et/ou sœurs
- Avec ses amies ou autres enfants

11. Est-ce que votre enfant a des frère(s) et sœur(s):

- Non, pas des frères ou sœurs
- Frère(s)
- Sœur(s)
- Les deux

12. Est-ce que vous avez d’autres remarques qui nous permettront de mieux comprendre les préférences de votre enfant pour certains jouets?

……………………………………………………………………………………………………………………………………
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