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Children`s reasoning: Motivation in the Wason Selection Task and the expression of body language

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Elisabeth Monitzer BSc

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Contents

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Zusammenfassung

Es wird angenommen, dass der Mensch objektiv handelt und entscheidet, jedoch wollen wir für uns zustimmende und erwünschte Aussagen eher glauben, als Aussagen mit welchen wir nicht übereinstimmen. Wunschvorstellungen beeinflussen somit unser tägliches Handeln und unsere Strategieauswahl, dies wird als ‚Motivated Reasoning' definiert. Der Mensch ist gewillt, wenn seine Wunschvorstellung dies beeinflusst, aktiv bestätigende Faktoren zu suchen, auch wenn die Aussagen eher zweifelhaft scheinen. Im Gegenzug, wenn Aussagen nicht unserem Wohlwollen entsprechen, jedoch richtig sind, suchen wir trotzdem Fakten um diese Richtigkeit zu ignorieren. Die ‚Wason Selection Task' (‚Wason Kartenselektionsaufgabe') stellt ein Hilfsmittel in der Humanethologie dar, in der Strategieauswahl durch Überprüfen von Aussagen untersucht werden kann. Um eine Aussage logisch korrekt zu überprüfen benötigt es eine Bestätigungs- und Falsifikationsstrategie, der Mensch tendiert jedoch eher zur Strategie der Affirmation. Der Einfluss unserer Wunschvorstellungen auf die Strategieauswahl wurde mit Kindern wie mit Erwachsenen untersucht. Die folgende Studie repliziert ein Experiment zweier Studien (Dawson et al., 2002 & Schaman, 2013) und untersucht in einem weiteren Experiment den Einfluss von Motivation in der Strategieauswahl bei Volksschulkindern. Zusätzlich wurden noch Adaptoren kodiert um eine mögliche Kompensation des Stressmanagements beim Wechsel der Bestätigungs- zur Falsifikationsstrategie zu beobachten.

In vier Tiroler Volksschulen (n = 82, 44 Jungen) wurden die Daten mit Hilfe zweier Selektionsaufgaben, mit negativen wie positiven Stereotypen und negativen wie positiven Aussagen über die bevorzugte Farbe, aufgenommen und Adaptoren kodiert. Die Autorin erwartete eine höhere Erfolgsrate in der Selektionsaufgabe, wenn die Kinder mit negativen Aussagen über ihr Geschlecht bzw. über ihre bevorzugte Farbe konfrontiert wurden. Zusätzlich wurden bei einer höheren Erfolgsrate mehr Adaptoren erwartet. Entgegen der Resultate von vorhergegangenen Studien waren die Kinder zwar besser bei negativen Aussagen über ihr

eigenes Geschlecht, jedoch auch im Vergleich erfolgreicher in Zusammenhang positiver Aussagen. Bezugnehmend auf das andere Geschlecht, wurde kein Erfolg verzeichnet (*n* = 82, F. E. = 10.144, *D.F.* = 2, *p* = .006). Im Farbexperiment waren die Kinder wiederum bei Aussagen bezugnehmend der nicht präferierten Farbe besser (*n* = 82, F. E. = 1.215, D.F. = 2, p = .633). Die Anzahl der Adaptoren stieg minimal bei dem Experiment mit den Stereotypen. In dieser Studie wurde nun versucht motiviertes Schlussfolgern bei Kindern zu erklären. Die Ergebnisse deuten nicht auf ein einfaches Muster hin, sondern erscheinen komplexer. Kinder agieren rationaler als erwartet und wählen ihre Strategien mit Sorgfalt.

Abstract

In every day reasoning humans should act and think objectively but influenced by their preferences they want to believe things and statements which are better and more desirable for themselves. Wishful thinking influences their reasoning and is defined in science as 'Motivated Reasoning'. Humans look for facts, which confirm wishful thinking, when they want to believe it, although the statements are possibly maybe not true. In contrast when they don't believe statements, although they are true, they look for negative facts which contradict the statement to dismiss the validity. The Wason Selection Task is now a helpful tool in human ethology which enables to analyse choosing strategies in a logical way. For proofing a statement two strategies should be used: The confirmation and the falsification strategy. The present study wants to replicate an experiment of two studies (Dawson et al., 2002 & Schaman, 2013), which investigated the influence of wishful thinking on success in the Wason Selection Task with adults and children. Additionally a second experiment was created to check Motivated Reasoning combined with the Wason Selection Task and the expression of body language as possible compensation for the stress management, while switching from the confirmation to the falsification strategy. In four Tyrolean elementary schools the data of 82 children (44 boys, 38

girls) were collected in two experiments with negative stereotypes and negative statements about preferred colour in the Wason Selection Task and adaptor coding during the sessions. The author expected a higher success rate in the Wason Selection Task when children were confronted with negative stereotypes about their own sex and with negative statements about their preferred colour. Additionally, a higher frequency of adaptors was expected. Children had more success in the task when they were confronted with negative stereotypes, but also with positive ones (n = 82, F. E. = 10.144, *D.F*. = 2, p = .006). In the experiment with the preferred colour, they had success in all three categories (self-referred pos., self-referred neg. and other) (n = 82, F. E. = 1.215, D.F. = 2, p = .633) and the frequencies of the adaptors showed a minimal increase. The study wanted to explain Motivated Reasoning and its influence on choosing strategies in children. The results did not show a clear pattern, overall it looks more complex. Children seem to act more rational than expected and choose their strategies with accuracy.

Introduction

‘Everyone believes very easily what he fears and what he wants.’

Jean de La Fontaine

What humans want to believe

To ‘desire’ is one of humanity’s most powerful qualities. It influences how humans choose strategies for ‘doing’ and ‘acting’ in life and with the environment. What humans want to believe and desire have a big influence on their opinions. Humans selectively search for confirming or conflicting references, which is known as: ‘Motivated Reasoning’. Motivation, in this case, means any wish, desire, or preference that concerns the outcome of reasoning (Kunda, 1990). Normally humans seek for references, which have a positive outcome for them. On the other hand, humans make sense of the world objectively by impartially presenting themselves to others as well as to themselves (Dawson et al. 2002). Here are two different projections described with the question being: Are they creating an illusion of objectivity? In a self-serving manner humans, when they are motivated, constitute causal theories. This self-serving biases in reasoning are results of motivational facts (Kunda, 1987).

Gilovich (1991) described ‘Motivated Reasoning’ in terms of how humans evaluate statements, specifically when they wish for a proposition to be true or false. If a statement is reviewed, humans prefer either the confirmation or the falsification strategy, that is, reason by agreement or disagreement. The author described two strategies to which humans related well. First, they ask themselves when they are confronted with a positive and pleasant statement: ‘Can I believe this?’ And second, when they are confronted with a negative and unpleasant statement they

develop the strategy: ‘Must I believe this?’ (Gilovich, 1991). Humans who are motivated in any way can find arguments for accepting a desirable hypothesis (Dawson et al., 2002). They know that it is not true, but when they agree with it they are presenting facts which should convince others.

What body-language can tell

In 1969 Eckman and V. Friesen first described the repertoire of nonverbal behaviour followed by many other studies (Eckman & V. Friesen, 1969 a/b, 1971, 1980; Genova B., 1974). They described a language of the body that is used much more than verbal language, with specific meanings and specific movements. They differentiated it in types of nonverbal behaviour, for example some provides specific information, while others provide more diffused information. Some nonverbal behaviour acts as a transmitter for messages or a designer for communication. Other types give information about emotions and promote traits and interpersonal dictions. One type of nonverbal communication is ‘adaptors’, which the authors declared as the most difficult to describe. They defined adaptors as movements that are first learned as adaptive efforts for personal needs, to perform actions, or to manage emotions. Eckman and V. Friesen (1969) made a differentiation in self-adaptors, object-adaptors, and changing-adaptors by illustrating different aspects of behaviour. Children develop self-adaptors in order to manage a diversity of problems, including stress management. When adaptors appear in adults, they act as a trigger for the current environment. These self-adaptors are usually used unconsciously with no intention for communication as they release their own external feedback.

Self-adaptors are movements, which humans make with their own body, i.e. they may move their hand to their face to rub it. Whereas object-adaptors are manipulations, which are similar, but include an object, i.e. playing with a pencil (V. Friesen et al., 1979).

Choosing strategies according to the Wason Selection Task

The Wason Selection Task is a tool in human ethology to study cognitive processes and the influence of strategies. A problem has a goal, and when the goal is achieved, there is no problem anymore. Humans don't like problems so they tend to solve them more often with a bias of confirmation. Wason (1966) described this behaviour as a kind of awkwardness. It's a mistake to draw a deduction. In daily life humans use the logical deception more often.

In the original Wason Selection Task, subjects had to investigate the statement 'If a card has a vowel on one side, it has an even number on the other side' by using four cards ('E', 'K', '4' & '7'). The task rule is explicable by a logical conclusion: From p follows q (p being a vowel and q being an even number). The four mentioned cards in the original Wason Selection Task correspond to p ('p' = 'E'), not-p ('-p' = 'K'), q ('q' = '4') and not-q ('-q' = '7'). Only two of the presented cards, 'E' & '7', can falsify the statement (Wason P. 1959, 1964, 1966, 1668; Wason P. & Shapiro D., 1971)

Few of the subjects pick these cards as a logically correct answer. Usually they choose 'E' & '4', but these cards only confirm the statement. As already mentioned, this is the tendency for 'fallacious confirmation' (Wason P., 1968). The Wason Selection Task was replicated many times with humans of different ages and similarly abstract rules. When connected to a social context, success rates were higher and the choice of the falsification strategy was higher. As explained, the authors described the development of social contract algorithms in humans as a set of programs evolved over natural selection for reasoning in social context. It declares, that success in human social exchanges needs conditional reasoning and the Wason Selection Task is a standard tool for investigating that (Cosmides & Tooby, 1992; Cosmides et al., 2010). It is due to this fact that cognitive strategies show a dependency on context and meaning.

The original Wason Selection Task was also modified in different forms for testing children. Harris and Nunez (1996) experimented with a modified Wason Selection Task to investigate

the understanding permission rules. In this modification the authors created a task which was logically related and presented to the children in a story format. They showed that 3- and 4-year old children can identify breaches of a permission rule.

Motivation acts on the choice of strategies, and hence, on the success in the Wason Selection Task. In a study with students, Dawson et al. (2002) analysed Motivated Reasoning with the Wason Selection Task. They presented the task in two experiments, either in a negative or positive way. In the first experiment, the students were asked by questionnaire about their psychic lability. Using the information about the questionnaire, the authors formed the task with the statements that all people who were psychically more labile, would die earlier. Contrarily, they told a set of other students that people who were psychically not labile, would die earlier. The results showed, that students who thought that they were psychically instable or more labile, had a higher success rate in the adjusted Wason Selection Task. In a second experiment, they used ethnic and gender stereotypes to create propositions that the students wanted to believe, i.e. 'All women are bad drivers'. The statements were also created to fit the 'If p, then q' format. The results showed that students who had to proof a negative self - referred statement about their own sex or ethnic group, had more success, whereas the success rate was low when the statement included a positive self – referred statement. The authors reasoned the results, higher success rate with negative self – referred, less success rate with other referred and the lowermost success rate with the positive self – referred statements, as the influence of Motivating Reasoning in the Wason Selection Task. The students wanted to believe positive statements so the success in the task was influenced by the confirmation bias, whereas they didn't want to believe the negative statements about their sex or ethnic group and they used the falsification strategy for refutation.

In 2013, Schaman performed a similar study with children of the fifth grade. The author used the Wason Selection task similar to Dawson et al. (2002) with the rule about sex stereotypes.

Children defined stereotypes, like ‘All boys can play soccer’ or ‘All girls can dance’ and the task was presented with the four cards on the board. According to Dawson et al. (2002), Schaman (2013) expected that the success rate would be higher when children were confronted with negative self – referred statements about their own sex. However, Schaman’s results contradicted Dawson’s. Children had more success in the task when they were confronted with a positive self – referred stereotype and had lower success with a negative self – referred stereotype. In this study there were also sex differences between boys and girls, they had more success when the rule was according to a stereotype referring to boys.

Referring to both studies, Dawson et al. (2002) and Schaman (2013), the author also investigated the immediate short-term influence of Motivated Reasoning in the Wason Selection Task. In the course of this study it was of interest to test choosing strategies in pre-school children correlated with the usage of adaptors. The author wanted to investigate if positive or negative statements about children’s sex and their future prospects influence the success rate in the Wason Selection Task. Additionally it was of interest to check if using the falsification strategy was correlated with the commitment of more adaptors. Three hypotheses were created to recap the parts which were of interest. First, the children should be better in the Wason Selection Task when they are confronted with a negative statement about their own sex. In the second experiment about the preferred colour, children should be better in the Wason Selection Task when they are confronted with a negative statement about their preferred colour, and they should be least successful in the task when they are confronted with a positive statement about their preferred colour. Referring to the usage of adaptors, the author hypothesised, that children use more adaptors when they have more success in the Wason Selection Task, according to stress management when changing from the confirmation to the falsification strategy.

Method

Pre – study

A total of 10 children (3 girls, 7 boys), took part in the pre study in a room of the primary school, Oberndorf in Tirol in January 2016, once letters of agreement had been collected. The Wason Selection Task with the statement about the stereotype (‘All boys can play soccer well’) and the statement about the colour (‘All who prefer the colour red have a bad job and earn less money.’) was used. The process of the experiment is described in the part of the procedure. Purpose of the pre - study was to test the study design, then to subsequently reflect and streamline.

To check reliability, for the adaptor coding, four children were filmed and the parents signed a separate letter of agreement for these video recordings. After the pre – study (one week later) the experimenter coded the video sequence. The results were not adequate, so a reliability check was designed with students. On two separate occasions, groups of-two and three students were filmed, whilst writing something, where full concentration was required. Both film sequences were coded after a week again (Table 1.1).

Table 1.1: Intra – Rater Reliability of the adaptor coding using the designed behavioural catalogue

Video sequence	Cohen`s Kappa	Krippendorff’s Alpha
Sequence One	0. 625	0. 614
Sequence Two	0. 484	1. 598
Sequence Three	0. 843	0. 941
Sequence Four	0. 756	0. 946

Recruitment

Four elementary schools in Tyrol allowed the study to take place with their classes. The school council of Tyrol authorised the work in the four schools and the author informed the principals and the class teacher of the fourth grade about background and process of the study.

A preliminary visit to the schools took place where the author distributed the information sheets and the letter of agreement for the parents and informed all the children about the experiment and the possibility of participating in it. They also were informed, a signed letter of agreement was a requirement of participation and that taking part was on a purely voluntary basis (Appendix 2.1 & Appendix 2.2). Additionally, the author agreed appointments for the data collection and inspected possible rooms where the experiments would take place.

Participants

Of the 102 potential fourth graders, 82 pupils participated in the experiment. This resulted in a sex distribution of 44 boys (53.7 %) and 38 girls (46.3 %) regarding all four elementary schools. The age ranged from nine years to eleven years, with a small variation between the schools (Table 1.2).

Table 1.2: Detailed list for sex and age of the participants at the four schools

School	Sex	*n*	*Mean Age (years)*	*St. Dev. (years)*	*Min. Age (years)*	*Max. Age (years)*
1	Boys	17	9.94	0.56	9	11
	Girls	22	9.86	0.47	9	11
	All	39	9.90	0.50	9	11
2	Boys	9	9.67	0.50	9	10
	Girls	3	9.33	0.58	9	10
	All	12	9.58	0.52	9	10
3	Boys	9	10.11	0.60	9	11
	Girls	8	10.00	0.54	9	11
	All	17	10.06	0.56	9	11
4	Boys	9	9.89	0.33	9	10
	Girls	5	9.60	0.55	9	10
	All	14	9.80	0.43	9	10
All schools	Boys	44	9.91	0.52	9	11
	Girls	38	9.82	0.51	9	11
	All	82	9.87	0.52	9	11

Material

In a separate room shared tables and four chairs were prepared (Figure 1.1). A blackboard was used for presenting the Wason Selection Task with the laminated cards. The various cards for the Wason Selection Task in the first experiment showed a boy, a girl, a cup representing the winner in soccer or dancing and a certificate representing the looser in soccer or dancing (Figure 1.2). In this case for the second experiment the cards showed the colour red, the colour blue, a money bag representing the person with the good job and a lot of money and a cancelled money bag representing the person with the bad job and less money.

Figure 1.1: An example for the setting briefly before starting the experiment.

The pupils used prepared answer sheets (Appendix 2.3 & 2.4) for their answers. One for the experiment with the stereotypes and two for the experiment with the favourite colour.

For the body language observation the experimenter used a behavioural catalogue (Appendix 2.5) and a template for the adaptors coding. The author created this catalogue after a month of ad lib observations in a learning institution with 33 children during study situations. In the experiment the Scan-sampling method and continuous recording was used. (Martin P. & Bateson P., 2007)

After both experiments the pupils filled in a questionnaire (Appendix 2.6). This contained questions about age, sex, mother tongue, grades in Mathematics and German. On a scale (0 – 12 cm) they signed their preference for Mathematics and German, the credibility of both statements (stereotype and favourite colour) and in the differences between boys and girls. With regard to the statements they were asked, if they thought it good or bad. Last question related to their emotional-state, which was also noted on a scale.

Small presents, like board games, were provided as a thank you gift for their participation.

Procedure

Data collection took place in May 2016, at each school on one morning. At the beginning, the experimenter informed the whole class of the rules during the experiment and gave an assurance of anonymity (encoding system). Four children at a time, who provided the letter of agreement, were picked during the fixed time, allocated by their teacher. The rules included being quiet, indicating questions only with hand signal, no cheating and copying and they also had the possibility to quit the experiment at any time.

Each setting included one experiment about the stereotypes (positive or negative) and a second experiment about the preferred colour (positive or negative). In the first experiment positive stereotypes were ‘All boys can play soccer well’ and ‘All girls can dance well’. The negative stereotypes were ‘All boys cannot dance well’ and ‘All girls cannot play soccer well’. In the second experiment, with the preferred colour, the positive statement was ‘All who prefer the colour red / blue have a better job and earn more money’ and the negative statement was ‘All who prefer the colour red / blue have a bad job an earn less money’. Before the experiment with the favourite colour, they had to choose the colour which they prefer more, red or blue. The Wason Selection Tasks were randomly chosen and prepared for every case with a random list.

Statements about the stereotypes were ‘All boys can play soccer well’, ‘All girls cannot play soccer well’, ‘All boys cannot dance well’ and ‘All girls can dance well’[1]. For the second Wason Selcetion Task, statements about the favourite colour were ‘All who prefer the colour red have a better job and earn more money’, ‘All who prefer the colour blue have a bad job and earn less money’, ‘All who prefer the colour red have a bad job and earn less money’ and ‘All who prefer the colour blue have a better job and earn more money’[2].

[1] Statements about the stereotypes were chosen based on the frequencies in Schaman 2013.

[2] Statements about the preferred colour were prompted in an education institute with 33 pupils and based on the frequencies chosen.

As already mentioned, during the completion of the answer sheets, the experimenter coded different adaptors, self-, object- and acoustic adaptors included. The variables ‘Looking’ (looking at the experimenter, looking at somebody else, looking somewhere else and looking at the task), ‘Object adaptors’ (object table, object paper, object pencil), ‘Subject adaptors’ (subject hair, subject brace, subject face, subject body), ‘Adaptors in the mouth region’ and ‘Acoustic adaptors’ (sigh, yawn, other) were coded on a template.

First Experiment: Stereotypes

The four cards of the Wason Selection Task were presented. On the cover, for example, there were Lukas (boy), Lisa (girl), participant A (first price in soccer / dancing) and participant B (last in soccer / dancing). For each statement of the stereotype the covers on the cards changed.

Figure 1.2: An example for the depiction of the Wason Selection Task: ‘All boys can play soccer well’

Subsequently the Wason Selection Task was formulated as follows:

‘Now I want you to find out whether this statement *x* (reading the statement ‘All boys / girls can /can`t play soccer /dance well’) is actually true. You can use the four people on the board. Ask whether *Lukas and/ or Lisa can or can´t do x* and whether *A and / or B are girls or boys*. You can ask as many or few of these four people as you want, but please *only* ask those who you really *need* to ask in order to be sure whether all boys / girl can / can´t do x. Please turn over the sheets in front of you but don´t start writing yet. I will tell you when to start. On the sheet, you`ll see that there are four circles, one for Lukas, one for Lisa, one for participant A and one for participant B. If you want to ask whether *Lukas can do x,* check the circle next to ‘Lukas’, if you want to ask whether *Lisa can do x,* check the circle next to ‘Lisa’, if you want to ask whether *A is a boy or a girl*, check the circle next to ‘participant A’ and if you want to ask whether *B is a boy or a girl,* check the circle next to ‘participant B’. You can ask as many or few of these four people as you want, but please *only* ask those who you really *need* to ask.

When I say ‘start’, think about your answer and tick the circle on the sheet. Take your time to think about your answer, but not longer than five minutes. Don´t cheat or chat and don´t write your name on your sheet. When you are finished put the pencil next to the sheet and I will collect it. Are there any questions? Please start now!’

During the task completion, the experimenter coded adaptors using a template of the behaviour catalogue. Time was also noted for each participant.

Second Experiment: Favourite colour

The pupils turn over the first answer sheet of the second experiment and fill in the question: ‘Which colour do you prefer?’ There are two possibilities to choose: ‘red’ or ‘blue’. Subsequently the experimenter collects the answer sheets and presents the cards of the

second task. On the cover is ‘participant A’ (likes red), ‘participant B’ (likes blue), ‘participant C’ (has a good job and earns more money) and ‘participant D’ (has a bad job and earns less money). Again, for each statement about the colours the covers on the cards have to be changed. After the presentation, a short story is narrated: ‘Scientists found out that football teams with red shirts win more often than others. Now they suppose a connection and believe (statement about the colour)‘. The statement about the colour is written on the board and follows the same text adapted in the second Wason Selection Task.

Even in the second experiment adaptors and time were coded.

After filling in the answer sheets, the children have to answer the questionnaire with questions about their sex, age, mother tongue, grades in Mathematics and German and some questions which they could answer on a chart from ‘bad’ to ‘good’ or ‘no’ to ‘yes’ about fondness for Mathematics/ German, belief and thinking in both statements, thinking in sex differences and about their emotional state.

In the end there was a clarification and the experimenter told the pupils that all that has been said during the experiment was imaginary. The children took a present and moved back to their classroom, accompanied by the experimenter.

Statistical Analysis

SPSS Version 20 was used for statistical analysis and graphical presentation of the results. The reliability, for analysing correct adaptor coding, was calculated with Cohen's Kappa and Krippendorff's content analysis referring to the zero values.

For descriptive statistical analysis frequencies for the demographic data, age, sex, mother tongue, Mathematics and German marks were calculated. After measuring the charts from the questionnaire, the data were described with mean, standard deviation, minimum and maximum values.

Assumptions of normal distribution and homogeneity of variance were tested using Kolmogorov Smirnov test (KS – Test).

To test the first and the second hypothesis children's success in the Wason Selection Task, in both experiments with stereotype and preferred colour as an internal motivation factor, was compared with Fisher's Exact Test. The effects of possible confounding factors on the success rate in the Wason Selection Task were statistically analysed.

For testing the third hypothesis, correlation of the success rate in the Wason Selection Task with an increasing of the adaptor frequencies, a new variable was calculated, adaptor per time. These results were analysed descriptively.

Results

Sample description

The distribution of sex was balanced: 53.7 % were boys (mean age: 9.9 years, S.D.: 0.53 years), whereas 46.7% were girls (mean age: 9.84 years, S.D.: 0.49 years; see Table 2.2). Of the 82 participants, 9 boys and 2 girls had a different mother tongue than German Seven of them had a "Befriedigend" in German, three a "Gut" and one a "Sehr Gut", there were no worse grades. There were no significant sex differences in demographic variables in the sample.

The most frequent grade in Mathematics for 80 participants (two of them didn't answer the question correct) was "Sehr Gut" - the best grade- : 39.0%), the second best grade was achieved by 36.6%, the third best grade by 18.3% and the fourth best grade by 3.7%. All children achieved passing grades in Mathematics. Girls and boys did not differ significantly in their grades in Mathematics (n = 80, FE-Test: χ^2 = 1.404, *D.F.* = 3, p = 0.705).

All 82 participants answered the question about their most recent grade in German. More than half of them achieved the second best grade, "Gut", (51.2%). The best grade, "Sehr Gut", was achieved by 22.0 %, the third best grade by 25.6 % and one child failed in German. The "Genügend", the lowest passing grade, wasn't represented in the sample. The grades in German did not differ significantly between girls and boys (n = 82, FE-Test: χ^2 = 7. 219, *D.F.* = 3, p = 0.065).

A statistical comparison in grades between schools is not feasible because of the small and variable sample sizes (see Table 2.2).

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[1] In the results, following abbreviations were used:
Degree(s) of Freedom: D. F., Standard Deviation: S.D., Standard Error: S. E., Kolmogorov-Smirnov Test for Normal Distribution: KS-Test, Pearson Chi-square Test: χ^2-Test, Fisher's Exact Test: F. E.

Scale rating in the questionnaire .

The participants answered the questions about their attitude towards Mathematics and German as well as their perception of the presented task rules on a continuous scale ranging from zero (negative) to ten (positive) in increments of 0.1. The average attitude towards Mathematic was more positive (*n* = 82, *mean*= 6.63, *S.D.* = 3.00) than towards German (*n* = 82, *mean* = 5.88, *S.D.* = 2.96). The children were sceptical of stereotype statements (believe = 10, doesn't believe = 0) (*n* = 82, *mean* = 3.94, *S.D.* = 3.05), perception about good or bad if the statement was true (good = 10, bad = 0) (*n* = 82, *mean* = 6. 00, *S.D.* = 3.49) and believing in differences between boys and girls (believe = 10, doesn't believe = 0) (*n* = 82, *mean* = 7.91, *S.D.* = 2.37). For the experiment with the favourite colour, children on average doubted the validity of the statement (valid = 10, invalid = 0) (*n* = 82, *mean* = 3.80, *S.D.* = 3.01) and the perception for good or bad if it is true (validity/good = 10, no validity/bad = 0) (*n* = 82, *mean* = 4.34, *S.D.* = 3.61). The children's reported emotional state was very positive (feeling good = 10, feeling not good = 0) (*n* = 82, *mean* = 9.13, *S.D.* = 1.39).

As shown in Table 3.1 each sex rated the statements as more positive if these statements contained a positive statement about their own sex: boys preferred the statement about all boys being able to play football well, whereas girls felt more positively about the statement that all girls can dance well. The negative statements about their sex, i.e. 'All boys cannot dance well' or 'All girls cannot play football well', were rated worse (see Figure 3.1).

Table 3.1: Results of the Mann Whitney U-Test for the evaluation of the statements with the stereotypes (rated on a scale: 0 = bad, 10 = good) compared with the condition of the stereotype (self-referred positive, self-referred negative and other).

Condition	*Z*	*p - value*	*significance level*
Self-referred pos. / neg.	-4.303	.000	***
Self-referred pos./ Other	-1.971	.049	*
Self-referred neg./ Other	-2.421	.015	**

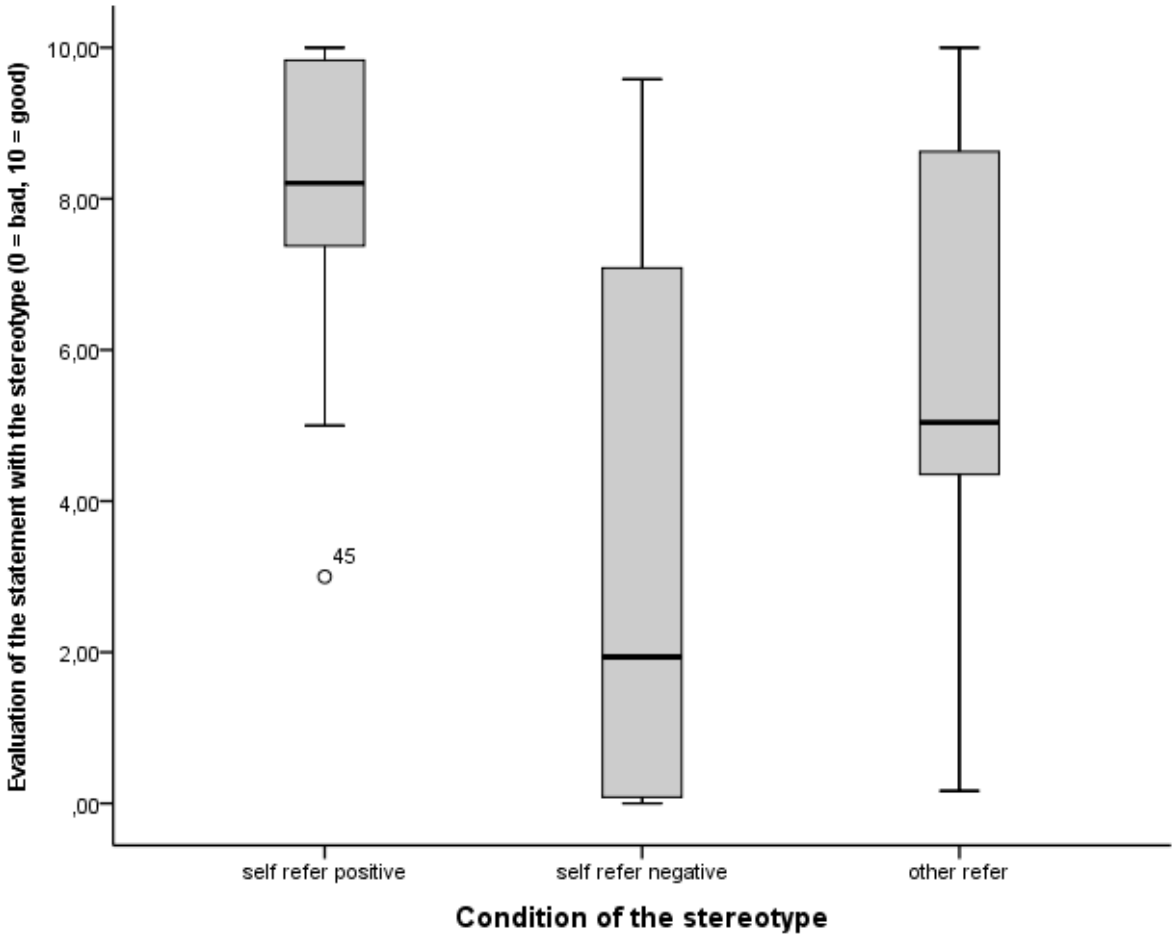

Figure 3.1: Differences in the evaluation of the statements about the stereotype compared with the condition of the stereotype.

Also shown in Table 3.2, each participant rated the statements as more positive if these statements contained a positive statement about their favour colour. Both, the positive and negative statements about the favourite colour deviate significantly, also the negative statement to the neutral value. The children, who chose red, rated the negative statement about the colour as more positive, than the children who chose blue (see Figure 3.2).

Table 3.2: Results of the Mann Whitney U-Test for the evaluation of the statements with the favourite colour (rated on a scale: 0 = bad, 10 = good) compared with the condition of the colour (favour colour positive, favour colour negative and other colour).

Condition	*Z*	*p - value*	*significance level*
Favour colour pos. / neg.	-3.205	.001	***
Favour colour pos./ Other	-1.466	.143	
Favour colour neg./ Other	-2.159	.031	*

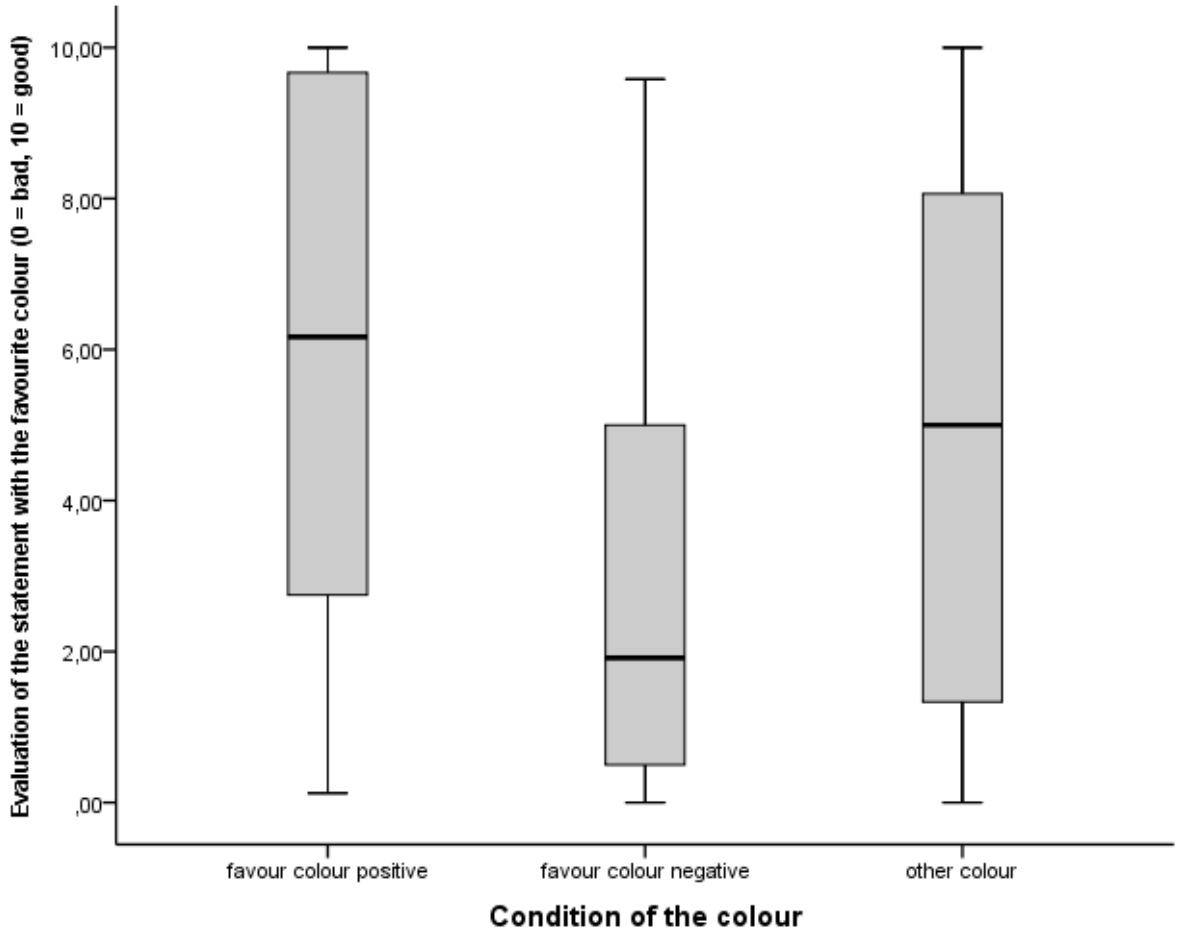

Figure 3.2: Differences in the evaluation of the statements about the favourite colour compared with the condition of the colour.

Success in the Wason Selection Task

When considering stereotypes, the participants achieved a success rate of 18.3% (7 boys and 8 girls marked the correct answer) and in the experiment with the favourite colour the success rate was 12.2% (5 boys, 5 girls marked the correct answer). Only 22 % of participants choose 'red' as favoured colour and 78 % choose the preferred colour 'blue', with no differences in sex.

In experiment one, about sex stereotypes, all successful children were considering statements about their own sex (see Figure 3.3). The success in the second experiment was independent of whether the favourite colour or another colour referred to in the task rule (see Figure 3.4).

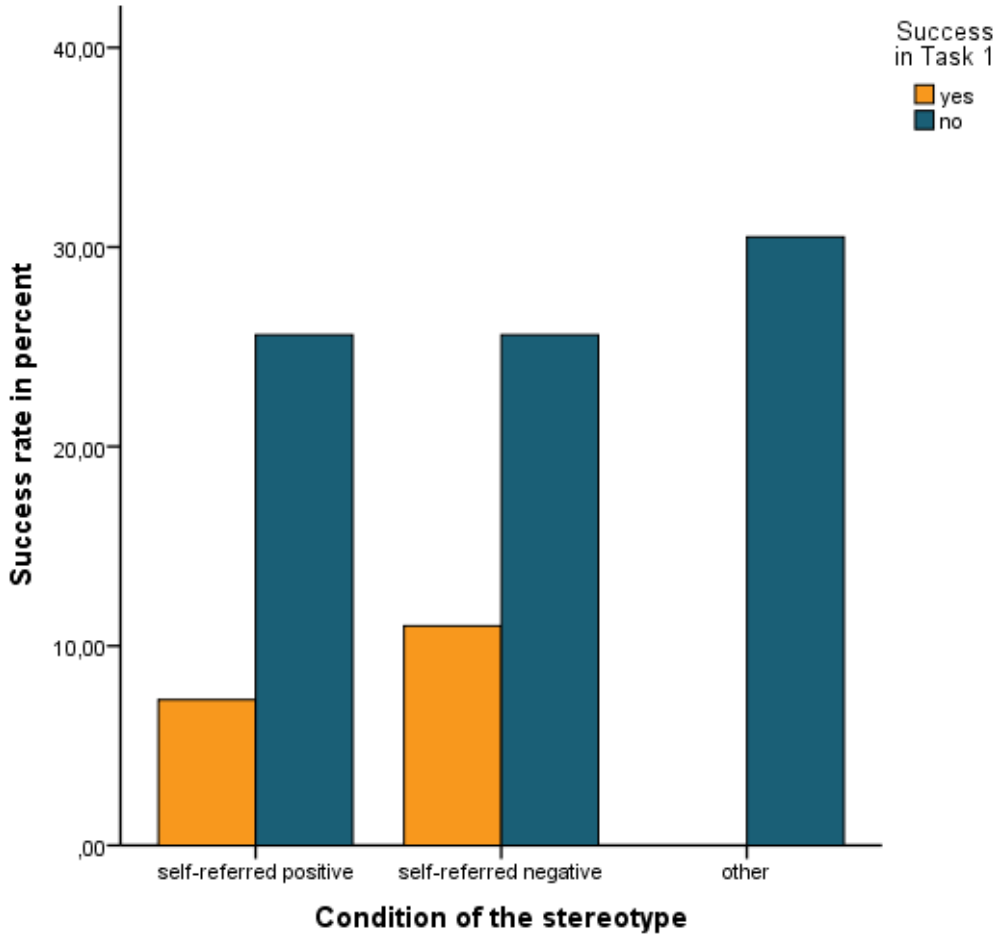

Figure 3.3: The success rate in the Wason Selection Task in relation with the statement about the own sex. (Success rate: self-ref positive = 7, 3%, self-ref negative = 11%, other = 0%)

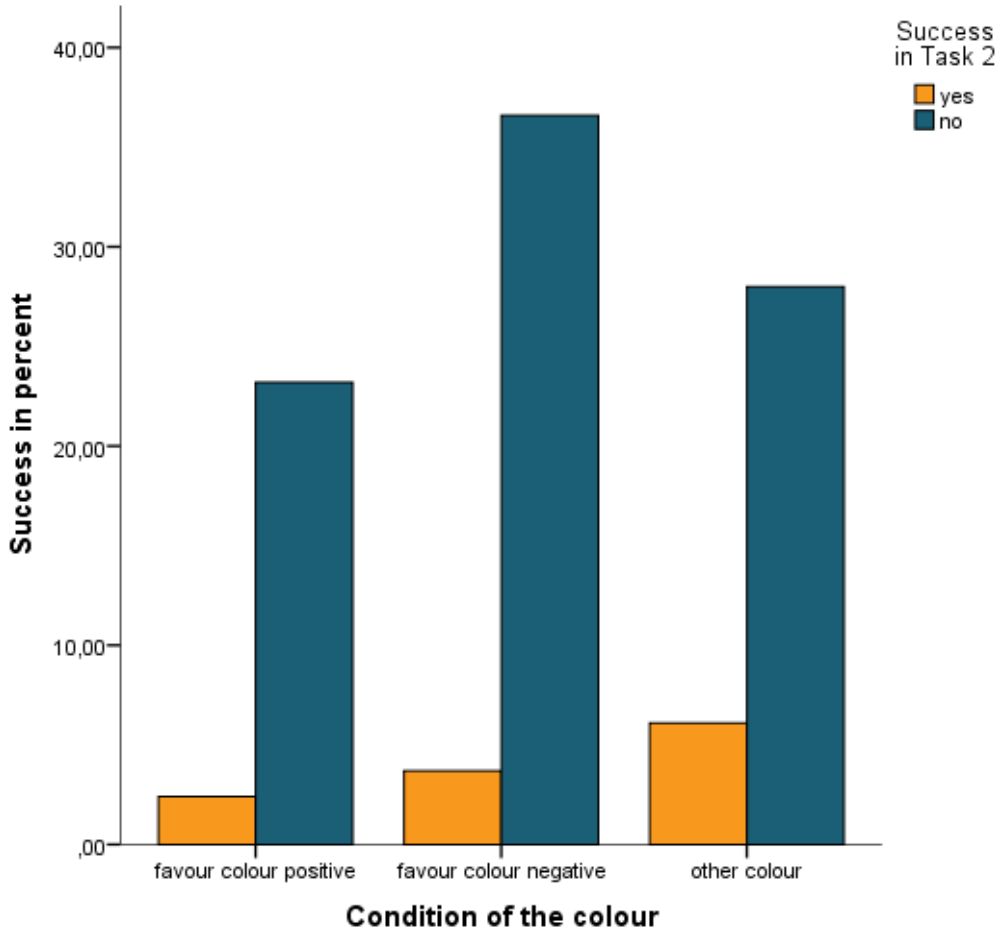

Figure 3.4: The success rate in the Wason Selection Task in relation with the statement about the favourite colour. (Success rate: favoured colour positive = 2, 4%, favoured colour negative = 3, 7 %, other colour = 6, 1%)

The children were significantly more successful if the Wason Selection Task contained a statement about their own sex (*n* = 82, F. E. = 10.144, *D.F.* = 2, *p* = .006). In the experiment with the favourite colour there were no significant interactions between success rate and whether the child's preferred colour was included in the statement (*n* = 82, F. E. = 1.215, D.F. = 2, p = .633) (see Table 3.3) .

Table 3.3: The success rate in the Wason Selection Task in relation with the stereotype's reference and the favoured colour.

Experiment	*Fisher's Exact Test*	*p - value*	*significance level*
Stereotypes (pos / neg/ other)	10. 144	.006	**
Favoured colour (favoured pos / neg not favoured)	1.215	.633	

The success rate in both tasks linked with the belief in the diverse statements showed interesting results. In the experiment with the stereotypes the 67 children who had no success and the 15 who had success the majority don't believe the statement about their sex (don't believe the stereotype = 0, believe the stereotype = 10). Both groups rated under five (= neither don't believe / believe) with an average of 4.15 (*S.D.* = 3.17) for the children who had no success and an average of 3.00 (*S.D.* = 2.28) for the successful group (see Figure 3.5).

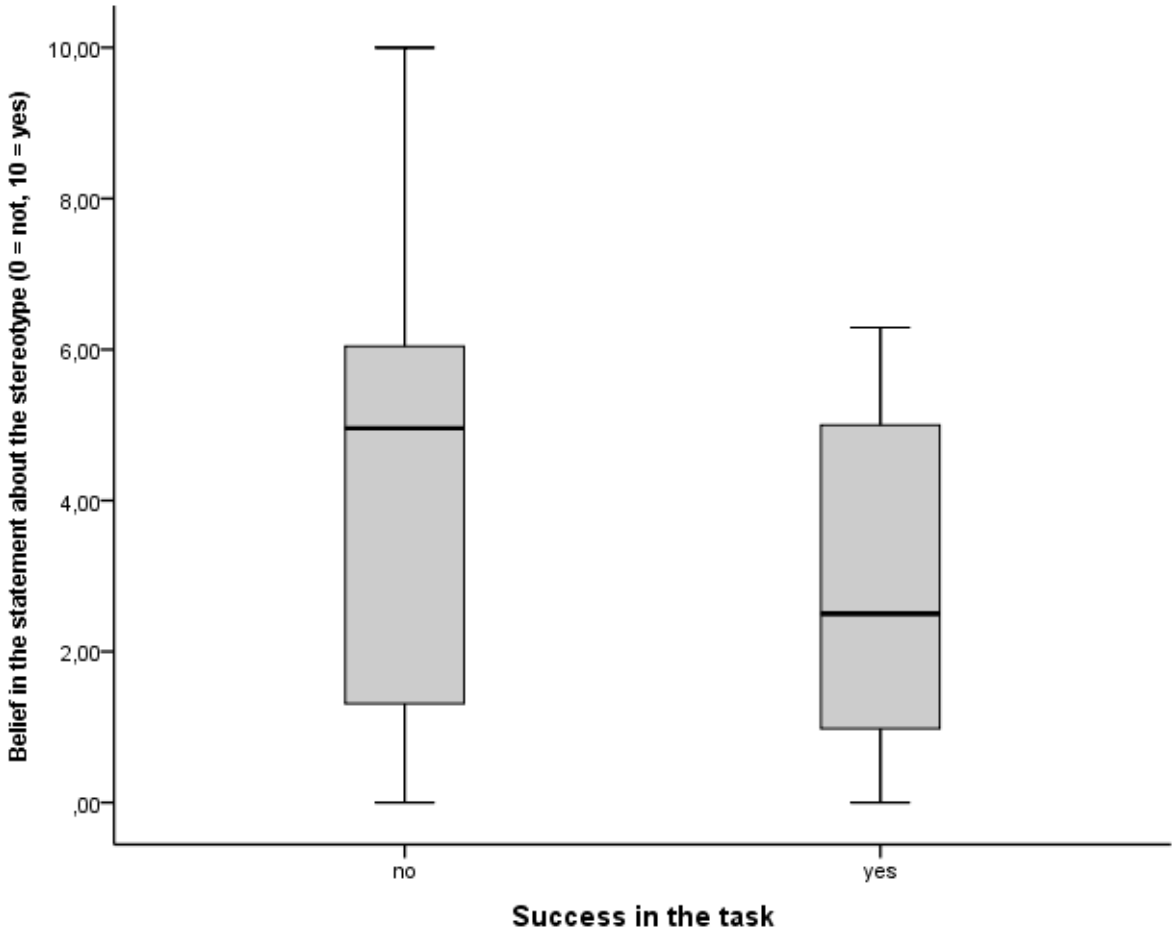

Figure 3.5: Believing (not believe = 0, believe = 10) in the statement of the stereotype divided in the successful group and in the not successful group.

In the experiment with the favourite colour, the majority of the 72 children who had no success and the 10 children who had success did not believe the statement about the colour (don't believe the statement = 0, believe the statement = 10). Both groups rated under five (= neither don't believe / believe) with an average of 3.82 (*S.D.* = 3.06) for the children who had no success and an average of 3.68 (*S.D.* = 2.80) for the successful group (see Figure 3.6).

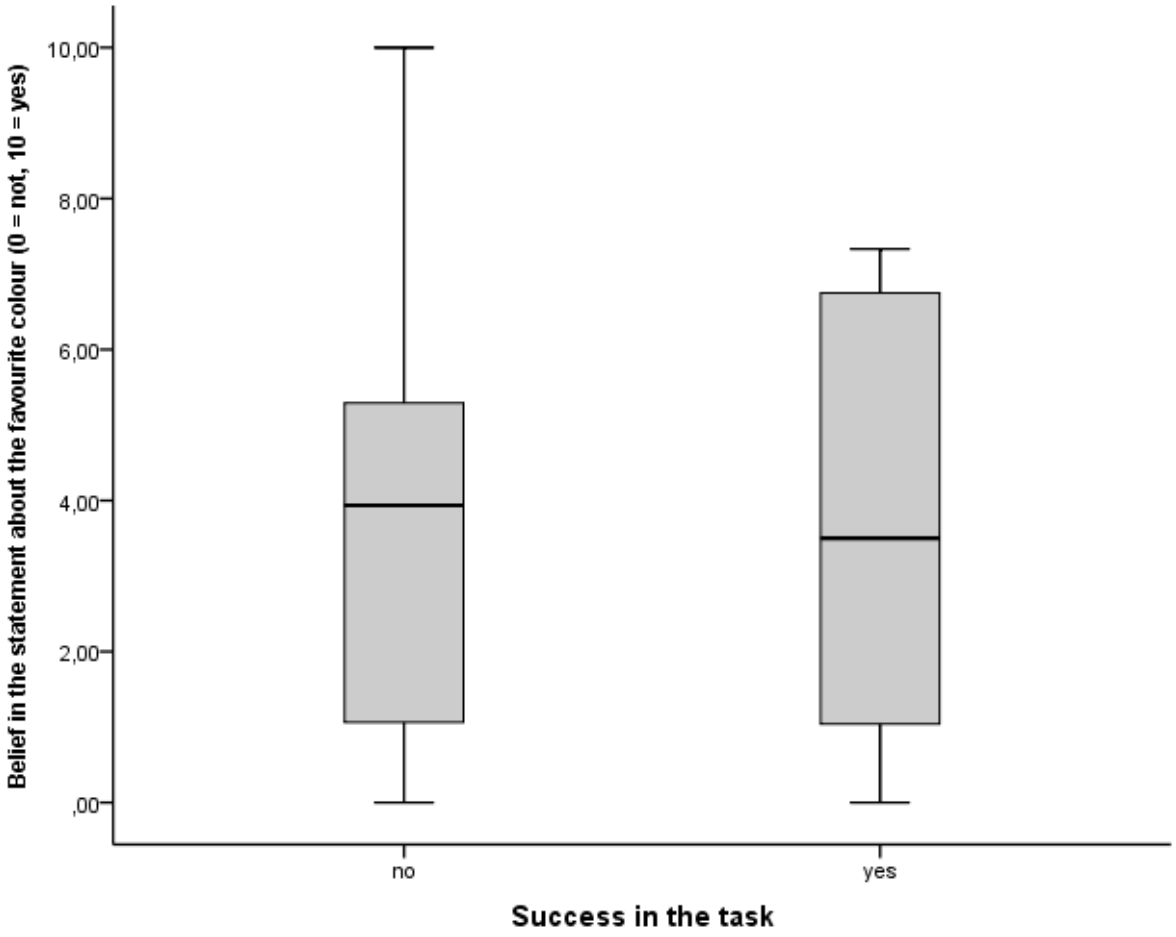

Figure 3.6: Believing (not believe = 0, believe = 10) in the statement of the colour divided in the successful group and in the not successful group.

Frequency of adaptors

To make the frequency of adaptors comparable between children who took unequal amounts of time in the test, new variables (Adaptor_ per_ sec_1 for the stereotype experiment & Adatpor_per_sec_2 for the experiment using the colours) were calculated by dividing the number of adaptors by the time to yield adaptors per second (see Table 3.4).

Table 3.4: The mean and the standard deviation of variables, adaptor_per_sec 1 and adaptor_per_sec_2.

Adaptors	N	Mean	S. D.
Adaptor_per_sec_1	82	.062	.041
Adaptor_per_sec_2	82	.077	.060

In the Wason Selection Task with the statements about the stereotypes, participants who were more successful schowed more adaptors. (see Figure 3.7)

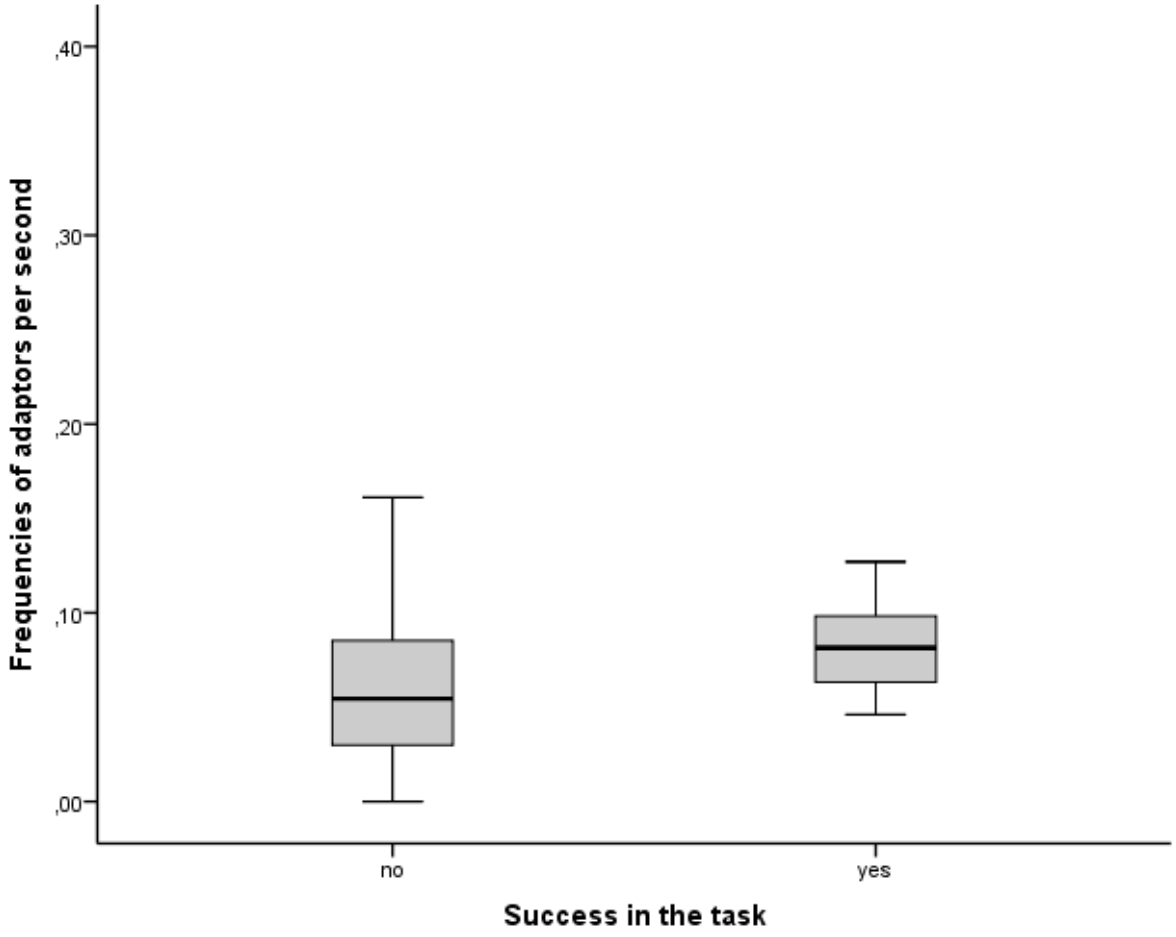

Figure 3.7: Frequencies of adaptor per sec in relation to success at the Wason Selection Task with the stereotypes.

In contrast, in the colour experiment succesful children did not show more adaptors (see Figure 3.8).

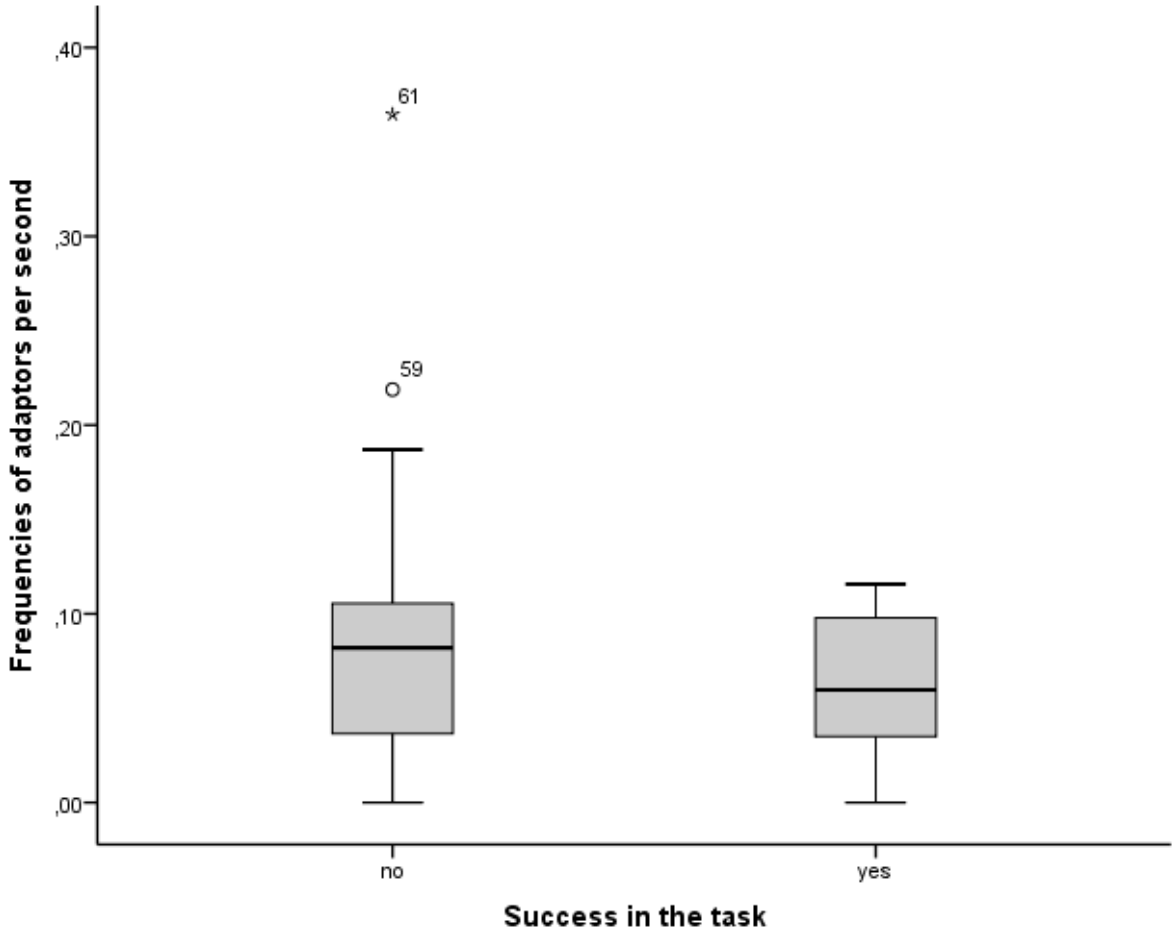

Figure 3.8: Frequencies of adaptor per sec in relation with the success of the Wason Selection Task with the favourite colour.

Card Selection Patterns

The most chosen option, p, was selected in the experiment with the stereotypes by 71.95% and in the experiment with the favourite colour by 70.73% of the children. Whereas q was chosen in the stereotype experiment by 56.09% and in the favourite colour experiment by 65.85% of the participants. In both experiments the option –q was never chosen and the combination of p and q was highest (21.95% of participants in the stereotype experiment and 26.83% of

participants in the favourite colour experiment). All four cards were selected only by 9.76% (experiment stereotype) and 12.20% (experiment favourite colour).

(See Table 3.5 and Table 3.6)

Table 3.5: Frequency of choice of complete answer in the experiment with the stereotypes

Complete answer	n	Percentage
p, q	18	21.95%
p, -q	15	18.29%
p, -p, q, -q	8	9.76%
-p, q	7	8.54%
-q, -p	6	7.32%
p, -p	6	7.32%
p, -p, q	5	6.10%
-p	4	4.88%
q, -q	3	3.66%
p, -p, -q	3	3.66%
p	2	2.44%
p, q, -q	2	2.44%
-p, q, -q	2	2.44%
q	1	1.22%
-q	0	
Total	82	100%

Table 3.6: Frequency of choice of complete answer in the experiment with the favourite colour

Complete answer	n	Percentage
p, q	22	26.83%
p, -q	10	12. 20%
p, -p, q, -q	10	12.20%
-p, q	7	8.54%
-q, -p	7	8.54%
p, -p, q	5	6.10%
p, -p, -q	5	6.10%
q, -q	4	4.88%
q	4	4.88%
p, -p	3	3.66%
p	2	2.44%
-p	1	1.22%
-p, q, -q	1	1.22%
p, -p, q	1	1.22%
q	0	
Total	82	100%

Discussion

Success in the Wason Selection Task

The results of the experiment with stereotypes are partly similar to the results of Dawson et al. (2002). The children were more successful in the Wason Selection Task when the rule included a negative statement – can' t play soccer well / can't dance well - about their own sex just like the adults were more successful in Dawson et al.'s experiment when considering negative statements about their own group. However, there are some differences in the children's behaviour in this experiment: The children had no success in the task when the rule included a statement about the other sex, which corresponds to the second most successful condition for adults. Children were intermediately successful when considering positive stereotypes about themselves whereas this was the least successful condition for Dawson et al.'s adults.

If we focus only on the success rate in the negative self-referent statement condition, our results seem consistent with Motivated Reasoning, however at a closer look they cannot be taken as a confirmation of Motivated Reasoning in children.

Dawson et al. (2002) explained that Motivated Reasoning influences humans in two ways. The first, is that when humans want to believe and agree with the statement, like a self- referred positive statement about their sex, they will perform least successful in the task. The second, is that when humans don't want to believe and disagree with a statement, they will perform better in the Wason Selection Task. In the present study, the children were not least successful when they were confronted with a positive statement about their own sex. Looking at the results from the questionnaires, it can be accepted that children don't believe the statements with the stereotypes. If the statement would be true, they would like it. So, if not 'Motivated Reasoning' influenced choosing the correct strategy, maybe it was scepticism in believing something – positive as negative - about the own person? If there would be no effect, then the data for the

condition in the stereotype would be equal, but they are inconsistent with Dawson et al. (2002) and Schaman (2013). In contrast to Schaman (2013) the success rate in this study showed no differences in the sex. Both, boys and girls had more success in the Wason Selection Task with the statement about their own sex. Both sexes showed better results when the task included a negative statement about their own sex.

In the experiment with the statements about the favoured colour, the children showed no evidences for self – referring positive or negative task rules or other referring rules. They had success in all the four categories with the most success occurring in the Wason Selection Task regarding the statement about the other colour, not the favoured. Nevertheless, in the discrimination of the rules between positive or negative referring statements about the favoured colour, children had more success in the Wason Selection Task with the negative statement about the favoured colour. These results are completely inconsistent with the literature about Motivated Reasoning (Gilovich, 1991; Dawson et al. 2002 & Schaman, 2013). It is assumed that in this task 'Motivated Reasoning', as described in the literature (Kunda, 1987; Gilovich, 1991; Dawson, 2002; Schaman, 2013), wasn't the trigger for success. There would be some effect, which influences the choosing of a strategy. The data in this study showed that children didn't believe the statements about their preferred colour, but if they were true they would have liked the positive statements more. Perhaps scepticism plays a key role. Dawson et al. (2002) explained a 'healthy scepticism' as a mechanism to think critically about data evaluation and its consequences. Scepticism in combination with motivation was frequently discussed in philosophy and is a big theme in epistemology (Gabriel, 2014).

The author considered a learning effect for the better results in the experiment with the stereotypes, and this was mostly conducted as the second experiment. This argumentation, however, did not match with the results. The children's answers were unrelated to the order of the experiments.

Belief in the Statements about the stereotype and favoured colour

As shown in the results, the statements in both Wason Selection Tasks weren't credible. In the two experiments, the children rated, that they didn't believe the statements. The statements about the stereotypes had a higher plausibility than the statements about the colours. This maybe occurred because the statements about the stereotypes in this study where predefined and validated in a study with more children (Schaman, 2013). Contrarily, the statements about the colour were chosen from children, but not evaluated with a high sample. If belief has an influence on Motivated Reasoning and in both experiments the belief was rather low, the favourite colour and the stereotype didn't act as a Motivated Reason. Though, the results in the success rate showed, like the results in adults in Dawson et al. (2002) and in children in Schaman (2013), that there is a certain influence on the success rate in the Wason Selection Task.

Success rate and body language

In the experiment with the stereotypes, the children who had more success in the Wason Selection Task, showed more adaptors. If the thesis about nonverbal body language acting as a catalyst in human stress situations is true (Genova, 1974; Folkman et al., 1986), then the author acted on assumption that using the falsifying strategy was triggered by stress. Adaptors work here as a mechanism of stress management. For more meaningful results a replication has to be constructed with a bigger sample size. In this sample a statistical analysis with parametric tests won't be meaningful because of the low success rate. On the other hand, in the experiment with the favourite colour, the children used adaptors equally, when they had no success and success in the Wason Selection Task. Maybe this is an expression of the stress management of confusion and scepticism in this experiment. Children showed only small differences in the frequencies of using adaptors in either experiments, so a repetition has to be done for more information.

Card selection Patterns

In both experiments the combination ‘p’ and ‘q’ was used very frequently, followed by the card combinations, ‘p’ and ‘-q’ – which is the logical correct selection (Wason, 1966). These results were consistent with results in replications of the original test (Wason, 1978, Schaman, 2013). The card selection patterns showed three strategies which children used most in both experiments: First the comination ‘p’ and ‘q’, that Wason (1966) described as the ‘confirmation bias’, followed by ‘p’ and ‘-q’ that Wason described as the logical correct answer, and the combination ‘p’,’-p’, ‘q’ and ‘-q’ as the safe strategy. It seemed that children are more rationally reasoned as supposed. The third save strategy cognitively not correct, but absolutely operational and easy to use in daily life. In an evolutionary aspect for humans this strategy needs no high intelligence but can be used for problem solving in any environment with a positive outcome, not necessarily correct but nevertheless positive. It’s the cheapest strategy with efficiency. The Wason Selection Task behaviour could be described as rational and as an optimal adaption in an environment with rare manor (Oaksford & Chater, 1994).

Limitations

Using the Wason Selection Task involves the need for a high sample size, because the success rate is very low (Wason, 1978; Dawson, 2002; Schaman, 2013). For better and statistically significant data a bigger sample size is needed. For the creation of a preferably comparable Wason Selection Task rule, the author discussed a lot with scientists of different areas. The conclusion showed no correct task rule, so the same rule with the same wording like Dawson et al. (2002), was used. It cannot be neglected, that the formulation of the task rule, in this case, the statements about stereotypes and favourite colour, influenced the success rate in the Wason Selection Task (Sperber et al., 2002). Dawson et al. (2002) instructed the participants in one experiment to choose two cards. In the present study the experimenter didn’t receive the

comparability with the original Wason Selection Task (Wason, 1996). Maybe when telling the children to choose two cards, the success rate would be higher

Another part is the adaptor coding: Adaptors are very difficult to interpret (Ekman et al., 1969). As Ekman et al. (1996) described, adaptors are normally not used consciously and they don't affect the acceptor. The easiest self-adaptors for coding, are the hand-face touch. In this study, this self-adaptor was only one of a big behavioural catalogue. This behavioural catalogue needs to be used in more cases for a good evaluation, and during coding it is important to code in detail, sometimes one long adaptor includes a smaller short one. In a setting with four children and just one experimenter it can be possible that the small adaptors get lost. A replication with a one child setting would be of interest.

Additionally, the emotional state of the participants plays a role in using adaptors in that self-adaptor usage is related to anxiety (Ekman et al., 1976) and described with emotional stability. Neff et al. (2011) described the usage of self-adaptors with a higher rate of emotional instability. In the present study only the emotional feeling, which showed that all participants felt comfortable, was analysed. Maybe for more concretion, children in such experimental situations, should be asked more about their feelings, i.e. if they are nervous, afraid, or proud to be part of such an experiment. Every society has their own 'feeling rules'; these are perceptions of how humans, and in this case, children, should feel and react in diverse social contexts. Maybe the situation of an experiment conducted by a member of the university influences their feelings and thoughts (Lazarus, 1982) and following results in the experiments.

A simple 'Motivated Reasoning pattern' does not exist. It is more complex and there are many more factors involved in choosing the right strategies. Further studies need a higher sample to get some more concrete results about 'Motivated Reasoning' in children and choosing the correct strategy in the Wason Selection Task. If choosing a strategy triggers stress and involves

our body language, this may also be found in adults. Maybe future studies could look at correlations between choosing a strategy and body language.

List of Figures

List of Tables

Appendix 2.1: Information sheet

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Department of Anthropology
University of Vienna

Informationsblatt

Versuch zur Entwicklung logischen Denkens

Fakultät für Lebenswissenschaften
Department für Anthropologie
Althanstraße14, 1090 Wien

Kontaktdaten des Experimenters

Sehr geehrte Eltern,

mein Name ist (Name Experimenter) und derzeit studiere ich Anthropologie, die Lehre vom Menschen, an der Universität Wien. In meiner Masterarbeit, die von (Name des Betreuers) betreut wird, setze ich mich mit dem Einfluss von Motivation auf das logische Denken bei Kindern auseinander.

Logisches Denken und die Entwicklung logischer Strategien stellen eine Herausforderung im täglichen Leben dar. Viele kognitive Prozesse sind daran beteiligt und diese bilden auch die Grundlage des Lernens und sind wichtig für die Schule und das weitere Leben. Ein besseres Verständnis für die Faktoren, welche logisches Denken beeinflussen, könnte helfen, Aufgaben zu entwickeln die den Kindern mit ihren logischen Strategien entgegenkommen.

Deshalb freue ich mich, dass Frau / Herr (Name der DirektorInnen) es genehmigt hat, in der 4. Klasse Volksschule diese wissenschaftliche Arbeit durchzuführen. Somit unterstützt die Volksschule (Name der Schule) und auch Ihr Kind die Wissenschaft durch die Mithilfe bei einem kleinen Gedankenspiel, in dessen Rahmen die Kinder, in Kleingruppen, eine Aussage überprüfen sollen.

Der Versuch ist in zwei kleine Gedankenspiele aufgeteilt. Im ersten werden Aussagen die Ihr Kind oder andere betreffen überprüft. Im zweiten Spiel überprüfen die Kinder Aussagen zu ihrer Lieblings – oder nicht Lieblingsfarbe. Zum Schluss bitte ich Ihr Kind noch einen Fragebogen zu Alter, Geschlecht, Mathematiknote, etc. auszufüllen. Somit möchte ich den Einfluss der persönlichen Relevanz der Aufgabe auf die logischen Strategien der Kinder herausfinden.

Die Teilnahme an der Studie ist selbstverständlich freiwillig und anonym, und ihr Kind kann den Versuch zu jedem Zeitpunkt ohne Angabe von Gründen abbrechen. Die erhobenen Daten werden im Rahmen meiner Masterarbeit, welche die Richtlinien der Deklaration von Helsinki einhält, verwendet. Zusätzlich wurde die Studie vom Landesschulrat Tirol geprüft und genehmigt.

Mit Ihrem Einverständnis Ihr Kind teilnehmen zu lassen, helfen Sie mir meine Masterarbeit abzuschließen und tragen zum Wissen über die Entwicklung logischen Denkens bei. Falls Sie weitere Fragen haben stehe ich Ihnen gerne zur Verfügung.

Ich bedanke mich vielmals für Ihre Mithilfe!

Mit freundlichen Grüßen,

Unterschrift und Foto des Experimenters

Appendix 2.2: Letter of agreement

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Einverständniserklärung

Hiermit erkläre ich mich einverstanden, dass meine Tochter / mein Sohn an dem Gedankenspiel zur Entwicklung logischen Denkens von Elisabeth Monitzer, Department für Anthropologie der Universität Wien, teilnimmt. Die im Verlauf des Gedankenspiels erhobenen Daten dürfen unter Wahrung der Anonymität in der Masterarbeit von Elisabeth Monitzer zum Zweck wissenschaftlicher Forschung verwendet werden.

Vor – und Nachname
der Tochter / des Sohns: _____

Vor – und Nachname
des Erziehungsberechtigten: _____

_____ _____
Ort, Datum Unterschrift des Erziehungsberechtigten

Ich möchte von den Ergebnissen der Studie per E – mail unter folgender Adresse verständigt werden:

_____
(Da die Teilnahme vollständig anonym erfolgt, können keine Auskünfte über Einzelergebnisse gegeben werden)

Appendix 2.3.: Answer sheet 1

Teilnr. 1

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Antwortblatt

Du kannst mehr als nur ein Kreuz machen. Wichtig ist nur, dass du nur dort Kreuze machst, bei der Person die du fragen MUSST.

Ich möchte

- o Lukas
- o Lisa
- o Person A
- o Person B

befragen.

Vielen Dank für deine Mitarbeit!

Appendix 2.4: Answer sheet 2.1

Teilnr. 2 / **1**

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Antwortblatt

Welche der beiden Farben hast du lieber? (entscheide dich für eine Farbe)

- o Rot
- o Blau

Appendix 2.4: Answer sheet 2.2

Teilnr. 2 / 2

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Antwortblatt

Du kannst mehr als nur ein Kreuz machen. Wichtig ist nur, dass du nur dort Kreuze machst, bei der Person die du fragen MUSST.

Ich möchte

- ○ Person A
- ○ Person B
- ○ Person C
- ○ Person D

befragen.

Vielen Dank für deine Mitarbeit!

Appendix 2.5: Behavioural catalogue

Variables	Definition	Code	Special
Looking	Change of the focus; divagation of the focus from paper for a few seconds		
Looking at the experimenter	Divagation of the focus to the experimenter	Look Exp.	
Looking at somebody else	Divagation of the focus to other children; one or more	Look other	
Looking somewhere else	Divagation of the focus to the air or another object in the room, but not on the whiteboard	Look else	
Looking at the task	Divagation of the focus to the task on the whiteboard	Look Task	

Object adaptors	Shift of the position of an object and / or the shape of the objects with fingers and hands		
Object table	Shift of the postition and / or the shape of the table	Arm O. table	
Object paper	Shift of the position and / or the shape of the paper	Arm O. paper	
Object pencil	Shift of the position and / or the shape of the pencil	Arm O. pencil	Includes playing with the object, e.g. bobbing of the pencil

Subject adaptors	Manipulation of the body or parts of the body using the finger or the hand		Only the upper body (visible)
Subject hair	Manipulation of the hair, strand of hair, fringe or single hair using fingers or hand; also to swipe them out of the face and / or behind the ears	Arm S. hair	Play, pull, pick, rip, any manipulation
Subject brace	Bracing of the head on the elbow or the underarm and / or touching diverse regions of the	Arm S. brace	Placing the head on the table is also weight displacement

	face or the head with the hand (cheek, forehead, . . .) Weight displacement recognizable		
Subject face	Manipulation of different regions of the face (cheek, nose, eyes, forehead, . . .) with the fingers or hand	Arm S. face	
Subject body	Manipulation of different body parts (upper body) (neck, arm, . . .) with fingers or hand Parts of the body are visible	Arm S. body	

Adaptors in the mouth region	Any movement of the lips, mouth, mouth corners without using fingers or hands	mouth	

Acoustic Adaptors	Any generation of sound with the mouth, which are clearly audible		
Sigh	Deep breath with clear sound	AA sigh	
Yawn	Wide open mouth and clear yawn sound	AA yawn	
Other	Any other acoustic sound, which are produced by the mouth without using other objects	AA other	e. g. cough, harrumph

Appendix 2.6: Questionnaire

Teilnr.

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Fragebogen

Kreuze an, ob du ein Junge oder ein Mädchen bist:

o Junge o Mädchen

Wann bist du geboren? _____

(Tag, Monat und Jahr)

Wie alt bist du? _____Jahre

Wie ist deine Muttersprache? _____

Magst du Mathematik?

Gar nicht Sehr gerne

(Mach ein Kreuz durch den Balken, der zeigt, wie gerne du Mathematik magst)

Welche Note hattest du in Mathematik im letzten Zeugnis? _____

Magst du Deutsch?

Gar nicht Sehr gerne

Welche Note hattest du in Deutsch im letzten Zeugnis? _____

Glaubst du, dass

Gar nicht Sehr

Teilnr.

Wenn das stimmt, findest du das gut oder schlecht?

Schlecht Gut

Glaubst du, dass Mädchen und Jungen unterschiedlich sind?

Gar nicht Sehr

Glaubst du, dass

Gar nicht Sehr

Wenn das stimmt, findest du das gut oder schlecht?

Schlecht Gut

Wie fühlst du dich heute?

Nicht gut Sehr gut

Vielen Dank für deine Mitarbeit!

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