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Parents May Help Their Kids to Lie

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Abstract: Deception was one way (possibly not a good way) for children to interact with surroundings by considering others' perspective. The development of deception itself, as well as the strategy of deception, was related to the environment they lived in and people they live with. In this study, we conducted experiment using "Die in a cup" task. By inducing parents to help their children to lie about the dice results, we showed that in order to escape from uncertainty (in exp1), or get a bigger chance to win a reward (in exp2), parents, together with their kids, lied on a aggregated level. Specifically, baby boys adopted more radical strategies to win for a present (by claiming they got the best results, Boys vs. Girls: 29% vs. 13% in exp1, 9%:0.4% in exp2), while baby girls ended up to choose a better but not obvious result. Although parents were not directly tested in our experiments, it is only with their help that children could complete their game, particularly showed consistent deception. Compared to previous research that men constantly cheat more than women, we could say that the way children were brought up shaped the way they will be as an adult.

Keywords: Deception, Children, Die in a Cup

1. Introduction

Deception happened everyday in life, According to DePaulo et. al., college students lied about two times a day, while other adults one time a day [4]. Lies did not only triggered moral crisis, but also facilitated social interaction on some level. It became a critique practice of perspective taking.

The situation of deception was contradictory. Dissimilar to other perspective-taking events, children were constantly told to connect dishonesty with expected negative consequences, like the long-nose "Pinocchio"; on the other hand, the prevalence of deception made it unavoidable. In fact, younger participants could lie more than older ones (Gerlach et. al., 2019) [6]. Parents may even unconsciously encouraged children to strategically lie in order to win a competition, or a friend (Houser et. al. 2016) [9]. The development of deception from 3 to 6 years was specially important to unravel this mystery.

"Die-in-a-cup" task was designed to detect the aggregate tendency of deception (Fischbacher & Follmi-Heusi, 2013) [5]. Participants in this kind of task tried to win their reward from specific result (such as number 6), without supervision. They are lured to deceive, as the cost of being honesty was

higher than being otherwise. However, strategies could be used in graded reward condition. If "5" lead to the best reward, participants who dishonestly reported more "4", or even "3" were seen as less radical (Fischbacher called it partial deception), compared to those reported "5". This also means people could adjust their unethical feeling of cheating by operating the amount of lies (Schurr & Ritov, 2016) [14].

Children were constantly found to be dishonest in this and other situations (Maggian & Villeval, 2015; Gervais et. a., 2000; Childs, 2011) [11, 7, 2], although gender and age difference were still controversial. Gervais and colleagues found boys lying more than girls. Childs, in a modified Ultimatum game, found girls lie as much as boys, but mainly in an other-centered way (a good lie). Maggian observed age difference among children, while Dräger, and Ibrahimi did not [3]. The critical question was, why did some children (may be most of them) lie? How did the act of deception develop? What is the role of parents in children's deception?

Houser et. al. [9] conducted an outstanding experiment about parents' modeling of deception on their children. Upon the appearance or disappearance of scrutiny by their own kids, parents showed different level of deception. Specifically, they lied about tossing when daughters were looking behind, not sons. The moral image parents tried to maintain in front of

their daughters may explain why gender difference was prevalent in adults.

In the following experiments, we assumed that when children rolled die with their parents for a gift at school, their parents would be induced to help to lie for the kids' sake. Furthermore, parents were convinced through introduction that rewards were distributed equally through six probable numbers, which could not be understood by their kids (3-6 years). These context ensure that parents would play important role.

2. Experiment 1

2.1. Participants

49 kids (and their parents) participated in this experiment, all of them came from Leyan Kindergarten in Nanjing. There were 22 girls and 27 boys, aged from three to six years old. The study was permitted by local ethical committee. All parents as well as their children were informed about the experiment.

Table 1. Age distribution in Exp. 1.

gender	age	Frequency	Valid Percent
girls	3-4	13	59.091
	4-5	4	18.182
	5-6	5	22.727
	Total	22	
boys	3-4	8	29.630
	4-5	6	22.222
	5-6	13	48.148
	Total	27	

2.2. Procedure

Deception lure was embedded in a dice-rolling game, which the kids get to play at home with there parents or caregivers. Each kid get one pamphlet with instructions like this,

"Welcome to play with our dice-rolling game. We are going to roll the dice you took home and take a record of the result you get. Remember, the bigger the number, the bigger chance you have to win a prize the next day, it means if you get number six, you will certainly win a prize. Also notice that you are going to write down the first ten rolls you get, although ONLY the first one count for the prize. Have fun!

FIRST ROLL_____
Second Roll _____
Third Roll_____
Fourth Roll_____
fifth Roll_____
Sixth Roll_____
Seventh Roll_____
Eighth Roll_____
Ninth Roll_____
Tenth Roll_____ "

Notice that the description about probability would not be easily understood by children their own, this is where we need parents to get involved. All children received present the next day, when they and their parents were debriefed.

2.3. Results

With 49 answer sheets collected from those kids, 35% of them chose number six for the first run, which was not the case for the next nine runs. Chi-Square ($\chi^2(5)=24.592$, $p<0.01$, $BF_{10}=445.771$) with expected probability under uniform distribution 0.167) showed significant difference. Specifically, numbers six and five for the first roll counted significantly higher than chance ($ps<0.05$, see in Figure 1); while number one across three counted significantly less than chance ($ps<0.05$). In the contrast, the left nine rolls were not significantly different from uniform distribution, except for run three and run six (Table 2). Notice that there were still three kids whose claim of first roll was the least (one). Assume they were purely honest, the percentage of them being honest was 36% ($=0.06*6*100\%$)[1]; On the other hand, the percentage of income maximizers (reporting 6) was 22%, leaving partial 42% of participants partial liars (reporting 4 and 5), almost the same as in Fischbacher.

Chi-square showed no significance neither between different gender in deception ($\chi^2(5)=3.171$, $BF_{10}=0.102$), nor among different age ($\chi^2(10)=9.849$, $BF_{10}=0.139$). However, when we took a further step to do the Bayesian multinomial test separately with girls and boys, we found that boys (with the help of their parents) were more likely to adopt deception ($BF_{10}=22.537$) than girls ($BF_{10}=2.021$). Binomial test (Figure 2) showed significant frequency of number 6 above baseline for boys ($p=0.000$), while significant frequency of number 5 above baseline for girls ($p=0.027$). To further demonstrate the strategies participants adopted, we calculated the percentage of income maximizers. It turned out there were 13% of girls who were income maximizers, compared to 29% of boys who maximized their income. Companion conditions were complicated due to multiple answers. As parents were the most who played this game with their kids, we removed other options, leaving only 10 kids accompanied by their dad and 20 accompanied by their mom. Contingency test still showed no significant effect of companion.

2.4. Discussion

The first experiment with only 49 samples demonstrated the existence of deception among those kids accompanied by their parents (or other caregivers). However, there were several problems left. First, the samples were not large enough to go along with ideal uniform distribution; Second, results of roll1 uniquely showed gradient increase to the probability of getting reward since number four. which may indicate a folk opinion toward probability that probabilities under 0.5 would be equal to nothing; Third, the roll of number six was claimed above baseline (0.167) most of the times (eight of ten) even for times that results did not count (in run 3, 6 and 9). It was mentioned

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[1] The calculation was based on Fischbacher and Follmi-Heusi's (2013) experiment. Percentage of honest is the frequency of least number (here least number was 1, its frequency was 3/49) times total options (6). Percentage of income maximizers is frequency of biggest number (6 in this case) above chance level (17/49-0.167)*6/5. Frequency of partial liar is the remaining frequency (1-36%-22%).

in Fischbacher's experiment that the disappearance of incentives for number six could trigger feelings of non-fairness, expecting more reasonable act of deception. Here for the children in our case, the biggest number six did not result in nothing, instead, it leaded to a certain reward. As we did not produce a conflict context as in Fishchbacher's, six may even dominated (dominance unrelated to physical incentives) other numbers as it looks bigger. We planned to run a same operation as Fishchbacher in experiment 2.
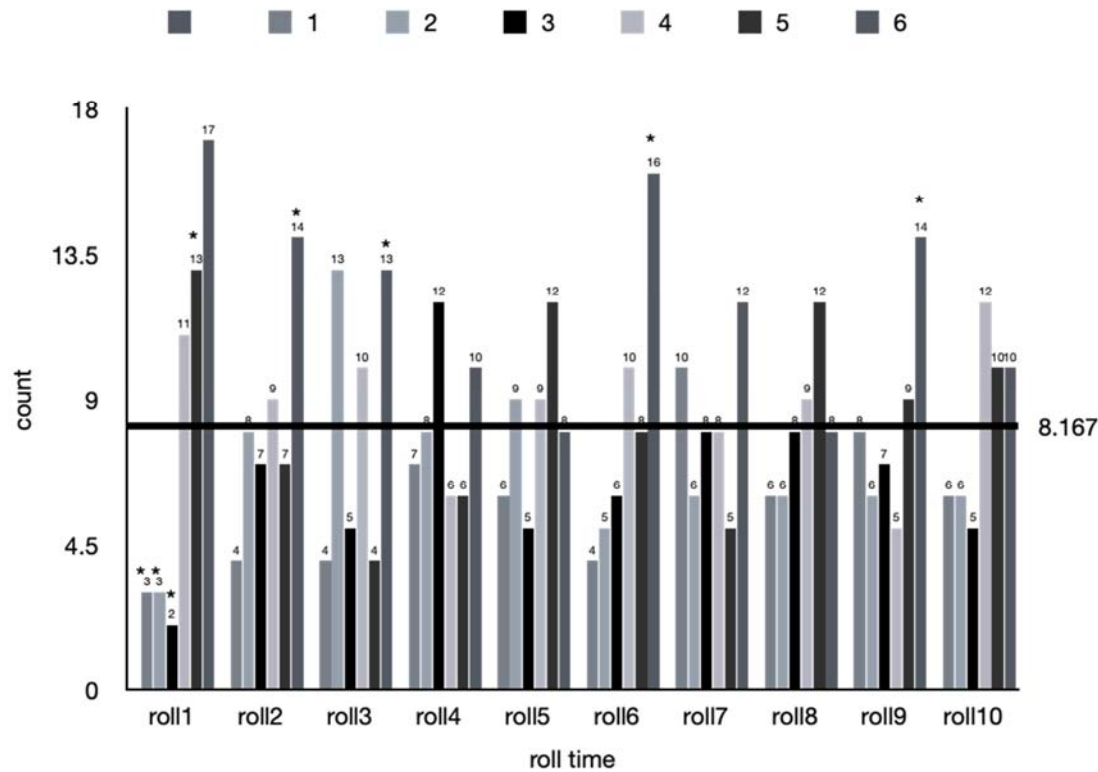

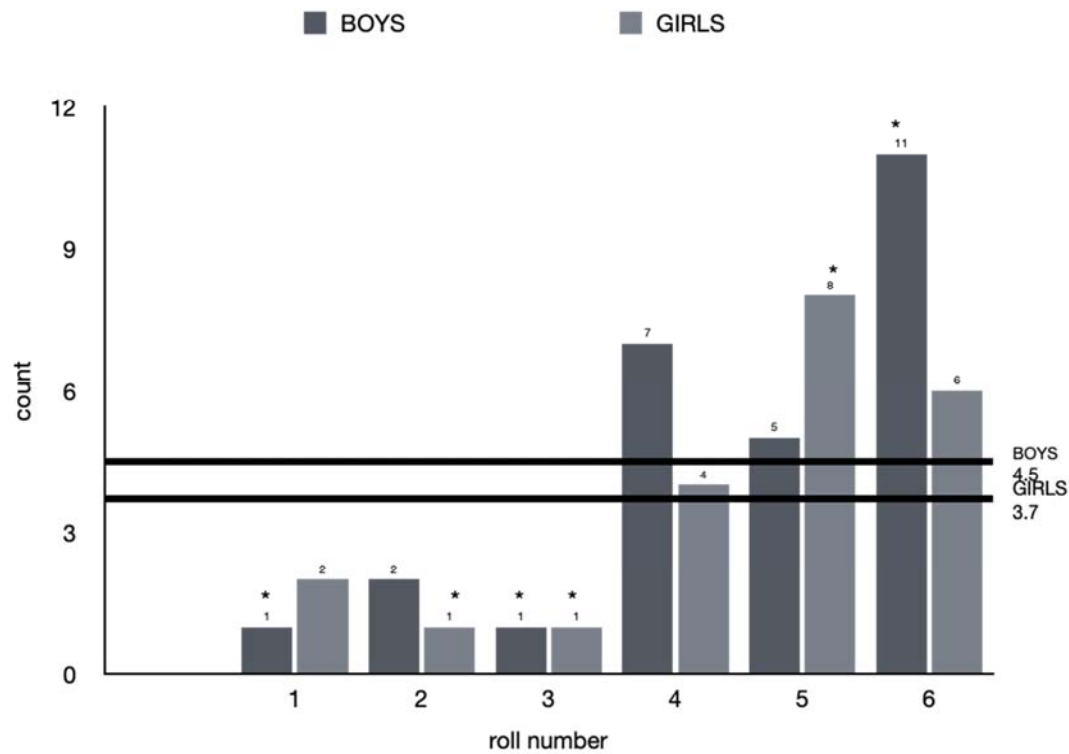**Figure 1.** *Counts of number for ten rolls (Binomial test with 0.167 as baseline).*

Figure 2. *Frequencies of first roll by girls and boys (Binomial test with 0.167 as baseline).*

Table 2. *Multinomial Test for ten rolls with equal distribution (df=5) in Exp. 1.*

	roll1	roll2	roll3	roll4	roll5	roll6	roll7	roll8	roll9	roll10
χ^2	24.592	6.714	11.612	3.531	3.776	11.857	4.020	3.041	6.224	5.000

3. Experiment 2

3.1. Participants

200 kids were recruited from Chengdu Jinniu Hongse Kindergarten, while responses from 198 were collected (101 girls, 48 girls aged from three to four; 37 aged from four to five; 16 aged from five to six years old; 97 boys, 41 aged from three to four; 33 aged from four to five; 23 aged from five to six years old.) The study was permitted by local ethical committee. All parents as well as their children were informed about the experiment.

3.2. Procedure

The procedure of Experiment Two was the same as Experiment One except for one line of instruction, "Number six (6) means you will get nothing, so the highest probability of getting present is 83.3%." Deception lure was embedded in a dice-rolling game, which the kids get to play at home with their parents or caregivers. All children received present the next day, when they and their parents were debriefed.

3.3. Results

For 198 rolls of the first time, only 5% of the participants wrote number six, in opposite to experiment One. Chi-Square ($\chi^2(5)=27.030$, $p<0.01$, $BF_{10}=683.283$) (with expected uniform distribution) showed significant difference. In the contrast, the other nine rolls were not significantly different from equal distribution (Table 3). Through Binomial test (Figure 3), we found number 3 and number 4 significant above baseline (0.167), while number 6 significantly below baseline. We counted 5% as pure honest kids who threw number six, leading to a total of 31% kids being honest. On the other hand, by contrasting number of kids throwing number 5 to baseline 33, there was 10% percent of income maximizers, leaving 59% of participants partial liars.

Table 3. *Multinomial Test for ten rolls with equal distribution (df=5).*

	roll1	roll2	roll3	roll4	roll5	roll6	roll7	roll8	roll9	roll10
χ^2	27.030	2.788	2.364	3.394	3.212	7.515	0.970	7.091	5.697	0.970
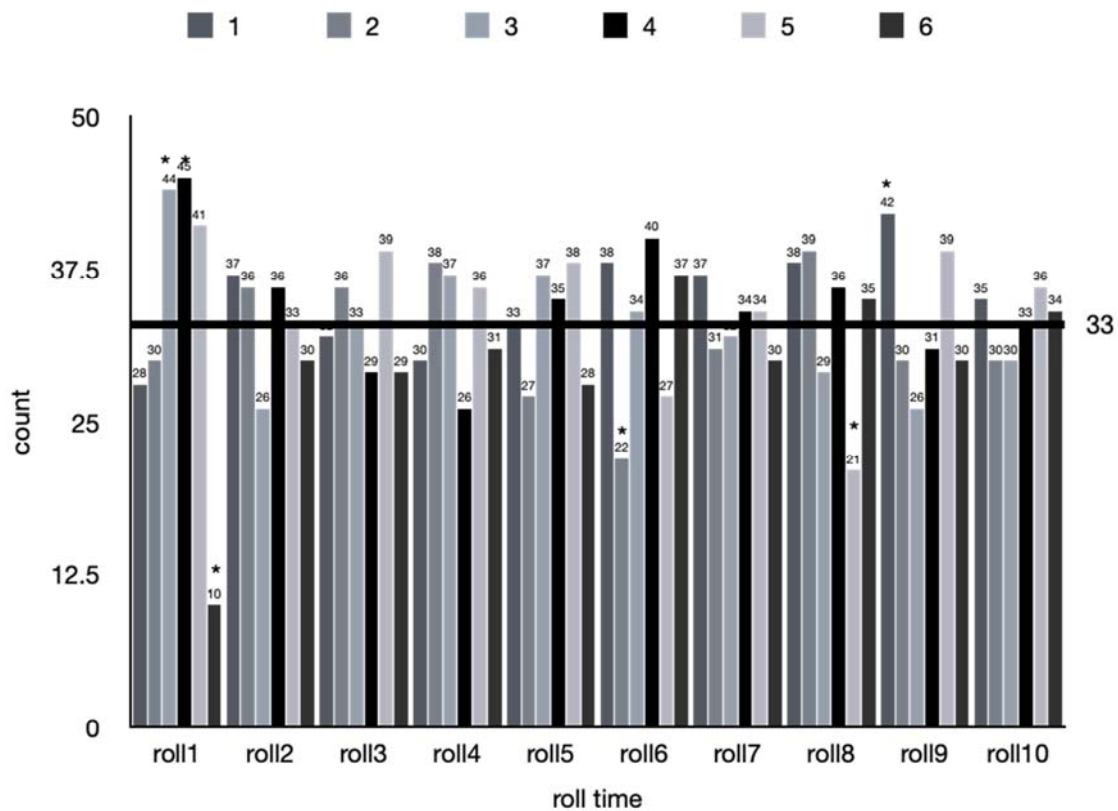
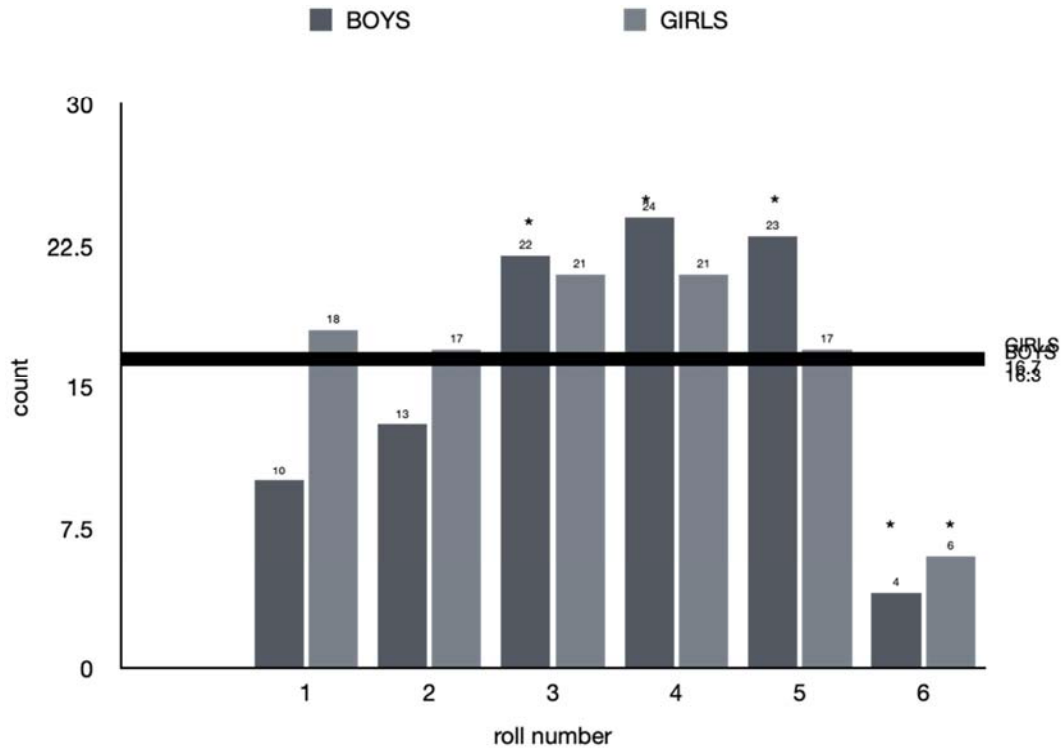**Figure 3.** *Counts of roll number for ten rolls in exp2.*

Figure 4. *First roll distribution of boys and girls (Binomial test with 0.167 as baseline).*

By adopting Bayesian Contingency test, we detected no significance between different gender, nor among different grade (age). Kids (and their parents) avoided number six for the first roll through both gender (BF_{10}=0.018), and all ages (BF_{10}=0.001).

We looked separately into male (97) and female (86) kids. It turned out that boys were more likely to adopt deceptive strategy ($\chi^2(5)$=21.825, BF_{10}=88.585, Figure 4) than girls ($\chi^2(5)$=9.673, BF_{10}=0.137, Figure 4). 9% of boys maximized their income, while only 0.4% of girls did it. After removed companions like grandmother and grandfather, leaving only male (85) and female (86) parents, we found girls accompanied by male and female parents reported roll numbers differently ($\chi^2(5)$=9.702, BF_{10}=1.664), which was not the case for boys ($\chi^2(5)$=1.613, BF_{10}=0.018). Specifically, girls accompanied by their mother tended to claim lower (less radical) than those who were accompanied by their father. (Table 4)

Table 4. *Contingency Tables for girls in the first roll.*

company	1	2	3	4	5	6	Total
father	3	2	7	4	9	2	27
mother	11	14	11	14	7	2	59
Total	14	16	18	18	16	4	86

4. General Discussion

4.1. Prevalence of Deception

Children in our two studies adopted prevalent dishonest strategy conditioned by their consequences. 17 out of 49 participants reported six in their first roll when six would lead to the largest reward, while only 10 out of 198 participants reported six when six would lead to no reward at all. On the other side, there were still kids who did not lie. 3 in experiment one reported number one which would give the least reward, and the 10 kids who knew they would end up with nothing still insist on the honest answer. Previous research showed that kids at three years could take others' perspective, giving basis of deception. Although we did not demonstrate deception of kids directly, we found that parents were OK with their children being dishonest, in our situation even offered help with it. Specifically, compared to boys, girls announced less extreme number (extreme number were those led to biggest reward, like six in experiment 1 and five in experiment 2), indicating different strategies their parents tried to adopt. Specifically, female parents, instead of male parents, helped more in leading their daughters' results. This was consistent with previous research in that women told lies differently from men (DePaulo et. al., 1996). [4] In their experiments, women showed more other-oriented deception, in order to make others feel better (or avoid being hurt). In our case, partial deception adopted by parents of girls may not be attributed solely to prosocial tendency. Instead, they may be motivated to keep a positive moral image.

4.2. Stability of Honesty

Percentage of kids who claimed their results honestly was similar through two experiments (33% and 31%), while percentage of income maximizers was dynamic (22% and 10%), showing stability of honesty as well as sensibility of consequences when it came to income maximizing. [8] In Experiment one when number six meant certainty, parents may have helped their children to get away from uncertainty by

adopting radical deception (of claiming 6); In experiment two when number six meant nothing, parents may help their children escape from loss by choosing less 6. The way of escaping could be diverse. Parents with daughters seemed to have no preference to any number across 1 to 5. Parents with sons, on the other hand, preferred above chance numbers (4 and 5).

4.3. Function of Deceptive Strategy

Here we came to a similar conclusion to previous research: boys reported bigger number than girls, reflecting that their parents helped their sons winning in the biggest chance (or even win certainly), while kept their daughters in a safer moral place but also a bigger chance to win. This was similar to research referring to Machiavellianism, where children's Machiavellian orientation was significantly correlated with their parents' (Kraut & Price, 1976) [10]. We could also get a clue from this result about why women had a higher tendency to take more moral responsibility (Wang et. al., 2016) [15]. Although this inference should be testified further with Machiavellian assessment (like MACH IV) [13] to see if higher level of Machiavellian characteristic lead to higher probability of deception.

5. Conclusion

In this study, we explored the role of parents during a game with their children. Results showed significant tendency of deception. Strategies adopted in different condition were inconsistent. There were more income maximizers in experiment one than in experiment two, which could be explained by uncertainty aversion. Girls (with their parents) lied less radical, probably a way to maintain their moral status. Parents mostly seemed all right about lying for their children. Their behavior may suggest how baby girls and boys grow up into a mature social person (with ability to win a better chance but also keep a positive social image), and where gender difference on deception came from [1].

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