Parent Reported Child Deception: The Online Preschooler Lie Scale

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Abstract

Generally viewed as a negative behavior, child lying is a cognitive accomplishment that requires awareness of others' thinking. In developing a measure of the breadth of a child's lie repertoire, we recruited an online, diverse, cross-cultural sample of 179 parents to answer questions about family demographics, parent personality, and the types of lies told by their child. Nine items that were internally consistent and positively correlated with age were summed to create the *Online Preschooler Lie Scale* score. *OPLS* scores' developmental identity remained evident even in the face of many competing demographic factors. The breadth of a child's lying repertoire is a marker for developmental advance, and it can be assessed with convenient online methods.

The intentional deception of others is typically viewed negatively and as a poor reflection of personality or character. This perspective motivated one of the classic studies of developmental psychology by Hartshorne and May (1928), who studied "character" by observing children in a variety of settings where it would be tempting to cheat or lie. Hartshorne and May then identified groups of extremely honest and extremely dishonest children and sought to relate that group membership to other factors like intelligence and family background. They did not, however, treat the appearance of deceitful acts as an accomplishment of cognitive development, which is the approach we take here. Several experimental studies have shown that there is a clear developmental component at work when a child demonstrates the ability to lie successfully (Wimmer & Perner, 1983; Talwar, Gordon, & Lee, 2007; Talwar & Lee, 2008).

Lying requires one to consider another person's thoughts. Theory of Mind (ToM) is the ability to reason that others' mental states are different from one's own and to use this understanding to apply feelings, intentions, and predict actions in others. Many studies on deception (DePaulo & Kashy, 1998; Talwar, Gordon, & Lee, 2007; Talwar & Lee, 2008) work from a ToM perspective and link a child's understanding of their own and other's minds to lying. On this view, lying is an important part of development in early childhood with respect to social interaction, emotional understanding, and communication. Lying, in essence, is ToM in action, and refers to an act by which one deliberately behaves so as to instill false beliefs into the mind of another (Talwar, Gordon, et al., 2007). During the preschool years an improved understanding of the minds of

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others means that the ability to deceive improves with age (Talwar & Lee, 2002, 2008; Wimmer & Perner, 1983).

Successful lying requires more than making a single false statement because it is often necessary to maintain a lie with subsequent statements. Preschool children have difficulty doing this (Talwar & Lee, 2008), though the ability to maintain lies continues to develop steadily through middle childhood and into adolescence (McCarthy & Lee, 2009). The ability to maintain lies with supportive statements is positively related to second-order ToM understanding. For example, Talwar and Lee found that second-order ToM understanding was related children's ability to provide plausible explanations in support of a lie. Their findings suggest that higher-order cognitive understanding plays an important role in children's ability to lie consistently.

Of course there could be other non-cognitive child characteristics that could be related to lying, a possibility that motivated Hartshorne and May's study described above. The pursuit of those other predictors of child lying is limited by the the fact that most extant work on lying has been done with experimental designs in laboratory settings. Such experiments offer many advantages and are extremely powerful for testing specific hypotheses. They are, however, time-consuming and expensive, and not well-suited for identifying the many variables that *could* be important to the development of child lying in the settings of daily life. Although correlational studies can not assess cause, they are particularly well-suited for identifying possible predictors of child lying. Correlational studies are most informative if they involve large, diverse samples, and heterogeneous samples are readily available in online contexts. Consequently, our understanding of child lying would be advanced by the availability of a reliable parent-based online measure of child lying.

Parents have privileged access to their children's daily behavior, and they could be enabled by an appropriate tool to provide new information about other influences on the development of child lying. A parent report tool for preschooler lying could relate child lying abilities to many other potential explanatory variables if information could be obtained from large heterogeneous samples. Such samples can now be obtained using web techniques, and the goal of the present study was to create an online parent report measure of child lying behavior that reflects age-related development of child lying.

There has been an increasing number of reports of successful internet experiments designed to measure developmental achievements, some of which have found that results obtained using online samples are consistent with findings obtained using traditional methods (Gosling, Vazire, Srivastava, & John, 2004; Krantz & Dalal, 2000). Further, the internet is an excellent source for the efficient recruitment of large samples that are relatively diverse with respect to gender, socioeconomic status (SES), geographic region, and age (Birnbaum, 2004; Nosek, Banaji, & Greenwald, 2002). To date, however, there have not been any attempts by researchers to gather measures of lying behaviours using online methodology.

Our first objective for the current study was to develop a measure of preschooler lying behaviour that would be sensitive to developmental changes in a heterogeneous sample of families. Such a measure, in which children's deceptive behaviours would be reported by parents, could be a valuable tool in terms of providing a simple, inexpensive, time-efficient complement to

experimental studies of child deception. Our second objective was to create this tool for an online environment, which would also us to gather data from children and their parents from many locations. If our measure captures a truly developmental phenomena, it should generalize across locations.

In our online procedure we ask parents to read instructions and questions to the child and to record the child's responses, so it is possible that parental characteristics such as personality could influence our results. For example, because telling lies is generally discouraged, a parent may bias their recording in a socially desirable direction by minimizing instances of child deception. Thus, our second objective was to address this social desirability issue by looking specifically at three Big 5 personality traits that have been found to correlate with measures of social desirability: neuroticism, agreeableness, and conscientiousness (Ones, Viswesvaran, & Reiss, 1996; Ziegler & Buehner, M., 2009). Relations between parental personality traits and their reports of child lying would raise several important issues that would need to be addressed by online researchers.

Survey questions were presented in a multiple-choice format. Each alternative could be selected by clicking on an adjacent button, and the alternatives were mutually exclusive (the choice of one precluded the choice of another; if one changed one's mind, the last button clicked was recorded as the selected answer). Some items' alternatives were presented in randomized order to control for position and response biases (e.g., the *yes* alternatives appeared in the first position half the time and in the second position half the time).

Recruitment

As part of a larger multi-part project, we recruited parents to our study with both local and online methods. Our local recruitment approach was to post information about the study in public places frequented by parents and children (4.5% of our final sample, described below) and to send e-mail invitations to family and friends (4.5%). Our online recruitment methods included: 1) *blog invitations* (9.5%), which involved our use key words to identify blogs about young children and posting an invitation to the blogger; 2) *social network invitations* (15.1%), which involved our posting of invitations on parent- and child-related forums and social networking sites such as Facebook; and 3) *Google advertising* (45.3%), which involved our use of paid text advertisements that appear beside the results page of a Google search. An additional 21.2% of our sample found our study in other or unknown ways. All recruitment approaches included a URL link that directed the interested person to our survey website. Individuals from 31 countries were included in our final sample, with India being the single largest source of participants (39.7% of the sample), followed by the United States (12.9%), the United Kingdom (11.2%), and Canada (7.8%).

Participants

Sample Funnel. Over a 15-month period, 11,696 individuals visited our study homepage, and of those 619 (5.3%) completed the study *Consent* page. Of these, 81.7% agreed to participate, which reduced the sample to 506. Two of these were excluded from the following analyses because they entered logically impossible (future) child birth dates, and five had timestamp problems. We also excluded from consideration those children who were younger than than 2.5 years of age because they would have an inadequate understanding of other people's knowledge states and lying (Chandler et al., 1989; Newton, et al., 2000; Polak & Harris, 1999; Southgate et al., 2007). We also excluded children older than 6.0 years because much of our item content would generally not be appropriate for school-aged children. We also excluded four cases where the respondent reported being under 18 years of age.

Data Enhancement. We then implemented several additional procedures designed to enhance the quality of our data. We established that it would take more than 20 seconds to *very* quickly read and respond to the items on each of the two lie-item webpages and then excluded 19 cases where less time was spent on either page. As another validity check we included *gout*, a relatively rare affliction of adults, as a child health condition and excluded three participants who said their child had gout. Lastly, we excluded three participants who answered fewer than 10 of the 12 lie items. After all the preceding exclusions we were left with a sample of 179.

Demographics. Child gender was not reported by 4 participants (2%), and for the remainder there were 88 boys and 87 girls. Adult respondents were primarily female (70%), married or in common-law relationships (92%), and the biological parent of the child (93%). In 42% of families, the participating child was the only child living in the household. One other child was present in the home of 34% of families, two others were present in 16% of families, and three or more were present in 6% of families. The religious affiliations of the respondents were broad: Hindus comprised 38% of the sample; Christians, 25%, Muslims, 17%; Secular/Agnostic/Atheists, 9%; and all others, 11%.

Socioeconomic and Health Status. Parental education and family income could influence the child's cognitive development and lie behavior, so we asked the parent to report their highest level educational attainment on an 8-category scale. Our sample was heterogeneous on this measure: 14% of the respondents had completed high school; 19% had some college or university education; 34% had a bachelor's degree; and 29% had some graduate or professional school experience. Because internet participants come from many countries with many currencies, it is impractical to ask about currency-specific incomes. Instead, we used the MacArthur Scale of Subjective Social Status, which has been shown to be a reliable and valid composite measure of income, education, and health (Goodman, Adler, Kawachi, Frazier, Huang, & Colditz, 2001; Operario, Adler, & Williams, 2004) . Participants were asked to choose where they think they fall on a 10-rung ladder that represents status in their society from low (1) to high (10). Again our sample was diverse: the mean MacArthur score was 7.2 (SD = 1.9, minimum = 2, maximum = 10). Because poor health could delay development, we asked the parent, *In general, would you say your child's health is ...?*, and give them five possible responses: *Excellent* (scored as 5), *Very Good* (4), *Good* (3), *Fair* (2), and *Poor* (1). In our

sample every alternative response on the general health was selected by at least one respondent. That said, the overall sample was skewed to the healthy end of the scale, (M = 3.9, SD = 1.1).

Parent Personality. We asked participants to complete the Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003), which is a brief self-report instrument designed to assess the Five Factor Model of personality (Goldberg, 1992) in situations where time is short. The five dimensions of personality are described as follows: (1) Openness to Experience is the degree to which individuals seek out a variety of interests and experiences, and this trait is often associated with high levels of intellect, curiosity, and open-mindedness; (2) Conscientiousness is the degree to which an individual has purposeful focus towards their goals, and those who score highly on this measure tend to be very organized, self-diciplined, and dependable; (3) Extraversion is the extent to which individuals enjoy interacting socially, and those who score highly on this trait typically have a large number of relationships and thrive in the company of others; (4) Agreeableness refers to an individual's general interpersonal orientation, with a focus on promoting warmth and avoiding conflict during interactions; and (5) Neuroticism is the degree to which individuals are prone to negative emotions and axiety, and is associated with difficulty in coping with stress. (Goldberg, 1990; McCrae & Costa, 1997). Each factor is represented by two items, such as *I see myself as extraverted, enthusiastic*, which are answered on a seven point scale, where 1 = *Disagree strongly* and 7 = *Agree strongly*. The TIPI has good convergent validity with longer-form Five Factor measures (Ehrhardt et al., 2009; See Table 1).

Table 1
Study Variable Summary Statistics

Variable	n	Mean	SD	Min	Max
Child age (yrs)	179	4.2	1.0	2.6	6.0
Parent age (yrs)	179	32.1	5.2	21	51
MacArthur Scale of Subjective Social Status	176	7.2	1.9	2	10
Parent Rated Child Health	179	3.9	1.1	1	5
TIPI - Extraversion	173	4.3	1.5	1.0	7.0
TIPI - Agreeableness	173	5.1	1.3	1.0	7.0
TIPI - Conscientiousness	172	5.3	1.3	2.0	7.0
TIPI - Emotional Stability	172	4.4	1.4	1.0	7.0
TIPI - Openness	172	5.3	1.3	2.0	7.0
Online Preschooler Lie Scale	179	4.4	2.4	0	9

Results

Online Preschooler Lie Scale

A child's ability to tell a lie rests on developmental changes in underlying cognitive abilities, so we should find that the presence of a particular type of lie is more likely in older than in younger children. Thus, to create a measure of the preschool child's deceptive behavior repertoire we wanted to sum the varieties of behaviors described by our items. If the parent had seen the deceptive behavior described in an item, we assigned it a score of 1.0; if the behavior hadn't been seen, we assigned it a 0.0; if the parent was not sure if they had seen the behavior, we assigned a score of 0.5. Given our developmental perspective, we believe that the probability of any lie item's appearance should increase with the child's age. Moreover, if the behavior described by an item does not become more likely with increasing age, the item is a poor candidate for inclusion in the scale. For these reasons we first correlated the 12 item scores with chronological age (CA) in our final sample. Two items correlated negatively with child CA (which had a mean of 4.2 years, and a SD of 1.0), and a third had a near-zero correlation of .02, so we dropped these three items from further consideration. The intercorrelations among the remaining nine items were all positive and ranged from .11 to .41. Such correlations reflect a good level of internal consistency for the nine items (corroborated by a Cronbach's alpha of .75), so we then created an Online Preschooler Lie Score (OPLS) for each child by summing that child's scores across the nine items (Table 2).

Table 2

Online Preschooler Lie Scale (OPLS)

The parent is asked to answer each of the following questions using one of the alternatives: *Yes*, *No*, or *Not Sure*. *Yes* answers are coded as 1; *No* and *Not Sure* answers are coded as 0. A total OPLS score is the sum of all *Yes* responses. Instruction to the parent: *Your child's participation is not needed in this part of the survey. These questions are about telling lies and should be answered by you only.*

Item	Yes	No	Not Sure
Has your child ever blamed something they did on someone (or something) else?			
Has your child ever made up false excuses in order to get something they want?			
Has your child ever made up false excuses in order to avoid doing something they don't want to do?			

Has your child ever said that they got permission to do something (such as eating a cookie before supper, drawing on the wall) from someone else when you know this is not true?			
Has your child ever said that they were going to do something which they know is not allowed, and then told you they were joking?			
Have you ever heard your child bragging to other children, when you know what they are saying is not true?			
After doing something they are not allowed to do, does your child ever pretend to know nothing about it?			
Have you ever caught your child lying?			
Have you ever caught your child trying to hide a lie?			

What predicts OPLS?

Our relatively large, heterogeneous, and multi-cultural sample offered a good initial opportunity to examine the potential correlates of the OPLS scores, and it is to these that we now turn. For analytic purposes we grouped our predictors into three conceptual groups and child age and entered them in a hierarchical multiple regression analysis of OPLS scores. We entered three groups of variables before entering age last. A set of household predictors was entered first because we thought proximal, ongoing factors could influence the child's ability to deceive others. This household set included subjective social status, parent education, parent age, parent gender, and number of children in the household. The second set of predictors was parent personality, which comprised the parent's five TIPI scores. Child characteristics comprised the third set of OPLS predictors and included child gender and rated health. Each of these sets was statistically tested with the SAS REG procedure to see if it made a significant contribution the OPLS variation, and then we added the child's chronological age in months as last predictor to determine if age had an effect on lie repertoire breadth even after the effects of the other predictors had been accounted for. It did (see Table 3 for regression result details). Of the 14 predictors, age was the only significant predictor of the number of deceptive strategies used by these children. None of the predictor sets were significant contributors to explaining OPLS variance.

Table 3
Summary of Hierarchical Regression Analysis for Variable Predicting Online Parent Lie Scale scores (*N* = 156)

Variable	ß	SE ß	F	
Intercept	1.61	2.15		
Set 1: Household Characteristics			1.52	
Parent Age	0.03	0.04	0.57	
Parent Gender	0.48	0.44	1.20	
Parent Education	-0.17	0.11	2.31	
Subjective Social Status	-0.14	0.20	1.93	
Other Children in House	0.24	0.20	1.52	
Set 2: Parent Personality			1.19	
Extraversion	-0.08	0.14	0.31	
Agreeableness	-0.10	0.17	0.36	
Conscientiousness	-0.08	0.15	0.29	
Emotional Stability	-0.17	0.15	1.30	
Openness	0.27	0.15	3.27	
Set 3: Child Characteristics				
Gender	0.54	0.38	1.95	
General Health	-0.01	0.19	0.00	
Set 4: Child Age			8.71	**
Chronological Age (mos.)	0.60	0.20	8.71	**

Note. R^2=.16.
* p <05. ** p < .01.

We did not include in the preceding regression analysis two variables that could serve as proxies for cultural differences -- country and religious affiliation. We omitted them because a majority

of participants came from a subset of countries and religions, leaving many countries and religious groups with very small sample sizes. Consequently, we grouped participants into two large geographic collectives that represented 80% of the entire sample. One grouping (n = 57) comprised the North Atlantic countries of the United States, Canada, United Kingdom, and Ireland. A second grouping (n = 86) included the South Asian countries of India, Pakistan, and Sri Lanka. We also combined our original 11 religion categories into four groups: Hindu (n = 57), Christian (n = 30), Muslim (n = 22), and Other (n = 30). These religion and locale categorizations are admittedly crude markers for possible cultural influences on OPLS scores, but they provide a starting point for considering possible cultural influences.

Religion and locale are very much intertwined as seen in Table 4, which is a cross-classification of our locale and religious groupings. Because of this collinearity, we conducted two ANOVA's, each of which had OPLS as the dependent variable, and gender as one of two independent factors. For the first ANOVA, Locale (N. Atlantic vs. S. Asia) was the second independent factor, and for the second ANOVA Religion was the independent factor. The Locale (2) x Gender (2) ANOVA had no significant results: the full model was non-significant, $F(3,139) = 0.45$, as were the main effects and interaction. The Religion (4) x Gender (2) ANOVA also revealed no significant results: the full model was non-significant, $F(7,166) = 0.54$, as were the main effects and interaction. These broad demographic analyses gave no hint that preschooler OPLS scores are influenced by factors like country or religion.
Frequency of participants by locale and religion

Table 4
Frequency of participants by locale and region

	Hindu	Muslim	Christian	Other	Total
North Atlantic	2	5	27	25	59
South Asia	59	17	3	7	86
Total	61	22	30	32	145

Discussion

If cognitive sophistication is reflected in the variety of kinds of lies one tells, older preschoolers are more advanced than their younger peers. This primary conclusion arises from our development of an online parent measure, which sought to tally the different types of lies typically used by children in daily life. The *Online Preschooler Lie Scale (OPLS)* is *not* a measure of lying frequency, but one of repertoire variety, and parents of older preschoolers observed and reported more lie diversity in their offspring than did the parents of younger preschoolers. This finding corroborates earlier experimental work that showed a developmental basis for the ability to lie successfully. Preschooler lying is a cognitive accomplishment, and our

understanding of how lying develops would benefit from the availability of a tool for measuring differences in the repertoire of child lies. Although our study empirically reinforces the truism that kids get smarter as they get older, it does not say that older children lie more often than younger ones, only that older preschoolers have larger repertoires of deceptive strategies than do their younger counterparts.

Because lying is typically considered to be a socially undesirable behavior, it is possible that parents would be reluctant to honestly answer questions about their children's lies. The reliance on parent report measures in general has been the subject of some criticism, as participants may be subject to bias and memory errors. Despite these limitations, there have been successes with parent report measures in the past. The MacArthur Communicative Development Inventory (Fenson, Dale, Reznick, & Bates, 1994), for example, is a parent report language measure which is well-known, is used widely, and has been shown to have excellent internal consistency, test-retest reliability and concurrent validity with tester-administered measures (Fenson et al., 1994). Despite the shortcomings of parent reports, they may be our best source of information for important domains of child development. Parents have a privileged vantage point for reporting on what children do in daily life, and we need to take better advantage of what they can tell us. Some investigators are dismissive of parent report and argue that parent-sourced information is beyond scientific redemption. We disagree. One need not categorically accept or reject parent reports because the validity of parent-sourced measures will vary in quality depending on how the information is collected. Instead of rejecting parent reports out of hand we should use methods that will minimize bias in their data. In the present study we sought to do this by using instructions that gave the parent permission to acknowledge that their child lied.

Our results could be criticized on the grounds that internet samples are not representative of the general population. This criticism could be leveled at nearly all published studies in child development, but but tends to be invoked selectively. Online samples are not representative because access to the internet is not universal. This lack of universal accessibility was once true of the telephone survey data, but as telephone access became nearly ubiquitous, this objection to telephone surveys virtually disappeared. Internet access has increased dramatically in nearly all developed countries. For example, internet use by adults in the U.S. is already extremely high: 95% for 18- to 29-year-olds and 87% for 30- to 49-year-olds (Pew Research Center, 2011). Although rates of internet use vary from country to country, the trend toward ubiquitous internet access will steadily weaken the concern that internet samples are unusual. Moreover, we have found that internet samples, if anything, are far more demographically heterogeneous that are the convenience samples that characterize most developmental research. Such heterogeneity is extremely valuable for trying to identify the important covariates of our focal variables.

Online methods also have many advantages; in addition to the heterogeneity issue they are also cost-effective for obtaining large sample sizes. The availability of inexpensive internet tools provides researchers with increasingly efficient means for the the creation of online measures, and it is becoming easier to administer an online study. The *OPLS* was completed by 179 parent participants from 31 different countries. Such a large sample would have been extremely difficult and expensive to obtain using more traditional methods.

The *OPLS* comprises nine items that have a good level of internal consistency, and correlate positively with chronological age. When we move beyond the fact that age was the best predictor of repertoire size (*OPLS* scores), we find that none of the 13 other predictors reach the threshold of statistical significance. For example, child gender was unrelated to the variety of deceptive statements used by the child. The absence of a gender difference effects is unsurprising because few childhood cognitive measures turn up consistent gender effects. In contrast, because of the many findings of socioeconomic influence on child outcomes in the developmental literature, we expected that family characteristics such as parent education, subjective social status, and household size would predict *OPLS* scores. They did not -- despite the fact that we had a large and diverse sample. One should be cautious with null findings, but we believe the absence of SES effects in a large sample implies the presence of a robust developmental function that is largely independent of SES influences. The ability to deceive is surely important for all humans, regardless of country of origin or level of household affluence. If so, the development of deceptive abilities may unfold without much differentiating input from socioeconomic factors.

The present findings also suggest testable hypotheses that, if confirmed, would strengthen confidence in our conclusion that lie repertoire size is a measure of cognitive attainment. We would predict, for example, that preschooler scores on Piagetian conservation tasks or intelligence tests would correlate positively with *OPLS* scores. That age was a consistent predictor of *OPLS* scores regardless of cultural variants within our cross-national sample suggests that deception may be a universal phenomenon. The emergence of a richer lying repertoire seems to be an important variable in terms of child development, and warrants consideration as a marker of cognitive sophistication. Future lab studies could collect *OPLS* scores from parents and combine them with the findings of controlled experiments on lying behaviors. We predict that what the parents see at home would be reflected in related child behaviors in the lab.

OPLS scores' developmental identity remained evident even after we simultaneously considered many competing demographic factors, and we believe that the breadth of a child's lying repertoire is a marker for developmental advance. As a convenient online measure, the *OPLS* should prove useful for many future studies of preschooler cognitive development.

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