Children's Use of a Verbal-Nonverbal Consistency Rule For Assessing Truth and Lying

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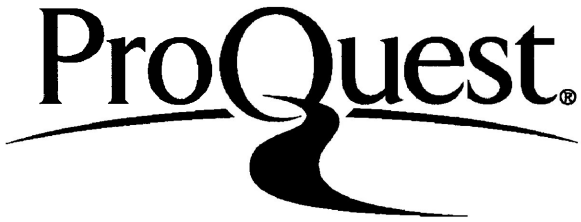

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Abstract

Research on adults and older adolescents has indicated that verbal and nonverbal communication cues are utilized by listeners to assess speaker truthfulness and sincerity. Some evidence suggests that truthfulness is inferred from the consistency between these two types of cues. The present study was designed to assess whether, and if so, at what age children use a consistency principle to determine truth and lying. Twenty subjects (10 boys and 10 girls) from each of kindergarten, second, and fourth grade were shown videotapes of male and female stimulus persons providing concomitant verbal and nonverbal cues of matched valence (consistent) or of mismatched valence (inconsistent). After each verbal-nonverbal communication subjects were asked to judge whether the stimulus person was telling the truth or lying. Results indicated that a consistency pattern was evident by fourth grade (age 9). Additionally, sex differences were found indicating that the consistency pattern was more evident in females than in males.

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Problem

Verbal and nonverbal communication cues are an integral part of social relations. Research with adults and older adolescents (DePaulo, Rosenthal, Green & Rosenkrantz, 1982; Friedman, 1979; Zuckerman, Spiegel, DePaulo & Rosenthal, 1982) has indicated that both types of cues are utilized by listeners to assess speaker truthfulness and sincerity. There is some evidence to suggest that truthfulness is inferred from the consistency between a speaker's verbal and nonverbal cues. Unfortunately limited research has been conducted with young children to see what cues they use to infer truthfulness. Two questions can be addressed 1) Is consistency used by children, and if so 2) At what age do children begin to adopt this principle. The present study sought answers to these questions. Once these have been addressed, it is hoped that we will gain a better understanding of how children infer truthfulness. This knowledge could then assist parents and teachers to communicate more effectively with young children.

The verbal - nonverbal consistency rule states that a person is perceived as telling the truth when he/she shows consistency between his/her verbal and nonverbal

communication. In contrast, a person is perceived as lying when there is a discrepancy between the two forms of communication. Use of the consistency principle is dependent upon the understanding that verbal and nonverbal communication generally reflect the same underlying emotional state. For example when one person likes another person's attire the verbal statement "I like your dress" is delivered in conjunction with the nonverbal communication cue of a smile. Thus both types of communication reflect the same emotional state. However inconsistency between verbal and nonverbal communications likely reflect the intention to mask true feelings.

The most direct evidence for the consistency principle has come from Friedman's (1979) work on adolescents of approximately 16 years of age. In his study subjects were asked to examine a series of pictures involving a teacher talking to a student. A caption spoken by the teacher was also included on the page. For each episode a happy, sad, angry, or surprised face was paired with a sentence which varied in it's affective tone. One dimension on which subjects gave ratings was the sincerity of the teacher. For the purpose of the present study it is assumed that if a person is perceived as sincere, implicitly this indicates the person is perceived as speaking the truth. Results indicated that when verbal and nonverbal cues were consistent the

stimulus person was rated more sincere. Additionally, female subjects were found to be more sensitive to inconsistencies between verbal and nonverbal cues than their male counterparts.

DePaulo and her colleagues have approached the problem from another direction in their research on lie detection (DePaulo, Rosenthal, Green & Rosenkrantz, 1982). University students were asked to assess truth versus lying when given information in one of five conditions. It was found that access to verbal and nonverbal cues together (audiovisual condition) resulted in more accurate detection of lies than conditions of verbal (transcript), visual (head and shoulders) or tone of voice cues alone. However the audiotape condition (verbal plus vocal) was found to facilitate the most accurate judgments. The difficulty with this method is that when information is separated the subject is forced to make judgments based on cues which may not have been used otherwise.

Use of the Consistency Principle by Children

There has been limited assessment of children's use of the consistency principle. Of the studies conducted in the area most have been indirect in nature. The most prominent researcher to date has been Bugental.

Bugental and her colleagues (Bugental,Kaswan & Love 1970; Bugental, Kaswan, Love & Fox 1970) examined the perceptions of children and their parents to conflicting messages. Children in the Bugental Kaswan and Love study ranged between 5 - 12 years of age while those in the Bugental Kaswan Love and Fox study were 5 -18 years of age. Subjects were shown videotapes of actors who displayed consistency and inconsistency of verbal and nonverbal cues. Three dimensions of communication were presented in the tapes: verbal communication (script), facial expression (picture), and vocal expression (voice). Consistency and inconsistency were manipulated by varying the valence of each dimension. Actors were judged on a positive to negative color coded scale which reflected perceived degree of friendliness. Both studies indicated that children and adults used the consistency of communication cues to make their judgments. Yet some age differences were found. Bugental, Kaswan, Love and Fox (1970) noted that the nonverbal communication of female actors received greater emphasis from adults than children. Bugental, Kaswan and Love (1970) found that joking messages (criticisms said with a smile) from female actors in particular were viewed more negatively by children than adults.

There are limitations with the Bugental research for directly assessing the use of the consistency principle in the inference of truth or lying. The first limitation is that

friendliness was assessed and not perception of truthfulness. Second, the pretesting of the clarity of verbal and nonverbal cues was assessed by adults only. Without a similar test for children, it is unclear whether the children in the study perceived the cues correctly. Third, and most important, the approach used by Bugental and her colleagues addressed the issue of consistency by focusing on the process of discounting. Essentially this approach attempted to identify which dimension was minimized when there was conflict among cues. Discounting is not sufficient evidence for the use of consistency because these two approaches can lead to very different inferences. For example, presentation of a smile with a statement of disliking should not necessarily lead to a simple positive or negative evaluation but a completely different inference, that of lying. This inference would not have been inferred from either communication alone.

In another study Zuckerman, Hanck, Depaulo and Rosenthal (1980) examined the decoding accuracy of 9 - 15 year olds. They found that children within this age group used verbal and nonverbal cues to decode messages. When the audio and visual cues were extremely discrepant 9 - 11 year olds focused on nonverbal cues whereas older children (12-15) showed the reverse pattern. Older children appeared to have developed a mistrust towards facial expressions when the verbal message is discrepant. Unfortunately, similar to Bugental, Zuckerman et

al. (1980) focused on the predominance of either verbal or nonverbal cues rather than examining the interaction of the two communication forms. Face-to-face human communication involves an interaction between verbal and nonverbal cues. The following study by Rotenberg and Bacic (1981) highlights the interactive nature of verbal and nonverbal communication.

The final studies to examine children's use of a consistency principle were two performed by Rotenberg and Bacic (1981). They were interested in whether children used a consistency principle or a benevolence principle (the stimulus person is perceived as helpful rather than harmful) when making trust judgments. For the purpose of the present study, it is proposed that trustworthiness is conceptually related to truthfulness.

In Experiment 1, kindergarten and fourth grade children were shown videotaped messages containing positive statements (e.g., I like that shirt) in conjunction with nonverbal information that was consistent with the message (a smile) or inconsistent with the message (a frown). Each verbal/nonverbal combination was presented either together or briefly apart in time. After viewing each message subjects were asked to rate the actor on trustworthiness. The temporal manipulation was necessary to identify which principle was being used by subjects. The consistency principle requires

that the verbal and nonverbal communication refer to the same inner state, hence the two communications should be presented concomitantly. In contrast, the temporal component is not a factor in the benevolence principle as long as the two communications are presented relatively close in time so that the information can be recalled. It was expected that fourth grade children would trust the consistent actor more than the inconsistent actor when communications were presented concomitantly. Further kindergarten children would trust the consistent actor more than the inconsistent actor regardless of whether the information together or apart. As expected, the results did indicate that kindergarten children trusted the consistent actor more than the inconsistent actor regardless of temporal presentation, thus demonstrating the use of benevolence. In contrast, fourth graders showed the same pattern only when the communications were presented together, thus demonstrating the use of consistency.

In Experiment 2 kindergarten, second, fourth and sixth grade children were shown videotaped messages. In this second study the verbal statements presented were negative (e.g., I do not like that book). These negative statements were paired with nonverbal communication that was consistent with the statement (a frown) or inconsistent (a smile). It was proposed that if children's trust was based primarily on benevolence the inconsistent - smiling actor would be trusted

more than the consistent - frowning actor. If their trust judgment was based on consistency the reverse pattern would be observed. It was hypothesized that kindergarten children would show the pattern representative of benevolence while fourth and sixth grade children would show the pattern representative of consistency. As expected, kindergarten children trusted the benevolent actor (inconsistent but smiling) more than the consistent actor while sixth graders showed the opposite pattern. Based on the these studies, the researchers concluded that when assessing trustworthiness younger children use a principle of benevolence whereas older children use a principle of consistency.

Although these two studies, through their systematic manipulation of verbal and nonverbal cues, address the consistency problem more directly than other research efforts there is one major drawback. The temporal manipulation involved separating the verbal and nonverbal communications. This manipulation was confounded because in the apart condition the verbal statement was necessarily accompanied by a neutral expression. This created an inconsistent communication for the apart condition which the older children responded to by assigning low trustworthiness to those actors. Since this confound can not be corrected within the design, an alternative approach was adopted in the present study.

In summary, the literature on adolescents indicates the consistency of verbal and nonverbal cues is used to assess sincerity. Studies on younger children have provided very tentative support for the belief that consistency is used to infer truthfulness. The present study was designed to overcome methodological problems encountered in previous studies. Specifically, methods were employed to ensure the children could correctly identify each verbal and nonverbal communication depicted in the videotapes. The three nonverbal cues used were a smile, neutral face, and frown which are commonly referred to by children as positive, neutral, and negative, respectively (Odom & Lemond, 1972). Additionally, the verbal and nonverbal cues were presented concomitantly rather than apart in time. Finally, use of the consistency principle was assessed directly by testing for the presence of a consistency pattern. If the consistency principle was used by children, a matching pattern would be evident such that actors delivering matching valences of verbal-nonverbal communication (found on the diagonal of Table 1) should be judged as more truthful than the actors presenting mismatched valences of verbal-nonverbal communication (found on the off diagonals of Table 1). Verbal-nonverbal communication combinations which subjects judged as truthful were scored as 1.00 while those judged as lying were scored as 3.00. The means corresponding to the use of the consistency principle is

shown in Table 1. These reflect ideal judgments; given that there is normally some error in the subjects' judgments and in the impact of the stimuli, it was expected that the children would only approximate the expected pattern. Specifically, it was expected that the children would judge the diagonals as significantly below neutral value (below 2.00) in the direction of invariant truth and the off-diagonals as significantly above neutral (above 2.00) in the direction of invariant lying. It was hypothesized that this matching pattern would be observed in the older children.

Table 1

Mean Truthfulness Scores as a Function of Valence of Verbal Communication and the Valence of Nonverbal Communication

	Valence of Nonverbal Communication		
Valence of Verbal Communication	Positive	Neutral	Negative
Positive	1.00	3.00	3.00
Neutral	3.00	1.00	3.00
Negative	3.00	3.00	1.00

Method

Subjects

Subjects were 20 children (10 boys and 10 girls) from each of kindergarten, second, and fourth grade. The mean ages were 5-6, 7-4, and 9-3 years and months respectively. Subjects were obtained from a public school in Thunder Bay. Participation was contingent upon parental consent (see Appendix A).

Stimuli and Apparatus

Six actors (3 males and 3 females) were videotaped while saying nine separate statements developed by Rotenberg and Bacic (1981). Three statements were positive, three were neutral, and three were negative (see Appendix B). During the taping sessions all actors were requested to perform each statement with three facial expressions, a smile, a neutral expression (straight face) and a frown. These were designed to depict positive, neutral, and negative valences, respectively. From this master tape, nine tape sets were developed for both male and female actors. Sets systematically varied on which actor presented each valence of verbal communication and the order of presentation for each valence of nonverbal communication. For example, in Set 1

Actor 1 presented the positive statements, however in Set 9, he/she presented neutral statements. Further, in Set 1 the first nonverbal valence shown by each actor was positive, while in Set 9 the first nonverbal valence presented was negative. All sets were used in the procedure, however, no subject was shown the same set for male and female actors (stimulus persons). The order of presentation for each valence of verbal communication and the sex of the stimulus person were counterbalanced within each grade.

A practice tape was also developed which contained 3 verbal-nonverbal communication combinations delivered by a male stimulus. A different valence of nonverbal communication was used in each combination. Further, one combination contained consistent verbal-nonverbal cues (positive-positive) whereas the other two communications contained inconsistent cues (positive-neutral and neutral-negative). This tape was developed to orientate the subject with the procedure and ensure that the instructions were understood.

Procedure

Subjects were taken from class and tested individually. The subject was seated in front of three cards each displaying one of the valences of nonverbal communication (positive, neutral, or negative). He/she was asked to verbally identify

the facial expression on each card and asked to make a similar face themselves. This ensured that each child was familiar with each valence of nonverbal communication to be depicted in the videotape. Following, an explanation and orientation to the procedure and apparatus was provided. Orientation was conducted through the use the practice tape. Upon completion of the practice tape, the experimental procedure began. In both the practice and experimental procedures the subject was asked the following information. After each verbal-nonverbal communication the video machine was stopped. The child was asked to (1) repeat what the person said and (2) "point to the picture that looks like that person's face". The videotaped communication was presented until the subject correctly identified the verbal and nonverbal cues. He/she was then asked to (3) state whether he/she thought the person was telling the truth, lying, or was he/she not sure. It was emphasized that there were no right or wrong answers for this last question.

Results

Truth/lying judgments were assigned scores of 1 for "truth", 2 for "not sure", and 3 for "lying". The lower the score the higher the truthfulness judgment. These data were subjected to a 3 (Grade) x 2 (Sex of Child) x 2 (Sex of Stimulus Person) x 3 (Valence of Verbal Communication) x 3 (Valence of Nonverbal Communication) analysis of variance with repeated measures on the last three variables.

The ANOVA yielded a main effect of valence of nonverbal communication, $F(2,108) = 20.61$, $p < .001$ that was qualified by a two-way valence of verbal communication x valence of nonverbal communication interaction, $F(4,216) = 15.05$, $p < .001$, and by the expected three-way grade x valence of verbal communication x valence of nonverbal communication interaction, $F(8,216) = 4.10$, $p < .001$. In order to evaluate this three-way interaction, the following descriptive system will be used. The valence of the verbal communication will be presented first followed by the valence of the nonverbal communication. For example, "positive-negative" indicates a positive valence verbal communication presented in combination with a negative valence nonverbal communication.

The preceeding three-way interaction contained the pattern of judgment corresponding to the verbal-nonverbal consistency principle. (The means for this interaction are

shown in Table 2.) If the subjects used the verbal-nonverbal consistency principle, then they should judge each match in valence - the diagonal combination, as more truthful than the mismatches in valence - the off-diagonal combinations. In order to provided meaningful comparisons, each diagonal combination was compared to the off-diagonal combinations on the corresponding row and column with the same valence of either the verbal or the nonverbal communication. There were twelve potential differences and these were assessed by Tukey a posteriori comparisons ($p < .05$).

Two significant diagonal - off-diagonal differences were found for kindergarten subjects. They judged the positive-positive combination as more truthful than the positive-neutral and positive-negative combinations. Five comparisons were significant for second grade subjects. They judged as more truthful: (a) the positive-positive than the positive-negative and negative-positive combinations; (b) the neutral-neutral than the neutral-negative combination; and (c) the negative-negative than the neutral-negative and positive-negative combinations. Contrary to expectation, these subjects judged the neutral-positive as more truthful than the neutral-neutral combination.

Eight comparisons were significant for fourth grade subjects. They judged as more truthful: (a) the

Table 2

Mean Truthfulness Scores as a Function of Grade, Valence of Verbal Communication and Valence of Nonverbal Communication

Grade	Valence of Verbal Communication	Valence of Nonverbal Communication		
		Positive	Neutral	Negative
Kd	Positive	1.60	2.03	2.13
	Neutral	1.95	2.10	2.23
	Negative	1.95	2.20	2.18
Second	Positive	1.50	1.83	2.60
	Neutral	1.45	1.85	2.35
	Negative	1.93	1.83	1.75
Fourth	Positive	1.28	2.20	2.35
	Neutral	1.40	1.70	2.33
	Negative	2.20	1.60	1.80

Note. Lower scores denote higher truthfulness ratings.

positive-positive than the positive-neutral, positive-negative and negative-positive combinations; (b) the neutral-neutral than the positive-neutral and neutral-negative combinations; and (c) the negative-negative than the negative-neutral, positive-negative and negative-positive combinations. Also, these subjects' judgments did approximate the absolute levels expected; the diagonal combinations of positive-positive and neutral-neutral were significantly below 2.00 ($t(216)= 4.19$, $p < .001$ and $t(216)= 1.74$, $p < .05$, one-tailed) and the off-diagonal combinations of positive-negative neutral-negative and were significantly above 2.00 ($t(216) = 2.03$, $p < .025$, and $t(216) = 1.92$, $p < .05$ one-tailed, respectively) and the positive-neutral and negative-positive combinations were in the expected direction. There were two violations of the expectations, these subjects judged the neutral-positive and negative-neutral as primarily truthful (below 2.00), more so than the negative-positive and positive-neutral combinations (ps $< .05$). These differences primarily accounted for the difference between the expected verbal-nonverbal consistency principle pattern and the observed pattern for fourth grade subjects. Overall, there were increases with grade in the verbal-nonverbal consistency principle pattern.

Consistent with the above comparisons, tests of simple main effects yielded a valence of verbal communication x

valence of nonverbal communication interaction for second and fourth grade subjects, $F(4,216) = 8.09$ $p < .001$, $F(4,216) = 14.55$ $p < .001$, respectively. This interaction was not found for kindergarten subjects.

The ANOVA yielded a sex of child x valence of verbal communication x valence of nonverbal communication interaction, $F(4,216) = 3.35$, $p < .05$. (The means for this interaction are shown in Table 3). The tests of simple main effects yielded a valence of verbal communication x valence of nonverbal communication interaction for females and for males, $F(4,216) = 15.97$, $p < .001$, and $F(4,216) = 2.43$, $p < .05$, respectively. Tukey a posteriori comparisons indicated that, in contrast to males, females judged: (a) the positive-positive combination as more truthful; and (b) the negative-positive and positive-negative combinations as less truthful (ps < .05). The verbal-nonverbal consistency principle pattern was more strongly shown by females than by males.

The ANOVA also yielded a four-way grade x sex of child x sex of stimulus person x valence of the nonverbal communication interaction, $F(4,108) = 3.44$, $p < .05$. (The means for this interaction are shown in Table 4.) Tests of simple main effects yielded only a sex of child x sex of stimulus person x valence of nonverbal communication

Table 3.

Mean Truthfulness Scores as a Function of Sex of Child, Valence of Verbal Communication and Valence of Nonverbal Communication

Sex of Child	Valence of Verbal Communication	Valence of Nonverbal Communication		
		Positive	Neutral	Negative
Male	Positive	1.60	1.88	2.20
	Neutral	1.77	1.98	2.23
	Negative	1.83	1.78	1.87
Female	Positive	1.31	2.15	2.52
	Neutral	1.43	1.95	2.33
	Negative	2.22	1.97	1.95

Note. Lower scores denote higher truthfulness ratings.

Table 4

Mean Truthfulness Scores as a Function of Grade, Sex of Child, Sex of Stimulus Person and Valence of Nonverbal Communication

Grade	Sex of Child	Sex of Stimulus Person	Valence of Nonverbal Communication		
			Positive	Neutral	Negative
Kd	Male	Male	2.10	1.93	2.27
		Female	1.73	2.13	1.80
	Female	Male	1.77	2.34	2.00
		Female	1.73	2.00	2.57
Second	Male	Male	1.40	1.77	2.20
		Female	1.77	1.63	2.27
	Female	Male	1.57	1.93	2.30
		Female	1.77	2.00	2.17
Fourth	Male	Male	1.87	1.83	1.93
		Female	1.53	1.67	2.17
	Female	Male	1.57	1.97	2.17
		Female	1.53	1.87	2.40

Note. Lower scores denote higher truthfulness ratings.

interaction for kindergarten subjects, $F(4,108) = 4.07$, $p < .01$. The kindergarten males judged the negative valence nonverbal communication as more truthful when it was exhibited by the female stimulus persons than when it was exhibited by the male stimulus persons; the kindergarten females showed the opposite pattern (Tukey *a posteriori* comparisons, $ps < .05$).

Discussion

The major purpose of this study was to test whether, and if so, at what age children use a principle of consistency to determine truth and lying. To test for the use of consistency within each grade, mean truthfulness scores for the diagonal verbal-nonverbal combinations were compared to those off diagonal combinations of each row and column. Also, the use of this principle was assessed by determining whether the means for the diagonal and off diagonal combinations approximated specified absolute levels, those of below 2.00 and above 2.00, respectively. The findings supported the conclusion that the use of the consistency principle was acquired with age. The kindergarten children did not show the use of the consistency principle with the exception that they judged the positive-positive combination as truthful. The consistency principle was more evident in second grade children and was manifested by fourth grade children with two exceptions. These results are similar to Rotenberg and Bacic's (1981) research findings in the area of trust. They found that fourth grade children used a notion of consistency to assess trust whereas kindergarten children did not. Also, they found that kindergarten children used a benevolence principle to assess trust; in the present study a similar benevolence principle (a positive statement and a smile) appeared to guide their perception of truthfulness.

As mentioned there were two violations of the consistency pattern for fourth grade children. The fourth grade children judged the neutral-positive and negative-neutral combinations as truthful; more so than the other off diagonal combinations. The following interpretations are offered as possible explanations. First, it is possible that the children perceived neutral verbal communications as probablistically positive. For this reason, children would view the neutral-positive combination as more truthful than the neutral-negative combination. Second, it is possible that children viewed the neutral nonverbal communication when paired with negative verbal communication as a stern look. Parents may show an expression similar to this when they reprimand their child. Thus children may perceive this communication as truthful more so than the neutral-positive combination. Further research is needed to investigate these interpretations.

Sex differences in children's use of consistency were also found. Results indicated the consistency pattern was more evident in girls than in boys. This finding is consistent with Friedman's (1979) research with adolescents which found girls to be more sensitive to inconsistencies between verbal and nonverbal cues than boys. That is, the females gave much higher ratings of sincerity when sentence (verbal) and face (nonverbal) cues were consistent while the

effect was less pronounced for males. Some other sex differences were evident in the present study. Kindergarten children showed a form of opposite sex judgment pattern. The negative valence nonverbal communication was judged by males as more truthful when it was exhibited by the female stimulus person than by a male stimulus person, while females made the opposite judgment. The reason for this pattern is unclear.

In summary, the results of the present study indicate that by fourth grade (age 9) children do use a notion of consistency to assess truth and lying. The results support the belief that face to face human interaction does involve an interaction between verbal and nonverbal cues.

Although further study is needed the present findings imply that if parents and teachers wish to be perceived as truthful by children 9 years of age and older, they should deliver verbal and nonverbal messages which are consistent. These findings also suggest new research possibilities. One possible line of research could involve testing older children to assess whether the consistency pattern persists in sixth grade, eight grade, and high school. Examination of sex differences at these levels might also yield interesting results.

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APPENDIX A

July 17, 1986

Dear Parent:

I would like to ask you if you would allow your child to participate in a study that I am currently conducting. The purpose of the study is to gather information about how children of difference ages use, in their judgments of truthfulness, the relationship between what people say and their facial expressions. In the study, the children will be presented a series of adults on videotape. Each adult will make a simple statement such as "I like that shirt" and will show either a smile, frown or neutral facial expression. The children will be asked to report what the adults said and looked like, and to decide whether the adult was telling the truth, a lie or maybe either. It should be pointed out that the content of the videotapes as well as the study itself have been approved by the Lakehead University and School Board ethics committees.

The study will take approximately 1 hour and it will be conducted in class in the school. It should be emphasized that the present study is concerned with the general way that children of different ages respond and it is not concerned with any given child. In effect, the responses of any given child will be kept completely confidential and the findings will be considered and reported solely in terms of the responses of the groups of children at different ages. Please fill out the attached form, indicating whether or not you are willing to let your child participate in the study, and return it to your child's school. Should you have any questions about the study, I would be pleased to answer them. I can be reached at 345-2121, ext. 476.

Yours sincerely,

Linda Simourd
Psychology Graduate Student

Name of child: _____

Birth date of child: _____

Sex of the child: Male Female (Circle the appropriate one)

I want my child to participate/not to participate (circle your choice) in the study.

Signed: _____
Signature of Parent or Guardian

Please return this form to school.

Appendix B

Statements Used for Each Valence of Verbal Communication

Positive

1) I like that shirt.

2) I like that movie.

3) I like that food.

Neutral

1) My house is white.

2) My car is blue.

3) My shoes are brown.

Negative

1) I do not like that coat.

2) I do not like that T.V. program.

3) I do not like that book.

Appendix C

3(Grade) x 2(Sex of Child) x 2(Sex of Stimulus Person) x
3(Valence of Verbal Communication) x 3(Valence of Nonverbal Communication)
ANOVA Source Table of the truth/lying scores

Source	df	SS	MS	F
Between Subjects	59	139.50	7.60	
Grade	2	5.41	2.71	1.11
Sex of Child (SexC)	1	2.41	2.41	.99
Grade by SexC	2	.07	.04	.01
Subjects within group	54	131.61	2.44	
Within Subjects	1020	774.86	59.12	
Sex of Stimulus Person (SexS)	1	.05	.05	.09
Grade and SexS	2	1.07	.53	1.04
SexC and SexS	1	.89	.89	1.74
Grade by SexC and SexS	2	1.18	.59	1.15
SexS by within subjects	54	27.65	.51	
Valence of Verbal Communication(V of VC)	2	.09	.05	.06
Grade and V of VC	4	4.74	1.18	1.68
SexC and V of VC	2	2.82	1.41	2.00
Grade by SexC and V of VC	4	4.74	1.19	1.69
V of VC by within subjects	108	75.94	.70	
Valence of Nonverbal Communication(V of NVC)	2	43.07	21.53	20.69**
Grade and V of NVC	4	4.56	1.14	1.10
SexC and V of NVC	2	4.04	2.02	1.94
Grade by SexC and V of NVC	4	2.59	.65	.62
V of NVC by within subjects	108	112.41	1.04	
SexS by V of VC	2	2.57	1.28	2.13
Grade and SexS by V of VC	4	1.19	.30	.49
SexC and SexS by V of VC	2	.17	.08	.14
Grade by SexC and SexS by V of VC	4	.57	.14	.24
SexS by V of VC by within subjects	108	65.17	.60	
SexS by V of NVC	2	1.22	.61	.94
Grade and SexS by V of NVC	4	4.57	1.14	1.76
SexC and SexS by V of NVC	2	1.76	.88	1.35
Grade by SexC and SexS by V of NVC	4	8.95	2.24	3.44*
SexS by V of NVC by within subjects	108	70.17	.65	
V of VC by V of NVC	4	36.25	9.06	15.05**
Grade and V of VC by V of NVC	8	19.74	2.47	4.10**
SexC and V of VC by V of NVC	4	8.08	2.02	3.35*
Grade by SexC and V of VC by V of NVC	8	7.18	.90	1.49
V of VC by V of NVC by within subjects	216	130.09	.60	

Appendix C cont'd

Source	df	SS	MS	F
SexS by V of VC by V of NVC	4	4.54	1.13	2.05
Grade and SexS by V of VC by V of NVC	8	3.42	.43	.77
SexC and SexS by V of VC by V of NVC	4	.76	.19	.34
Grade by SexC and SexS by V of VC by V of NVC	8	2.95	.37	.67
SexS by V of VC by V of NVC by within subjects	216	119.67	.55	

** $p < .001$
* $p < .05$