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OBSERVATIONAL MEASUREMENTS OF CHILD NONCOMPLIANCE WITH NORMAL PRESCHOOL CHILDREN IN THE HOME

by

Brian J. Livesay

A Thesis

Submitted in partial fulfillment

Of the requirements for the degree of

Master of Science in the Department of Psychology

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To the Graduate Faculty:

The members of the committee appointed to examine the thesis of BRIAN J. LIVESAY find it satisfactory and recommend that it be accepted.

Mark Roberts, Ph.D.
Major Advisor

Maria Wong, Ph.D.
Committee Member

Heather Ramsdell-Huddock
Graduate Faculty Representative

(Human Subjects Committee Approval Page)

Idaho State
UNIVERSITY

Office for Research Integrity
921 South 8th Avenue, Stop 8046 • Pocatello, Idaho 83209-8046

November 19, 2015

Brian Livesay
Psychology
MS 8112

RE: regarding study number IRB-FY2016-86 : Observational Measurements of Child Compliance With Normal Preschool Children in the Home

Dear Mr. Livesay:

I have reviewed your responses from concerns raised from the full-board review for the study listed above. This is to confirm that I have approved your application.

Notify the HSC of any adverse events. Serious, unexpected adverse events must be reported in writing within 10 business days.

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Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

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List of Abbreviations

APA	American Psychiatric Association
BSMSS	Barratt Simplified Measure of Social Status
BRC	Behavioral Record Card
CBCL	Child Behaviors Checklist
DSM-5	Diagnostics and Statistics Manual of Mental Disorders – Fifth Edition
ODD	Oppositional Defiance Disorder
PLS-5	Preschool Language Scales – 5
PP	Primary Parent
SP	Secondary Parent
TC	Target Child

Abstract

Parent-collected home observations on Behavior Record Cards have yielded accurate and reliable frequencies of child noncompliance and sibling aggression. A prior cross-sectional clinic analog study revealed dramatic improvement in child compliance probabilities after age 4.0. The purpose of the current project was to extend the 4-year old transition in compliance probability in the clinic to noncompliance rates in the home. Four age groups of 10 normal children participated: 2.0-2.9; 3.0-3.9; 4.0-4.9; and 5.0-5.9 years. Parents were trained to detect and record noncompliance for a 2-week period. It was hypothesized that the older groups would display lower mean daily noncompliance rates than younger groups. Although the 5-year old group mean (2.1 per day) was the lowest, significant differences were not found among the 4 age groups. The probability of days with one or more noncompliant acts was calculated and compared to current psychiatric diagnostic recommendations for deviant symptom levels. The mean probabilities ranged from 0.81 to 0.95, suggesting that noncompliance is both quite common and occurs at rates inconsistent with symptom criteria offered by the Diagnostics and Statistics Manual of Mental Disorders – Fifth Edition. Stratified random sampling that considers at least age, sex, and ethnicity would be necessary to construct empirically-based norms for noncompliance in the homes of typically developing children.

INTRODUCTION

The importance of pre-school child compliance with parental instructions is found in the clinical child literature (Forehand, 1977) and developmental socialization literature (Maccoby & Martin, 1983). The complexities of child compliance and inter-sibling aggression involve many variables, including: child age, learning history (in home, school, and community settings), gender, sibling age gap, sibling specific conflicts, and adult instruction style. Surprisingly, normative data have not been obtained for use by child clinical psychologists. What normative data do exist are limited to clinical analogs of normal children at different developmental ages and collected via cross-sectional designs (e.g., Brumfield & Roberts, 1998). Unfortunately, the ecological validity of laboratory measurements is not well established for noncompliance with parent instructions. As a consequence, clinicians cannot determine the statistical deviance of children's noncompliance, relative to the child's developmental level, despite overt noncompliance which can be readily observed in clinic settings (Roberts & Powers, 1988). This determination is important for clinicians charged with the obligation to justify the use of Diagnostics and Statistics Manual of Mental Disorders – Fifth Edition (DSM-5) codes for Oppositional Defiance Disorder (ODD) (American Psychiatric Association, 2013, p. 462), as well as Specified or Unspecified Disruptive, Impulse Control, and Conduct Disorder (American Psychiatric Association, 2013, pp. 479-480). Similarly, laboratory measurements for sibling conflict and aggression are only recently emerging in the literature (Nakaha, Grimes, Nadler, & Roberts, 2016). The literature review reported below was performed to identify previous research that has used observational methods for identifying the rate of aggression or the probability/rate of noncompliance in children between 2.0 and 12 years of age. Only

observations done in a clinic lab, home, or school setting were considered. Further, only studies with longitudinal or cross-sectional designs were included.

Brumfield and Roberts (1998) used the Compliance Test and the Clinic Task Analog (Roberts & Powers, 1988) to evaluate compliance probabilities in 2.0 to 5.9 year old children. A distinct shift was found between a normal 2.0 to 3.9 year old cohort and a normal 4.0 to 5.9 year old cohort. The shift was dramatic on the Compliance Test: children under age 4.0 averaged 27% to 37% compliance with parent instructions; children above 4.0 years averaged above 75% compliance. Unfortunately, the external validity of the Compliance Test to predict home setting data is quite limited. Specifically, there are no data regarding normal frequency counts of overt noncompliance by parent observers. Based on socialization research in western cultures it is predicted that noncompliance episodes decline between 2.0 and 6.0 years. Recently, observational methods have been shown to yield reasonably accurate and reliable mean daily rate data in the home using parents as proxy observers (Nadler & Roberts, 2013). Parents are trained to recognize and record both noncompliance and sibling aggression on Behavior Record Cards (BRC) using a series of videotaped exemplars. The project described below used the BRC system to obtain preliminary normative data for noncompliance rates in the home with a normal sample of 2.0 to 5.9 year old children. In addition, the project attempted to determine if the dramatic improvement in compliance probabilities in the laboratory setting after age 4 would generalize to mean daily rates of noncompliance in the home.

Socialization Processes

Socialization is the process by which children gradually acquire the skills and attitudes consistent with their larger culture. This process involves a complex interplay between biological and social-cultural mechanisms, unique variations of those mechanisms, and the

cognitive landscape that is produced in response to individual experiences (Bugental & Grusec, 2006). Socialization requires an individual to conform to standards appropriate for his or her present and future roles in relevant social contexts. Many agents and agencies play a role in the socialization process, including family, peers, schools, media, and larger social contexts (Bronfenbrennar, 1998). While it is recognized that relevant social contexts interact, rather than function independently, the family context has been recognized as early, pervasive, and highly influential for socialization (Parke & Buriel, 1998).

Throughout history parents and communities have been concerned with ways to influence their young. Children have been born into many different cultures at different periods of time. Caregivers hope to prepare their children to be effective in the culture and period of relevance. Socialization represents the preparation of the young to manage the tasks of social life and involves the continuous interplay among several mechanisms. The first of these involves biological mechanisms which mature gradually during development. Maturational levels clearly impose limits on the repertoire of youth at any given point. Second, social-cultural mechanisms serve to shape and strengthen the biological potential of the child. Biological and social-cultural factors build on each other in a recursive fashion. Third, idiosyncratic variations in a child's biological, social, and cognitive development, which occur in response to their experiences with their environment, round out the foundation in which the process of socialization takes place (Bugental & Grusec, 2006).

Developmentalists have often articulated three principles of socialization research. First, an individual is likely predisposed (e.g., temperaments) to certain developmental routes by which socialization occurs. This may be thought of as "experience expectant". Additionally, socializing experiences act to modify the cognitive, socio-emotional, linguistic, and motoric

competencies of the developing individual. This may be thought of as "experience-dependent". Second, the expanding set of social contexts (e.g., from home to school) encountered by an individual has a significant impact on socializing experiences. Third, the relevant skill repertoires in each context (e.g., protection, learning group rules, collaborative work, or the exertion of control over a child whose actions may be dangerous to others) also determines the impact of particular socialization experiences (Bugental & Grusec, 2006).

Successful socialization can function to foster a child's individual success in managing life challenges with others around them. Thus, socialization includes a child's ability and motivation to acquire individual and culturally shared competencies at a social, emotional, and cognitive level. On the other hand, socialization failure creates threats to these ends. Parents, or other agents of socialization, may lack the knowledge, investment, or competency to help the young develop in ways that add to the child's successful adjustment to changing contextual demands. Finally, there are inherent conflicts between the motives of the young and their elders. Conflicts may occur at specific points of transition in a specific culture or period. Noncompliance, for example, may have evolved in western cultures when a child seeks to increase his or her autonomy over the objection of authority figures, such as parents, teachers, or peers (Bugental & Grusec, 2006).

Socialization research has been guided by many different theoretical perspectives. Psychoanalytic concepts about the conflict between the unconscious drives of the individual and the demands of society have transitioned to a variety of social learning theory conceptualizations, reflecting changes in empirical evidence and methodology. Increasing attention to cognitive processes, including self-representation, and to emotional expression and emotion regulation are manifest in modern socialization research. Although attachment theory remained formally

separate from traditional theories of socialization, the parent-child relationship became increasingly evident as the foundation for successful socialization and it appears to be quite important (Parke & Buriel, 1998)

Overview of Noncompliance and Aggression to Socialization Research

Noncompliance and aggression in children have been identified by parents, researchers, and practitioners as a key disrupting element in the normal socialization of a child. Moreover, child noncompliance has historically been the most frequent reason for a child referral to a professional (Bernal et al., 1980). Noncompliance, also referred to as defiance or disobedience, describes those active or passive behaviors demonstrated by a child where he or she knowingly and purposefully does not perform as instructed by an authority figure (e.g., parent, teacher, or caregiver). Consequently, all instances of noncompliance require an interaction between the child and an authority figure such that an explicit instruction or demand has been verbalized or otherwise indicated by the authority figure and, subsequently, defied by the child.

Aggression describes any intentional behavior that can cause harm or injury to another person or persons (Parke & Slaby, 1983). In children, aggression is typically displayed toward siblings and peers, but may also be directed at caregivers. Aggressive behavior has a deleterious effect on the socialization of the child. Aggression often co-occurs with other anti-social behaviors such as, lying, stealing, and destruction of property (Dodge, Coie, & Lynam, 2006) as well as vindictiveness and defiance. Sustained aggression and/or noncompliance into middle childhood are primary indicators of socialization failure.

Both aggression and noncompliance have known developmental trajectories. Facial configurations associated with the experience of anger in adults, can be identified by 3-months of age (Izard et al., 1995). Nevertheless, normal infants from birth to 12-15 months are unlikely to

be considered aggressive or noncompliant, given limitations of the motor repertoires needed to perform noncompliant or aggressive actions, the absence of intentionality, and limited receptive language skills. The literature on attachment suggests that infants who are categorized as securely attached, which develops as early as 8-12 months, may be subsequently more compliant than infants who are not securely attached (Lamb, 1987).

Between the ages of two and three years, aggression toward adults, peers and siblings can be more readily observed. Conflict is common among children, but not often reported at high rates (Hay, 1984; Shantz, 1987). Studies of peer interaction suggest that physical aggression is infrequent and occurs at a lower rate at the onset of conflicts, as opposed to the later stages of a dispute (Caplan et al., 1991; Hay & Ross, 1982). In observations of small groups of 1- and 2-year-olds, groups with a majority of females were less likely than groups with a majority of males to come into conflict and to use personal force (Caplan et al., 1991). In contrast, laboratory studies of sibling interaction have not detected main effects of sex for children, although same-sex dyads are more likely than mixed-sex ones to enter into conflict (Hay et al., 1993; Vespo et al., 1995).

Noncompliance is readily identified by 2.0 years of age. Many parents report their children as being excessively noncompliant during the preschool years (2.0 to 5.9 years) of development (Koot, 1991). As discussed above, observational studies suggest a decreasing trend in noncompliance for normal children after the age of 4.0 years (Brumfield & Roberts, 1998; Webster-Stratton, 1983).

Male aggression is much more likely than aggression among females during the preschool period (Archer, 2004). Gender, however, appears to be less relevant in aggression among sibling dyads; both girls and boys report fairly high rates of physical aggression with their

siblings (Dunn, 1993). While extensive conflict between siblings is not currently seen as a form of maladjustment, sibling aggression has been found to be predictive of aggression in school settings (Storashak et al., 1996) and at home (Patterson, 1989).

Developmental processes and socialization pressures result in a decrease of noncompliance as children reach school age (Crandall, 1958), however, for some children noncompliance continues to be an issue (Lobitz, 1975). Concurrent with the development of a child, more complex displays of noncompliance emerge during middle childhood. In particular, prosocial skills emerge, such as negotiating and offering alternate behaviors to the instruction-giver (Kuczynski et al., 1987).

Literature Review

A literature review was conducted by a search for publications between the years of 1930 and 2015 in six specific journals: *Child Development*, *Developmental Psychology*, *Clinical Child & Adolescent Psychology*, *Journal of Pediatric Psychology*, *Journal of Abnormal Child Psychology*, and *Aggressive Behavior*. In addition, other journals were identified by references found in the six targeted journals and by review chapters in developmental psychology on socialization (e.g., Bugental & Grusec, 2006; Parke & Buriel, 1998). All articles had to meet three specific criteria to be considered: first, articles must report a longitudinal or cross-sectional design; second, children were between the ages of 2.0 years and 12.0 years; third, the data obtained were observational (e.g., home, school, or clinic observations) and performed by trained observers. Articles were excluded if participants were infants or teenagers, observations were limited to a single point in time, or there was use of rating scales that sample the beliefs of an informant.

Tables 1a, 1b, and 1c summarize findings for 8 articles that met inclusion criteria for noncompliance. Note articles that have multiple relevant analyses are listed by alphabetical labels.

Table 1a
Compliance/Noncompliance Studies

ID	First Author Only	Age Range	N (female)	Design	Duration	Waves
1.	Brumfield, 1998	2.0 - 5.9 years	99 (50)	Cross-sectional	Short-term	5 Age Bins
2.	Roberts, 1988	2.0 - 7.8 years	231 (74)	Cross-sectional	Short-term	5 Age Bins
3.	Shaffer, 1980	1.3 - 2.0 years	24 (12)	Cross-sectional	Short-term	2 Age Bins
4a.	Howes, 1986	1.5 - 3.0 years	89 (42)	Cross-Sectional	Short-term	4 Age Bins
b.		1.5 - 3.0 years	89 (42)	Cross-Sectional	Short-term	4 Age Bins
5.	Mash, 1982	3.1 - 9.7 years	53	Cross-sectional	Short-term	2 Age Bins
6.	McLaughlin, 1983	1.3 - 3.8 years	24 (12)	Cross-sectional	Short-term	3 Age Bins
7.	Kuczynski, 1990	1.5 - 5.0 years	25 (14)	Longitudinal	1.5 - 3.5 years	2 Age Bins
8a.	Power, 1994	2.0 - 6.0 years	21 Male	Cross-sectional	Short-term	3 Age Bins
b.		2.0 - 6.0 years	21 Female	Cross-sectional	Short-term	3 Age Bins
c.		2.0 - 6.0 years	21 Female	Cross-sectional	Short-term	3 Age Bins
d.		2.0 - 6.0 years	21 Male	Cross-sectional	Short-term	3 Age Bins

Table 1b
Compliance/Noncompliance Studies

ID	Coder Accuracy	Interaction Setting	Interaction Event	Interaction Target	Rated Interaction
1.	KR20 = .99	Laboratory	Task Analog	Parent	Compliance
2.	Agree Ratio > .97	Laboratory	Task Analog	Parent	Compliance
3.	Kappa > .81	Laboratory	Free Play Analog	Parent	Compliance
4a.	ICCs > .97	Laboratory	Task Analog	Parent	Compliance
b.	ICCs > .97	Home	Task Analog	Parent	Compliance
5.	Not reported	Laboratory	Task Analog	Parent	Noncompliance
6.	ICCs > .91	Home	Free play analog	Parent	Noncompliance
7.	Kappa > .81	Home	Naturalistic	Parent	Noncompliance
8a.	Kappa > .87	Home	Naturalistic	Parent (Father)	Noncompliance
b.	Kappa > .87	Home	Naturalistic	Parent (Father)	Noncompliance
c.	Kappa > .87	Home	Naturalistic	Parent (Mother)	Noncompliance
d.	Kappa > .87	Home	Naturalistic	Parent (Mother)	Noncompliance

"Age Bins" are defined by the author's use of distinct cohorts to test for age differences, such that Age Bin A represents the youngest cohort used by the author and the following Age Bins (B through E, if applicable) represent subsequent cohorts.

Table 1c
Compliance/Noncompliance Studies

ID		Age Bin A (*)	Age Bin B (*)	Age Bin C (*)	Age Bin D (*)	Age Bin E (*)
Compliance						
1.	Significant Increase	2.0 - 2.4 (27)	2.5 - 2.9 (39)	3.0 - 3.9 (36)	4.0 - 4.9 (75)	5.0 - 5.9 (81)
2.	Significant Increase	2.0 - 2.9 (31)	3.0 - 3.9 (43)	4.0 - 4.9 (52)	5.0 - 5.9 (68)	6.0 - 6.9 (76)
3.	Not Significant	1.5 - 1.9 (34)	2.0 - 2.4 (56)	X	X	X

4a.	Not significant	1.5 - 1.9 (5.5)	2.0 - 2.4 (6.1)	2.5 - 2.9 (7.9)	3.0 -3.5 (7.6)	X
b.	Not significant	1.5 - 1.9 (8.8)	2.0 - 2.4 (11.1)	2.5 - 2.9 (15.4)	3.0 -3.5 (12.5)	X
	Noncompliance					
5.	Significant Decrease	4.0 - 4.9 (8.3)	8.0 - 9.7 (4.9)	X	X	X
6.	Significant Increase	1.5 - 1.9 (42)	2.5 - 2.9 (65)	3.5 - 3.9 (65)	X	X
7.	Significant Decrease	1.5 - 3.5 (39)	5.0 - 5.4 (21)	X	X	X
8a.	Significant Decrease	2.0 - 2.9 (28)	4.0 - 4.9 (25)	6.0 - 6.9 (07)	X	X
b.	Significant Decrease	2.0 - 2.9 (20)	4.0 - 4.9 (16)	6.0 - 6.9 (11)	X	X
c.	Significant Decrease	2.0 - 2.9 (56)	4.0 - 4.9 (35)	6.0 - 6.9 (22)	X	X
d.	Not Significant	2.0 - 2.9 (33)	4.0 - 4.9 (33)	6.0 - 6.9 (31)	X	X

∗Percent change between Age Bin waves

All studies in Table 1 reported acceptable accuracy-of-rater coding. Studies were conducted in either a laboratory or home setting with a population comprised primarily of European-Americans between the ages of 1.5 and 9.7 years. Half of the identified studies measured child compliance (studies 1 – 4b) with parental instruction, while the remaining measured noncompliance (studies 5 – 8d) to parental instruction. Sample sizes for these studies range from 21 to 231.

Two of the four compliance studies detected a significant increase in percentage of compliance across Age Bins. Common age ranges for studies that found an initial significant increase in compliance were between ages 3.0 to 3.9 and 4.0 to 4.9 years. Three of the four noncompliance studies show a significant decrease in percentage of noncompliance across Age Bins. Due to the limitations in the age ranges measured, there are no reported common age ranges for the initial significant decrease in noncompliance. Specifically, decreases were found to occur between 5.0 and 6.0 years, 5.0 and 8.0 years, as well as 3.5 and 5.0 years.

Two of the identified compliance studies revealed a lack of significance change in compliance across Age Bins. However, these two projects were restricted to children under the age of 3.5 years. Of note, the Howe's project did show a significant change in rate of compliance for setting, which used home and laboratory setting, such that compliance in a laboratory setting was significantly greater than in a home setting for children between the ages

of 1.5 and 3.5 years. It is difficult to interpret Howe's findings, given the absence of information about the number of instructions provided during the specified time period. Surprisingly, and inconsistent with all other developmental projects, McLaughlin (study 6) yielded a significant increase in noncompliance across Age Bins. Children over the age of 2.5 years were more noncompliant than children under 2.0 years. This unusual finding may reflect instruction effects with children under age two, who are likely to receive additional prompts (gestures) and simpler tasks (1-step motor tasks related to expected child care routines) than 2.5 year olds. Only two noncompliance studies held instruction effects (Roberts et al., 1978) constant across age. Although not listed in Table 1, gender effects indicating greater female compliance were detected in the Power's and Howe's projects.

Tables 2a, 2b, and 2c summarize findings for 12 articles that met inclusion criteria for aggression.

Table 2a
Aggression Studies

ID	First Author Only	Age Range	N (female)	Design	Duration	Waves
1.	Mesman, 2008	1.0 - 4.0 years	237 (104)	Hybrid	1 year	3 Age Bins
2.	Cummings, 1989	2.0 - 5.0 years	43	Longitudinal	3 years	2 Age Bins
3.	Crick, 2006	2.5 - 4.3 years	91 (52)	Longitudinal	18 months	4 Age Bins
4.	Murray-Close, 2009	3.0 - 4.5 years	101 (61)	Longitudinal	12 months	2 Age Bins
5.	Ewon, 2013	3.5 - 6.0 years	239 (118)	Longitudinal	24 months	2 Age Bins
6.	Stauffacher, 2006	4.0 - 8.0 years	46 (Sib Pairs)	Longitudinal	48 months	2 Age Bins
7.	Roseth, 2007	3.2 - 5.2 years	61 (28)	Hybrid	9 months	2 Age Bins
8.	Ostrov, 2008	2.5 - 4.5 years	120 (69)	Longitudinal	2 months	2 Age Bins
9.	Hay, 2000	1.5 - 3.0 years	66 (33)	Cross-sectional	6 months	3 Age Bins
10.	Ostrov, 2006	3.0 - 5.0 years	50 (24)	Cross-sectional	6 months	2 Age Bins
11.	Patterson, 1967	3.5 - 4.5 years	36 (18)	Longitudinal	8 months	2 Age Bins
12.	Jersild, 1935	2.0 - 4.0 years	54	Cross-sectional	9 Months	2 Age Bins

Table 2b
Aggression Studies

ID	Coder Accuracy	Interaction Setting	Interaction Event	Interaction Target	Cultural Affiliation
1.	ICCs = .70 - .90	Laboratory	Task Analog	Peer/Parent	European
2.	Kappa > .77	Laboratory	Free Play Analog	Peer	American
3.	ICCs > .86	Preschool	Free Play	Peer	American (Presumed)
4.	ICCs > .90	Preschool	Free Play	Peer	63% Euro-American
5.	Kappa = .95	Preschool	Free Play Analog	Peer	91% Euro-American
6.	ICCs > .90	Home	Free Play	Sibling	100% Euro-American
7.	Kappa = .80	Preschool	Free Play	Peer	American (Presumed)
8.	ICCs > .70	Preschool	Free Play	Peer	60% Euro-American
9.	ICCs = .97	Home	Free Play	Peer and Sibling	British (Presumed)
10.	ICCs > .82	Preschool	Free Play	Peer	72% Euro-American
11.	ICCs > .80	Preschool	Free Play analog	Peer	American (Presumed)
12.	ICCs = .80	Preschool	Free Play	Peer	American (Presumed)

"Age Bins" are defined by the author's use of distinct cohorts to test for age differences, such that Age Bin A represents the youngest cohort used by the author and the following Age Bins (B through E, if applicable) represent subsequent cohorts.

Table 2c
Aggression Studies

ID	Aggression Outcome	Age Bin A (Mean Rate Change)	Age Bin B (Mean Rate Change)	Age Bin C (Mean Rate Change)	Age Bin D (Mean Rate Change)
1.	Significant Decrease	1.0 - 1.9 (2.44)	2.0 - 2.9 (3.13)	3.0 - 3.9 (2.29)	X
2.	Significant Decrease	2.0 - 2.4 (8.06)	5.0 - 5.4 (5.93)	X	X
3.	Significant Decrease	2.5 - 2.9 (.45)	3.0 - 3.4 (.35)	3.5 - 3.9 (.41)	4.0 - 4.49 (.22)
4.	Significant Decrease	3.5 - 3.9 (**)	4.5 - 4.9 (**)	X	X
5.	Significant Decrease	3.5 - 3.9 (.80)	5.0 - 5.4 (.40)	5.5 - 5.9 (.40)	X
6.	Significant Decrease	4.0 - 4.4 (1.0)	7.0 - 12.0 (0.8)	X	X
7.	No Significant Change	3.2 - 4.2 (*)	4.3 - 5.2 (*)	X	X
8.	No Significant Change	2.5 - 3.4 (*)	3.5 - 4.5 (*)	X	X
9.	No Significant Change	1.5 - 1.9 (*)	2.0 - 2.4 (*)	2.5 - 3.0 (*)	X
10.	No Significant Change	3.0 - 3.9 (*)	4.0 - 5.0 (*)	X	X
11.	No Significant Change	3.5 - 3.9 (*)	4.0 - 4.5 (*)	X	X
12.	No Significant Change	2.0 - 2.9 (*)	3.0 - 4.0 (*)	X	X

* Mean rates were not reported for these studies

** Regression analysis showed a significant negative slope relationship for Age Bin 1 and Age Bin 2

All studies in Table 2 reported reasonably accurate rater coding. These studies were conducted in either a laboratory, school, or home setting with a population that comprised primarily European-Americans between the ages of 1.0 and 12.0 years. Sample sizes for these studies range from 36 to 239.

There were no common age ranges for the initial significant decline in aggression frequency. Six of the 12 aggression studies show a significant decrease in rate of aggression across Age Bins. Two of the studies found the initial significant decrease in aggression between ages 2.0 – 2.9 and 3.0 – 5.4 years; three studies found a decrease from 3.0 – 3.9 to 4.0 – 5.4; one study found a decrease from ages 4.0 – 4.5 to 7.0 – 12.0.

Importantly, five of the identified studies revealed a lack of significant change in the rate of aggression across Age Bins. Only two of these studies involved methodologies where of rates of aggression between siblings was investigated in a home setting. The remaining ten studies investigated aggression in either a preschool or lab setting with school aged peers.

Evaluating normative shifts in noncompliance and aggression in an ecologically valid context appears to be rather rare in the current literature. Nevertheless, it is a necessary methodological step if the field is to understand normal developmental transitions as they occur in home or school settings in order for clinicians to make better assessments of the children referred for problems of aggression and/or noncompliance. One possible strategy is to gather these data through the methodology established by Nadler and Roberts (2013). In that project parents were trained to observe and record instances of noncompliance and aggression in their children throughout the day. These observations are recorded on a system designed to tally discriminable incidences of the target behaviors. This Behavioral Record Card (BRC) system may prove to be an effective instrument to evaluate the normal developmental transitions of noncompliance and sibling aggression in the home setting.

Limitations of the current literature review are several. Only observational methods were included, which reduced the total number of eligible studies considerably. Of critical importance is the difficulty of interpreting changes (or lack of change) in compliance percentages and/or

aggression rates across studies. Cross-study comparisons were rendered nearly impossible by a host of variables not held constant, including: disparate observational settings, laboratory conditions, instructions or rules given by authority figures, dissimilar coding techniques, the number/age of children present, and so on.

Overview of Thesis

The project was designed to measure noncompliance in the home setting of normal children in four age groups of one year each from 2.0 to 6.0 years. Additionally, if a sibling older than 2.0 years and within 4.0 years of the target child were available, it was planned to obtain sibling aggression frequency. As discussed below, the aggression frequency goal was abandoned. Noncompliance data were used to provide preliminary normative data for the small, regional sample of normal children. Statistical analyses of the parent collected home data were performed to determine if there was any evidence of declines in noncompliance rate data in the home, which would be predicted by the boost in compliance probability in the laboratory (Brumfield & Roberts, 1998).

Primary Hypothesis

Mean daily noncompliance rates in the home setting will be lower in children older than 4.0 years of age than in children younger than 4.0 years of age.

METHODS

Participants

Forty-four families were recruited from the community via posted announcements on social media, community bulletin boards, and Idaho State University's (ISU) SONA research participant system. Forty families had a Target Child (TC) who met specific inclusion criteria for the study (19 females and 21 males). There were 10 TCs in each of the four age groups: Group 1 = age 2.0 to 2.9; Group 2 = age 3.0 to 3.9; Group 3 = age 4.0 to 4.9; Group 4 = 5.0 to 5.9. In all cases a Primary Parent (PP) was identified. The PP participated in all project eligibility processes and received training for the home observation tasks. Child exclusion criteria involved any diagnosis of Intellectual Disability, Autism Spectrum Disorder, or any mental health referral, diagnosis, or treatment status. All children included in the study had a Child Behaviors Checklist (CBCL) Aggression Behavior Subscale T-score of 64 or less and normal receptive/expressive language development as determined by the Preschool Language Scales – 5 (PLS-5) (Zimmerman et al., 2012). Four recruited families were excluded from the project. One family met exclusion criteria by screening positive on the PLS-5. Three families failed to return for the second session.

Initial planning for the study anticipated that if a sibling of the TC were over the age of 2.0, within four years of age of the TC, and met the same inclusion criteria, this child would have been included in the study to quantify sibling aggression rates in the home. Early into the project this secondary goal was determined to be infeasible. Specifically, no families with an eligible sibling were identified within the first 8 families to volunteer for the study. At that point the decision was made to discontinue training/recording sibling aggression, since an insufficient sample for testing was likely. Upon completion of data collection, this expectation was found to

be correct. Only 13 families among the 44 families eventually recruited had a sibling in the eligible age range. In addition, the time requirement to screen the sibling's language readiness (about 10 minutes) and to train the parent to code aggression (about 20 minutes) was difficult to schedule. Thus, the effort to test developmental trends in sibling aggression in the home was deferred to future research projects.

Given the presence of multiple children whose age fell between 2.0 and 5.9 within the same family unit, the TC from a family was determined by the number of existing TCs already assigned to an age group. For example, if a 2-year old (eligible for Group 1) and a 5-year old (eligible for Group 4) were both available from the same family, the number of participants who had already been assigned to Groups 1 and 4 were compared. The potential TC who would contribute to the group with the fewer number of assigned participants to date was selected as the TC from that family.

Demographic Information about Families and Parents

Primary Parents (PP) reported on marital status, age, gender, education completed, and occupation for themselves, as well the same information for the spouse/partner (i.e., the Secondary Parent or SP). The education and occupation information was used to yield a measure of social status offered by Barratt (2006); see the summary data in Table 3. Religious affiliation and ethnicity were labeled as "(optional)" on the form (see Appendix B). These optional data are categorical and incomplete, but nevertheless reported in Table 4.

Measurements

A. *Behavior Record Card (BRC)* – BRCs are counting tools used by parents in the home setting to record frequencies of noncompliance or sibling aggression, developed by Nadler and Roberts (2013). Data were used to compute a mean noncompliance rate per day for each participant.

B. *Child Behavior Checklist (CBCL)* – A questionnaire designed to evaluate parent beliefs about their child's psychopathology across seven clinical dimensions (Achenbach & Rescorla, 2000). Parents respond to 100 symptoms which are rated on 3-point scales, such that 0 = Not True, 1 = Somewhat or Sometimes True, and 2 = Very True or Often True. Only the Aggressive Behavior Subscale was used in the current project. Raw scores were transformed to T-scores (M = 50; SD = 10). Only children with a T-scores of 64 or lower were included in the current project. Only one child had a score of 65 or higher, however his sibling scored below 65 and was included in the project.

C. *Preschool Language Scales-5 (PLS-5)* – A screening tool used by professionals to determine if children from birth to eight years possess sufficient expressive and receptive language skills for their age (Citation). Only Record Forms for children from 2:0 through 5:11 years were used in the current project. The specific rules for each age group were followed to determine if the child passed or failed the screening test. Only one child failed to pass the screening test.

Procedures

This project consisted of a Phone Intake followed by the three phases: Phase 1 - Initial Session at the ISU Psychology Clinic; Phase 2- Home Data Collection and Phone Check; and Phase 3- Follow-up Session at the ISU Psychology Clinic.

Phone Intake

See the Phone Intake form in Appendix B. During the Phone Intake information was gathered to determine eligibility. Since social media was used for recruitment, some of the eligibility information was gathered via email correspondence prior to the formal Phone Intake. Requirements for eligibility included: date of birth of all children and the absence of Autism Spectrum Disorder, Intellectual Disability Disorder, or any other mental health diagnosis/treatment. All families who met eligibility criteria advanced to Phase 1 and were

scheduled for the Initial Session at the ISU Psychology Clinic. Three families were identified whose children failed the eligibility criteria. These families were thanked for their interest and excluded.

Phase 1: Initial Session at the ISU Psychology Clinic

During the Initial Session the PP reviewed and signed the Consent Form approved by the ISU Human Subjects Committee (see Appendix A). The intake form was then completed (Appendix B) as needed. Completion of the intake form included items not collected over the phone such as occupation, education of each parent, as well as discretionary items such as religious affiliation and ethnicity. Next, the PLS-5 screener (measure of receptive and expressive language ability) was administered to the TC while the CBCL was concurrently completed by the PP. As noted above, only one TC screened positive on the PLS-5. This family was compensated for attending one session and referred to the ISU Speech and Hearing Clinic. As noted above, one child whose sibling participated in the study had a score of great than 65. The mother completed the BRC training and collected data on both of her otherwise eligible children. The child with the T-score less than 65 participated in the project. The BRC data for the child who screened positive for social aggression did display a clinically deviant level of noncompliance. Referral options were discussed with the parent.

Once a TC passed both screening measures (the CBCL and the PLS-5), the PP was trained to use the BRC system in a separate room from the TC. The TC was attended to by an assistant in a separate room to ensure the TC would not be aware that their behavior was going to be observed and recorded by their parent at home. The BRC system training involved three steps. The first step entailed a verbal review of the Parent Handout; see Appendix C. The Parent Handout included: operational definitions for “aggression” and “noncompliance”, examples of

aggression and noncompliance, detailed instructions for observing and recording noncompliance on the BRC, and instructions for the placement of the actual BRC in the home. The PP was encouraged to manage noncompliance the way they normally would and only engage in the process of recording noncompliance after they had implemented their parenting strategy for noncompliance. This was done to reduce the BRC's procedural footprint on the ecology of current procedures in the home. The placement of the BRC was designed to be in a location that would be readily available to the parent, but not the child. The PP was also instructed not to remove the BRC from the home during community outings. Evidence of noncompliance in the community was to be recorded upon return to the home. A practical demonstration of recording noncompliance was done on a practice BRC (See Appendix D). The aggression component of the Parent Handout review was disregarded. The following operational definition was used to guide the parent's coding at home and during BRC training.

"<u>Noncompliance</u>":

A child response that is inconsistent with the twice-repeated adult instruction to "start" or "stop" a specific action that could be performed or inhibited in the immediate setting.

The second step of BRC training included a guided exercise between the PP and the BRC system trainer. Specifically, the PP viewed 16 Practice Scenarios on a video that included interactions between a model child and a model parent; see Appendix E. The scenarios included various combinations of instructions given by the model parent and a response of compliance or noncompliance by the model child such that certain scenarios included noncompliance while other scenarios did not. These scripted scenes ranged from 15 to 25 seconds (Nadler & Roberts, 2013) and were displayed on a 16 inch computer screen placed directly in front of the PP. The PP was guided through the detection and recording process of noncompliance on a practice form

of the BRC. The trainer kept track of the compliance training on the worksheet (Appendix E). The trainer discussed the PP's decisions, socially reinforced correct decisions, and labeled why that decision was correct. When the PP was incorrect, the trainer discussed the reason why the parent should have recorded (or not recorded) noncompliance. This guided practice exercise allowed the PP to practice detection and recording of discrete compliance and noncompliance events with immediate feedback.

The third step of BRC system training culminated with a test of noncompliance/compliance discriminations and recording of those observations on a practice BRC form. Specifically, the PP viewed 20 Test Scenarios similar to the Practice Scenarios given earlier. See Appendix E. The PP was instructed to code each act of noncompliance she/he observed on the BRC using tally marks. The trainer observed the PP's coding of noncompliance on the BRC and recorded the accuracy of the PP's coding on the worksheet. The trainer did not respond to the PP's decisions during the Test Scenarios unless an error was made. In the event of an error the trainer gave immediate feedback followed by replaying the scenario and discussing the correct code and rationale for that code. If more than four recording errors were made by the PP during the 20 Test Scenarios, the entire 20 scenes would have been replayed and coded again. This proved unnecessary. All 40 PPs completed the Test Scenarios with four or fewer mistakes. The mean percent correct of the 40 PPs was 99%.

Duration of training with practice and test scenarios for home observation and collection of noncompliance rates in the home required approximately 20 minutes. Throughout this training process the PP was instructed and reminded to not inform their child(ren) of home observation procedures. Following BRC system training, a date and time for the phone check (Appendix B) was identified. The phone check was scheduled as near to the half-way point

between Phase 2 and Phase 3 as possible, typically around the 7th day of home data collection. Scheduling the Phase 3 Follow-up Session was set for a date and time following the 14th day of home data collection. The goal was to obtain 14 full days of observation if at all possible. Typically, the first day of data collection occurred on the same day the PP completed Phase 1. Since data collection for this day was initiated after the beginning of the day, this day was coded as a half day. Days were also coded as a half day if data were collected on the same day the BRCs were returned. Days were excluded if the family spent the entire day outside of the home or in a vacation status. These occurrences were identified during Phase 1 by interviewing the PP for their intent to take vacation days during the home observation phase. If vacation days were identified the PP was instructed to not attempt to code noncompliance as they would not be in the home setting and engaged in normal routines. This process yielded an average of 15 days of observation across the 40 families who completed the project (SD = 0.8 days). Prior to leaving the lab parents were provided with two BRCs (one per week), the Parent Handout, a copy of the Informed Consent, and contact information for the ISU Psychology Clinic.

Phase 2: Home Data Collection and Phone Check

During Phase 2 parents recorded data for noncompliance on a daily basis. Control over environmental conditions was only limited by vacation status. All noncompliance observed in the home and community was recorded by the PP on the BRC. The BRC was to be maintained in a fixed location in the home. On approximately the seventh day of home observation the scheduled phone check was conducted. The purpose of the phone contact was twofold. First, all questions the parent may have had about coding were addressed and current coding progress was reviewed verbally. Second, the date and time of the Phase 3 Follow-up Session was confirmed.

Phase 3: Follow-up Session at the ISU Psychology Clinic

The two BRCs were returned. The researcher introduced the Accuracy Test, which consisted of two, 10-minute video scenarios in which a parent interacted with two children. The Accuracy Test (Appendix G) was constructed by Nadler and Roberts (2013). The PP used a BRC to record any instances of noncompliance, as per the training they received during Phase 1. The following instructions were read to the PP prior to beginning the Accuracy Test:

> "You have been keeping track of your children's behaviors using the BRC system. Now, we'd like you to use that same system to track the noncompliance of children on this DVD. We want to see how accurate you can be. The first 10 minutes include an older boy and a younger girl; the last 10 minutes include an older boy and a younger boy. I can remind you of who is who while the DVD is playing, but we can't pause it and I can't answer any questions while we watch. Do your best to keep track of all the noncompliance you see on the video, just as you did with your own children. Any questions before we start?"

The researcher addressed any questions the PP had prior to beginning the Accuracy Test. The researcher then identified the "Older" and "Younger" children upon their first appearances in the accuracy scenarios, as well as upon any subsequent request of the PP. The researcher remained available to the parent in the same room, but did not sit by the parent during the test. The Accuracy Test compared the performance of the PP relative to a template that identified every noncompliance episode on the digital video. The percent correct for detecting the occurrence of noncompliance was determined by placing the number of agreements of occurrence in the numerator and dividing by the number of possible agreements. This agreement ratio determined a percent correct for each PP, relative to the template. Note that the respondent or the template

could define the denominator based on which count of noncompliance was the larger. Across the 40 PPs who completed the project, the mean percent correct was 90% (SD = 6%; range = 83% to 100%).

Final compensation for participation in the study was made as per the agreement in the informed consent by providing SONA credits (3 families) or cash payment (37 families) in the form of a 30 dollar check.

RESULTS

Parent and Family Demographic Data

The mean, standard deviation, and range for parent demographic data are presented in Table 3. Family social status was determined using the Barratt Simplified Measure of Social Status (BSMSS) (Barratt, 2006). The BSMSS was based on the work of Hollingshead (1957, 1975) who created a measure of social status by combining several factors that included employment, education, and occupation. The BSMSS is not a measure of social class, which is better understood within a cultural context. To derive a family score the qualitative information provided by the PP was transformed to a numerical value according to the BSMSS rules. For example, a PP who indicated their education was "college graduate" and occupation was "nurse" would receive a score of "18" and "35", respectively. Information for both parents was transformed in this manner, summed, and divided by 2 to yield the social status score for the family. In the event that the PP did not report information for a SP, only the PP's information for education and occupation was considered (i.e., not averaged across two spouses).

The descriptive data for the families of the four age groups on Table 3 include Barratt's Social Status index, marital status, PP and SP ages, and sex of the PP. Ratio data (social status as well as age) were analyzed with an analysis of variance, while categorical data were analyzed by the chi-square statistic. As noted in the test results column of Table 3, there were no significant group differences across age groups for social status, marital status, PP age, PP sex, or SP age. Since the BSMSS scale ranges from 8 to 66, it appears that the sample as a whole (grand mean = 38.9) is best characterized as families whose education includes some college and whose occupation is comprised of skilled employees, such as machinist, office manager,

Table 3
Parent Demographic Data

Group ID	**1**	**2**	**3**	**4**	**Statistical Test Results**
Group N	**10**	**10**	**10**	**10**	
Social Status					$F(3,36) = 0.7$, *ns*
Mean	40.3	41.65	34.6	40.8	
(SD)	(14.8)	(9.9)	(13.4)	(10.9)	
Range	17-66	26.5-57	17-53	18.5-61	
Marital Status					$X^2(3) = 1.08$, *ns*
Single	1	0	1	1	
Married	9	10	9	9	
Primary Parent Group N	**10**	**10**	**10**	**10**	
Primary Parent Age					$F(3,36) = 1.0$, *ns*
Mean	31.8	32.6	29.8	32.6	
(SD)	(4.0)	(3.7)	(4.7)	(4.7)	
Range	23-38	28-40	24-38	21-37	
Primary Parent Sex					$X^2(3) = 2.11$, *ns*
Female	9	9	10	10	
Male	1	1	0	0	
Secondary Parent Group N	**9**	**10**	**9**	**10**	
Secondary Parent Age					$F(3,34) = 0.24$, *ns*
Mean	33.0	34.0	33.6	34.9	
(SD)	(6.4)	(2.5)	(3.4)	(6.5)	
Range	20-42	31-39	28-39	25-43	

insurance sales, etc. Most families in the sample were married (37 of 40) and in their early 30s. The PPs were virtually all females. Primary parents were given the option to disclose information on themselves and their partner or spouse with regard to "Ethnicity" and "Religious Affiliation" (Table 4). These data are offered descriptively, since the information is both categorical and incomplete, due to the voluntary nature of the reporting option. It appears that participating families were predominately Euro-American. Those who chose to report a religious affiliation were primarily of a Christian denomination.

Overall, the demographic data reported and analyzed in Tables 3 and 4 did not reveal any significant differences across the four age groups. This uniformity suggests that were group differences to emerge in the noncompliance data, such differences could be interpreted as developmental trends, rather than encumbered with any confounding of demographic data and a specific age group.

Child Demographic Data

Means, standard deviations, and range statistics of the four child demographic indices can be found in Table 5 across the four age groups: TC age, number of siblings, TC ordinal position among siblings (if any), and sex. Age was not analyzed, since the participants were selected to differ by age. As noted in the statistical test column of Table 5, the number of siblings for each TC did vary significantly by cohort, $F(3, 36) = 3.8$, $p < 0.05$. Tukey's post hoc analysis indicated that Group 1 TCs had significantly fewer siblings than Group 2 TCs. In contrast, age group differences were not present for either ordinal position or sex of the TC.

Table 4

Parent Demographics (Voluntarily Disclosure)

Group ID	**1**	**2**	**3**	**4**
Primary Parent	**N=10**	**N=10**	**N=10**	**N=10**
Ethnicity	7 E-American 3 None Reported	7 E-American 3 None Reported	6 E-American 1 Brazilian 3 None Reported	10 E-American 0 None Reported
Religious Affiliation	2 Christian 8 None Reported	1 Catholic 1 Christian 2 LDS 3 No Affiliation 3 None Reported	1 Christian 4 LDS 3 No Affiliation 2 None Reported	2 LDS 4 No Affiliation 4 None Reported
Secondary Parent	**N=9**	**N=10**	**N=9**	**N=10**
Ethnicity	5 E-American 1 Mix 3 None Reported	5 E-American 1 Hispanic 4 None Reported	6 E-American 1 Hispanic 2 None Reported	1 Black 8 E-American 1 None Reported
Religious Affiliation	2 Christian 8 None Reported	1 Catholic 2 LDS 3 No Affiliation 3 None Reported	1 Christian 3 LDS 3 No Affiliation 2 None Reported	2 LDS 4 No Affiliation 4 None Reported

Table 5
Target Child Demographic Data

Group ID	**1**	**2**	**3**	**4**	**Statistical Test Results**
Group N	10	10	10	10	
Target Child Age					
Mean	2.4	3.6	4.5	5.5	
(SD)	(0.3)	(0.3)	(0.3)	(0.3)	
Range	2.0-2.8	3.0-3.9	4.1-4.9	5.0-5.8	
Number of Siblings					$F(3,36) = 3.8$, $p < 0.05$
Mean	0.4	1.7	1.3	1.2	
(SD)	(0.5)	(1.1)	(1.1)	(0.8)	
Range	0-1	0-3	0-4	0-2	
TC Ordinal Birth Position					$F(3,36) = 1.8$, *ns*
Mean	1.4	2.3	1.8	1.4	
(SD)	(0.5)	(1.3)	(1.2)	(0.7)	
Range	1^{ST}-2^{ND}	1^{ST}-4^{TH}	1^{ST}-5^{TH}	1^{ST}-3^{RD}	
Target Child Sex					$X^2(3) = 1.91$, *ns*
Female	5	5	3	6	
Male	5	5	7	4	

Mean Daily Rate of Noncompliance

The mean daily rates of noncompliance are reported in Table 6. First, Groups 1 and 2 were combined and compared with Groups 3 and 4, per the primary hypothesis, as informed by the Brumfield and Roberts' (1998) findings. They found that normal children above age 4.0 years were distinctly more compliant than those below age 4.0 years in their laboratory test of compliance probability. As noted in the t-test column of Table 6, no analogous difference was apparent when evaluating the mean daily rate of noncompliance in the home, $t(38) = 1.68$, *n.s.* The older cohorts (Groups 3 & 4) mean daily noncompliance rate was 2.8 per day, while the younger cohorts (Groups 1 & 2) averaged 4.1 per day, an apparent difference that failed to reach statistical significance, possibly a result of the large within-cell variances and the small sample size. Similarly, when all four groups were considered, the means also failed to reveal any significant age group differences, $F(3, 36) = 1.77$, *n.s.* Therefore, the data collected in this project failed to support the primary hypothesis that a significant reduction in noncompliance rates in the home would be present after age 4.0 years (i.e., Groups 3 & 4).

The DSM-5 makes a clear distinction between children who are 5 years and older from those who are younger than 5 years. An analysis of mean daily rate of noncompliance was performed contrasting these groups such that children younger than 5.0 years of age (i.e., Groups 1-2-3; n = 30) were compared to those older than 5.0 (i.e., Group 4; n = 10); see Table 6. An independent-samples *t*-test indicated that the mean rate of noncompliance was significantly lower for children over age 5.0 compared to children under age 5.0, $t(37.88) = 3.16$, $p < .01$ (Table 6). Since the variance between the two groups appeared discrepant (7.3 for the younger group versus 0.81 for the older group), Levene's test for equality of variance was performed.

Table 6
Mean Daily Rate Noncompliance

Group Age	**2.0-3.9**		**4.0-5.9**		**t-test**
Group N	20		20		
Mean-Daily Rate of Noncompliance					$t(38) = 1.68$, *n.s.*
Mean	4.1		2.8		
(SD)	(3.0)		(1.7)		
Range	0.9-12.3		0.5-6.9		
Group ID	**1**	**2**	**3**	**4**	**ANOVA**
Group N	10	10	10	10	
Mean-Daily Rate of Noncompliance					$F(3, 36) = 1.77$, *n.s.*
Mean	3.6	4.6	3.5	2.1	
(SD)	(2.5)	(3.5)	(2.0)	(0.9)	
Range	0.9-8.3	1.1-12.3	0.5-6.9	0.9-3.3	
DSM-5 Group Age	**2.0-4.9**		**5.0-5.9**		**t-test**
Group N	30		10		
Mean-Daily Rate of Noncompliance					$t(37.88) = 3.16$, $p < 0.01$
Mean	3.9		2.1		
(SD)	(2.7)		(0.9)		
Range	0.9-12.3		0.9-3.3		

The test indicated significant heterogeneity of variance ($F = 5.55$, $p < .05$). Under those conditions, the standard statistical correction is to reduce the degrees of freedom, which was done.

An effort to evaluate the consistency (i.e., reliability) of the mean daily rate of noncompliance for the TC during the 2-week home data collection period was calculated by comparing the sum of noncompliance episodes across "Odd" days with the sum across "Even" days. Days during the project onset were not considered, since coding was not performed for the whole day. Similarly, the day data were returned to the clinic was usually a partial day, and therefore not used in the analysis. Finally, were the family to be on vacation or outside of the home for the entire day, such days were also excluded. Since only consecutive, whole days (i.e., no breaks via on vacation) were desired to ensure similarity of comparison between the odd and even days, participants varied by the number of odd and even day for the analysis. Most PPs collected data on either 12 or 14 consecutive, whole days. However, one participant in Group 1 was limited to six consecutive, whole days prior to a vacation (or outside-the-home break in data collection), and one participant in Group 4 was limited to eight consecutive, whole days for the same reason. The uncorrected Odd Day/Even Day, split-half reliability coefficient was $r_{xx}(38) = .95$, $p < .001$. Descriptive statistics for the two periods: Odd Days, M = 22.0, (SD = 16.6); Even Days, M = 21.2 (SD = 17.4). Finally, the standard error of measurement for the mean daily rate of noncompliance, based on the uncorrected, Odd/Even reliability coefficient, was determined to be 0.6.

A final look at noncompliance and age was available through the age correlation with the mean daily rate of noncompliance. Ages ranged from 2.0 to 5.9, while the noncompliance rate ranged from 0.5 to 12.3 per day. The correlational analysis yielded, $r = -0.23$, which was in the

hypothesized, inverse direction (i.e., older children should display lower rates of noncompliance), but the correlation did not reach traditional levels significance.

The correlation between the mean daily rate of noncompliance and the CBCL Aggressive Behavior Subscale standard scores was also insignificant, $r = .18$, *n.s.* However, the standard deviation of the obtained T-scores was 3.6, relative to the expected standard deviation of 10 that might have been achieved were the full range of CBCL T-scores collected. Since the CBCL Aggressive Behavior Subscale range was intentionally restricted (i.e., to scores of 64 or lower), a correction for the range restriction on the predictor (CBCL) was performed (Gullicksen, 1950, p. 137). The corrected correlation, $r = .45$ (df = 38), was significant at $p < .01$.

Analysis of Probability of Daily Noncompliance

Given the American Psychiatric Association's diagnostic criteria for Oppositional Defiance Disorder, daily occurrence probability data (one or more recorded acts of noncompliance on a given day) were evaluated for children in all four age groups. See the data in Table 7. Behavior Record Card observations tracked occurrences of noncompliance on a daily basis, making this analysis possible. A probability statistic was generated by dividing the number of days on which one or more acts of noncompliance were present by the total number of days of observation. An analysis was conducted using an independent samples *t*-test by combining the younger children (Groups 1 & 2) and comparing them to the older children (Groups 3 & 4). As was true for mean daily rate of noncompliance, this analysis failed to detect an age group effect on the mean probability of days with one or more noncompliant acts $t(38) = 1.66$, *n.s.* Of importance is the high occurrence probability of days with one or more noncompliant acts ($p = .92$ for younger children and $p = .85$ for those above age 4.0 years).

Table 7

Days in which 1 or more Noncompliant Acts Occurred

Group Age	**2.0-3.9**		**4.0-5.9**		**t-test**
Group N	20		20		
Probability of Days with 1+ Noncompliance					$t(38) = 1.66$, *ns*
Mean	0.92		0.85		
(SD)	(0.12)		(0.16)		
Range	0.5-1.0		0.4-1.0		
Group ID	**1**	**2**	**3**	**4**	**ANOVA**
Group N	10	10	10	10	
Probability of Days with 1+ Noncompliance					$F(3, 36) = 1.79$, *ns*
Mean	0.89	0.95	0.89	0.81	
(SD)	(0.14)	(0.10)	(0.18)	(0.12)	
Range	0.5-1.0	0.7-1.0	0.4-1.0	0.7-1.0	
Days Observed					$F(3, 36) = 2.8$, *ns*
Mean	14.6	14.9	15.1	15.0	
(SD)	(0.7)	(0.7)	(0.8)	(0.8)	
Range	14-15.5	14-16	14-16	14-17	
DSM-5 Group Age	**2.0-4.9**		**5.0-5.9**		**t-test**
Group N	30		10		
Probability of Days with 1+ Noncompliance					$t(38) = 2.06$, $p < 0.05$
Mean	0.91		0.81		
(SD)	(0.14)		(0.12)		
Range	0.4-1.0		0.7-1.0		

Similarly, the analysis of variance performed to detect differences across the four age groups for probability of days with one or more noncompliant acts also failed to find a group effect, $F(3, 36) = 1.79$, *n.s.* Again, the importance in this second analysis is the high daily mean probability of occurrence found in each of the four age groups, which were .89, .95, .89, and .81 for Groups 1, 2, 3, and 4 respectively. Specifically, there were no differences across age groups of children who are 2, 3, 4, or 5 years of age, which is relevant to the DSM-5 diagnostic criteria discussed below.

A final analysis was performed for probability of days with one or more noncompliant acts comparing the DSM-5 "under 5 – over 5" age groups. The "over 5" group (n = 10) was found to have a significantly lower probability of days with one or more noncompliant acts (mean $p = .81$) than the "under 5" group (n = 30) (mean $p = .91$), $t(38) = 2.06$, $p < 0.05$.

DISCUSSION

Adequacy of the Sample of Participants

Forty-four families, 40 of which completed the project, were recruited. The sample was predominately comprised of young, married families with parents of European-American decent, and with mid-level social economic status. The PP who collected BRC data in the home were virtually all females. Child participants were balanced for sex, typically possessed at least one sibling, and usually occupied the first or second ordinal position among the siblings. This was a sample of convenience, based on volunteers who met inclusion criterion. Participants were not selected at random from the larger population and, consequently, cannot be considered representative of the larger population of families in Southeastern Idaho with typically developing 2-6 year old children. This project yielded similar demographic profiles to families participating in prior research at ISU that used a laboratory measurement of compliance probabilities across the same age range (Brumfield & Roberts, 1998). As in the Brumfield and Roberts (1998) sample, screening procedures made certain that the sample included only children who could pass a language screening test and whose parents perceived normal levels of social aggression on the Child Behavior Checklist. These procedures were adequate to ensure that children included in the study were not perceived as abnormal on the social aggression dimension, nor at risk for delayed language development. In addition, children with existing mental health or a developmental disability diagnoses were excluded. The sample is considered satisfactory for its intended purpose.

Primary Hypothesis

It was expected that a child's mean daily noncompliance rate in the home setting would be lower in children between the ages of 4.0 and 5.9 than in children between 2.0 and 3.9 years

of age. This hypothesis was not supported, despite very high child reliability of noncompliant responding during the two week interval. Indeed, the findings were inconsistent with laboratory research on compliance probabilities conducted with a similar sample some years ago (Brumfield & Roberts, 1998). Figure 1(a-b) was designed to illustrate the differential findings between the two projects across similar age groups. Partial support for the primary hypothesis was provided by the finding that the 5.0-5.9 year group did yield a significantly lower mean daily rate of noncompliance (M = 2.1) than the combined groups of 2.0 to 4.9 year olds (M = 3.9).

There are several reasons that might explain why the current project failed to support its primary hypothesis. At the most macro-level, the current project investigated the rate of noncompliance as it occurs naturally in the home setting (i.e., an ecologically valid measurement of noncompliance) over the course of two weeks. In contrast, Brumfield and Roberts (1998) measured compliance percentages during a single session in a laboratory setting using the Compliance Test (Roberts & Powers, 1988). Specifically, the laboratory measurement structured 30, two-step instructions (e.g., "Pick up X; Put it in/on Y") by way of a radio-controlled "bug-in-the-ear" device such that the parent received immediate guidance for each instruction they gave their child. Compliance with such 1-step motor tasks, specified by a direct verbal instruction accompanied by close parental proximity, a gesture, and a post-instruction pause (up to 5-seconds) has been demonstrated to be within the linguistic and motor abilities of normal 2-year olds. Two-year olds may not chose to obey, but the response is within their repertoire. The Compliance Test methodology allowed for the computation of a percent compliance (from 0% to 100%), since the number of compliant acts could be divided by a known number of instructions (in this case, 60). In contrast, noncompliance measured in the current project in the home by

Noncompliance Rates in the Home

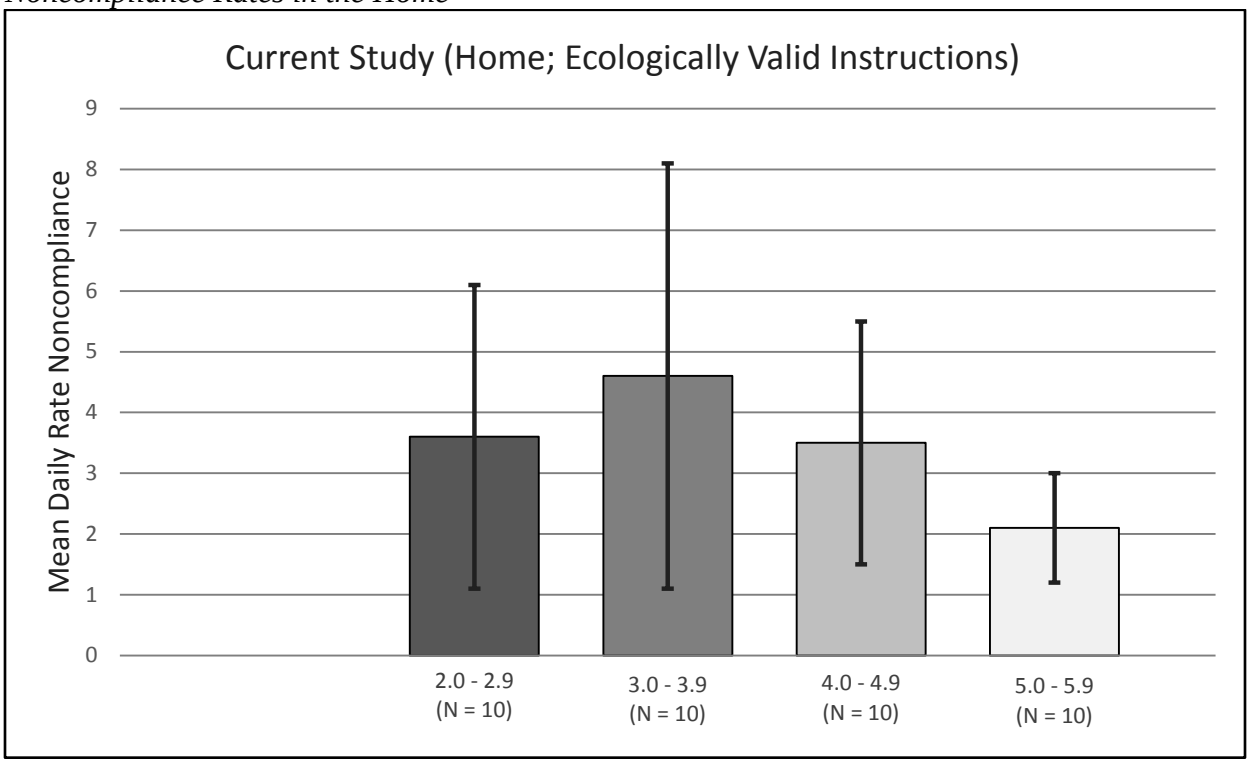

Figure 1a.

Compliance Probabilities in the Laboratory

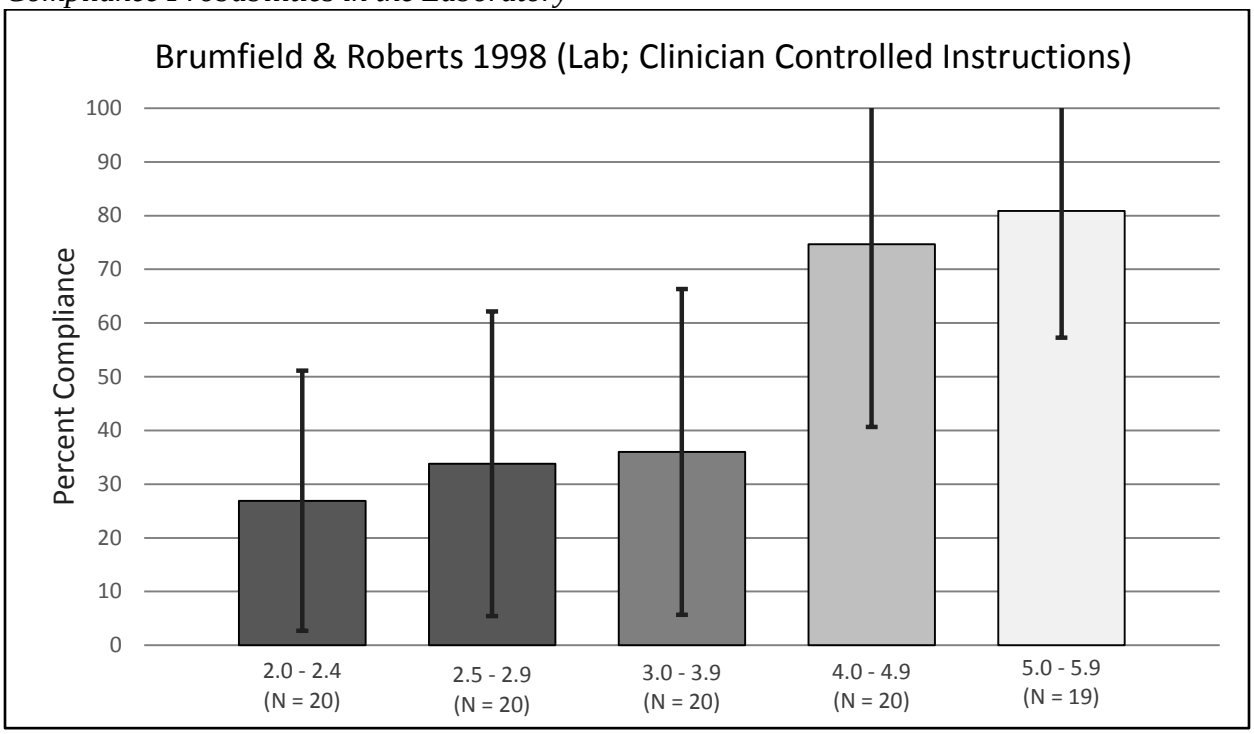

Figure 1b.

parents using the BRC technology was restricted to the rate of noncompliance occurrences per day. The noncompliance rate data makes no pretense of assessing the number of times a child might have complied with parent instructions, which precludes a compliance probability as in Brumfield and Roberts (1998). Training parents to code all instructions given to the target child in the home and all acts of child compliance to those instructions in the home would have dramatically altered the parental instruction style, sacrificing the ecological validity of the noncompliance rate data. Consequently, no effort was made to interfere with the PP's interaction style, precluding a compliance probability measurement in the home.

Counting the number of problem behaviors in the home during assessments is traditional and an essential component of clinical assessments that lead directly to both diagnostic conclusions and intervention recommendations. Were the mean daily rate of noncompliance in the home found to approach zero, interventions designed to reduce noncompliance would not be considered, regardless of a child's compliance probability during a laboratory test. Indeed, the validity of the laboratory test would be greatly diminished were the correlation between the noncompliance rate data and the laboratory Compliance Test found to be insignificant. Such a study has never been done. Importantly, the current diagnostic code offered by the American Psychiatric Association in the DSM -5 emphasizes the presence of noncompliance as a symptom. Consequently, the mean daily rate of noncompliance is consistent with diagnostic strategies relevant to the DSM-5. In contrast, compliance ratios vary with development, ranging from low to high consistent with age (Brumfield & Roberts, 1998); see Figure 1b.

In addition to the macro differences between the current project and the Brumfield and Roberts (1998), there are several micro-level distinctions between the two methodologies. These

dissimilarities might account for the failure to find the hypothesized declines in the rate of noncompliance for children after the age of 4.0 years. These differences include sample size, coding accuracy, setting effects, and instruction qualities, any or all of which may have adversely contributed to the failure to support the hypothesized decline in noncompliance rates after age 4.0 years.

First, Brumfield and Roberts (1998) evaluated 99 families from five different age groups in their cross-sectional study of compliance probability in a laboratory setting. In contrast, the current project was limited to 40 families from four different age groups. See Figure 1 for sample sizes of each age group. Lower statistical power may be an important factor in why the current results did not extend the earlier finding that compliance probabilities dramatically increased after age 4.0. It is reasonable to infer that if compliance probabilities increased after age 4, that noncompliance rates would decline after age 4. The possibility of a Type II error is present, given differential statistical power across the two projects, although not certain. Increasing the sample size to at least the level of Brumfield and Roberts (1998), which was 20 per age group, would be needed to adequately explore the possibility that the current findings are simply a reflection of a lack of statistical power. Alternatively, it could be that noncompliance rates in the home of typically developing children do not shift dramatically after age 4. After all, noncompliance rates were relatively low in both the 2.0 to 3.9 age groups (i.e., 4.1 per day) and the 4.0 to 5.9 age groups (i.e., 2.8 per day), relative to the presumed number of instructions issued to young children by parents each day, which could indeed number in the hundreds. Such low base rates of noncompliance in the home may be viewed as perfectly normal and acceptable to parents of 2- to 6-year olds in the sample, and was surely managed by the parent when noncompliance did occur. For example, parents might manage noncompliance with

physical prompts, or reducing the task difficulty, or simply abandoning such instructions for that child in that context in the future.

Second, the current project trained parents how to detect and record noncompliance during a 30 minute training session at the beginning of the 2-week data collection period, as per the Nadler and Roberts (2013) protocol. How accurately these parents actually coded noncompliance in the home is unknown. Poor accuracy may account for the failure to support the hypothesized decline in noncompliance rates. Parents were aware that there was no mechanism in place to evaluate the accuracy of their home coding. In contrast, Brumfield and Roberts (1998) used rigorously trained professionals to detect and code compliance in the laboratory. The current project limited its accuracy estimates to a parent's ability to detect and code noncompliance on a standardized video following completion of home coding. It is important that these accuracy data were acceptable, averaging 90% agreement. In addition, prior research has indicated that parents can accurately code noncompliance in the home following training (Nadler & Roberts, 2013). Nevertheless, there was no procedure in the current project to quantify the accuracy of parental coding in the home, which may have adversely contributed to the failure to find the expected decline in noncompliance rates.

Third, Brumfield and Roberts (1998) conducted their research exclusively in a laboratory setting, whereas data collection for the current project took place in the home. The differences in setting effects are dramatic and may have accounted for the failure to support the primary hypothesis. Home setting effects are likely to include variables such as the presence and number of siblings, the presence and number of non-familial playmates, the activity requirements of the social context (e.g., free play, meals, car trips, bedtime, dressing, bathing, etc.), restrictions or access to specific material reinforcers (e.g., toys, electronics), and a multitude of other unknown

variables present in the home. Any or all of the home setting variables are likely to influence the presence or absence of noncompliance by children. Further, there may have been variables germane to the home setting which would compete for the parent's attention, thus precluding them from effectively managing noncompliance or accurately detecting and coding noncompliance. Such parenting distractions might include, but are not limited to: 1) necessary parental activities, such as meal preparation, shopping, household chores, transportation of children to activities, and maintaining safety; 2) demands on the parent's attention from other siblings or the spouse and their immediate needs; 3) the demands of adult employment when at home or family leisure activities. Any or all of these events may influence a parent's management of child compliance (e.g., the type of instruction issued, if any, and the importance of child compliance at the moment to the caregiver). Importantly, any attempt by social scientists to control these many setting variables would compromise the ecological validity that was sought by the BRC home data collection methodology.

Forth, instructional quality differences between the home setting and Brumfield and Roberts' (1998) laboratory measurement may have contributed to the failure to support the hypothesized decline in noncompliance rates. Several difference are likely. Instructions given by parents in the home might include tasks that require a child to cease on ongoing misbehavior (i.e., "Stop doing X."). Parents may have included multiple tasks within a single verbal utterance (e.g., "Do X and then Y."). Sustained effort tasks that must be performed in the absence of a parent are also distinctly different from the type of instruction given in the lab setting (e.g., "Pick up all the toys you left in the living room."). Finally, parents are very likely to adjust the quality of the instructions they give to their children based on the child's developmental level and the history of their child's compliance with those specific instructions.

Implications of the Noncompliance Occurrence data for DSM-5 Diagnoses

Results from analyses on mean daily rates of noncompliance are relevant to the diagnostic rules offered by the American Psychiatric Association (APA) for the diagnosis of Oppositional Defiance Disorder (ODD). The DSM-5 specifies that the criteria for a diagnosis of ODD can include the symptom of noncompliance (Symptom "A5"). Four of the eight listed symptoms must be present for a clinician to consider the diagnosis of ODD. No distinction is made regarding the rate or probability of noncompliance by the APA, only that it "occurs" (i.e., one or more times). Consequently, Table 7 was constructed to display the probability of days with one or more occurrences of noncompliance across the four groups. The APA manual does suggest that the "frequency" of symptomatic behaviors should be used to distinguish behavior that is within normal limits from behavior that is symptomatic. However, frequency is defined by the APA not as a rate per unit time (e.g., "days" in the current project), but by the number of days of occurrence. In the case of ODD, the DSM-5 code makes a specific distinction between children who are 5-years old versus those who are younger. Specifically, for children younger than 5 years of age, "…active defiance or refusal to comply with requests [noncompliance] from authority figures [parent]…should occur on most days and for a period of at least 6 months." Further, for children 5 years or older, the symptom of noncompliance "…should occur…at least once per week…for a period of at least 6 months". These statements are meant to operationally define the "frequency" that constitutes symptomatic levels of noncompliance. Because the DSM-5 neglects to specify an operational definition of "most days" for children under age 5, it is incumbent on professionals to interpret this term. Arguably, but quite reasonably, "most days" can be considered to be more than half but less than all of the days observed. Consequently, the

Observed Noncompliance Compared to DSM-5 Criteria

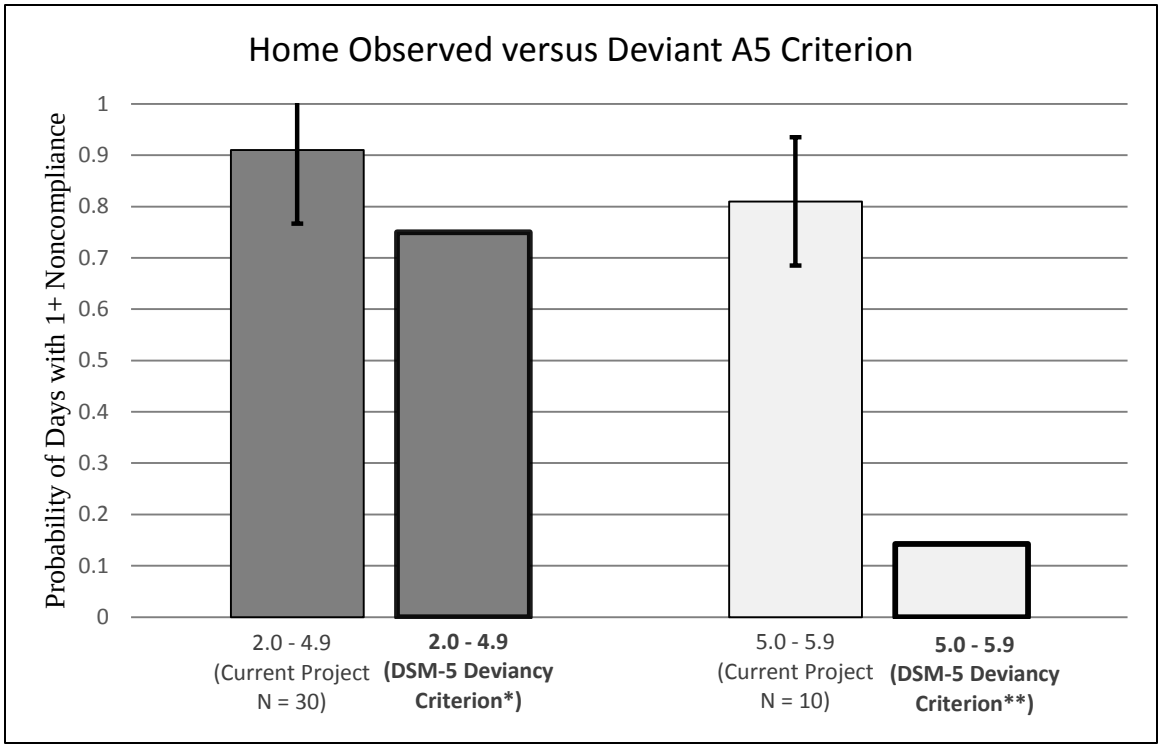

Figure 2. *Per DSM-5 “most days” is the suggested symptomatic levels for Criterion A5 In the “under 5” group. **Per DSM-5 “once per week” is the suggested symptomatic levels for Criterion A5 in the “over 5” group.

threshold of 0.75 days with one or more noncompliance occurrences was adopted to define the DSM-5 criterion for symptom deviance for the 2.0 to 4.9 age group. Comparatively, the DSM-5 specifies an operational definition of noncompliance for children over age 5 as "at least once per week". This allowed the threshold of 0.14 days with one or more noncompliant acts to define symptom deviance for the 5.0 to 5.9 age group. The data presented in Table 7 are germane to the distinctions presented in DSM-5. Specifically, Table 7 provides group means (as well as standard deviations and ranges) for the probability of days with one or more noncompliant acts (i.e., one or more occurrences of symptom A5). Further, Figure 2 provides a comparison between the sample of typically developing children in this study and the APA manual's criteria for symptomatic levels of misbehavior in the population. Notably, only two out of the 40 children in the current project displayed daily occurrence probabilities for noncompliance below the DSM-5 threshold for symptomatic behavior. Indeed, the mean probability of days with 1 or more noncompliant acts ranged from $.81 < p < .95$ across all age groups.

The APA distinction between children under age 5 and those over age 5 warrants additional comment. Twenty-eight out of 30 children between 2.0 and 4.9 years of age met our definition for the occurrence of noncompliance on "most days". Further, all children ages 5.0 to 5.9 met criteria for the APA manual's criteria of "…at least once a week". Clearly, the occurrence of noncompliance as set forth by the DSM-5 does not appear to be an adequate distinction for diagnosing symptomatic levels of noncompliance among these age groups. Indeed, the "symptom" occurred virtually every day in nearly every child participating in this project. Moreover, these typically developing children had never been referred to a professional for an evaluation of externalizing disorders, nor are they likely to be referred, given their normal scores on the Social Aggression dimension found on the CBCL. Our own data do provide some

empirical support for the “under 5 - over 5” distinction offered by the APA. Specifically, when we compared just 5-year olds to the three younger age groups, the 5-year olds year olds displayed an average daily rate of noncompliance (2.1/day) which was about half the mean daily rate for the 2.0 to 4.9 year olds (3.9/day). Statistical problems may qualify this analysis, but the finding warrants replication.

The DSM-5 standard for a diagnosis of ODD requires four out of a possible eight symptoms to be present. Criterion A5, noncompliance, is just one of these symptoms. A5 was the only symptom evaluated by the current study, and it was evaluated for a 2-week period, rather than the APA criteria of 6 months. The remaining seven symptoms have yet to be investigated with regard to any metric of rate, probability, or daily occurrence. This creates an issue for professionals using the ODD code when diagnostic criteria rely heavily on interview information and parent beliefs expressed on standardized questionnaires like the CBCL. Direct observation of child externalizing behaviors in clinic laboratory analogs (Brumfield & Roberts, 1998) and parent collected symptom frequency in the home (Nadler & Roberts, 2013, as well as the current project) are not widely used. Objective, representative, normative data based on lab probability data and/or home symptom counts do not exist. Clearly, a better approach for clinical scientists to measure symptomatic deviance is to embark upon the daunting and expensive, but ultimately necessary methodologies to collect normative data on the scale currently in use for cognitive measurements (i.e., neuropsychology). First, large representative samples of children at different developmental levels would be needed to obtain normative data, based on objective measurements. Consistent with neuropsychological measurements (e.g., Intelligence Tests, Achievement Tests, etc.), one standard deviation above the mean for symptomatic behavior would constitute a “borderline” score, while two standard deviations

above the mean would be evidence of "clearly deviant" levels of a specific act of social deviance. Using the "DSM-5 Group Age" data from Table 6 and a one standard deviation criteria, "borderline" levels of noncompliance rate in the home for children between 2.0 and 4.9 years of age would be a mean daily rate of 6.6 or higher, whereas a "borderline" rate of noncompliance for 5.0 to 5.9 year olds would be 3.0 or higher. Clearly deviant levels (i.e., two standard deviations above the mean) would be 9.3 per day for the under-5 age group and 3.9 per day for the over-5 age group. Note that these thresholds would be impacted by the standard error of measurement (0.6), which in the case of 5-year olds would elevate the symptom criteria to 4.5 per day or higher. It is clear that adequate normative research would require stratified random sampling to identify representative "borderline" and "clearly deviant" rates of noncompliance in the home across relevant demographic and age groups. This is a huge task. Nevertheless, such efforts would greatly contribute to our knowledge of assessing deviance in the 2- to 5-year old, referral population.

Future Directions

Based on current findings, a reasonable next project could be designed to address identified problems and to extend current findings. First, by increasing the sample size from 10 to 20 per age group a future researcher could address issues with statistical power that may have limited the current results. Second, the BRC noncompliance rate per day at home and the laboratory Compliance Test could be combined to allow a study of the concurrent validity of compliance probabilities assessed in the laboratory, with an ecologically valid measure of symptom frequency in the home. Third, it might be possible to arrange conditions in the home to yield an objective compliance ratio without sacrificing the ecological validity. For example, a future researcher could utilize modern technology (e.g., cellphone-based video capture) to record

child compliance to parent instruction in a condition nominated by the parent from a predetermined list of common home interactions between the parent and child (e.g., getting ready for bed). A trained coder could then review the video recordings and objectively code both instructions and compliance, thus yielding a compliance ratio. A fourth variable that should be considered is ethnicity. It could well be that Euro-American families and Hispanic-American families, both of whom reside in SE Idaho, might differ in the anticipated decline in noncompliance rates at home across the 2- to 5-year period. These three methodological enhancements (sample size, the inclusion of the Compliance Test, and the inclusion of two ethnic groups) would constitute a worthy and feasible next step in the effort to objectively measure child compliance and/or noncompliance using cross-sectional designs. Efforts to use a stratified, random sample from a larger population is beyond the scope of dissertation research, but ultimately will need to be addressed.

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Appendix A

Idaho State University
Human Subjects Committee
Informed Consent Form for Non-Medical Research

CONSENT TO PARTICIPATE IN RESEARCH

You are asked to participate in a research study conducted by Brian J. Livesay, B.S., and Mark Roberts, Ph.D., at Idaho State University. The results from this study will be used to complete research for a thesis. You have been asked to participate in this research because you have a child between 2.0 and 6.0 years who is developing normally. This research project will evaluate forty families. Your participation in this research project is voluntary. You should read the information below, and ask questions about anything you do not understand, before deciding whether or not to participate.

1. **PURPOSE OF THE STUDY**

The proposed project is designed to measure noncompliance in the home setting of normally developing children between 2.0 and 6.0 years of age. Additionally, if a sibling older than 2.0 and within 4.0 years of the primary child is present, sibling aggression will also be measured. The purpose of the study is to quantify changes in noncompliance and aggression in normally developing children between the ages of 2.0 and 6.0 years in the home setting.

2. **PROCEDURES**

If you volunteer to participate in this study, we would ask you and your child to do the following things:

I. Check and complete a demographic questionnaire about you and your family (most of which has already been completed over the phone).
II. Allow your child to be given a language screening test (about 10 minutes).
III. Complete a brief questionnaire about your child's behavior problems, the Child Behavior Checklist (about 10 minutes).
IV. If found to be eligible for the project (normal language development and normal behavior problems), then participate in training to identify and record child noncompliance in the home using the Behavior Record Card system, and possibly training in recording sibling aggression (about 25 to 45 minutes depending on the need to train for sibling aggression). If your child does not pass either screening test (Language screening and/or parent questionnaire regarding child behaviors), we will discuss your options, including referral for a thorough evaluation by a local provider.
V. Record occurrences of noncompliance (and possibly sibling aggression) that you observe in the home over the next two week on Behavior Record Cards. During this time there will be one phone check approximately one week into the data collection

process. Noncompliance data you will be gathered and your questions will be addressed.

VI. Return to the ISU Psychology Clinic with your Behavior Record Cards and complete a brief coding accuracy check on child noncompliance and sibling aggression (about 30 minutes).
(Note: Children need not attend the second meeting).

3. **POTENTIAL RISKS AND DISCOMFORTS**

I. Screening Devices

There are no known risks to your child associated with the demographic questionnaire, the language screener, or the Child Behavior Checklist.

II. Training

Learning how to identify and record child noncompliance and sibling aggression requires 25 to 45 minutes (25 minutes if only noncompliance training).

III. Data Collection

Recording child behavior without child awareness is a necessary part of this research. If children were informed that parents were recording, they may change their behavior and, thereby, distort the assessment process. To learn about the children's current behavior, no changes in the parent's management style should occur, and that would include any child perception of parent recording of their behavior. There are no known risks associated with a parent recording the normative problem behaviors of children.

IV. Unforeseen Risks

The research procedures may involve risks that are currently unforeseeable.

4. **ANTICIPATED DIRECT BENEFITS TO SUBJECTS**

There is no likelihood that participants will benefit directly from their participation in the research. You have the right to refuse participation in this research study.

5. **ANTICIPATED BENEFITS TO SOCIETY**

It is important to society for researchers to identify effective assessment methods for typical behavior problems that arise during normal childhood development. Accurate parent reports help clinicians appropriately diagnose and treat problems of aggression and/or noncompliance. The data collected in this project will further scientific knowledge about the normal process of developmental change in noncompliance and sibling aggression during the 2.0 to 6.0 year period.

6. **ALTERNATIVES TO PARTICIPATION**

If you choose not to participate, you can:

I. Fulfill your class research participation obligations in another way.

II. Withdraw participation at any time with no penalty.

7. **PAYMENT FOR PARTICIPATION**

I. Based on your referral source (undergraduate psychology class or community volunteer), you will receive one of the following forms of compensation for participation:

A. If you are currently enrolled in an undergraduate psychology class at ISU, you will receive course credit for the time spent in both sessions (1 SONA credit for each 30 minutes; 4 SONA credits for completion of home observations and both sessions; 1 SONA credit if ineligible).

B. If you are a community volunteer, you will be paid $30 for completing the two research sessions, home data collection, and home phone check. You will be paid by check at the end of the second session. If your child is found ineligible following screening tests, you will be compensated $10.

C. Children will be able to choose a small prize from the Clinic Store upon completion of the language screening test.

8. **PRIVACY AND CONFIDENTIALITY**

All records and information collected during this project will be kept confidential in accordance with the ISU Human Subjects Committee research standards. Only this consent form will contain your name, and this consent form will not be linked in any way to the research data obtained by your child's participation. The only people who will know that you are participating in research are members of this research team. No **identifying** information about you, or provided by you during the research, will be disclosed to others without your written permission, except (a) if necessary to protect the rights or welfare of any party (for example in the event of injury), or (b) if required by law. When the results of the research are published or discussed in conferences, no information will be included that would reveal your identity. After project completion research data will be maintained for 5 years at a minimum and then destroyed. If published, the raw data will be maintained for a 5 year post publication period. Research data are de-identified (your name or child(ren)'s names will not appear) and will be locked in the archive file room at the ISU Psychology Department.

9. **PARTICIPATION AND WITHDRAWAL**

Your participation in this research is VOLUNTARY. If you choose not to participate, that will not affect your relationship with Idaho State University, or your right to receive services at Idaho State University to which you are otherwise entitled. If you decide to participate, you are free to withdraw your consent and discontinue participation at any time without prejudice to your future at Idaho State University.

10. **WITHDRAWAL OF PARTICIPATION BY THE INVESTIGATOR**

The investigator may withdraw you from participating in the research if circumstances arise which warrant doing so. Conditions that will prevent you from participating in this research project include if your child is diagnosed with Intellectual Disability, Autism Spectrum, and or another pervasive developmental disorder. Also, participation is prevented if the child does not score in the normal range on the Child Behavior Checklist or the language screening test. If you have knowledge that would prevent you from participating in both sessions and the phone check session, we would require you to withdraw from this study. The investigator (Brain Livesay or Mark Roberts) will make the decision and let you know if it is not possible for you to continue. The decision may be made either to protect your health and welfare, or because it is part of the research goal to evaluate differences in noncompliance and sibling aggression in normally developing children between 2.0 and 6.0

If your child does not meet eligibility requirements, you will be paid $10 for your participation in the initial session or 1 SONA credit.

11. **IDENTIFICATION OF INVESTIGATORS**

In the event of a research related injury or if you experience an adverse reaction, please immediately contact one of the investigators listed below. If you have any questions about the research, please feel free to contact the following persons Monday – Friday 8am-5pm:

Brian Livesay (208)761-4712
Idaho State University
Department of Psychology
Campus Box 8112
Pocatello ID, 83201

Mark Roberts (faculty advisor) (208)282-2462
Idaho State University
Department of Psychology
Campus Box 8112
Pocatello ID, 83201

12. **RIGHTS OF RESEARCH SUBJECTS**

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have any questions regarding your rights as a research subject, you may contact the Human Subjects Committee office at 282-2179 or by writing to the Human Subjects Committee at Idaho State University, Mail Stop 8130, Pocatello, ID 83209.

SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE

I have read (or someone has read to me) the information provided above. I have been given an opportunity to ask questions, and all of my questions have been answered to my satisfaction. I have been given a copy of the informed consent form.

BY SIGNING THIS FORM, I WILLINGLY AGREE TO PARTICIPATE IN THE RESEARCH IT DESCRIBES, INCLUDING GIVING CONSENT FOR MY MINOR CHILD(REN) TO PARTICIPATE.

_____

Printed Name of Parent or Guardian

_____ _____

Parent or Guardian's Signature **Date**

_____ _____

Witness's Signature **Date**

Appendix B

Intake Form

1. Parent

Age _____
Gender _____
Education completed _____
Occupation _____
Race/Ethnicity _____ (optional)
Religious Affiliation _____ (optional)

Partner/Spouse

Age _____
Gender _____
Education completed _____
Occupation _____
Race/Ethnicity _____ (optional)
Religious Affiliation _____ (optional)

2. Marital Status: _____

3. List all children in household from **Youngest** to **Oldest** (use back of paper if necessary).

Name	DOB	Age	Gender	Grade
i.				
ii.				
iii.				
iv.				
v.				

4. Have any of your children been diagnosed with Intellectual Disability Disorder (formerly Mental Retardation) or Autism Spectrum Disorder or receive any special services?
NO YES ➔ If yes, circle the child's or children's name(s).

5. Home Address:
_____
_____
_____

6. Contact Information:
Phone Number: _____

Researcher Use:
- Referral Source: SONA Community
- Language Screen: _____
- Phone check time/date: _____ Researcher: _____
- Follow-up Session time/date: _____ Researcher: _____

Appendix C

Parent Handout – Behavior Record Card (BRC)

1. Noncompliance: a child response that is inconsistent with the twice repeated adult instruction to "start" or to "stop" a specific action that should be performed or inhibited in that immediate setting right then.

Examples:

a. Suzie disobeys 2 repeated instructions to pick up her toys: **code one** tally mark for Suzie under noncompliance on the BRC;

b. Johnny disobeys 6 repeated instructions to stop yelling while Mom's on the phone: **code three** tally marks for Johnny under noncompliance on the BRC;

c. Suzie disobeys 3 instructions to pick up her toys; Dad leaves and returns a few minutes later, repeating the same instruction 2 more times; she continues to not listen:
code two tally marks for Suzie under noncompliance on the BRC;

d. Johnny disobeys three repeated instructions to "come here" and then disobeys two instructions to "leave Suzie alone": **code two** tally marks for noncompliance on the BRC.

DO NOT code noncompliance if your instruction involves:

A Child Choice or A Parent Suggestion (no parent demand for compliance)

A Future Requirement (reminder of something to be done later or in another setting)

2. Aggression: any intentional act of hitting, kicking, biting, pushing, spitting, pinching, throwing objects or other physical acts that could hurt the sibling

Examples

a. Johnny pushes Suzie: **one** tally mark for Johnny under aggression on the BRC;

b. Johnny and Suzie fight over toy: **one** tally mark for Johnny AND **one** tally mark for Suzie under aggression on the BRC;

c. Suzie yells in anger at Johnny: **no** tally marks (not physical);

d. Johnny and Suzie argue angrily over a disagreement: **no** tally marks (not physical);

e. Johnny teases Suzie by repetitively touching her shoulder: **no** tally marks (not hurtful).

General Coding Instructions

1. Whenever a child acts aggressively or disobeys two repeated instructions, make tally mark(s) in the appropriate column for the appropriate child(ren). If noncompliance or aggression occurs in community settings or in your vehicle, please insert tally marks upon your return to home.
2. Be sure to manage your children's misbehavior as you normally would.
3. Please DO NOT tell your children that you are keeping track of their behavior.
4. Your one-week phone call is scheduled for _____ at _____. The clinician/researcher will collect Week 1 BRC data and answer any questions about the recording process. You will then be asked to use the Week 2 BRC provided to you.

Placement of the BRC in your home

If your child(ren) is under age 4 (2-3 years old), PLEASE ATTACH THE BRC ON THE REFRIDGERATOR. If your child (ren) is over age 4, please place the BRC elsewhere in the kitchen or some common location where you will see it every day, but your child is UNLIKELY TO NOTICE. Please do not remove the BRC from your home until your return to the Clinic

Cy Nadler, Ph.D., & Mark Roberts, Ph.D.
Idaho State University Psychology Clinic

Revised January 2016

Appendix D

Behavior Record Card Case #:_____

Next Appointment:_____

1) Record (tally) every instance of noncompliance and of aggression you observe when you are with your child (home, community, car, etc).

2) Manage your child's disobedience and aggression as you normally would.

3) DO NOT REMOVE the BRC from your home. Record community episodes UPON RETURN.

	NAME:		**NAME:**	
Date	**Disobey**	**Aggression**	**Disobey**	**Aggression**

NOTE: Disobey = Refuse despite 2 good instructions
Aggression = Hit, kick, bite, push, spit, or pinch; Intentional toward sibling

Appendix E

BRC Training: Noncompliance

Client _____ Date_____

Trainer_____ This is the client's _____ attempt at master

Practice scenarios (17)

1. Client checks category on sample BRC (use Day 1 row)
2. Trainer discusses coding briefly. Pause tape as needed.

Correct Codes

1	**Disobey (both)**	6	No code (future)	11	No code (future)	16	**Disobey**
2	No Code Obey	7	**Disobey**	12	No Code Obey	17	No Code Obey
3	No Code (future)	8	**Disobey**	13	No code (future)		
4	No Code Obey	9	**Disobey**	14	No Code (choice)		
5	**Disobey (both)**	10	No code (choice)	15	**Disobey (both)**		

Test scenarios (20)

1. Client marks on sample BRC for every occurrence (use Day 2 row)
2. Trainer records if parent report` is correct (+/-_ for scenario
3. Trainer gives feedback for errors only; followed by replaying the scenario, discussing the correct code and rationale
4. If more than 4 errors are made, the 20 scenarios will be replayed with incorrectly coded scenarios managed as above. Use a new BRC until mastery (> 80%) is demonstrated.

Scenario	Code	Correct	Error	Scenario	Code	Correct	Error
1	No Code (Obey)			11	No Code (choice)		
2	**Disobey**			12	No Code (choice)		
3	No Code (Obey)			13	**Disobey**		
4	**Disobey (both)**			14	No Code (Choice)		
5	No Code (Choice)			15	No Code (Obey)		
6	No Code (Obey)			16	No Code (Obey)		
7	No Code (Future)			17	No Code (Obey)		
8	No Code (Obey)			18	**Disobey**		
9	**Disobey**			19	No Code (Obey)		
10	No Code (Obey)			20	No Code (Obey)		

Total Errors _____

Appendix F

BRC Training: Aggression

Client_____ Date_____
Trainer_____ This is the client's _____ attempt at mastery

Practice scenarios (15)

1. Client marks on sample BRC (use Day 1 row).
2. Trainer discusses coding briefly. Pause tape as needed.

Correct Codes

1	No Code (Table)	6	No Code (b-room)	11	No Code (game)
2	No Code (Hall)	7	**Aggression (both)**	12	**Agg (older boy only)**
3	No Code (B-room)	8	No Code (couch)	13	No Code (bed)
4	No Code (Bed)	9	**Aggression (both)**	14	No Code (b-room)
5	**Aggression (both)**	10	**Agg (younger boy only)**	15	**Aggression (both)**

Test Scenarios (22)

1. Client marks on sample BRC for every occurrence (use Day 2 row).
2. Trainer records if parent report is correct (+/-) for scenario.
3. Trainer gives feedback for errors only; followed by replaying the scenario, discussing the correct code and rationale.
4. If more than 5 errors are made, the 22 scenarios will be replayed with incorrectly coded scenarios managed (as above). Use a new BRC, until mastery (accuracy ≥ 80%) is demonstrated.

Scenario	Code	Scenario +/- ?
1	No Code (game)	
2	No Code (couch)	
3	**Aggression (both)**	
4	No Code (table)	
5	**Aggression (both)**	
6	No Code (Table)	
7	No Code (living-r)	
8	**Aggression (both)**	
9	No Code (couch)	
10	No Code (counter)	
11	No Code (room)	

Scenario	Code	Scenario +/- ?
12	**Agg (older only)**	
13	No Code (book)	
14	No Code (couch)	
15	No Code (room)	
16	**Aggression (both)**	
17	**Aggression (both)**	
18	No Code (game)	
19	No Code (truck)	
20	**Aggression (both)**	
21	**Agg (girl doll only)**	
22	No Code (car)	

Total Errors = _____

Appendix G

Participant # _____
Accuracy _____
Date _____
Administrator_____

Accuracy Test Procedures

"You have been keeping track of your child(ren)'s behaviors on the BRC for the past two weeks. Now, we'd like you to use that same system to track noncompliance (and possibly aggression) of the children on this video. We want to see how accurate you can be. The first 10 minutes include an older boy and a younger girl; the last 9 minutes include an older boy and a younger boy. I am allowed to remind you of who is who while the video is playing, however the video cannot be paused and I cannot answer any questions while we watch. Using the Behavior Record Card provided, do your best to keep track of all the noncompliance (and aggression) you see on the video, just as you have been with your own children. Any questions before we start?"

- Answer questions

Test

- Once the participant is ready, start the video
- Do not pause the video
- Point out who is who at the beginning of each 10 minute segment, and whenever requested by the participant (Do not answer any questions other than to identify who is who)
    - Tally:
- After the last segment is over, stop the video and proceed with paperwork/debriefing
- Record any other disruptions: