THE TRANSITIVE SEQUENCE OF DEVELOPMENT OF ANTISOCIAL BEHAVIOR IN EARLY CHILDHOOD: THE DEVELOPMENT OF DEVIANT TALK

A Dissertation by

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DEDICATION

To my husband, Jeremy, my daughter Bridget and my parents, Larry and Peggy,

for their unconditional love, support and understanding.

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ABSTRACT

The present study investigated the specific temporal progression, from less to more serious, that 5-6 year old children follow in their deviant talk and behavior during peer interaction. To investigate temporal progressions in deviant talk and behavior, the peer interactions of 267 children were videotaped at three different time points (fall, winter and spring) during the kindergarten school year. Each child's behavior during peer interaction at each time point was coded into several independent categories of deviancy reflecting different levels of severity. Transitional probability matrices describing temporal changes in both the severity and variety of deviant talk were calculated for the transitions from fall to winter, and from winter to spring. Analyses of these transitional matrices indicated at least some systematic changes in the variety and severity of deviant talk over time. A tendency to remain at the same level or to increase in severity and variety of deviant talk over time appeared to predominate over a pattern of regression in the severity and variety of deviant talk. The observed progressions were somewhat larger for boys than for girls, and occurred earlier in the year for boys than for girls. The present study indicates that the exchange of deviant talk or peer deviancy training occurs and is a dynamic social process as early as the beginning of elementary school. The findings support the potential preventive benefits of interventions that target child deviant talk and peer deviancy training well before the transition to adolescence.

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CHAPTER 1

INTRODUCTION

Research has clearly implicated the role of peers in the development of deviant behaviors (Loeber & Stouthamer-Loeber, 1998; Reid & Eddy, 1997; Patterson & Yoerger, 1999; Lauer, Akers, Massey, & Clark, 1982; Krohn, Lanza-Kaduce, & Akers, 1984; Patterson, Dishion, & Yoerger, 2000). Researchers have examined questions of the origins of such deviant patterns as well as the mechanisms by which peers promote deviant behavior. These studies have found peer reinforcement for talk about deviant behaviors increases the occurrence of such behaviors. This study investigates the sequence of the development of deviant talk.

Deviant talk entails discussions among peers about and endorsement of deviant activities such as lying, stealing, defiance of authority, rule breaking, and drug use. Deviant talk has been shown to be one factor that increases deviant behavior (Dishion, Spracklen, Andrews, & Patterson, 1996; Dishion, 2000). Specifically, this study seeks to examine whether deviant talk unfolds in a specific sequence over time within peer groups. The specific sequence of such talk remains largely unknown.

The trivial-serious hypothesis suggests that children who engage in more serious deviant offenses should also engage in higher rates of more trivial deviant offenses as well (Patterson, Reid & Dishion, 1992). When viewed in terms of deviant talk, the trivial-serious hypothesis suggests that children who are engaging in more serious forms of deviant talk will also be engaged in less serious forms of deviant talk. Moreover, this hypothesis clearly states that all those engaged in more trivial offenses do not go on to engage in more serious offenses, suggesting a similar sequence for the development of

deviant talk. In this study the specific sequence of deviant talk from more trivial, common forms of deviant talk to more serious, uncommon forms of deviant talk is examined.

Developmental Influences

Children experience a variety of influential relationships as they develop. Parents, siblings, peers, neighbors, teachers, and extended family all influence how children develop. There is evidence pointing to the importance of parental influence specifically, suggesting that parental factors are crucial in children's social development (Patterson, Reid, & Dishion, 1992). Parents have been found repeatedly to have a large impact on the development of antisocial and coercive behaviors such as lying or stealing, and prosocial behaviors such as cooperation and social play.

Patterson et al. (1992) state the repeated occurrence of coercive behavior during parent-child interaction serves as one path to the development of antisocial or deviant behavior. Coercive behaviors are utilized by primates and infants alike in some form (Patterson, 1982). Coercive behavior begins in the parent-child relationship as children utilize aversive behaviors in an attempt to change their immediate environment (Patterson et al., 1992). Crying is one such instance; the infant cries in an attempt to elicit some reaction from the caretaker. Once the reaction is satisfactory, the infant crying ceases (1992). As the child grows older, temper tantrums begin to occur. An effective parent teaches the child that temper tantrums are not the most effective method and begins to teach the child other skills and techniques to communicate needs and wants. Children of such parents should eventually attain the skills to use language rather than coercive behavior for this purpose.

A child may have parents who do not teach these noncoercive skills. In addition, they may have parents who themselves practice coercive techniques. Parents who do not teach noncoercive skills and parents who practice coercive techniques increase the likelihood that a child will continue using such coercive techniques. According to Patterson et al. (1992), it is when children persist in the use of such coercive techniques that they begin to have difficulty.

In addition to parental shaping of coercive patterns, some research indicates a link between maltreatment in early childhood and later antisocial behavior (Egeland, Yates, Appleyard, & van Dulman, 2002). A variety of other parenting factors also increase risk for child antisocial behavior, such as poor monitoring and supervision, lack of discipline, harsh discipline, low levels of involvement, unemployment, drug and alcohol use, domestic violence and child abuse (Loukas, Fitzgerald, Zucker, & Krull, 2003; Patterson, Reid, & Dishion, 1992). While the impact of parents on child development is compelling, there is also significant evidence to indicate an exclusive focus on parents as the main source of socialization provides an incomplete picture.

Research points to the contribution of a number of other relationships to child development. Cook, Herman, Phillips and Settersten (2002) purport that socialization during childhood is dependent on a variety of contexts and environments, including parents in the home environment and peers in the school environment. They found that the quality of each context promoted differing degrees of healthy and unhealthy development. Their research indicated that a variety of highly influential and prosocial relationships in a variety of contexts were important in the positive development of

children, illustrating the need for research which focuses on more than just parental socialization.

In addition to looking at parental influence specifically, Cook et al. (2002) also looked at the various ways schools, neighborhoods, nuclear families and peer groups positively influenced children during adolescence. They found that each group had positive influence on the child, but it was the cumulative social context, not each context individually, that was most important in influencing the child in a positive manner. However, other research points to the particular importance of a child's peer group in the development of both prosocial and antisocial behaviors (Harris, 1995, 1998). The following section will discuss the importance of peer relationships in the development of such behaviors.

Peer Relations

Peer relationships provide repetitive social learning experiences that are highly valued by children. As children mature, they move out of the family into neighborhood and school environments that provide children with increasing exposure to other children (Fabes, Hanish, & Martin, 2003). Experiences with peers are influential in promoting both prosocial behaviors and antisocial behaviors (Snyder, 2002). This research highlights the influence of peers on the development of antisocial behaviors.

Most research concerning the effect of peers on the development of antisocial behavior has focused on the development of such behavior during adolescence. However, Walker and Golly (1999) indicate that powerful risk factors and early manifestations of antisocial behavior may be found in children during both elementary and preschool. They state that risk factors for the development of antisocial behavior include: young children utilizing violence to solve problems, lack of respect for other's

rights, lack of social responsibility, lack of basic manners and social conventions, and lack of normative values. Lewin, Davis, and Hops (1999) found that risk factors for the development of antisocial behavior include peer rejection, aggression, withdrawal and low prosocial behavior. Both studies point to the important role of maladaptive peer interaction to the development of antisocial behavior.

Research repeatedly indicates that maladaptive behavior patterns, including patterns of aggression and withdrawal, increase the risk that a child will develop antisocial behaviors as they mature. Hinshaw and Lee (2003) describe the means by which peers contribute to this risk in terms of two distinct but connected developmental processes. Patterson et al. (1992) propose a more complex four stage model of the development of coercion.

Hinshaw and Lee (2003) hypothesize the first developmental process occurs as children exhibit and rehearse patterns of coercive behavior in the home environment. They hypothesize stage two of the process occurs as coercive behaviors learned at home are then sustained and amplified as the child uses these same patterns of coercive behavior at school.

In Patterson and colleagues' (1992) 4-stage model of the development of coercion, stage one begins as a "basic training." They propose that this stage occurs prior to adolescence, occurring in the home as family members "train" children. They believe this occurs when parenting strategies are ineffective, specifically citing poor discipline which shapes coercive patterns in which the child begins to find these patterns are effective in gaining rewards. This, they say, leads to the beginnings of child antisocial behavior and low social competence.

Patterson et al. (1992) propose stage two begins when the child enters school and the "social environment reacts" to the child's coercive strategies. They believe that children who have learned coercive patterns at home are at a very high risk of being rejected by peers with normative relational styles when they become involved in coercive exchanges with peers and teachers. Patterson and Yoerger (2002) agree, stating that a "child's coercive interpersonal style leads to rejection by many normal peers." In addition, children who have been reinforced for coercive patterns will continue to use them in all venues, avoiding school work, not staying on task, or not attending school at all (Patterson et al., 1992). Together, this may leave children at risk for peer and parental rejection, poor academic performance and possible depression during stage two.

Patterson et al. (1992) go beyond the two stage model of Hinshaw and Lee (2003), stating that stage 3 begins when these children begin to form bonds with peers. These bonds lead to the creation of deviant peer groups as children selectively affiliate with peers who are as deviant as they are. These bonds go beyond a coercive style to include an increase in deviant skills through collusion and shaping in deviant peer groups. This increase in deviant skills leads to a subsequent rise in delinquency and substance use. This stage begins near the onset of adolescence. Patterson and Yoerger (2002) suggest that rejection by the normative peer group leads rejected children to seek out and select peers and environments which will reinforce them for their limited and maladaptive set of behaviors.

Patterson et al. (1992) propose stage four is a culmination of all these past experiences in which coercion, rejection, and deviant peer affiliation create a path to the "career antisocial adult." Individuals who follow the stages all the way through until

stage four may experience difficulty with relationships, including a disrupted marriage, a chaotic employment history, multiple offenses, and possible institutionalization.

In summary, Patterson et al. (1992) state, "We view deviancy as a developmental process in which one type of deviant act is a prelude to more extreme acts." They point out that coercion progresses in severity as children mature, and there is a shift from coercive acts to deviant acts such as stealing, lying, vandalism, and drug use. Children hone their coercive skills and subsequently get reinforced for deviant behaviors within the peer group. It is this peer process which serves as a source of education and reinforcement that will be discussed in the following section.

Deviant Peer Groups

As previously discussed, as children mature, the second developmental process of selective peer affiliation begins. Boivin, Vitaro and Poulin (2005) believe that children begin to have preferences for specific peer affiliates as early as toddlerhood. Stayer and Santos' (1996) report early preschool friendships are actually part of a larger peer affiliation network, suggesting that children are selecting peer affiliates early in life.

Snyder, West, Stockemer, Gibbons, and Almquist-Parks (1996) also believe that children begin the process of selective peer affiliation as early as preschool. They report that preschool aged children are highly selective in their peer affiliations, spending large amounts of time with very small numbers of available peers. They found that children spent very little time with other peers. In addition, they discovered that children selected peer affiliates based on which peers provided the most positive reinforcement for their behavior, highlighting the importance of positive reinforcement in a child's selection of peer affiliates.

Children who are rejected, highly coercive, and beginning to show deviant tendencies find reinforcement through affiliations and bonds with other rejected children, forming deviant peer groups. Patterson et al. (1992) indicate that these bonds further distance the already rejected children from their normative peer group, and provide reward, modeling and role rehearsal of antisocial behaviors.

Peer group norms determine what behaviors are rewarded and punished, modeled and rehearsed within the peer group. Rejected coercive children are then very likely to select peer affiliations that reflect their similar style of behaving, including aggressive and antisocial behaviors (Cairns, Cairns, Neckerman, Gest, & Gariepy, 1988). Snyder, Horsch, and Childs (1997) found this to be true even with preschool aged children. Boivin, Vitaro and Poulin (2005) assert that behavioral homophily, or the tendency for children to selectively affiliate with peers whose behavior is similar to their own, already occurs before the end of preschool.

Snyder et al. (1997) suggested that both aggressive and nonaggressive children are selective in their peer affiliations. They reported that aggressive children had more difficulty establishing and maintaining mutual peer affiliations, but that aggressive children sought out and developed very strong mutual affiliations with other children who were also aggressive. In addition, when aggressive children established a strong mutual affiliation with other aggressive children, the affiliation itself remained highly stable. Affiliations with aggressive children had cumulatively negative effects on the development of these children. Snyder, Schrepferman, Oeser, Patterson, Stoolmiller, Johnson, and Snyder (2005) found that children with high levels of conduct problems

were likely to associate with other children with high levels of conduct problems even at entry into their kindergarten school year.

As children mature, opportunities arise allowing for an increase in time children spend in unsupervised settings. Given decreased supervision, antisocial peer affiliations provide a rich opportunity for children to reward, model and rehearse deviant behavior. Deviant talk is one process by which peers may promote deviant behavior in young children. The following discussion examines research about the occurrence and importance of deviant talk in peer affiliations, and the contribution of such talk to the development of deviant behavior.

Deviant talk

As children selectively affiliate with deviant peers, they engage in the process of deviancy training (Dishion, Spracklen, Andrews, & Patterson, 1996). During such training, peer affiliates engage in behavior that encourages antisocial behavior through talk about deviant topics, endorsement of deviant values, role rehearsal of deviant activities, and subsequent approval of such talk and actions. Dishion (2000) indicates that peer deviant talk is one very important mechanism by which a peer group promotes the antisocial behavior of children in the proximal peer group. More specifically, deviant talk entails discussions about and endorsement of deviant activities such as lying, stealing, defiance of authority, and rule breaking. In deviant peer groups, deviant talk elicits positive reinforcement and collusion in deviant actions. Over time, it is likely that each child's repertoire of antisocial talk and behavior are expanded, reflecting the collective "expertise" of group members (Dishion et al., 1996).

Research suggests that as deviant talk is reinforced by peers there is also an increase in antisocial behavior. Snyder, Stoolmiller, Patterson, Schrepferman, Oeser, Johnson and Soetaert (2004) suggest that, according to relational frame theory, talk and overt behavior are in a reciprocal relationship. Talk begets behavior and behavior begets talk. When children are reinforced for talk about and role rehearsal of activities, they begin to anticipate reinforcement for the performance of those activities. As a result of such anticipation, deviant talk is translated into deviant behavior.

Snyder et al. (2005) found that the rate of deviant talk among children increased as the kindergarten year progressed. In addition, they found that deviant talk by kindergartners predicted growth of conduct problems during the subsequent year both at home and at school. This research suggests that, even in very young children, deviant talk is a substantial risk factor for early onset and persisting conduct problems.

As children advance to middle school and adolescence, there are even more opportunities for unsupervised activities and increasing exposure to and involvement in a variety of different forms of deviant talk and behavior. Substance abuse has been frequently highlighted as one of the consequences of deviant talk and behavior during adolescence. Peer associations have been found to be the best predictor of beginning, continuing, and ceasing smoking during adolescence (Lauer, Akers, Massey, & Clark, 1982). Dishion, Capaldi, Spracklen, and Li (1995) found that associating with antisocial peers has been found to be correlated with substance use in early adolescence. Dishion et al. (1996) also found that male adolescents engaging in deviant talk with peer affiliates showed an increase in antisocial behavior such as substance use as well as police contact. In a study reported by Krohn, Lanza-Kaduce and Akers (1984), adolescents who

associated with frequent substance users had an increased probability of developing a frequent substance use habit as well.

In addition to substance use, research has indicated an increased exposure to more complex forms of antisocial talk and behavior during adolescence. Loeber and Stouthamer-Loeber (1998) and Reid and Eddy (1997) report that affiliating with deviant peer groups not only increases overt antisocial acts such as aggression and defiance, but also increases covert acts such as stealing, vandalism and truancy. Patterson, Dishion and Yoerger (2000) found that deviant peer affiliation paired with verbal endorsement of deviant behaviors were linked to an increase in delinquency, sexual activity and substance use during adolescence. This indicates that involvement in such affiliation increases a child's risk of negative outcomes both in early adulthood as well as adolescence (Patterson & Yoerger, 1999).

The implications of such affiliations takes on even more ominous tones when looked at in terms of early childhood research. The impact of such affiliations has been found to begin as early as preschool. Snyder, Horsch, and Childs (1997) found that preschoolers who affiliated with aggressive peers demonstrated reliable increases in aggression based on both teacher rated aggression as well as observer rated aggression. They also found that even peers who only spent 15% to 30% of their social time with aggressive peers showed moderate increases in aggression. Regular association with aggressive individuals appears to amplify the child's current level of aggression.

Previous research clearly implicates the role of peers in the development of deviant talk and behaviors beginning as early as preschool. This suggests a need to describe and understand the processes of deviant talk and deviancy training in greater

detail. The following discussion examines evidence on the parameters of deviant talk in young children.

Evidence of Early Deviant Talk

Significant portions of the research on the outcomes of deviant talk focuses on children during adolescence. Loeber, Delamatre, Keenan, and Zhang (1998) suggest that overt forms of deviant behavior are present during preschool but decrease during elementary school. They suggest these overt forms are replaced by more covert forms of deviant behavior that manifest during early elementary school and continue to increase as children mature to adolescence.

Oeser (2004) states that deviant talk about both overt and covert forms of antisocial behavior occur in peer groups in very young children. Oeser (2004) ascertained deviant talk by children in their kindergarten year, including verbal content about sex, drugs, alcohol, gross body functions, defiance of authority, aggression, swearing, obscenities, delinquency, lying cheating, and stealing. Oeser (2004) suggests levels of deviant talk about overt antisocial behavior to be higher than those for covert. Deviant talk about overt antisocial activities was broken down into three distinct types: (1) gross talk and enactment of bodily functions, occurring approximately one time every 26 minutes; (2) defiance of authority including blatant and passive actions, occurring approximately one time every 26 minutes; and (3) talk about aggression, swearing, obscenities and delinquency, occurring approximately one time every 15 minutes.

Deviant talk about covert antisocial activities, although occurring at lower levels, was also observed (Oeser, 2004). Deviant talk about covert activities was broken down into three distinct types: (1) sexual talk, and behaviors which were sexually explicit or

playful reenactments of sexual behaviors, occurring approximately one time every 24 minutes; (2) talk about and endorsement of sneaky behaviors such as lying, stealing, and cheating, occurring approximately one time every 24 minutes; and (3) talk of drugs and alcohol in a positive manner or exhibiting precocious knowledge of drugs and alcohol, occurring approximately one time every 250 minutes. When all forms deviant talk are combined, Oeser (2004) found that the kindergarten children in the study engaged in antisocial talk at a mean rate of approximately one time every 4 minutes. When viewed in terms of developmental trajectories suggesting that early age of onset is a critical indicator of negative outcomes, the occurrence of such talk during early childhood is troubling (Snyder et al., 2005). The impact of such early-onset of deviant talk is described in the next section.

Developmental Progression

Research repeatedly indicates that age of onset is a crucial factor in the persistence and growth of antisocial behavior. The younger a child is when deviant behavior first manifests, the more likely the child will become involved in more serious deviant behaviors for longer periods of time (Tolan & Thomas, 1995). The general pattern suggests a sequence of development where less serious problems are maintained and new, varied and often more serious problems are added, and the earlier this pattern begins, the more likely it is to progress to more serious acts.

Hinshaw and Lee (2003) describe the onset of diagnosable conduct problems as being considered more environmental in origin when compared to more biologically linked disorders. Conduct problems such as Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) are frequently the precursors to the development of Antisocial

Personality Disorder in adults and are linked to a plethora of other deviant behaviors and adult adjustment problems.

Hinshaw and Lee (2003) point out that the specific trajectory for ODD and CD is progressive. As outlined by Hinshaw and Lee (2003), the average age of onset for ODD is age 6 with approximately 3-6% prevalence. The DSM-IV indicates that ODD is "a pattern of negativistic, hostile, and defiant behavior lasting at least 6 months" with four or more of the following symptoms: "often loses temper, often argues with adults, often actively defies or refuses to comply with adults requests or rules, often deliberately annoys people, often blames others for his or her mistakes or misbehavior, is often touchy or easily annoyed by others, is often angry and resentful, or is often spiteful or vindictive." At approximately age 9, half of those children who were diagnosed with ODD are still considered to be in that category, and approximately 25% of those with ODD progress to a diagnosis of CD. The average age of onset for CD is 9 years old, with an approximate prevalence of 2-4%. Children with a diagnosis of CD have similar symptomatology as those diagnosed with ODD, however, there appears to be an escalation in severity. DSM-IV defines CD as "A repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms or rules are violated" as shown through the manifestation of the following symptoms: "aggression to people or animals, destruction of property, deceitfulness or theft, and serious violations of rules." The specific trajectory is variable, and the course children take with ODD and CD looks very different depending on age of onset. Typically the earlier the age of onset, the worse the progression, leading these children down a more serious path of deviant actions and more serious diagnoses (Hinshaw & Lee, 2003).

Ultimately, the progression may lead to the development of Antisocial Personality Disorder (APD) as an adult. The DSM-IV states that individuals diagnosed with APD evidence "a pervasive pattern of disregard for and violation of the rights of others since age 15." An adult diagnosed with APD must also have been diagnosed with CD before the age of 15, in addition to showing early antisocial tendencies. Such a diagnosis indicates a "failure to conform to social norms…deceitfulness…impulsivity…irritability and aggressiveness…reckless disregard for safety of self and others…consistent irresponsibility…and lack of remorse." Because of the seriousness of such deviant outcomes, identifying the early pathway to such behaviors is critical.

The trivial-serious hypothesis as described by Patterson et al. (1992) suggests that "youths who engage in serious offenses should engage in high rates of trivial offenses as well." This relationship is not reciprocal however; not all youths who engage in trivial offenses necessarily progress on to engage in more serious offenses as well. However, they suggest that the sequence is transitive in nature; more serious antisocial behavior is necessarily preceded and accompanied by its less serious earlier manifestations.

Patterson et al. (1992) state that it is expected that all normal children at some point will engage in some form of coercive or deviant behavior. Patterson (1982) states "a normal preschool boy will yell, tease, or whine approximately once every three minutes, and a normal 10-year-old boy will engage in the same behaviors once every 10 minutes." However, most children show reduced rates with age.

Patterson et al. (1992) found evidence for a progression from less to more serious antisocial behaviors. They found fighting and stealing to be two important antecedents to more serious offenses, as determined by the categorizing of child problem behaviors by

police officers and the staff of the Oregon Social Learning Center. Results indicated the correlation of trivial problems, such as low level defiance, with the more serious problem of fighting was .39 ($p<.001$). The correlation of trivial problems with the more serious problem of stealing was found to be .32 ($p<.05$). In addition, they also found that male multiple offenders relative to nondelinquent and minor delinquent boys, committed approximately twice as many trivial antisocial acts as the other two groups.

This type of research suggests that the development of deviant behaviors may typically follow the transitive sequence of less severe, or trivial, to more severe and serious acts. Based on these findings, it seems reasonable to hypothesize that a systematic progression of development for deviant talk would follow the same path, from trivial to serious in nature. This study hypothesized the following sequence of deviant talk would evolve during the repeated observations of peer interactions distributed over the kindergarten year: talk about aggression, swearing, obscenities and talk about delinquency; defiance of authority including blatant and passive actions; talk about and endorsement of sneaky behaviors; sexual talk, and behaviors which were sexually explicit or playful reenactments of sexual behaviors; and talk of drugs and alcohol in a positive manner or exhibiting knowledge of drugs and alcohol. This systematic progression can be analyzed by using a longitudinal Guttman simplex approach, a technique for looking at individual growth across factors, such as the systematic progression of different types of deviant talk.

Longitudinal Guttman Simplex

Measuring the sequence and progression of the development of deviant talk is an attempt to explain growth in deviancy training, essentially measuring individual growth

in variety across time. Collins and Cliff (1990) state that traditional approaches to measuring growth are functionally problematic because they are "not based on a model of individual growth in the latent variable" and because "traditional approaches place a heavy emphasis on within-time interindividual variability in latent variables" in contrast to intraindividual change over time. They believe that traditional approaches limit the exploration of growth of individuals across time.

The Longitudinal Guttman Simplex (LGS) does not have these limitations, and in fact has multiple advantages when trying to ascertain the sequence of growth of deviant talk (Collins & Cliff, 1990). LGS is defined as a "logic-theoretic model with an axiomatic definition (Collins & Cliff, 1990)." LGS is formulated to look at individual differences over multiple instances, and at individual growth as an increase in variety of exemplars comprising a factor (Collins & Cliff, 1990). LGS has been utilized to analyze the validity of the Gateway Hypothesis in substance use research. In this instance LGS was utilized to test the concept that people use a gateway substance, in this case, marijuana, before using other substances, and that the use of the gateway substance is associated with an increased risk for using other more serious substances. In this research, they laid out different stages in substance use were hypothesized, indicating the sequence a substance user would progressively go through over time (Kandel, 2002). This model assumes cumulative unitary growth; in the case of deviant talk this would mean that as children acquire new forms of deviant talk, old forms are retained, and that all children will acquire these forms of deviant talk in the same order.

LGS utilizes the consistency index, CL. This measure shows how well the cumulative unitary growth of the logic-theoretic model describes the latent variable. In

this study, the CL will indicate the degree to which the sequence of deviant talk is developed in a cumulative and unitary fashion (Collins & Cliff, 1990). Therefore, by utilizing the longitudinal Guttman simplex, this research is attempting to find cumulative unitary growth among individuals' deviant talk, showing a systematic progression of deviant talk from less serious to more serious forms.

Conclusion

Affiliation with deviant peers and deviant talk occur at very young ages, placing children at high risk for developing later and increasingly serious deviant behaviors. Children rejected by their peers form deviant peer affiliations which provide a rich training ground for engaging in deviant talk and learning deviant behavior. Deviant peer affiliations at early ages provide a venue to structure learning experiences that have been shown to promote negative outcomes. However, the specific sequence by which such deviant talk and behaviors are acquired and performed remains largely unknown. Research has described the general mechanisms within friendships that serve to increase deviant talk and behaviors (Dishion et al., 1996). However, the cumulative sequence of learning and escalation of deviant talk and behavior remains unexplored. Applying the LGS method to the trivial-serious hypothesis, individual progressions in the display of deviant talk will be explored. The current research is motivated by the need to investigate the specific sequence, from less serious to more serious, that children follow in their deviant talk and behavior patterns in peer groups. These data are likely to be useful in developing more effective peer-based interventions for child conduct problems.

Hypotheses

The hypotheses are:

1. The development of deviant talk follows a cumulative unitary pattern of development over the kindergarten year.
2. The sequence of development of deviant talk follows a pattern from less severe or trivial deviant talk to more severe and serious deviant talk.
3. The theory driven sequence of development will evidence the following pattern (from less severe to more severe): talk about aggression, swearing, obscenities and talk about delinquency; defiance of authority including blatant and passive actions; talk about and endorsement of sneaky behaviors; sexual talk, and behaviors which were sexually explicit or playful reenactments of sexual behaviors; and talk of drugs and alcohol in a positive manner or exhibiting knowledge of drugs and alcohol.

CHAPTER 2

METHOD

Participants

The sample consisted of 267 children, from the School Transitions Project, which began data collection in 1998 and ceased data collection in 2003. The sample includes 133 girls and 134 boys and their caregivers from a mid-sized Midwestern city (450,000). Participants were recruited from a school which served a recognized population of low-socioeconomic status families. The school included two classrooms with a pre-kindergarten program, three classrooms with a kindergarten program, and three classrooms with a first grade program. Classrooms typically consisted of twenty to twenty-five students and one teacher.

Participants were recruited over three consecutive years at the children's entry into kindergarten. All 352 children entering kindergarten at the school served as the recruitment target. Overall, during the three year recruitment period, consent was obtained for the participation of 267, yielding an overall recruitment rate of 76%. Participants were recruited directly before the child's entry into kindergarten and during kindergarten pre-registration in 1998, 1999, and 2000. The mean age of the children was 5.3 years when data collection began, and 6.9 years of age at their exit from first grade, at the end of data collection.

Characteristics of the sample were generally representative of the general population of the city, although there were some distinct characteristics of the sample which imply it was more at-risk sample than the general population. The median per capita family income was $8,300. Twenty-eight percent of the families in the sample had incomes below the federal poverty line. The neighborhood where the recruitment school

was located has one of the highest crime rates in the city. When data collection began, 43% of the children resided with two biological parents, 28% resided with one parent, and 21% resided in blended homes. The race/ethnicity of the children was: 71% European American, 19% African American, 5% Hispanic/Latino, 3% Native-American, and 2% Asian American. Nine percent of the families had no employed adult in the household at the time of recruitment. All participants were reimbursed for their time at a rate of $10 per hour.

Participants who moved during their involvement in the research were followed for data collection and retained in the sample. Full or partial data are available for all 267 participants. Data for 95% of the sample for the kindergarten year are available.

Measures

Measures of deviant talk were obtained by utilizing videotapes of peer play. The social interaction of each child was videotaped during nine, 30-minute sessions of play. Each session included three same gender children from the same classroom. Data collection took place during the child's kindergarten year.

In three of the nine videotaped sessions, the child was the target or focus of coding; these three sessions are spread over the kindergarten year early, middle and late. The peers in each videotape were selected in a semi-random fashion. In six of the nine videotaped sessions, the child was not the target, and the child's behavior was coded solely for reactions to the designated target child. Non-target, same-gender classmates were selected in semi-random fashion as children were available during the school day. The children were each given a different color T-shirt to indicate the child's coding status. Target children were given black t-shirts, and the non-target children were given a red t-shirt or a blue t-shirt.

Two members of the School Transitions Project staff recorded each session on a digital video camera. These assessors were trained to focus the video camera on the target child while keeping the peers in the frame of the camera as much as possible. The video camera had a sound recording device which was placed close to the children in order to capture the content of the children's speech. In addition, assessors were trained not to interfere in the children's interactions unless the behaviors were dangerous or the children were out of view of the camera.

The children engaged in two tasks during each session. In the first 15 minutes of the session, the children played a structured age-appropriate interactive game, such as Mr. Mouth, Hungry Hungry Hippos, or Chutes and Ladders, while seated at a table. After the first 15 minute segment, the assessors told the children to stop the activity. The assessors then removed the table, chairs and game from the play area, and instructed the children to return to the play area. In the second 15 minutes of the session, the children engaged in free play with a variety of age appropriate toys, such as dolls, action figures, dress up clothes, toy cars and legos on an 8' by 12' rug. Near completion of the second 15 minute segment, the assessors instructed the children to clean up the play area and return toys to their appropriate places. During this time assessors were more directive in order to gain compliance from the children.

Each sample of peer interactions was coded using the Antisocial Content Code (ACC) developed by Oeser, Schrepferman, Snyder, Johnson, and Snyder (2003). The ACC is an adaptation of the Topic Code developed by Poe, Dishion, Griesler, and Andrews (1990). The ACC focuses on talk and playful enactment of deviant or antisocial behavior. Talk about and playful enactment of deviant or antisocial behavior "…has been

found to be predictive of future delinquent behavior in early adolescent boys," and is "seen as a pseudo mature indicator of antisocial behavior" (Oeser et al., 2003)

The ACC provides real time coding of talk about and role rehearsal of deviant and antisocial behaviors as well as peer responses to such acts. The ACC included six categories of such talk and enactment: deviant content, authority defiance, sneaky content, sexual content, knowledge of or endorsement of drugs, alcohol or tobacco products, and gross body functions,.

The category of deviant content included four subcategories of talk and acts, all coded under the category of deviant content. Subcategories included: endorsement of aggression, denigrating talk about persons not present in the session, obscene gestures and swearing, and endorsing delinquent behavior. The subcategory endorsing aggression included any affirmative talk about aggression, violence or property damage as well as the encouragement of another child to be destructive to property or to be aggressive. Actual damage to property during the session was also coded as deviant content. Denigrating talk about persons not present in the session included negative or derogatory talk about specific people, including teachers or parents, or talk about groups or classes of people such as police officers, women or certain races. Obscene gestures and swearing included verbal obscenity, obscene gestures, and swearing; this category included acts such as giving someone the finger or using curse words. Endorsing delinquent behavior included statements made in a neutral or positive manner about delinquent activities such as sneaking out of the house or skipping school; this category also included nonverbal behaviors which endorse delinquent behaviors such as demonstrating a gang sign.

The category of authority defiance included acts of defiance directed at the assessors present in the room as well as endorsement of defiance of any sort through talk or the encouragement of a peer to be defiant. Coding in the category of authority defiance included the child demonstrating a clear and direct verbal or nonverbal refusal to comply with the assessors' instructions, glaring in response to an assessor request, turning or crossing their arms in response to an assessor request or stomping their feet in response to a request. In addition, authority defiance included passive defiance of authorities demonstrated through the child ignoring the assessors' request, coded after two clear requests made by the assessors to which the child failed to comply within 5 seconds of the second request. This category also included a child's verbal endorsement of defiance such as instructing their peers not to clean up or telling a story about defying the teacher.

The category of sneaky actions included three subcategories of talk and acts. Subcategories included: positive talk about cheating, positive talk about or actual lying or stealing, and whispering to avoid being heard or to avoid detection by the assessors. Positive talk about cheating included any positive statement made about cheating or utilizing the word cheat in a positive manner. Positive talk about or actual lying included verbalizing a positive evaluation of lying or stealing such as telling another child to steal a toy from the room, the child actually placing a toy in their clothing or telling a readily observable lie in response to either an accusation or query. Whispering to avoid being heard or to avoid detection included the child using a low toned vocal quality or turning away from the view of the video camera in order to avoid being detected by the assessors or by the video camera.

The category of sexual content included two subcategories of talk and acts. Subcategories included: age inappropriate sex talk, and sexual activities and acts. Age inappropriate sex talk included talk which is considered inappropriate for 5-6 year old children in reference to sexuality, sexual body parts or sexual activity. Sexual activities and acts included any acts demonstrated by the child or actions with dolls or animals indicative of sexual activities which are inappropriate for a 5-6 year old child including: dolls kissing for extended periods of time, dolls kissing of sexual body parts, and a child dancing in a suggestive manner.

The category of knowledge of or endorsement of drugs, alcohol or tobacco products included talk about drugs, alcohol or tobacco products and descriptions of a parent or peer using one of the substances in a neutral or positive manner. It also included pretending to consume drugs, alcohol, or tobacco.

The category of gross body functions included both verbal and nonverbal gross behaviors that reference any nonsexual body functions. Coding in the category of gross body functions included both talk about as well as demonstration of nonsexual body functions such as talk about or actual flatulence, spitting, urinating, excretions, vomit, etc. This category of the ACC will not be utilized in the analysis because it is likely a normative behavior for children at this age and appears to be gender specific. Table 1 provides a summary of the each deviant talk category.

Table 1

Deviant Talk Summary

Deviant Talk Category	Definition
Deviant Content	talk and acts of: endorsement of aggression, denigrating talk about persons not present in the session, obscene gestures and swearing, and endorsing delinquent behavior
Authority Defiance	acts of defiance directed at the assessors present in the room as well as endorsement of defiance of any sort through talk or the encouragement of a peer to be defiant
Sneaky Actions	positive talk about cheating, positive talk about or actual lying or stealing, and whispering to avoid being heard or to avoid detection by the assessors
Sexual Content	age inappropriate talk about sex, and sexual activities and acts
Knowledge of or Endorsement of Drugs, Alcohol or Tobacco Products	talk about drugs, alcohol or tobacco products, descriptions of a parent or peer using one of the substances in a neutral or positive manner, and pretending to consume drugs, alcohol, or tobacco
Gross Body Functions	verbal and nonverbal gross behaviors that reference any nonsexual body functions

The ACC also coded responses of same gender classmates. Responses were coded as either accommodating or neutral/negative. Accommodating responses were

encouraging to the target child and included behaviors such as: laughing, smiling or nodding. Neutral or negative responses were either negative evaluations of the behavior or a lack of response to a behavior. Neutral/negative responses included behaviors such as ignoring or complaining. Though coded, peer responses to child deviant talk were not used in this research.

Coders viewed each videotape of each child. Coders were instructed to consider each 10 seconds of tape as a distinct interval of time. Within the ten second interval, coders recorded the exact time of occurrence when the target child exhibited one of the six categories previously described. Each tape had a time stamp on the videotape to ensure accuracy. If more that one category of behavior occurred within the ten second interval, coders utilized a hierarchy and coded the highest level category. The hierarchy is as follows from lowest to highest level: verbal or nonverbal gross behavior, blatant defiance of authority, deviant content, sneaky content, sexual content, and knowledge of or endorsement of drugs, alcohol or tobacco. In addition, coders recorded peer responses, either negative/neutral or accommodating for each display of one of the six categories of deviant talk by the target child.

Coders were trained in the use of the Antisocial Content Code to a criterion of 65% agreement on a code-by code level. Weekly coding meetings were held to maintain reliability and reduce observer drift. Percent agreement of coder reliability for each category were as follows: verbal or nonverbal gross behavior 67%, blatant defiance of authority 54%, deviant content 64%, sneaky content 50%, sexual content 67%, and knowledge or endorsement of drugs, alcohol or tobacco 79%. Percent agreement and Kappa indices of coder reliability for all categories of antisocial talk were 87.5% and .74,

respectively. Percent agreement and Kappa coder reliability for peer responses to all categories of antisocial talk were 77.1% and .60, respectively.

CHAPTER 3

RESULTS

Analysis

In order to examine the transitive sequence of development of deviant talk in kindergarten children, a series of statistical analyses were conducted. The statistical procedures include descriptive statistics as well as analysis of transitional probability matrices comparing observed versus expected probabilities.

The longitudinal Guttman simplex was proposed as a method for analyses of these data. It is a nontraditional method and is valuable for measuring intra-individual change over time. Unlike a traditional Guttman simplex which jointly orders items and persons, the longitudinal Guttman simplex jointly orders items and times which are also ordered consistently with persons (Collins & Horn, 1991). It assumes cumulative unitary growth. For this research, the theory of cumulative unitary individual growth fit the hypothesis regarding the pattern of development of deviant talk from less severe or trivial deviant talk to more severe and serious deviant talk. Cumulative unitary individual growth was not supported in preliminary analyses, precluding the relevance of this model as a test of the hypothesis. Therefore, the proposed use of the longitudinal Guttman simplex using the LGSINDEX for this model (Collins & Dent as cited in Collins & Horn, 1991) was not utilized after results from preliminary analyses revealed that this statistical model clearly did not fit the observed data.

This research examined the development of deviant talk in kindergarten children across their kindergarten year as observed in video tapes of peer interaction. Research suggests that the development of deviant talk is cumulative in nature, meaning that when

a new form of deviant talk is learned, all previously learned forms of deviant talk will remain and the new form is added to those that already exist. This research assumed a unitary path of development, meaning that the latent variable, deviant talk, develops in the same order for each child. Although LGS was not utilized to test this hypothesized model, analyzing observed versus expected probabilities provides the means to track the general pattern of growth that was actually observed.

To investigate the hypothesis of the study, observed and expected transitional probabilities were calculated on a cell by cell basis separating children by gender. Transitional probabilities for session 1 to session 2 and then subsequent probabilities for session 2 to session 3 were calculated. Observed probabilities were then compared to the computed expected probabilities which assume equal distribution for each of the cells in the transition matrix. By comparing these observed and expected transitional probabilities, it is possible to describe changes in deviant talk expressed by these children. This was done in two ways, one looking at developmental progressions in the severity of deviant talk, and the other looking at developmental progressions in the variety of deviant talk.

Descriptive Statistics

Table 2 provides descriptive statistics for various forms of deviant talk. Deviant talk is measured in the rate per minute of occurrence in each session. As shown in Table 2, children displayed approximately one instance of deviant talk involving content of aggression, swearing, obscenities and delinquency, every 10-15 minutes. Children displayed defiance of authority including blatant and passive actions, approximately every 25-30 minutes. They displayed talk about and endorsement of sneaky behaviors

approximately every 25-50 minutes. Sexual talk and behaviors which were sexually explicit or reenactments of sexual behaviors during play were displayed approximately every 20-50 minutes. Talk of drugs and alcohol in a positive manner or an exhibition of knowledge of drugs and alcohol was displayed by children approximately every 160-500 minutes. In each case, deviant talk was displayed at measurable but modest levels, but tends to increase over sessions or over time.

Table 2

Mean Rate Per Minute Observed Deviant Talk

	Session 1	Session 2	Session 3
Deviant Content	.06	.09	.09
	(.12)	(.15)	(.12)
Blatant Defiance	.03	.04	.04
	(.06)	(.06)	(.05)
Sneaky Content	.02	.03	.04
	(.04)	(.05)	(.07)
Sexual Content	.02	.04	.05
	(.14)	(.12)	(.17)
Drugs/alcohol	.002	.004	.006
	(.01)	(.01)	(.03)

Note: Standard deviations are in parentheses.

Table 3 provides correlations among the various forms of deviant talk averaged over the three observation sessions. These modest but occasionally reliable correlations are expected in that they reflect not only trait-like characteristics of the child, but also variations due to the random differences in the characteristics of the peers with whom children were paired in each session.

Table 3

Correlations of RPM of Various Forms of Deviant Talk

	1	2	3	4	5
1. Deviant content		.22**	.06	.22**	.25**
2. Blatant defiance			.09	.21**	.02
3. Sneaky content				.14*	.05
4. Sexual content					.25**
5. Drugs/alcohol					

** Correlation is significant at the 0.01 level.
* Correlation is significant at the 0.05 level.

Table 4 describes the percent of children who display each form of deviant talk in each session. These percentages show that children are more likely to display less severe forms of deviant talk such as talk with deviant content and blatant defiance as compared to the more severe forms of deviant talk such as talk about drug and sex. This table also shows the percentage of children displaying any type of deviant talk (see bottom row) which also tends to increase across sessions or across time.

Table 4

Percent of Children Displaying Observed Various Forms of Deviant Talk

	Session 1	Session 2	Session 3
Deviant Content	48%	57%	63%
Blatant Defiance	41%	51%	54%
Sneaky Content	29%	35%	46%
Sexual Content	17%	28%	31%
Drugs/alcohol	4%	6%	5%
All Types Combined	77%	84%	91%

Probability Matrices

Observed and expected transitional probabilities were calculated on a cell by cell basis, separating children by gender as well as time of transition. The observed versus expected probability of particular transitions in each matrix can be compared to ascertain change in the severity or variety of deviant talk over time.

Transitional Probability Matrices – Severity. The primary goal of the present study was to predict the sequence of development of deviant talk over the course of three different observation periods during each participant's kindergarten year. Transitional probability matrices were calculated to ascertain sequences in severity separately for gender, and for the transition from period or session 1 to session 2 and the transition from period or session 2 to session 3. Transition matrices combining gender as well as sessions are included in the appendices.

Table 5 provides the transitional probability matrix for the severity of deviant talk for males from session 1 to session 2. Using the hypothetical order of severity of deviant talk, each child's severity level at each session was determined. The highest level of severity of deviant talk displayed in session 1 was then compared to the highest level of severity of deviant talk displayed in session 2. Each child contributes one count to the entire matrix. Each cell then provides the observed probability of a child making that particular transition in severity.

As illustrated in Table 5, there were a total of 5 males who displayed no forms of any deviant talk in either session 1 or 2 (top left cell). In this same cell the number below the frequency, .22, indicates the observed probability of making that particular transition in session 2 given no deviant talk in session 1 relative to transitions to other more severe forms of deviant talk in session 2. Following the same rationale, the number of children who displayed deviant talk in session 1 who advanced to sneaky talk in session 2 (second row, fourth column) was 5. The associated transitional probability of .31 indicates the degree to which children advanced to this form compared to those who regressed in deviant talk (e.g., none at session 2, $p = .00$) or whose most severe form of deviant talk remained as deviant at session 2 (4 at session 2, $p = .25$).

These observed probabilities may be compared to the expected probabilities for each column (see bottom row) to ascertain trends for development of severity of deviant talk. As illustrated in Table 4, there were a total of 12 of males who displayed no deviant talk at session 2. This number may be obtained by summing the column labeled None. The expected result would be an equal distribution of those 12 males across the cells in the column. Therefore the bottom number in that cell can be used to calculate the

marginal probability which represents the total frequency of males making transitions in a specific column divided by the total number of male transitions in the entire matrix (in this case, 12 divided by 131 = a probability of .09).

Each column total has a corresponding marginal probability which can then be compared to the observed probability in the corresponding cells in each column. For example, when comparing the observed probability of males who displayed no forms of deviant talk at session 1 or session 2 (.22) with the marginal probability of the corresponding column (.09), the observed probability appears to be higher than one would expect by chance. The same comparisons can be made for all cells in the Table.

The low frequency of such transitions makes it impossible to analyze the data in Table 5 in a formal statistical way. However, as a general way to view these data, Table 5 indicates the cells for which the observed probabilities are at least 1.5 times larger than the column marginal probabilities by shading. In addition, Table 5 also indicates the observed probabilities which are less than .5 times smaller than the column marginal probabilities by italicizing these cells. These cells show what could be a significant difference between the observed and marginal probabilities of each cell

When looking at a comparison of expected versus observed transitional probabilities in Table 5, the data indicate a general trend for males to either remain at the same level of severity (along the diagonal) or increase their level of severity (above the diagonal – two shaded cells) from session 1 to session 2.

Table 6 provides aggregated sum conditional probabilities, consistent with the hypothesis in the study. Cells were summed to create 3 superordinate categories, those that represented a decrease in the level of displayed severity of deviant talk from session

1 to session 2 (below the diagonal in Table 5), those that represented the same level of severity of deviant talk from session 1 to session 2 (on the diagonal), and those that represented an increase in the level of severity of deviant talk from session 1 to session 2 (above the diagonal). These distinctions are represented by the first three columns of Table 6, respectively.

The fourth column of Table 6 indicates the combined conditional probability of the observed mean frequencies of those cells in which deviant talk during session 2 remained at the same level of severity at session 1 or which increased in severity from session 1 to session 2. The final column indicates the expected cell probability for the entire matrix if the transitions occurred by chance. Therefore the final column may be compared to the previous four columns to assess changes in the severity of deviant talk from session 1 to session 2. Each column in Table 6 also contains the observed frequencies (second number in top row) and expected frequencies (third number in top row) for each summary transition.

In addition, the bottom row of Table 6 shows the percentage of transitions represented by each category. The data indicate that 79.39% of males either stay at the same level of severity or increase in severity from session 1 to session 2. In addition, of those males from session 1 to session 2 who change their severity level, 70% increase in severity whereas only 30% decrease in severity (not shown in Table).

A chi-square statistic was calculated to determine the statistical significance of the differences between the observed frequencies and the expected frequencies in Table 6, assuming that the expected frequencies would reflect equal cell distribution. This chi-square comparison was done in three ways. The first method compared the frequencies of

each of 3 different categories (those that represented a decrease in the level of displayed severity of deviant talk, those that represented the same level of severity of deviant talk, and those that represented an increase in the level of severity of deviant talk, (the 3 left hand columns in Table 6) to the expected equal cell distribution of frequencies. The chi-square fit statistic for this distinction was χ^2 (2, N = 131) = 33.56, p<.01. The observed distribution is different than that expected by chance.

The second chi-square statistic compared the frequencies in 2 different categories, the first category represented a decrease in the level of displayed severity of deviant talk and the second category represented a combination of those that remained at the same severity level and those who increase in their severity level of deviant talk. The chi-square statistic for this distinction was χ^2 (1, N = 131) = 23.89, p<.01, indicating that more individuals either stayed the same or increased in severity than would be expected by chance.

The third chi-square statistic compared the frequencies in 2 other different categories, the first category represented those who decreased in the level of displayed severity of deviant talk and the second category represented those who increased in their severity level of deviant talk. Because these categories did not contain the category of those who stayed at the same level of severity, a new expected cell frequency was calculated and used to determine the chi-square for this distinction (expected cell frequency = 2.97). The chi-square fit statistic for this distinction was χ^2 (1, N = 131) = 13.75, p<.01, indicating that of those boys whose severity of deviant talk changed from session 1 to session 2, more showed increases and fewer showed decreases relative to chance. All three chi-square statistics showed a significant difference between the

expected and observed frequencies, indicating that the frequency distributions do not appear to be due to chance, and that boys were more likely to display the same or an increased severity in forms of deviant talk.

Table 5

Transitional Probability Matrix, Frequencies and Conditional Probabilities: Severity, Males Session 1 to Session 2

		Session 2						
Session 1		**None**	**Deviant**	**Blatant**	**Sneaky**	**Sex**	**Drugs**	**Row Totals**
	None	5 (.22)	6 (.26)	3 (.13)	4 (.17)	5 (.22)	*0 (.00)*	23 (.18)
	Deviant	*0 (.00)*	4 (.25)	2 (.13)	5 (.31)	5 (.31)	*0 (.00)*	16 (.12)
	Blatant	4 (.10)	5 (.13)	11 (.28)	8 (.21)	9 (.23)	2 (.05)	39 (.30)
	Sneaky	3 (.10)	*1 (.03)*	5 (.17)	7 (.24)	9 (.31)	4 (.14)	29 (.22)
	Sex	*0 (.00)*	*0 (.00)*	3 (.14)	4 (.19)	14 (.67)	*0 (.00)*	21 (.16)
	Drugs	*0 (.00)*	*0 (.00)*	*0 (.00)*	2 (.67)	*0 (.00)*	1 (.33)	3 (.02)
	Column Totals	12 (.09)	16 (.12)	24 (.18)	30 (.23)	42 (.32)	7 (.05)	131

Note: Conditional probabilities are in parentheses.

Table 6

Aggregate Conditional Probabilities and Percentages:

Severity, Males Session 1 to Session 2

	Decrease Severity	**Same Severity**	**Increase Severity**	**Combined Same + Increase Severity**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	1.80	7.00	4.13	4.95	***3.64***
Total Observed Frequency	*27*	*42*	*62*	*104*	
Total Expected Frequency	(54.6)	(21.84)	(54.6)	(76.44)	
Percent of Total Frequency	20.61	32.06	47.33	79.39	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Table 7 provides the transitional probability matrix for severity for males for the transition from session 2 to session 3. Table 7 may be understood in the same manner as Table 5. Table 5 provides the observed transitions in severity level for deviant talk for males from session 1 to session 2, just as Table 7 provides the observed transitions in severity level for males for deviant talk from session 2 to session 3. The observed conditional probabilities are again shown underneath each frequency for each cell, and these may again be compared with column total marginal conditional probabilities. Table 7 also indicates the observed probabilities which are at least 1.5 times larger than the

column marginal probabilities by shading these cells, as well as indicating those that are less than .5 times as small as the column marginal probabilities by italicizing these cells.

When looking at a comparison of expected versus observed transitional probabilities in Table 7, the data indicate a general trend for males from session 2 to session 3 to remain at the same level of severity (along the diagonal), with an equal number of cells above and below the diagonal.

Table 8 provides selected sum conditional probabilities which may be understood in the same manner as Table 6. Each category of observed mean cell conditional probabilities may be compared to the expected observed mean cell conditional probability. The selected sum conditional probabilities in Table 8 are not completely consistent with the hypothesis of the study, showing that more males decrease in severity (36.36%) rather than increase (30.28%).

Table 8 also shows the percentage of transitions represented by each category. This data indicate that 64.42% of males either stayed at the same level of severity or increased in severity of deviant talk from session 2 to session 3. In addition, of those males from session 2 to session 3 who change their severity level, 45% increased in severity, whereas 55% decreased in severity.

Chi-square statistics were also calculated for the frequency of males transitioning from session 2 to session 3. These chi-square comparisons were again done in three ways. The first comparison was done between three categories (decrease in severity, same severity and increase in severity). The chi-square statistic for this distinction was χ^2 (2, N = 109) = 23.81, $p<.01$. The total distribution is different than expected by chance. The second comparison was done between two categories (decrease in severity, versus same

or increase in severity). The chi-square statistic for this distinction was χ^2 (1, N = 109) = 1.56, *p*=NS. The third comparison was between two different categories (decrease in severity and increase in severity). Because these categories did not contain the category of those who stayed at the same level of severity, a new expected probability was calculated and used to determine the chi-square for this distinction (expected cell frequency = 2.40). The chi-square statistic for this distinction was χ^2 (1, N = 109) = .50, *p*=NS. There is no difference relative to chance in the number of boys who showed increases versus decreases in the severity of deviant talk from session 2 to session 3. There was no systematic increase in the severity of different forms of deviant talk from session 2 to session 3.

Table 7

Transitional Probability Matrix, Frequencies and Conditional Probabilities: Severity, Males Session 2 to Session 3

		Session 3						
		None	**Deviant**	**Blatant**	**Sneaky**	**Sex**	**Drugs**	**Row Totals**
Session 2	**None**	2 (.25)	*0 (.00)*	*0 (.00)*	4 (.50)	2 (.25)	*0 (.00)*	8 (.07)
	Deviant	4 (.25)	5 (.31)	*1 (.06)*	*1 (.06)*	5 (.31)	*0 (.00)*	16 (.15)
	Blatant	*0 (.00)*	2 (.11)	4 (.22)	8 (.44)	*3 (.16)*	1 (.06)	18 (.17)
	Sneaky	*0 (.00)*	6 (.25)	7 (.29)	5 (.21)	6 (.25)	*0 (.00)*	24 (.22)
	Sex	2 (.05)	4 (.11)	5 (.14)	4 (.11)	20 (.54)	2 (.05)	37 (.34)
	Drugs	*0 (.00)*	*0 (.00)*	1 (.17)	1 (.17)	3 (.50)	1 (.17)	6 (.06)
	Column Totals	8 (.07)	17 (.16)	18 (.17)	23 (.21)	39 (.36)	4 (.04)	109

Note: Conditional probabilities are in parentheses.

Table 8

Aggregate Conditional Probabilities and Percentages:

Severity, Males Session 2 to Session 3

	Decrease Severity	**Same Severity**	**Increase Severity**	**Combined Same + Increase Severity**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	2.60	6.17	2.20	3.33	***3.03***
Total Observed Frequency	*39*	*37*	*33*	*70*	
Total Expected Frequency	(45.45)	(18.18)	(45.45)	(63.63)	
Percent of Total Frequency	36.36	33.94	30.28	64.22	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Table 9 provides the transitional probability matrix for severity for females from session 1 to session 2. Table 9 may be understood in the same manner as Tables 5. Table 5 provides the observed transitions in severity level for deviant talk for males from session 1 to session 2, just as Table 9 provides the observed transitions in severity level for females for deviant talk from session 1 to session 2. The observed conditional probabilities are again shown underneath each frequency for each cell, and these may again be compared with column total marginal conditional probabilities. Table 9 also indicates the observed probabilities which are at least 1.5 times larger than the column

marginal probabilities by shading these cells, as well as indicating those that are less than .5 times as small as the column marginal probabilities by italicizing these cells.

When looking at a comparison of expected versus observed transitional probabilities in Table 9, the data indicate a general trend for females from session 1 to session 2 to remain at the same level of severity (along the diagonal), with an equal number of cells above and below the diagonal.

Table 10 provides selected sum conditional probabilities which may be understood in the same manner as Table 6. Each category of observed mean cell conditional probabilities may be compared to the expected observed mean cell conditional probability. The selected sum conditional probabilities in Table 10 are not completely consistent with the hypothesis of the study, showing that more females decrease in severity (38.21%) rather than increase (31.70%).

Table 10 also shows the percentage of transitions in which females stayed at the same level of severity or increased severity in forms of deviant talk. The data indicate that 61.79% of females either stayed at the same level of severity or increased in severity of deviant talk from session 1 to session 2. In addition, of those females from session 1 to session 2 who change their severity level, 51% increased in severity, whereas 49% decreased in severity.

Chi-square statistics were also calculated for the frequency of females' transitions from session 1 to session 2. These chi-square comparisons were again done in three ways. The first comparison was done between three categories (decrease in severity, same severity and increase in severity). The chi-square statistic for this distinction was χ^2 (2, N = 123) = 16.54, $p<.01$. The total distribution is different than expected by chance. The

second comparison was done between two categories (decrease in severity, versus same or increase in severity). The chi-square statistic for this distinction was χ^2 (1, N = 123) = .60, *p*=NS. The third comparison was between two different categories (decrease in severity and increase in severity). Because these categories did not contain the category of those who stayed at the same level of severity, a new expected probability was calculated and used to determine the chi-square for this distinction (expected cell frequency = 2.87). The chi-square statistic for this distinction was χ^2 (1, N = 123) = .74, *p*=NS. Although the first chi-square did indicate significant differences, there appears to be no difference relative to chance in the number of females who showed increases versus decreases in the severity of deviant talk from session 1 to session 2. This does not support the hypothesis.

Table 9

Transitional Probability Matrix, Frequencies and Conditional Probabilities: Severity, Females Session 1 to Session 2

		Session 2						
		None	**Deviant**	**Blatant**	**Sneaky**	**Sex**	**Drugs**	**Total**
Session 1	**None**	10 (.26)	5 (.13)	10 (.26)	6 (.15)	6 (.15)	2 (.08)	39 (.32)
	Deviant	4 (.37)	4 (.37)	2 (.18)	*1 (.09)*	*0 (.00)*	*0 (.00)*	11 (.09)
	Blatant	7 (.37)	*1 (.05)*	6 (.32)	3 (.16)	*1 (.05)*	1 (.05)	19 (.15)
	Sneaky	8 (.31)	3 (.12)	8 (.31)	5 (.19)	*2 (.08)*	*0 (.00)*	26 (.21)
	Sex	3 (.14)	*1 (.05)*	*2 (.10)*	5 (.24)	10 (.48)	*0 (.00)*	21 (.17)
	Drugs	1 (.14)	1 (.14)	*0 (.00)*	2 (.29)	1 (.14)	2 (.29)	7 (.06)
	Total	33 (.27)	15 (.12)	28 (.23)	22 (.18)	20 (.16)	5 (.04)	123

Note: Conditional probabilities are in parentheses.

Table 10

Aggregate Conditional Probabilities and Percentages:

Severity, Females Session 1 to Session 2

	Decrease Severity	**Same Severity**	**Increase Severity**	**Combined Same + Increase Severity**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	3.13	6.17	2.60	3.62	***3.42***
Total Observed Frequency	*47*	*37*	*39*	*76*	
Total Expected Frequency	(51.30)	(20.52)	(51.30)	(71.82)	
Percent of Total Frequency	38.21	30.08	31.70	61.79	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Table 11 provides the transitional probability matrix for severity for females from session 2 to session 3. Table 11 may be understood in the same manner as Table 9. Table 7 provides the observed transitions in severity level for deviant talk for males from session 2 to 3, just as Table 11 provides the observed transitions in severity level for females for deviant talk from session 2 to session 3. The observed conditional probabilities are again shown underneath each frequency for each cell, and these may again be compared with column total marginal conditional probabilities. Table 11 also indicates the observed probabilities which are at least 1.5 times larger than the column

marginal probabilities by shading these cells, as well as indicating those that are less than .5 times as small as the column marginal probabilities by italicizing these cells.

When looking at a comparison of expected versus observed transitional probabilities in Table 11, the data indicate a general trend for females from session 2 to session 3 to remain at the same level of severity (along the diagonal), or to increase in the level of severity (above the diagonal).

Table 12 provides selected sum conditional probabilities which may be understood in the same manner as Table 8. Each category of observed mean cell conditional probabilities may be compared to the expected observed mean cell conditional probability. The selected sum conditional probabilities in Table 12 are consistent with the hypothesis of the study, showing that more females increase in severity (38.24%) rather than decrease (31.37%).

Table 12 also shows the percentage of transitions which stay the same or increase in severity in the form of deviant talk. This data indicates that 68.63% of females either stayed at the same level of severity or increased in severity of deviant talk from session 2 to session 3. In addition, of those females from session 2 to session 3 who change their severity level, 51% increased in severity, whereas 49% decreased in severity.

Chi-square statistics were also calculated for the frequency of transitions in deviant talk by females from session 2 to session 3. These chi-square comparisons were again done in three ways. The first comparison was done between three categories (decrease in severity, same severity and increase in severity). The chi-square statistic for this distinction was χ^2 (2, N = 102) = 14.43, p<.01. The total distribution is different than expected by chance. The second comparison was done between two categories (decrease

in severity, versus same or increase in severity). The chi-square statistic for this distinction was χ^2 (1, N = 102) = 4.46, $p<.05$. The distribution is different than expected by chance. The third comparison was between two different categories (decrease in severity and increase in severity). Because these categories did not contain the category of those who stayed at the same level of severity, a new expected probability was calculated and used to determine the chi-square for this distinction (expected cell frequency = 2.37). The chi-square statistic for this distinction was χ^2 (1, N = 102) = .68, *p*=NS. This provides some modest support for the hypothesis for progressions to equivalent or greater severity in the forms of deviant talk.

Table 11

Transitional Probability Matrix, Frequencies and Conditional Probabilities: Severity, Females Session 2 to Session 3

		Session 3						
		None	**Deviant**	**Blatant**	**Sneaky**	**Sex**	**Drugs**	**Total**
Session 2	**None**	8 (.29)	*1 (.04)*	5 (.18)	9 (.32)	4 (.14)	1 (.04)	28 (.27)
	Deviant	3 (.23)	4 (.31)	2 (.15)	*2 (.15)*	*1 (.08)*	1 (.08)	13 (.13)
	Blatant	3 (.19)	*0 (.00)*	5 (.31)	4 (.25)	2 (.13)	2 (.13)	16 (.16)
	Sneaky	2 (.10)	3 (.15)	4 (.20)	7 (.35)	4 (.20)	*0 (.00)*	20 (.20)
	Sex	2 (.10)	1 (.05)	3 (.15)	8 (.40)	5 (.25)	1 (.05)	20 (.20)
	Drugs	*0 (.00)*	*0 (.00)*	1 (.20)	*0 (.00)*	2 (.40)	2 (.40)	5 (.05)
	Total	18 (.18)	9 (.09)	20 (.20)	30 (.30)	18 (.18)	7 (.07)	102

Note: Conditional probabilities are in parentheses.

Table 12

Aggregate Conditional Probabilities and Percentages:

Severity, Females Session 2 to Session 3

	Decrease Severity	**Same Severity**	**Increase Severity**	**Combined Same + Increase Severity**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	2.13	5.17	2.60	3.33	***2.83***
Total Observed Frequency	*32*	*31*	*39*	*70*	
Total Expected Frequency	(42.45)	(16.98)	(42.45)	(59.43)	
Percent of Total Frequency	31.37	30.39	38.24	68.63	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Transitional Probability Matrices – Variety. Because the primary goal of the present study was to predict the sequence of development of deviant talk over the course of three different observation periods during each participant's kindergarten year, transitional probability matrices were also calculated to ascertain sequences in variety separately by gender and for the transition from session 1 to session 2 and the transition from session 2 to session 3. Transition matrices combining gender as well as sessions are included in the appendices. Data included in each matrix were collected during the course of the kindergarten year, approximately equidistant, one in the early fall of the child's kindergarten year, once in the winter and once in the spring.

Table 13 provides the transitional probability matrix for the variety of deviant talk for males from session 1 to session 2. Each child's level of variety was determined by the number of different types of deviant talk displayed in each session. The number of different types of deviant talk displayed in session 1 was then compared to the number of different types of deviant talk displayed in session 2. Each child contributes one count to the entire matrix. Each cell then provides the observed probability of a child making that particular transition in variety.

As illustrated in Table 13, there were a total of 5 males who displayed no deviant talk (variety = 0) in either session 1 or 2 (top left cell). In this same cell the number below the frequency, .22, indicates the observed probability of making that particular transition (variety in session 2 = 0) relative to transitions to all varieties of deviant talk. Following the same rationale, the number of children who displayed one form of deviant talk who advanced to two forms of deviant talk (second row, third column) was 9. The associated transitional probability of .28 indicates the degree to which children advanced to two types compared to those who display no form of deviant talk (4 at session 2, p = .13) or who displayed the same number of different types of deviant talk at session 2 (10 at session 2, p = .31).

These observed probabilities may be compared to the expected probabilities for each column to ascertain developmental trends in variety of deviant talk. As illustrated in Table 13, there were a total of 12 of males who displayed no deviant talk at session 2. This number may be obtained by summing the column labeled None. The expected result would be an equal distribution of those 12 males across the cells in the column. Therefore the bottom number in that cell can be used to calculate the marginal probability which

represents the total frequency of males making those transitions in that column divided by the total number of male transitions in the entire matrix.

Each column's total has a corresponding marginal probability which can then be compared to the observed probability in the corresponding cells in each column. For example, when comparing the observed probability of males who displayed no forms of deviant talk at session 1 or session 2 (.22) with the marginal probability of the corresponding column (.09), the observed probability is shown to be higher than one would expect by chance. The same comparisons can be made for all cells in the Table.

Just as was shown in terms of severity, the low frequency of the transitions in the variety of deviant talk preclude to analysis of the data in Table 13 in a formal statistical way. However, as a general way to view this data, Table 13 indicates the cells for which the observed probabilities are at least 1.5 times larger than the column marginal probabilities by shading. In addition, Table 13 also indicates the observed probabilities which are less than .5 times smaller than the column marginal probabilities by italicizing these cells. These cells show what could be a significant difference between the observed and marginal probabilities of each cell

When looking at a comparison of expected versus observed transitional probabilities in Table 13, the data indicate a general trend for males to either remain at the same level of variety (along the diagonal) or increase their level of variety (above the diagonal) from session 1 to session 2.

Table 14 provides selected sum conditional probabilities. Cells were summed to create 3 superordinate categories, those that represented a decrease in the number of different forms of deviant talk from session 1 to session 2, those that represented the

same number of different forms of deviant talk from session 1 to session 2, and those that represented an increase in the number of different forms of deviant talk from session 1 to session 2. These distinctions are represented by the first three columns of Table 14, respectively.

The fourth column of Table 14 indicates the combined conditional probability of the observed mean frequencies of those cells in which the number of different forms of deviant talk remained the same from session 1 to session 2 and which increased from session 1 to session 2. The final column indicates the expected cell probability for the entire matrix if the frequencies occurred by chance. Therefore, the final column may be compared to the previous four columns to assess for changes in the variety of deviant talk from session 1 to session 2. Each column also contains the observed frequencies (second number in top row) and expected frequencies (third number in top row) for each distinction.

In addition, Table 14 shows the percentage of transitions represented by each category. This data indicate that 78.79% of males either displayed the same number of different forms or increased the number of different forms of deviant talk from session 1 to session 2. In addition, of those males from session 1 to session 2 who showed a change in the number of forms, 69% increased in the number, whereas only 31% decreased in the number.

A chi-square statistic was calculated to determine the statistical significance of the differences between the observed frequencies and the expected frequencies in Table 14, assuming that the expected frequencies would reflect equal cell distribution. This chi-square comparison was done in three ways. The first method compared the frequencies of

each of 3 different categories (those that represented a decrease in the number of forms of deviant talk, those that represented the same number of forms of deviant talk, and those that represented an increase in the number of forms of deviant talk, the 3 left hand columns in Table 5) to the expected equal cell distribution of frequencies. The chi-square fit statistic for this distinction was χ^2 (2, N = 132) = 30.80, p<.01. The observed distribution is different than expected by chance.

The second chi-square statistic compared the frequencies in 2 different categories, the first category represented a decrease in the number of forms of deviant talk from session 1 to session 2 and the second category represented a combination of those that remained at the same number of forms and those who increased in number of forms of deviant talk from session 1 to session 2. The chi-square statistic for this distinction was χ^2 (1, N = 132) = 22.70, p<.01. This indicated a higher than expected number of males displayed the same or an increasing number of different forms of deviant talk from session 1 to session 2 than those who displayed a diminished number of different forms of deviant talk.

The third chi-square statistic compared the frequencies of 2 other different categories, the first category represented children who displayed a decrease in the number of different forms of deviant talk and the second category represented those who displayed an increase in the number of different forms of deviant talk. Because these categories did not contain the category for children who displayed the same number of forms of deviant talk a new expected probability was calculated and used to determine the chi-square for this distinction (expected probability = 3.03). The chi-square statistic for this distinction was χ^2 (1, N = 132) = 13.48, p<.01. A larger than expected number of

males displayed an increasingly wide variety of different forms of deviant talk from session 1 to session 2 and a smaller number of boys than expected displayed decreases in such variety. All three chi-square statistics showed a significant difference between the expected and observed frequencies, indicating that the frequency distributions do not appear to be due to chance. This supports the hypothesis of progression over time in the variety of forms of deviant talk displayed by males from fall to winter of the kindergarten year.

Table 13

Transitional Probability Matrix, Frequencies and Conditional Probabilities: Variety, Males Session 1 to Session 2

		Session 2						
Session 1		**0**	**1**	**2**	**3**	**4**	**5**	**Total**
	0	5 (.22)	9 (.39)	5 (.22)	*3 (.13)*	*1 (.04)*	*0 (.00)*	23 (.17)
	1	4 (.13)	10 (.31)	9 (.28)	7 (.22)	2 (.06)	*0 (.00)*	32 (.24)
	2	*2 (.04)*	9 (.20)	16 (.36)	14 (.31)	3 (.07)	1 (.02)	45 (.34)
	3	*1 (.04)*	*1 (.04)*	4 (.16)	10 (.40)	8 (.32)	1 (.04)	25 (.19)
	4	*0 (.00)*	2 (.29)	4 (.57)	1 (.14)	*0 (.00)*	*0 (.00)*	7 (.05)
	5	*0 (.00)*	*0 (.00)*	*0 (.00)*	*0 (.00)*	*0 (.00)*	*0 (.00)*	0 (.00)
	Total	12 (.09)	31 (.23)	38 (.29)	35 (.27)	14 (.11)	2 (.02)	132

Note: Conditional probabilities are in parentheses.

Table 14

Aggregate Conditional Probabilities and Percentages:

Variety, Males Session 1 to Session 2

	Decrease Variety	**Same Variety**	**Increase Variety**	**Combined Same + Increase Variety**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	1.87	6.83	4.20	4.95	***3.67***
Total Observed Frequency	*28*	*41*	*63*	*104*	
Total Expected Frequency	(55.05)	(22.02)	(55.05)	(77.07)	
Percent of Total Frequency	21.21	31.06	47.27	78.79	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Table 15 provides the transitional probability matrix for variety for males from session 2 to session 3. Table 15 may be explained in the same manner as Table 13. Table 13 provides the observed transitions in forms of deviant talk for males from session 1 to session 2, just as Table 15 provides the observed transitions in forms of deviant talk for males for deviant talk from session 2 to session 3. The observed conditional probabilities are again shown underneath each frequency for each cell, and these may again be compared with column total marginal conditional probabilities. Table 15 also indicates the observed probabilities which are at least 1.5 times larger than the column marginal

probabilities by shading these cells, as well as indicating those that are less than .5 times as small as the column marginal probabilities by italicizing these cells.

When looking at a comparison of expected versus observed transitional probabilities in Table 15, the data indicate a general trend for males from session 2 to session 3 to remain at the same number of different forms of deviant talk (along the diagonal) or to increase the number of different forms of deviant talk (above the diagonal).

Table 16 provides selected sum conditional probabilities which may be understood in the same manner as Table 14. Each category of observed mean cell conditional probabilities may be compared to the expected observed mean cell conditional probability. The selected sum conditional probabilities in Table 16 are consistent with the hypothesis of the study, showing that more males increase in the number of forms of deviant talk rather than decrease the number of forms of deviant talk.

Table 16 also shows the percentage of transitions represented by each category. This data indicates that 62.04% of males either stayed at the same number of forms of deviant talk or increased in the number of forms of deviant talk from session 2 to session 3. In addition, of those males from session 2 to session 3 who change their severity level, 53% increased in severity, whereas 47% decreased in severity.

Chi-square statistics were also calculated for the frequency of transitions in variety of deviant talk by males from session 2 to session 3. These chi-square comparisons were again done in three ways. The first comparison was done between three categories (decrease in number of forms, same number of forms and increase in the number of forms). The chi-square statistic for this distinction was χ^2 (2, N = 108) = .72,

p=NS. The second comparison was done between two categories (decrease in number of forms, versus same or increase in number of forms). The chi-square statistic for this distinction was χ^2 (1, N = 108) = .72, *p*=NS. The third comparison was between two different categories (decrease in number of forms and increase in number of forms). Because these categories did not contain the category of those who had the same number of forms of deviant talk, a new expected probability was calculated and used to determine the chi-square for this distinction (expected cell frequency = 2.87). The chi-square statistic for this distinction was χ^2 (1, N = 108) = .19, *p*=NS. None of these chi-square statistics showed a significant difference between the expected and observed probabilities. This does not support the hypothesis concerning an increase in the variety of different forms of deviant talk over time.

Table 15

Transitional Probability Matrix, Frequencies and Conditional Probabilities: Variety, Males Session 2 to Session 3

		Session 3						
		0	**1**	**2**	**3**	**4**	**5**	**Total**
Session 2	**0**	2 (.25)	*0 (.00)*	1 (.13)	4 (.50)	1 (.13)	*0 (.00)*	8 (.07)
	1	4 (.15)	7 (.26)	6 (.22)	8 (.30)	*2 (.07)*	*0 (.00)*	27 (.25)
	2	*1 (.03)*	8 (.26)	7 (.23)	9 (.29)	5 (.16)	1 (.03)	31 (.29)
	3	1 (.04)	5 (.19)	9 (.35)	*4 (.15)*	7 (.27)	*0 (.00)*	26 (.24)
	4	*0 (.00)*	2 (.14)	2 (.14)	7 (.50)	2 (.14)	1 (.07)	14 (.13)
	5	*0 (.00)*	*0 (.00)*	*2 (.10)*	*0 (.00)*	*0 (.00)*	*0 (.00)*	2 (.02)
	Total	8 (.07)	22 (.20)	27 (.25)	32 (.30)	17 (.16)	2 (.02)	108

Note: Conditional probabilities are in parentheses.

Table 16

Aggregate Conditional Probabilities and Percentages:

Variety, Males Session 2 to Session 3

	Decrease Variety	**Same Variety**	**Increase Variety**	**Combined Same + Increase Variety**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	2.73	3.67	3.00	3.19	***3.00***
Total Observed Frequency	*41*	*22*	*45*	*67*	
Total Expected Frequency	(45.00)	(18.00)	(45.00)	(63.00)	
Percent of Total Frequency	37.96	20.37	41.67	62.04	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Table 17 provides the transitional probability matrix for variety for females from session 1 to session 2. Table 17 may be explained in the same manner as Table 13. Table 17 provides the observed transitions in forms of deviant talk for females from session 1 to session 2, just as Table 13 provides the observed transitions in variety of forms of deviant talk for males for deviant talk from session 1 to session 2. The observed conditional probabilities are again shown underneath each frequency for each cell, and these may again be compared with column total marginal conditional probabilities. Table 17 also indicates the observed probabilities which are at least 1.5 times larger than the column

marginal probabilities by shading these cells, as well as indicating those that are less than .5 times as small as the column marginal probabilities by italicizing these cells.

When looking at a comparison of expected versus observed transitional probabilities in Table 17, the data indicate a general trend for females from session 1 to session 2 to remain at the same number of different forms of deviant talk (along the diagonal) or increase the number of different forms of deviant talk (above the diagonal).

Table 18 provides selected sum conditional probabilities which may be understood in the same manner as Table 16. Each category of observed mean cell conditional probabilities may be compared to the expected observed mean cell conditional probability. The selected sum conditional probabilities in Table 18 are consistent with the hypothesis of the study, showing that more females increase in the number of forms of deviant talk rather than decrease the number of forms of deviant talk.

Table 18 also shows the percentage of transitions in which females displayed the same or more of a variety of forms of deviant talk. This data indicates that 71.78% of females either stayed at the same number of forms of deviant talk or increased in the number of forms of deviant talk from session 1 to session 2. In addition, of those females from session 1 to session 2 who change their severity level, 57% increased in severity, whereas 43% decreased in severity.

Chi-square statistics were also calculated for the frequency of female transitions in variety of forms of deviant talk from session 1 to session 2. These chi-square comparisons were again done in three ways. The first comparison was done between three categories (decrease in number of forms, same number of forms and increase in the number of forms). The chi-square statistic for this distinction was χ^2 (2, N = 124) =

23.63, $p<.01$. The total distribution is different than expected by chance. The second comparison was done between two categories (decrease in number of forms, versus same or increase in number of forms). The chi-square statistic for this distinction was χ^2 (1, N = 124) = 9.23, $p<.01$. A larger number of females displayed the same or an increasing number of different forms of deviant talk than a decrease in the number of forms of deviant talk from session 1 to session 2. The third comparison was between two different categories (decrease in number of forms and increase in number of forms). Because these categories did not contain the category of those who had the same number of forms of deviant talk, a new expected probability was calculated and used to determine the chi-square for this distinction (expected cell frequency = 2.80). The chi-square statistic for this distinction was χ^2 (1, N = 124) = 2.32, p=NS. This provides partial support for the hypothesis of an increase in the variety of forms of deviant talk over time.

Table 17

Transitional Probability Matrix, Frequencies and Conditional Probabilities: Variety, Females Session 1 to Session 2

		Session 2						
		0	**1**	**2**	**3**	**4**	**5**	**Total**
Session 1	**0**	10 (.25)	18 (.45)	5 (.13)	4 (.10)	3 (.08)	*0 (.00)*	40 (.32)
	1	18 (.37)	18 (.37)	6 (.12)	7 (.14)	*0 (.00)*	*0 (.00)*	49 (.40)
	2	4 (.17)	7 (.30)	9 (.39)	*1 (.04)*	1 (.04)	1 (.04)	23 (.19)
	3	*1 (.11)*	*0 (.00)*	3 (.33)	2 (.22)	3 (.33)	*0 (.00)*	9 (.07)
	4	*0 (.00)*	*0 (.00)*	*0 (.00)*	2 (1.0)	*0 (.00)*	*0 (.00)*	2 (.02)
	5	*0 (.00)*	*0 (.00)*	*0 (.00)*	*0 (.00)*	*0 (.00)*	1 (1.0)	1 (.01)
	Total	33 (.27)	43 (.35)	23 (.19)	16 (.13)	7 (.06)	2 (.02)	124

Note: Conditional probabilities are in parentheses.

Table 18

Aggregate Conditional Probabilities and Percentages:

Variety, Females Session 1 to Session 2

	Decrease Variety	**Same Variety**	**Increase Variety**	**Combined Same + Increase Variety**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	2.33	6.67	3.27	4.24	***3.44***
Total Observed Frequency	*35*	*40*	*49*	*89*	
Total Expected Frequency	(51.60)	(20.64)	(51.60)	(72.24)	
Percent of Total Frequency	28.23	32.26	39.52	71.78	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Table 19 provides the transitional probability matrix for variety for females from session 2 to session 3. Table 19 may be explained in the same manner as Table 17. Table 18 provides the observed transitions in the variety of forms of deviant talk for females from session 2 to session 3, just as Table 17 provides the observed transitions in forms of deviant talk for females from session 1 to session 2. The observed conditional probabilities are again shown underneath each frequency for each cell, and these may again be compared with column total marginal conditional probabilities. Table 19 also indicates the observed probabilities which are at least 1.5 times larger than the column

marginal probabilities by shading these cells, as well as indicating those that are less than .5 times as small as the column marginal probabilities by italicizing these cells.

When looking at a comparison of expected versus observed transitional probabilities in Table 19, the data indicate a general trend for females from session 2 to session 3 to remain at the same number of different forms of deviant talk (along the diagonal) or decrease the number of different forms of deviant talk (below the diagonal).

Table 20 provides selected sum conditional probabilities which may be understood in the same manner as Table 18. Each category of observed mean cell conditional probabilities may be compared to the expected observed mean cell conditional probability. The selected sum conditional probabilities in Table 20 are consistent with the hypothesis of the study, showing that more females increase in the number of forms of deviant talk rather than decrease the number of forms of deviant talk.

Table 20 also shows the percentage of transitions represented by each category. This data indicates that 71.29% of females either stayed at the same number of forms of deviant talk or increased in the number of forms of deviant talk from session 2 to session 3. In addition, of those females from session 2 to session 3 who change their severity level, 57% increased in severity, whereas 43% decreased in severity.

Chi-square statistics were also calculated for the frequency females' transitions in the variety of forms of deviant talk from session 2 to session 3. These chi-square comparisons were again done in three ways. The first comparison was done between three categories (decrease in number of forms, same number of forms and increase in the number of forms). The chi-square statistic for this distinction was χ^2 (2, N = 101) = 19.79, p<.01. The total distribution is different than expected by chance. The second

comparison was done between two categories (decrease in number of forms, versus same or increase in number of forms). The chi-square statistic for this distinction was χ^2 (1, N = 101) = 6.96, $p<.01$. A larger number of females displayed the same or an increasing number of different forms of deviant talk from session 2 to session 3. The third comparison was between two different categories (decrease in number of forms and increase in number of forms). Because these categories did not contain the category of those who had the same number of forms of deviant talk, a new expected probability was calculated and used to determine the chi-square for this distinction (expected cell frequency = 2.27). The chi-square statistic for this distinction was χ^2 (1, N = 101) = 1.47, *p*=NS. This provides some support for the hypothesis of a progression over time of an increasing number of forms of deviant talk.

Table 19

Transitional Probability Matrix, Frequencies and Conditional Probabilities: Variety, Females Session 2 to Session 3

		Session 3						
Session 2		**0**	**1**	**2**	**3**	**4**	**5**	**Total**
	0	7 (.26)	11 (.41)	6 (.22)	3 (.11)	*0 (.00)*	*0 (.00)*	27 (.27)
	1	6 (.18)	12 (.35)	8 (.24)	5 (.15)	3 (.09)	*0 (.00)*	34 (.34)
	2	3 (.17)	4 (.22)	9 (.50)	2 (.11)	*0 (.00)*	*0 (.00)*	18 (.18)
	3	*1 (.07)*	4 (.27)	5 (.33)	4 (.27)	1 (.07)	*0 (.00)*	15 (.15)
	4	*0 (.00)*	*0 (.00)*	3 (.50)	2 (.33)	1 (.17)	*0 (.00)*	6 (.06)
	5	*0 (.00)*	*0 (.00)*	*0 (.00)*	*0 (.00)*	1 (1.0)	*0 (.00)*	1 (.01)
	Total	17 (.17)	31 (.31)	31 (.31)	16 (.16)	6 (.06)	0 (.00)	101

Note: Conditional probabilities are in parentheses.

Table 20

Aggregate Conditional Probabilities and Percentages:

Variety, Females Session 2 to Session 3

	Decrease Variety	**Same Variety**	**Increase Variety**	**Combined Same + Increase Variety**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	1.93	5.50	2.60	3.43	***2.81***
Total Observed Frequency	*29*	*33*	*39*	*72*	
Total Expected Frequency	(42.15)	(16.86)	(42.15)	(59.01)	
Percent of Total Frequency	28.71	32.67	38.61	71.29	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Summary Tables

Table 21 and Table 22 both provide summaries of the previous tables, indicating which of the chi-square statistics were significant as well as if that particular category provided support for the hypothesis. Table 21 provides a summary of the growth of severity of deviant talk and Table 22 provides a summary of the growth of variety of deviant talk.

Table 21

Summary Table: Severity

	Males Session 1 to Session 2	**Males Session 2 to Session 3**	**Females Session 1 to Session 2**	**Females Session 2 to Session 3**
χ^2 **Three categories: decrease in severity, same severity and increase in severity**	*Significant*	*Significant*	*Significant*	*Significant*
χ^2 **Two categories: Decrease in severity and same or increase in severity**	*Significant*	Not Significant	Not Significant	*Significant*
χ^2 **Two categories: decrease in severity and increase in severity**	*Significant*	Not Significant	Not Significant	Not Significant
Overall Support	***Yes***	**No**	**No**	***Partial***

Table 22

Summary Table: Variety

	Males Session 1 to Session 2	**Males Session 2 to Session 3**	**Females Session 1 to Session 2**	**Females Session 2 to Session 3**
χ^2 **Three categories: decrease in number of forms, same number of forms and increase in the number of forms**	*Significant*	Not Significant	*Significant*	*Significant*
χ^2 **Two categories: Decrease in number of forms, and same or increase in number of forms**	*Significant*	Not Significant	*Significant*	*Significant*
χ^2 **Two categories: decrease in number of forms and increase in number of forms**	*Significant*	Not Significant	Not Significant	Not Significant
Overall Support	***Yes***	**No**	***Partial***	***Partial***

CHAPTER 4

DISCUSSION

The current study examined the sequence children follow in the development of deviant talk in peer groups, ascertained by shifts in its variety as well as severity at three approximately equidistant points in the children's kindergarten year. The original theoretical model hypothesized that children in the sample would follow a cumulative unitary pattern of development of deviant talk over the three equidistant points of their kindergarten year, progressing over time to more deviant forms but continuing to display less deviant forms as well. In testing this model it was also expected that children would follow a theory driven sequence evidencing the following pattern (from less severe to more severe): talk about aggression, swearing, obscenities and talk about delinquency; defiance of authority including blatant and passive actions; talk about and endorsement of sneaky behaviors; sexual talk and behaviors which were sexually explicit or playful reenactments of sexual behaviors; and talk of drugs and alcohol in a positive manner or exhibiting knowledge of drugs and alcohol. The data did not support this hypothesis. In preliminary descriptive analysis of transitional probability matrices, it was found that the children in this sample did not display this clear cumulative unitary pattern. Because of this, the longitudinal Guttman simplex was not utilized for analyses of the data. However, the general pattern of development of such deviant talk was tested.

Preliminary descriptive analysis of transitional probability matrices of both the severity and variety of deviant talk indicate that changes in variety and severity of deviant talk over time are not random but rather display an at least somewhat systematic pattern. The data indicated that children move in both directions in terms of both severity and

variety of deviant talk displayed. That is, some regressed and some progressed in variety and severity. In fact the most common pattern was to display deviant talk at the same severity and variety as in previous observation. The next most common pattern indicated that many children progressed one level of severity or variety or regressed one level of severity or variety. However, even given this pattern of either progressing one level or regressing one level, there appears to be a tendency to increase or stay the same rather than to decrease in variety and severity of deviant talk, depending on the time period in kindergarten during which observations were made and the gender of the child being observed. This is consistent with other research which indicates that children follow a systematic pattern of growth of deviant behavior beginning in early childhood (Patterson et al., 1992; Hinshaw & Lee, 2003), but these changes are not most accurately depicted by a cumulative unitary pattern.

In the pattern observed, the tendency to remain at the same level or to increase appeared to predominate over the pattern of regression, and the amount of regression was smaller than the amount of progression. Though not hypothesized in the current research, the observed patterns are consistent with the social ecological learning processes experienced by children. Patterson et al.'s (1992) 4-stage model of the development of deviancy, for example, states that as children are trained in deviancy at home, rejected by their normative peers and are indoctrinated into deviant peer groups, processes of shaping and collusion are operating in which children are trained to become increasingly deviant. The specific pattern of changes in deviant talk over time found in this research could be due to similar learning processes. These processes may include a component of extinction to explain regression as well as components of reinforcement to explain progression in

the severity and variety of deviant talk (Dishion, Spracklen, Andrews, & Patterson, 1996). Exposure or modeling processes may also contribute.

The general pattern of increasing severity supports previous research indicating that children increase severity levels from more trivial forms of deviancy to progressively more serious forms of deviancy (Patterson, Reid & Dishion, 1992). The data in this study may indicate changes in deviant talk are another exemplar of such a progression that operates in the peer environment in early childhood. Data indicated that males, in particular, were more likely to progress in terms of severity and variety of deviant talk when compared with regression at least early in the year (fall to winter) but less so in winter to spring. Thus, the impact of peers on deviant talk appears to operate most powerfully for males during the initial entry to the peer group. The results for females were less powerful but similar. This progression in deviant talk was more modest and appeared to occur later in the kindergarten year. Such gender differences could have occurred for a variety of reasons. Males display higher levels of conduct problems relative to girls, and there is some same gender selection and bias in peer association, so one would expect a greater impact of peer experiences on peer deviant talk for males rather than females. Data also show that male deviant talk is over twice as likely to be reinforced by peers (other males) than that of girls (Snyder, Stoolmiller, Patterson, Schrepferman, Oeser, Johnson, et al., 2004). Males therefore have more exposure to deviant talk, are reinforced more frequently for such talk, and therefore practice and utilize deviant talk more. Females, having less exposure and less reinforcement for such talk, would therefore practice and utilize deviant talk less.

The data are consistent with previous research on deviant talk. First, it clearly indicates the presence of a variety of different forms of deviant talk and behavior in young children (Oeser, 2004). The data also suggest that deviant talk is an important part of peer deviancy training that has previously been identified and studied during adolescence (Dishion et al, 1996). Deviant talk has also been found to be prospectively predictive of an increase in delinquency, sexual activity and substance use during adolescence (Patterson, Dishion, & Yoerger, 2000). The current research indicates that deviant talk in the peer group occurs much earlier, and is a dynamic developmental process. Despite these findings, however, there are a multitude of prosocial skills also being learned in early childhood. It is important to mention that in addition to the deviancy training process, children are also learning a variety of these positive skills in their kindergarten year as well.

The present study and analyses have several limitations. First, the number of data collection periods was low. Although the data collection periods were spaced out over a one school year period, only three, 30 minute samples of children's displays of deviant talk and behavior were obtained. This is a relatively small number of brief observation periods on which to base an analysis of the progression in deviant talk given its relatively low rate of occurrence. In addition, the same gender peers with which children interacted during these observation samples were selected in a semi-random fashion as they were available during the school day.

This random selection of peer associates for observation was designed to capture the general effects of peer influence rather than specific effects related to selected friends or regular associates of the target child as used in previous research (Dishion et al., 1996).

As such, it may underestimate the amount of progressions in severity and variety. In this research, displays of deviant talk by children may have strongly been affected by the characteristics of the peers who were with them in a particular session. Random variation in the behavioral characteristics of the peers may have actually reduced the consistency with which children displayed severity and variety of deviant talk. This random variation would serve as error or noise in the current analyses. Thus changes in severity and variety may have actually been underestimated or masked by these random peer effects which confound time effects.

Summary and Implications

The present study adds to the existing research on the role of deviant talk in the development of problem behavior. Past research has demonstrated a strong link between deviant talk and problem behavior, putting children who exhibit deviant talk at higher risk for the development of a multitude of problems including the development of Oppositional Defiant Disorder, Conduct Disorder, Antisocial Personality Disorder, involvement with law enforcement, early and risky sexual activity, and substance use and abuse (Hinshaw & Lee, 2003; Patterson et al., 1992). This research demonstrates the occurrence of deviant talk and behavior at a very early age, and suggests that the peer environment may contribute to this growth during early childhood.

The findings in the current study reaffirm the need to identify children who display progressions in severity of deviant talk and behavior early in development. Evidence suggests that growth in deviant talk and behavior increments risk for the development of future problems (Snyder et al., 2005). The tendency for deviant children to seek out other deviant peers, and as a consequence to learn and develop more severe

and more numerous forms of deviant behavior is well documented in research (Loeber & Stouthamer-Loeber, 1998; Reid & Eddy, 1997; Patterson & Yoerger, 1999; Lauer, Akers, Massey & Clark, 1982; Krohn, Lanza-Kaduce & Akers, 1984; Patterson, Dishion & Yoerger, 2000). Knowing that this pattern begins as early as kindergarten and that growth occurs during a single school year has important treatment implications.

The current study affirms the necessity of early identification and intervention with children who are at risk for developing deviancy skills and problem behavior in order to prevent their persistence and progression. This research shows children, regardless of their risk factors, who are left in their natural peer environment will be exposed to and participate in increasing levels of such deviant talk and in growing, become at risk for developing conduct problems. Explicit contingencies are needed to prevent the growth of deviant talk. Parents, teachers, and other caregivers, need to be made aware of the display of deviant talk by young children. These individuals should monitor and shape the environments of the children in order to reduce the displays of and exposure to deviant talk. This focus may provide a novel but potentially powerful early intervention for conduct problems. An intervention focused on peer deviancy training processes would complement more established standard interventions such as parent training and classroom behavior management.

Strengths

The present study has a number of strengths. The use of observed peer interaction provided an accurate real frequency measure of various forms of deviant talk. Through utilization of observations of peer interaction, the present study was able to incorporate a more accurate measurement of deviant talk and behavior than is available from teacher,

peer or self report measures. The longitudinal design allowed for stronger inferences to be made about temporal changes and developmental patterns of deviant talk. In addition, the research sample represented the full range of deviant talk and behavior, which may increase the generalizability of these results.

Limitations

Although this research is based on theoretically derived models and reliable observations, some issues of measurement error are important to mention. Although deviant talk is displayed by kindergarten children, it was observed at measurable but modest rates, limiting the sample of deviant talk data to analyze. One hypothesis regarding the data is that this may reflect the inherently low base rate at which these behaviors are displayed by young children. Another hypothesis is that these behaviors are naturally covert in nature and difficult to measure because children are attempting to hide them. More frequent and longer duration observation periods are needed to more clearly ascertain temporal changes in deviant talk.

Another limitation regarding the data involves the sample utilized in the data. The at-risk sample was taken from one school in one city. In addition, the sample was primarily Euro-American. Therefore, the findings may not generalize to other more varied populations of children and families.

Future Directions

As a result of these findings, it is apparent that further research is needed to more clearly understand the development of deviant talk and behavior. Results of this study indicate that children as early as kindergarten demonstrate deviant talk that may be increasing in both severity and variety. The specific progression needs more scrutiny and

should be tested over longer time periods and transitions across school, classroom and peer groups. It would be helpful in terms of developmental trajectories as well as interventions to know the specific progression children follow, and the evidence that such behavior is present at such young ages makes such research even more important. Finally, the importance of progression in the variety and severity of various forms of deviant talk needs to be more clearly established by linking progression (rather than simply frequency) to increased risk for negative developmental outcomes.

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APPENDICES

Appendix A: Transitional Probability Matrix, Frequencies and Conditional Probabilities: Severity, Males Combined Session 1 to Session 2 and Session 2 to Session 3

		Combined Session 2 and Session 3						
Combined Session 1 and Session 2		**None**	**Deviant**	**Blatant**	**Sneaky**	**Sex**	**Drugs**	**Total**
	None	7 (.23)	6 (.19)	3 (.10)	8 (.26)	7 (.23)	*0 (.00)*	31 (.13)
	Deviant	4 (.13)	9 (.28)	3 (.09)	6 (.19)	10 (.31)	*0 (.00)*	32 (.13)
	Blatant	4 (.07)	7 (.12)	15 (.26)	16 (.28)	12 (.21)	3 (.05)	57 (.24)
	Sneaky	3 (.06)	7 (.13)	12 (.23)	12 (.23)	15 (.28)	4 (.08)	53 (.22)
	Sex	*2 (.03)*	*4 (.06)*	8 (.13)	8 (.13)	34 (.57)	2 (.03)	58 (.24)
	Drugs	*0 (.00)*	*0 (.00)*	1 (.11)	3 (.33)	3 (.33)	2 (.22)	9 (.04)
	Total	20 (.08)	33 (.14)	42 (.17)	53 (.22)	81 (.33)	11 (.05)	240

Note: Conditional probabilities are in parentheses.

Appendix B: Aggregate Conditional Probabilities and Percentages:

Severity, Males Combined Session 1 to Session 2 and Session 2 to Session 3

	Decrease Severity	**Same Severity**	**Increase Severity**	**Combined Same + Increase Severity**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	4.40	13.17	6.33	8.29	***6.56***
Total Observed Frequency	*66*	*79*	*95*	*174*	
Total Expected Frequency	(98.40)	(39.36)	(98.40)	(137.76)	
Percent of Total Frequency	26.27	33.47	40.25	73.72	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Decrease Severity versus Same Severity versus Increase Severity

χ^2 (2, N = 240) = 50.70, p<.001

Decrease Severity versus Combined Same Severity and Increase Severity

χ^2 (1, N = 240) = 20.20, p<.001

Decrease Severity versus Increase Severity

χ^2 (1, N = 240) = 5.22, p<.001

Appendix C: Transitional Probability Matrix, Frequencies and Conditional Probabilities:

Severity, Females Combined Session 1 to Session 2 and Session 2 to Session 3

		Combined Session 2 and Session 3						
Combined Session 1 and Session 2		**None**	**Deviant**	**Blatant**	**Sneaky**	**Sex**	**Drugs**	**Total**
	None	*18 (.12)*	6 (.09)	15 (.22)	15 (.22)	10 (.15)	3 (.04)	67 (.37)
	Deviant	7 (.29)	8 (.33)	4 (.17)	*3 (.13)*	*1 (.04)*	1 (.04)	24 (.13)
	Blatant	10 (.29)	*1 (.03)*	11 (.31)	7 (.20)	*3 (.09)*	3 (.09)	35 (.19)
	Sneaky	10 (.22)	6 (.13)	12 (.26)	12 (.26)	6 (.13)	*0 (.00)*	46 (.25)
	Sex	*5 (.12)*	*2 (.05)*	*5 (.12)*	13 (.32)	15 (.37)	*1 (.02)*	41 (.22)
	Drugs	*1 (.08)*	1 (.08)	*1 (.08)*	2 (.16)	3 (.25)	4 (.33)	12 (.07)
	Total	51 (.28)	24 (.13)	48 (.26)	52 (.28)	38 (.20)	12 (.07)	225

Note: Conditional probabilities are in parentheses.

Appendix D: Aggregate Conditional Probabilities and Percentages:

Severity, Females Combined Session 1 to Session 2 and Session 2 to Session 3

	Decrease Severity	**Same Severity**	**Increase Severity**	**Combined Same + Increase Severity**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	5.26	11.33	5.20	6.95	***6.25***
Total Observed Frequency	*79*	*68*	*78*	*146*	
Total Expected Frequency	(93.75)	(37.50)	(93.75)	(131.25)	
Percent of Total Frequency	35.11	30.22	34.66	64.88	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Decrease Severity versus Same Severity versus Increase Severity

χ^2 (2, N = 225) = 29.77, p<.001

Decrease Severity versus Combined Same Severity and Increase Severity

χ^2 (1, N = 225) = 3.97, p<.05

Decrease Severity versus Increase Severity

χ^2 (1, N = 225) = 0, p=NS

Appendix E: Transitional Probability Matrix, Frequencies and Conditional Probabilities: Severity, Males and Females Session 1 to Session 2

		Session 2						
		None	**Deviant**	**Blatant**	**Sneaky**	**Sex**	**Drugs**	**Total**
Session 1	**None**	15 (.24)	11 (.18)	13 (.21)	10 (.16)	11 (.18)	2 (.03)	62 (.24)
	Deviant	4 (.15)	8 (.30)	4 (.15)	6 (.22)	5 (.19)	*0 (.00)*	27 (.11)
	Blatant	11 (.19)	6 (.10)	17 (.29)	11 (.19)	10 (.17)	3 (.05)	58 (.23)
	Sneaky	11 (.20)	4 (.07)	13 (.24)	12 (.22)	11 (.20)	4 (.07)	55 (.22)
	Sex	*3 (.07)*	*1 (.02)*	5 (.12)	9 (.21)	24 (.57)	*0 (.00)*	42 (.17)
	Drugs	1 (.10)	1 (.10)	*0 (.00)*	4 (.40)	*1 (.10)*	3 (.30)	10 (.04)
	Total	45 (.18)	31 (.12)	52 (.20)	52 (.20)	62 (.24)	12 (.05)	254

Note: Conditional probabilities are in parentheses.

Appendix F: Aggregate Conditional Probabilities and Percentages:

Severity, Males and Females Session 1 to Session 2

	Decrease Severity	**Same Severity**	**Increase Severity**	**Combined Same + Increase Severity**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	4.93	13.17	6.67	8.52	***7.03***
Total Observed Frequency	74	79	101	180	
Total Expected Frequency	(105.45)	(42.18)	(105.45)	(147.63)	
Percent of Total Frequency	29.25	31.23	39.53	70.76	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Decrease Severity versus Same Severity versus Increase Severity

χ^2 (2, N = 254) = 41.71, p<.001

Decrease Severity versus Combined Same Severity and Increase Severity

χ^2 (1, N = 254) = 16.48, p<.001

Decrease Severity versus Increase Severity

χ^2 (1, N = 254) = 4.06, p<.05

Appendix G: Transitional Probability Matrix, Frequencies and Conditional Probabilities: Severity, Males and Females Session 2 to Session 3

		Session 3						
		None	**Deviant**	**Blatant**	**Sneaky**	**Sex**	**Drugs**	**Total**
Session 2	**None**	10 (.28)	*1 (.03)*	5 (.12)	13 (.36)	6 (.17)	1 (.03)	36 (.17)
	Deviant	7 (.24)	9 (.31)	3 (.10)	*3 (.10)*	6 (.21)	1 (.03)	29 (.14)
	Blatant	3 (.09)	*2 (.06)*	9 (.26)	12 (.35)	5 (.15)	3 (.09)	34 (.16)
	Sneaky	*2 (.05)*	9 (.20)	11 (.25)	12 (.27)	10 (.23)	*0 (.00)*	44 (.21)
	Sex	4 (.07)	5 (.09)	8 (.14)	12 (.21)	25 (.44)	3 (.05)	57 (.27)
	Drugs	*0 (.00)*	*0 (.00)*	2 (.18)	*1 (.09)*	5 (.45)	3 (.27)	11 (.05)
	Total	26 (.12)	26 (.12)	38 (.18)	53 (.25)	57 (.27)	11 (.05)	211

Note: Conditional probabilities are in parentheses.

Appendix H: Aggregate Conditional Probabilities and Percentages:

Severity, Males and Females Session 2 to Session 3

	Decrease Severity	**Same Severity**	**Increase Severity**	**Combined Same + Increase Severity**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	4.73	11.33	4.80	6.67	***5.86***
Total Observed Frequency	71	68	72	140	
Total Expected Frequency	(87.90)	(35.16)	(87.90)	(123.06)	
Percent of Total Frequency	33.65	32.23	34.12	66.35	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Decrease Severity versus Same Severity versus Increase Severity

χ^2 (2, N = 211) = 36.46, p<.001

Decrease Severity versus Combined Same Severity and Increase Severity

χ^2 (1, N = 211) = 5.24, p<.05

Decrease Severity versus Increase Severity

χ^2 (1, N = 211) = .01, p=NS

Appendix I: Transitional Probability Matrix, Frequencies and Conditional Probabilities: Severity, Males and Females Combines Session 1 to Session 2 and Session 2 to Session 3

		Combined Session 2 and Session 3						
Combined Session 1 and Session 2		**None**	**Deviant**	**Blatant**	**Sneaky**	**Sex**	**Drugs**	**Total**
	None	25 (.26)	12 (.12)	18 (.18)	23 (.23)	17 (.17)	3 (.03)	98 (.21)
	Deviant	11 (.20)	17 (.30)	7 (.13)	9 (.16)	11 (.20)	*1 (.02)*	56 (.12)
	Blatant	14 (.15)	8 (.09)	26 (.28)	23 (.25)	15 (.16)	6 (.07)	92 (.20)
	Sneaky	13 (.13)	13 (.13)	24 (.24)	24 (.24)	21 (.21)	4 (.04)	99 (.21)
	Sex	*7 (.07)*	*5 (.05)*	13 (.13)	21 (.21)	49 (.49)	3 (.03)	98 (.21)
	Drugs	*1 (.05)*	*1 (.05)*	2 (.10)	5 (.24)	6 (.29)	6 (.29)	21 (.05)
	Total	71 (.15)	56 (.12)	90 (.19)	105 (.23)	119 (.26)	23 (.05)	464

Note: Conditional probabilities are in parentheses.

Appendix J: Aggregate Conditional Probabilities and Percentages:

Severity, Males and Females Combines Session 1 to Session 2 and Session 2 to Session 3

	Decrease Severity	**Same Severity**	**Increase Severity**	**Combined Same + Increase Severity**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	9.60	24.50	11.53	15.20	***12.89***
Total Observed Frequency	*144*	*147*	*173*	*320*	
Total Expected Frequency	(193.35)	(77.34)	(193.35)	(270.69)	
Percent of Total Frequency	31.03	31.68	37.28	68.96	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Decrease Severity versus Same Severity versus Increase Severity

χ^2 (2, N = 464) = 77.48, p<.001

Decrease Severity versus Combined Same Severity and Increase Severity

χ^2 (1, N = 464) = 21.58, p<.001

Decrease Severity versus Increase Severity

χ^2 (1, N = 464) = 2.64, p=NS

Appendix K: Transitional Probability Matrix, Frequencies and Conditional Probabilities: Variety, Males Combined Session 1 to Session 2 and Session 2 to Session 3

		Combined Session 2 and Session 3						
Combined Session 1 and Session 2		**0**	**1**	**2**	**3**	**4**	**5**	**Total**
	0	7 (.23)	9 (.29)	6 (.19)	7 (.23)	*2 (.06)*	*0 (.00)*	31 (.13)
	1	8 (.14)	17 (.29)	15 (.25)	15 (.25)	4 (.07)	*0 (.00)*	59 (.25)
	2	*3 (.04)*	17 (.22)	23 (.30)	23 (.30)	8 (.11)	2 (.03)	76 (.32)
	3	*2 (.04)*	6 (.12)	13 (.25)	14 (.27)	15 (.29)	1 (.02)	51 (.21)
	4	*0 (.00)*	4 (.19)	6 (.29)	8 (.38)	2 (.10)	1 (.05)	21 (.09)
	5	*0 (.00)*	*0 (.00)*	2 (1.0)	*0 (.00)*	*0 (.00)*	*0 (.00)*	2 (.01)
	Total	20 (.08)	53 (.22)	65 (.27)	67 (.28)	31 (.13)	4 (.02)	240

Note: Conditional probabilities are in parentheses.

Appendix L: Aggregate Conditional Probabilities and Percentages:

Variety, Males Combined Session 1 to Session 2 and Session 2 to Session 3

	Decrease Variety	**Same Variety**	**Increase Variety**	**Combined Same + Increase Variety**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	4.60	10.50	7.20	8.14	***6.67***
Total Observed Frequency	*69*	*63*	*108*	*171*	
Total Expected Frequency	(100.5)	(40.02)	(100.5)	(140.07)	
Percent of Total Frequency	28.75	26.25	45.00	71.25	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Decrease Variety versus Same Variety versus Increase Variety

χ^2 (2, N = 240) = 23.63, p<.001

Decrease Variety versus Combined Same Variety and Increase Variety

χ^2 (1, N = 240) = 16.69, p<.001

Decrease Variety versus Increase Variety

χ^2 (1, N = 240) = 8.59, p<.01

Appendix M: Transitional Probability Matrix, Frequencies and Conditional Probabilities:

Variety, Females Combined Session 1 to Session 2 and Session 2 to Session 3

		Combined Session 2 and Session 3						
Combined Session 1 and Session 2		**0**	**1**	**2**	**3**	**4**	**5**	**Total**
	0	17 (.25)	29 (.43)	11 (.16)	7 (.10)	3 (.04)	*0 (.00)*	67 (.30)
	1	24 (.29)	30 (.36)	14 (.17)	12 (.14)	3 (.04)	*0 (.00)*	83 (.37)
	2	7 (.17)	11 (.27)	18 (.44)	*3 (.07)*	*1 (.02)*	1 (.02)	41 (.18)
	3	*2 (.08)*	4 (.17)	8 (.33)	6 (.25)	4 (.17)	*0 (.00)*	24 (.11)
	4	*0 (.00)*	*0 (.00)*	3 (.38)	4 (.50)	1 (.13)	*0 (.00)*	8 (.04)
	5	*0 (.00)*	*0 (.00)*	*0 (.00)*	*0 (.00)*	1 (.50)	1 (.50)	2 (.01)
	Total	50 (.22)	74 (.33)	54 (.24)	32 (.14)	13 (.06)	2 (.01)	225

Note: Conditional probabilities are in parentheses.

Appendix N: Aggregate Conditional Probabilities and Percentages:

Variety, Females Combined Session 1 to Session 2 and Session 2 to Session 3

	Decrease Variety	**Same Variety**	**Increase Variety**	**Combined Same + Increase Variety**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	4.27	12.17	5.87	7.67	***6.25***
Total Observed Frequency	*64*	*73*	*88*	*131*	
Total Expected Frequency	(93.75)	(37.50)	(93.75)	(131.25)	
Percent of Total Frequency	28.44	32.44	39.11	71.55	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Decrease Variety versus Same Variety versus Increase Variety

χ^2 (2, N = 225) = 43.40, p<.001

Decrease Variety versus Combined Same Variety and Increase Variety

χ^2 (1, N = 225) = 9.44, p<.001

Decrease Variety versus Increase Variety

χ^2 (1, N = 225) = 3.78, p<.10

Appendix O: Transitional Probability Matrix, Frequencies and Conditional Probabilities:

Variety, Males and Females Session 1 to Session 2

		Session 2						
		0	**1**	**2**	**3**	**4**	**5**	**Total**
Session 1	**0**	15 (.24)	27 (.43)	10 (.16)	7 (.11)	4 (.06)	*0 (.00)*	63 (.25)
	1	22 (.27)	28 (.35)	15 (.19)	14 (.17)	*2 (.02)*	*0 (.00)*	81 (.32)
	2	*6 (.09)*	16 (.24)	25 (.37)	15 (.22)	4 (.06)	2 (.03)	68 (.27)
	3	*2 (.06)*	1 (.03)	7 (.21)	12 (.35)	11 (.32)	1 (.03)	34 (.13)
	4	*0 (.00)*	2 (.22)	4 (.44)	3 (.33)	*0 (.00)*	*0 (.00)*	9 (.04)
	5	*0 (.00)*	*0 (.00)*	*0 (.00)*	*0 (.00)*	*0 (.00)*	*0 (.00)*	0 (.00)
	Total	45 (.18)	74 (.29)	61 (.24)	51 (.20)	21 (.08)	3 (.01)	255

Note: Conditional probabilities are in parentheses.

Appendix P: Aggregate Conditional Probabilities and Percentages:

Variety, Males and Females Session 1 to Session 2

	Decrease Variety	**Same Variety**	**Increase Variety**	**Combined Same + Increase Variety**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	4.20	13.33	7.47	9.14	***7.08***
Total Observed Frequency	*63*	*80*	*112*	*192*	
Total Expected Frequency	(106.20)	(42.48)	(106.20)	(148.68)	
Percent of Total Frequency	24.71	31.38	43.92	75.30	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Decrease Variety versus Same Variety versus Increase Variety

χ^2 (2, N = 255) = 51.02, p<.001

Decrease Variety versus Combined Same Variety and Increase Variety

χ^2 (1, N = 255) = 30.19, p<.001

Decrease Variety versus Increase Variety

χ^2 (1, N = 255) = 12.65, p<.001

Appendix Q: Transitional Probability Matrix, Frequencies and Conditional Probabilities: Variety, Males and Females Session 2 to Session 3

		Session 3						
		0	**1**	**2**	**3**	**4**	**5**	**Total**
Session 2	**0**	9 (.26)	11 (.31)	7 (.20)	7 (.20)	*1 (.03)*	*0 (.00)*	35 (.17)
	1	10 (.16)	19 (.31)	14 (.23)	13 (.21)	5 (.08)	*0 (.00)*	61 (.29)
	2	4 (.08)	12 (.24)	16 (.33)	11 (.22)	5 (.10)	1 (.02)	49 (.23)
	3	*2 (.05)*	9 (.22)	14 (.34)	8 (.20)	8 (.20)	*0 (.00)*	41 (.20)
	4	*0 (.00)*	*2 (.10)*	5 (.25)	9 (.45)	3 (.15)	1 (.05)	20 (.10)
	5	*0 (.00)*	*0 (.00)*	2 (.67)	*0 (.00)*	1 (.33)	*0 (.00)*	3 (.01)
	Total	25 (.12)	53 (.25)	58 (.28)	48 (.23)	23 (.11)	2 (.01)	209

Note: Conditional probabilities are in parentheses.

Appendix R: Aggregate Conditional Probabilities and Percentages:

Variety, Males and Females Session 2 to Session 3

	Decrease Variety	**Same Variety**	**Increase Variety**	**Combined Same + Increase Variety**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	4.67	9.17	5.60	6.62	***5.80***
Total Observed Frequency	*70*	*55*	*84*	*139*	
Total Expected Frequency	(87.00)	(34.80)	(87.00)	(121.80)	
Percent of Total Frequency	33.49	26.32	40.19	66.51	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Decrease Variety versus Same Variety versus Increase Variety

χ^2 (2, N = 209) = 15.14, p<.001

Decrease Variety versus Combined Same Variety and Increase Variety

χ^2 (1, N = 209) = 5.74, p<.05

Decrease Variety versus Increase Variety

χ^2 (1, N = 209) = 1.28, p=NS

Appendix S: Transitional Probability Matrix, Frequencies and Conditional Probabilities: Variety, Males and Females Session 1 to Session 2 and Session 2 to Session 3

		Combined Session 2 and Session 3						
Combined Session 1 and Session 2		**0**	**1**	**2**	**3**	**4**	**5**	**Total**
	0	24 (.24)	38 (.39)	17 (.17)	14 (.14)	5 (.05)	*0 (.00)*	98 (.21)
	1	32 (.23)	47 (.33)	29 (.20)	27 (.19)	7 (.05)	*0 (.00)*	142 (.31)
	2	10 (.09)	28 (.24)	41 (.35)	26 (.22)	9 (.08)	3 (.03)	117 (.25)
	3	4 (.05)	*10 (.13)*	21 (.28)	20 (.27)	19 (.25)	1 (.01)	75 (.16)
	4	*0 (.00)*	4 (.14)	9 (.31)	12 (.41)	3 (.10)	1 (.03)	29 (.06)
	5	*0 (.00)*	*0 (.00)*	2 (.66)	*0 (.00)*	1 (.33)	*0 (.00)*	3 (.01)
	Total	70 (.15)	127 (.27)	119 (.26)	99 (.21)	44 (.09)	5 (.01)	464

Note: Conditional probabilities are in parentheses.

Appendix T: Aggregate Conditional Probabilities and Percentages:

Variety, Males and Females Session 1 to Session 2 and Session 2 to Session 3

	Decrease Variety	**Same Variety**	**Increase Variety**	**Combined Same + Increase Variety**	***Expected Frequency Per Cell***
Observed Mean Cell Frequency	8.87	22.50	13.07	15.76	***12.89***
Total Observed Frequency	*133*	*135*	*196*	*331*	
Total Expected Frequency	(193.35)	(77.34)	(193.35)	(270.69)	
Percent of Total Frequency	28.66	29.09	42.24	71.33	

Note: Observed frequencies are in italics and expected frequencies are in parentheses.

Decrease Variety versus Same Variety versus Increase Variety

χ^2 (2, N = 464) = 61.85, p<.001

Decrease Variety versus Combined Same Variety and Increase Variety

χ^2 (1, N = 464) = 32.27, p<.001

Decrease Variety versus Increase Variety

χ^2 (1, N = 464) = 12.06, p<.001