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CONVERSATIONAL INTERACTIONS OF PEER DYADS IN RULE OBSERVANCE SITUATIONS

BY

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This is to certify that I have examined this copy of a PhD's thesis by

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and have found that it is complete and satisfactory in all respects,
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STATEMENT OF AUTHORSHIP

This thesis contains no material which has been accepted for any awards or other degree or diploma in any university or other institution. It is affirmed by the candidate that, to the best of her knowledge, the thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

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THESIS ABSTRACT

This dissertation examined how preschool children behave when they are asked to follow rules by adults and how they report in conjunction with their friend when they violate a rule in a dyadic context. We used a modified version of the temptation resistance paradigm (Kochanska & Aksan, 1995), where two children were asked to follow a tempting rule (i.e., refraining from touching off-limit toys once the adult leaves) and then were later interviewed about how they handled this rule. The three papers of the current dissertation employed this procedure. The first paper focused on children's behaviors when they were alone in the room, while the other two papers examined children's behaviors during the collective interview phase. The sample consisted of 90 same-sex friend dyads, 47 male-male and 43 female-female pairs of children. The age range of the children was between 48 and 83 months of age (M = 64.18, SD = 9.32). In the first paper (Chapter II), we investigated whether preventive norm enforcement strategies (i.e., before a potential violation) differed from interventive ones (i.e., after an actual violation) in degree of power assertiveness. We further examined (a) which prevention strategies were more likely to change subsequent compliance behavior of the friend, and (b) which strategies were more likely to be used in the following turn when a previous strategy was not successful in attaining compliance. Children tended to prevent their friend from transgressing the rule by using gentle control strategies (e.g., reminding rule or distracting). However, when the rule was violated by the friend, children were more likely to disengage (i.e., no response). Children did not tend to use negative control (e.g., threats or criticism) as a prevention and intervention strategy in this context. Among prevention strategies, gentle control facilitated, whereas disengagement inhibited subsequent compliance. Children maintained the same behavioral strategy before and after a transgression for negative control and disengagement, even though their strategy was ineffective in preventing transgressions. In the second paper (Chapter III), we examined the diversity and consistency in children's lie-related responses during the collective interview, as well as socio-cognitive and temperamental differences between response groups. Children's responses were heterogeneous such as we found self-motivated liars, confessors, reticents, truthful deniers, secret-keepers as well as tattlers. The majority of the children retained their lies (dubbed lie maintainers) throughout the collective interview. Secret-keepers were better at backward digit span than self-motivated liars and confessors, while they were lower in impulsivity and higher in falling reactivity and soothability than confessors. On the other hand, lie maintainers were lower in impulsivity and higher in theory of mind than lie non-maintainers. Finally, in the third paper (Chapter IV), we investigated differences in nonverbal behaviors between lie- and truth-tellers. Nonverbal behaviors were coded during the entire interview phase where they could lie by withholding transgression (i.e., lying by omission) and right after a target question where children chose to lie or tell the truth (i.e., lying by commission). Truth-tellers and lie-tellers showed differences in response latency, looking at friend, and use of gestures right after the target question. However, both groups were similar in their interactive nonverbal behaviors during the entire interview (i.e., speech transition, looking at friend, and utterance rate). Overall, findings of this dissertation highlighted that (1) norm enforcement strategies that

are preventive in nature differ qualitatively from intervention strategies in degree of power assertiveness, (2) children's responses are diverse and they can maintain their lies when interviewed collectively, (3) individual differences in socio-cognitive and temperamental domains are not as robust in dyadic as in individual contexts to differentiate different types of responses, (4) nonverbal cues to deception emerge right after when children decide to actively lie to an unanticipated question.

Keywords: rule observance, norm enforcement, lie-telling behavior, nonverbal cues to deception, collective interview

TEZ ÖZETİ

Bu doktora tezi, bir yetişkin tarafından verilen bir kurala iki çocuğun birlikte uymaları istendiğinde, çocukların nasıl davrandıklarını ve kuralı ihlal ederlerse bir aradayken bunu nasıl rapor ettiklerini incelemektedir. Katılımcı çocuklar, Çeldiriciye Direnç paradigması (Kochanska ve Aksan, 1995) kullanılarak, dokunmalarının yasak olduğu üzeri cezbedici birçok oyuncakla dolu masanın yer aldığı bir odada yalnız bırakılmışlardır. Ardından, çocuk çiftleri odanın kuralına uyup uymama davranışları hakkında birlikte mülakata (toplu mülakat) alınmışlardır. Bu tezde yer alan üç makale de bu prosedürü kullanmaktadır. İlk makale, çocukların yalnız kaldıkları bölümdeki davranışlarına odaklanırken, diğer iki makale çocukların toplu mülakat esnasındaki davranışlarına odaklanmaktadır. Çalışmada 4-6 yaş (*Ort*. = 64.18, *SS* = 9.32, *Ranj* = 48-83 ay) arasında birbirini tanıyan hemcins 90 çift çocuk yer almıştır. İlk makalede (Bölüm-2), olası bir kural ihlalini önlerken ve kural ihlali gerçekleştikten sonra duruma müdahale ederken çocukların arkadaşlarına uyguladıkları stratejilerdeki güç kullanım düzeyindeki farklılaşma incelenmiştir. Ayrıca, kural ihlalini önlerken kullanılan stratejilerden hangilerinin arkadaşının takip eden kurala uyma davranışını değiştirdiği ile arkadaşını önlemede başarısız olan bir strateji sonrası çocukların hangi stratejiyi kullandıkları da incelenmiştir. Çocuklar arkadaşlarının olası kural ihlalini önlerken hafif kontrol stratejileri (örn., kuralı hatırlatma veya dikkati başka yöne çekme) kullanırken, kural ihlali gerçekleştikten sonra müdahale stratejisi olarak geri çekilmeyi (örn., tepki vermeme) tercih etmişlerdir. Bu bağlamda, olumsuz kontrol stratejileri (örn., tehdit etme) önleme veya müdahale stratejisi olarak anlamlı bir şekilde daha fazla kullanılmamıştır. Hafif kontrol stratejisinden sonra kurala uyma davranışının arttığı, geri çekilme stratejisinden sonra ise kuralı ihlal etme davranışın arttığı gözlenmiştir. Çocuklar kural ihlalini önlemede başarısız olsa bile olumsuz kontrol ve geri çekilme stratejilerini kural ihlali öncesi ve sonrası kullanmaya devam etmişlerdir. İkinci makalede (Bölüm-3), toplu mülakat esnasında çocukların yalan söylemeyle alakalı cevaplarındaki çeşitlilik ve tutarlılık incelenmiştir. Ayrıca, farklı cevap gruplarının sosyo-bilişsel ve mizaç boyutlarındaki farklılaşmaları da araştırılmıştır. Toplu mülakat esnasında kendini korumak için yalan söyleme, itiraf etme, suskun kalma, doğruyu söyleme, sır tutma ve ispiyonlama olmak üzere 6 farklı cevap grubu gözlenmiştir. Yalan söyleyen çocukların büyük çoğunluğu yalanlarını toplu mülakat süresince devam ettirmişlerdir. Sır tutan çocuklar, kendi için yalan söyleyen ve itiraf eden çocuklara kıyasla, ters sayı dizisinde daha iyiyken; itiraf eden çocuklara kıyasla, düşük dürtüsellik ve yüksek azalan tepki/sakinleşmeye sahiptir. Toplu mülakat boyunca yalanını sürdürebilen çocuklar, sürdüremeyen çocuklara kıyasla, düşük dürtüselliğe ve yüksek zihin kuramı becerisine sahiptir. Üçüncü makalede (Bölüm-4), çocukların yalan ve doğru söyleme davranışlarına eşlik eden sözel olmayan göstergeler incelenmiştir. Yalan ve doğru söyleyen çocukların sözsüz davranışları iki farklı bölümde kodlamıştır: Kural ihlali davranışını gizleyip başlarından geçen başka olaylar hakkında konuşarak yalan söylemelerinin mümkün olduğu tüm mülakat boyunca (gerçeği gizleme) ve kurala uyma davranışlarının doğrudan sorgulanmasıyla kendiliğinden gelişen yalan veya doğru söylemeye karar verdikleri soru sonrası (yanıltıcı bilgi verme). Doğru ve yalan söyleyen çocukların doğrudan sorgulama sonrasında cevap verme süresi, arkadaşa bakma ve jest

kullanımında farklılaştıkları gözlenmiştir. İki grup tüm mülakat boyunca gösterdikleri etkileşimsel davranışlarda (örn., konuşma geçişi, arkadaşa bakma, sözce oranı) ise birbirine benzemektedir. Bu tezin sonuçları (1) kurala uymada kullanılan önleme ve müdahale stratejilerinin güç düzeylerinde farklılıklar olduğunu, (2) toplu mülakat yapıldığında çocukların cevaplarının çeşitli olduğunu ve yalanlarını devam ettirebildiklerini, (3) sosyo-bilişsel ve mizaç boyutlarında farklı gruplar arasında büyük farklar olmadığını, (4) yalana eşlik eden sözel olmayan davranışların özellikle çocukların yalan söylemeye karar verdikleri anda ortaya çıktığını göstermiştir.

Anahtar Kelimeler: kurala riayet, kuralı uygulama, yalan söyleme davranışı, yalan söyleme davranışının sözel olmayan göstergeleri, toplu mülakat

DEDICATION

to Mehmet and Piraye…

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This dissertation is a product of a very long and circuitous process. Its completion is in large part to the special people who supported and challenged me along this way. Now, it is my time to thank all these people.

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CHAPTER-1:

GENERAL OVERVIEW

Children's daily lives are surrounded by socially enforced conventional norms such as eating dinner at the table rather than in bed, forming a single line while entering the classroom, or refraining from touching the teacher's desk during her absence. The violation of these social norms leads to no obvious harm or victimization (Turiel, 1983). However, children are motivated to follow these norms because children do not want to be disapproved or punished by others, as they want to act properly (Schmidt & Tomasello, 2012). Around 3 years of age, children start to follow social norms and enforce these norms when they are with others. In other words, they expect other interactants to abide by rules and react when they violate the rule (e.g., Göckeritz, Schmidt, & Tomasello, 2014; Köymen, Schmidt, Rost, Lieven, & Tomasello, 2015; Rakoczy, Warneken, & Tomasello, 2008). Schmidt and Tomasello (2012) argue that, from very early on, young children develop a group identification when they are in social groups. This makes children to develop a sense of "we do things in a certain way". This feeling of shared intentionality motivates children to react to other-party violations.

The current literature has documented the way children react to peer's violation of conventional norms or the way children report about own or others' rule violations (i.e., transgressions) as two separate lines of research (e.g., Nucci & Nucci, 1982; Köymen, Schmidt, Rost, Lieven, & Tomasello, 2015; Talwar & Lee, 2002; Talwar, Lee, Bala, & Lindsey, 2004). However, there is paucity of research about how children surrounded with friends behave to follow rules and how they report in conjunction with their friend once they violate a rule in a dyadic context. In this dissertation, we aim to fill this gap by using a semi-naturalistic context to mimic common situations in children's lives where they are tempted to break rules. Mainly, we

focus on features of dyadic interactions in friends' (a) rule enforcement before and after rule transgressions and (b) reporting after rule transgressions. Specifically, we examine the following research questions:

1. What are the verbal and nonverbal strategies for preventing a friend from transgressing a rule or intervening with a friend if they have already violated the rule? Which strategies are effective in preventing a friend to transgress a rule?
2. How do children report their behaviors when they are interviewed together (i.e., during collective interviews)? What kind of responses such as lying, confessing, tattling, or truth-telling do we find in this dyadic context? What are social, cognitive, and temperamental differences among different response groups?
3. Are there nonverbal indicators of lying while carrying out an unanticipated collective interview? Can we differentiate between lie-telling and truth-telling children in a dyadic context based on these indicators?

To answer these questions, we observed pairs of same-sex preschool children who knew each other. We particularly focused on preschool period because children start to socialize with their friends in different social norm settings such as preschools or play groups. They learn social norms together and get used to enforcing norms (see Schmidt & Tomasello, 2012). Moreover, children's socio-cognitive skills are budding and developing at this period, enabling us to examine individual differences, particularly in the ways of reporting rule violations. We used a modified version of the temptation resistance paradigm (Kochanska & Aksan, 1995). Children were introduced to a room where there were two tables: one with attractive off-limit toys and the other with less interesting touchable toys. Children were collectively told by an adult experimenter that touching the attractive toys was forbidden as a rule of the room. Then, the

dyads were left alone in the room working together on a plastic cutlery sorting task. After a minute of being alone, an unfamiliar experimenter entered the room and played with the forbidden toys for a minute to increase the temptation of the forbidden toys, and then the children were left alone for another six minutes. At the end, children were collectively interviewed about their behaviors when they were alone in the room. The questions were as follows: “Tell me in detail, what you did together when I was not here?”, “When I was not here, did you touch these toys?” (target question), “Were you here around this table [children’s table] all the time?”, and “It seems that the locations of these toys have changed, haven’t they?”. If the children did not answer the questions, E1 repeated them or asked “anything else?”. After the interrogation was completed, the pairs of children were allowed to play with the forbidden toys for a few minutes.

The three papers of the current dissertation make use of data obtained from this procedure. The first paper focuses on children’s behaviors when they were alone in the room, while the other two papers examine children’s behaviors during the collective interview phase.

In the first paper, we investigated norm enforcement strategies used by children to prevent a potential transgression and to intervene with a peer’s actual transgression. Previous work has focused on children’s reactions to norm violation both in naturalistic and experimental settings (e.g., Göckeritz, Schmidt, & Tomasello, 2014; Nucci & Nucci, 1982). However, there is dearth of studies focusing on strategies of prevention of a potential rule breaching and the effectiveness of those strategies in facilitating the subsequent norm following behavior. In this study, we examined strategies of both prevention and intervention and compared those strategies to elucidate if there were differences in children’s reactions to a transgression attempt or actual transgression. Finally, we examined which prevention strategies leads to subsequent compliance,

and which strategies were more likely to be used in the following turn when a previous strategy was not successful in attaining compliance. Chapter II contains the manuscript of this paper in preparation.

In Chapter III we examine how children spontaneously decide to report on past behavior and maintained their response in the presence of a friend, when dyads were subjected to an unexpected collective interview. Current literature on children's lie-telling behavior focuses on individual children, showing that lying for self is prevalent, but lying for another person occurs less frequently when children are interviewed individually (e.g., Bottoms, Goodman, & Schwartz-Kenney, 2002; Gordon, Lyon, & Lee, 2014; Talwar & Lee, 2002; Talwar, Lee, Bala, & Lindsey, 2004). Here we investigated the diversity of children's responses such as truthful denying, lying for self, lying for friend, tattling, or confessing, as well as the consistency in these responses throughout the interview (i.e., lie maintenance). We further explored whether response groups differed on socio-cognitive skills and temperamental dimensions. Chapter II contains the manuscript submitted to the *Merrill-Palmer Quarterly*.

In the third paper, we investigated whether lie-telling and truth-telling children could be differentiated based on their nonverbal behaviors during the collective interview phase. In previous collective interview studies, the members of lying dyads did not actually experience the event; rather, they were asked by researchers to prepare a false alibi for the interview (e.g., Driskell et al., 2012; Jundi et al., 2013b; Vrij et al., 2012). However, when a collective interview is carried about actual events, people get an opportunity to talk about their shared experiences while concealing important information. In such a context, nonverbal differences between lie-teller and truth-tellers may emerge right after when people decide to lie against a direct question targeting their misbehavior. However, lie-tellers and truth-tellers may not necessarily differ in

their interactional nonverbal behaviors during the entire interview. Here, we tested these predictions by observing children's behavior during the entire interview phase and right after a target question where they were decided to lie or tell the truth. Chapter IV contains the currently accepted manuscript to be published by the *Journal of Nonverbal Behavior*.

A list of works published and presented during the PhD is listed below.

LIST OF PUBLICATIONS

- **Şen, H. H**. & Küntay, C. A. (2018). Nonverbal markers of lying during children's collective interviewing with friends. *Journal of Nonverbal Behavior.* doi: 10.1007/s10919-018-0287-2.
- Yagmurlu, B., Yavuz, M., & **Sen, H.** (2015). Well-being of mothers of children with orthopedic disabilities in a disadvantaged context: findings from Turkey. *Journal of Child and Family Studies, 24*(4), 948-956. doi: 10.1007/s10826-014-9905-8
- Yagmurlu, B., & **Sen, H.** (2015). Eisenberg's theory of prosocial reasoning. In James D. Wright (editor-in-chief), *International encyclopedia of the social and behavioral sciences* (2nd ed.), vol. 7, 315-320. Oxford: Elsevier.
- **Sen, H.,** Yavuz-Muren, M., & Yagmurlu, B. (2014). Parenting: The Turkish context. In. H. Selin (Ed.), *Parenting across cultures: Childrearing, motherhood and fatherhood in nonwestern cultures*. Science across Cultures: The History of Non-Western Science. Vol 7. (pp. 175-192). Netherlands: Springer.
- **Şen, H. H**. & Küntay, C. A. (*submitted*). Truths, lies, and confessions: Collective interviewing of preschool dyads. *Merrill-Palmer Quarterly.*
- **Şen, H. H**. & Küntay, C. A. (to be submitted). Norm enforcement for rule abiding among friends: Prevention and intervention strategies.

LIST OF PRESENTATIONS

- **Şen, H. H.,** & Küntay, A. C. (2018, November). *Çocuklarla Yapılan Toplu Mülakat Yönteminde Yalan Söylemenin Sözlü Olmayan Göstergeleri.* Oral presentation at the 20th National Congress of Psychology, Ankara, Turkey.
- **Şen, H. H.,** & Küntay, A. C. (2018, November). *Kurallara Uymada Çocukların Kullandığı Önleme ve Müdahale Yöntemleri.* Oral presentation at the 20th National Congress of Psychology, Ankara, Turkey.
- **Sen, H.,** Bozkurt, C., Vardar, S. Z., & Küntay, A. C. (2017, July). *Nonverbal Markers of Collaborative Lying in a dyadic context.* Paper presented at the 14th International Congress for the Study of Child Language, Lyon, France.
- **Sen, H.,** Bozkurt, C., Vardar, S. Z., & Küntay, A. C. (2017, May). *Nonverbal Markers of Collaborative Lying in Pairs of Preschoolers.* Poster presented at the 29th APS Annual Convention, Boston, the USA.
- **Sen, H.,** Bozkurt, C., Vardar, S. Z., & Küntay, A. C. (2017, April). *Non-verbal markers of collaborative lying in a dyadic context.* Paper presented at the 2017 Society for Research in Child Development Biennial, Texas, the USA.
- **Sen, H.,** Karadağ, D., As, G., Bakır, Z. E., Erkaya, M., & Küntay, A. C. (2017, April). *Types of responding in deceptive peer-dyadic contexts: Truth-tellers, real liars, blue liars, social loafers, confessors, and tattlers.* Poster presented at the 2017 Society for Research in Child Development Biennial, Texas, the USA.
- **Sen, H.,** Bozkurt, C., Vardar, S. Z., & Küntay, A. C. (2017, January). *Non-verbal markers of collaborative lying in a dyadic context.* Paper presented at the Budapest CEU Conference on Cognitive Development, Budapest, Hungary.

- **Şen, H. H.,** Karadağ, D., Bozkurt, C., Erkaya, M., Bakır, Z. H., As, G., & Küntay, A. C. (2016, September). *The descriptive properties of lying in children: Truth-tellers, liars, confessors and snitchers*. Poster presented at the 19th National Congress of Psychology, İzmir, Turkey.
- **Şen, H. H.,** Bozkurt, C., & Küntay, A. C. (2016, September). *Q-Method evaluation of dominant child: The measurement of dominance in childhood.* Poster presented at the 19th National Congress of Psychology, İzmir, Turkey.
- **Sen, H.,** Altan, S., Karadag, S., Bakir, Z. E., As, G., Kosegil, E., & Kuntay, A. C. (2015, March). *Turn-taking in peers' conversations: Does inhibitory control matter?* Poster presented at the 2015 Society for Research in Child Development Biennial, Philadelphia, the USA.

CHAPTER 2

NORM ENFORCEMENT FOR RULE ABIDING AMONG FRIENDS: PREVENTION AND INTERVENTION STRATEGIES

Şen, H. H. & Küntay, C. A. (to be submitted). Norm enforcement for rule abiding among friends: Prevention and intervention strategies.

Abstract

Recent studies about how children enforce conventional norms with others focus on children's reactions only after a violation occurs. Children may exhibit different levels of power assertiveness when enforcing norms before, rather than after, a norm violation occurs. In this study, we made a distinction between preventive and interventive strategies to investigate if preventive norm enforcement strategies (i.e., before a potential violation) differ from interventive ones (i.e., after an actual violation) in a temptation resistance paradigm. We further examine (a) which prevention strategies are more likely to change subsequent compliance behavior of the friend, and (b) which strategies are more likely to be used in the following turn when a previous strategy is not successful in attaining compliance. Ninety same-sex familiar friend dyads of 4- to 6-year olds were observed after an experimenter proscribed touching of certain toys through stating a rule and then left the children alone. The results showed that children tended to prevent their friend from transgressing the rule by using gentle control strategies (e.g., reminding rule or distracting). However, when the rule was violated by a friend, they were more likely to disengage (i.e., no response). Children did not significantly use negative control (e.g., threats or criticism) as a prevention and intervention strategy. Among prevention strategies, gentle control increased, whereas disengagement decreased the likelihood of subsequent compliance. Children maintained the same behavioral strategy before and after a transgression for negative control and disengagement, even though their strategy was ineffective in preventing transgression. This is the first study suggesting that norm-enforcement strategies that are preventive in nature differ qualitatively from intervention strategies in degree of power assertiveness.

Keywords: norm enforcement, prevention strategies vs. intervention strategies, gentle control, negative control, disengagement

Norm Enforcement for Rule Abiding among Friends: Prevention versus Intervention Strategies

Human social activities are regulated by conventional norms, such as having to dress up for a formal ceremony or to avoid running disturbingly fast in the classroom (Nucci & Turiel, 1978; Rakoczy & Schmidt, 2013). Previous works showed that children follow conventional norms and expect others to follow them as well. Evidence for norm enforcement is demonstrated in children's interventions in norm violations of others via critiques, protests, tattling, rule statements, and ridicules (Göckeritz, Schmidt, & Tomasello, 2014; Hardecker, Schmidt, Roden, & Tomasello, 2016; Köymen, Schmidt, Rost, Lieven, & Tomasello, 2015; Rakoczy, Warneken, & Tomasello, 2008; Nucci & Nucci, 1982a, 1982b; Vaish, Misanna, & Tomasello, 2011; Yucel & Vaish, 2018). Children also frequently preempt the potential rule breaching attempts of others before an actual violation occurs by restating rules, giving explanations, protesting or objecting to prevent a transgression. However, there is scarcity of research on children's prevention of potential rule violations and the role of those strategies in facilitating subsequent norm following behavior. We fill this gap by studying preschool-aged peer dyads in three steps: first, by comparing different forms of norm enforcement strategies used to prevent a rule transgression before it occurs and to intervene right after; second, by investigating which prevention strategies are more likely to lead to friend's subsequent compliance; and third, by examining which strategies are more likely to be used following a previous prevention strategy which resulted in noncompliance.

Conventional norms represent "general and shared knowledge of uniformities in social interactions and are determined by the social system in which they are formed" (Nucci & Turiel, 1978, p. 400). Despite the arbitrary and context-dependent nature of conventional norms, people are motivated to follow these norms to avoid being disapproved or punished by others, and to

affirm their belonging to a group by conforming and acting properly (Schmidt & Tomasello, 2012). Most children are naturally sensitive to violations of conventional norms. Earlier naturalistic observational studies showed that 7- to 14-year-old children can make a conceptual distinction between social conventional and moral events, and give different forms of reactions to these events (Nucci & Nucci, 1982a, 1982b). In responding to conventional norm transgressions, children focused on achieving conformity to social order by displaying more frequent responses of rule restatements, deviation statements, and ridicule responses in comparison to moral norm transgressions.

Preschool children's spontaneous responses (e.g., critiques, protests) have been recently investigated, mostly to a norm-violating puppet (Hardecker et al., 2016; Rakoczy, Brosche, Warneken, & Tomasello, 2009; Rakoczy et al., 2008; Vaish et al., 2011; Yucel & Vaish, 2018). Despite some procedural differences, the general logic of testing is the same in these studies. The participant child is taught a game rule by an experimenter. A puppet controlled by another experimenter joins the game and engages in behavior that is a mistake or violation of the rule in the experimental condition, and neutral or appropriate in the control condition. Children's reactions to the puppet's violation are then compared across the conditions. Children's verbal and behavioral responses were generally categorized as normative protests, imperative protests, hints of protest, and irrelevant/no response. *Normative protests* include normative vocabulary (i.e., "No, you cannot do that", "No, it does not go like this!"), whereas in *imperative protests*, there is no normative vocabulary but commands/directives (i.e., "No! Not in this hole!" or "Take this stick"). *Hints of protest* include exclamations (i.e., "Hey!"), questions (i.e., "Why are you doing that?"), or pointing/gesturing towards the game equipment. Normative protests are

considered the most indicative behaviors indexing children's awareness of norms, and were found to emerge at around 3 years of age (Rakoczy et al., 2008; 2009).

In these studies, children's reactions were always examined after the puppet violated the rule. Only in two studies, a distinction was made between pre-violation (i.e., prevention) and post-violation (i.e., intervention) reactions. However, either the intention of the puppet with respect to rule violation was not made explicit in the pre-violation phase (Rakoczy et al., 2009) or prevention reactions were not separated from intervention reactions in the coding of responses (Hardecker et al., 2009). Moreover, the use of the puppet as an interactive partner controlled by an adult experimenter does not square with children's daily norm enforcement interactions. Children spend most of their time interacting with their friends in playground or school settings, surrounded by various conventional rules. There is a handful of studies examining the extent to which 3- to 5-year-old children use normative language with their peers while enforcing conventional norms (Göckeritz, et al., 2014; Köymen, Lieven, Engemann, Rakoczy, Warneken, & Tomasello, 2014; Köymen et al., 2015). But these studies also leave out prevention strategies children use for norm enforcement. We need to distinguish between prevention and intervention strategies used to enforce norms with friends to determine whether the degree of power assertiveness differs in these two forms of strategies. When dyads of children are faced with an adult-set rule, they try to achieve conformity to this rule while avoiding disruption of a relationship with a friend who may engage in rule violation. To prevent their friends from committing a transgression, we expect children to rely more on strategies with relatively low power assertiveness. However, if a rule is already violated, children may react to the situation via strategies with high power assertiveness to be able to intercept an ongoing action.

Trying to prevent a friend from committing a transgression can bring about conflict between children (Hay, 1984). In conflicts, children use an array of strategies to resolve conflict including negotiation (i.e., sharing, turn-taking, or talking things out), coercion (i.e., commands, denials, or physical/verbal aggressions), and disengagement (i.e., withdrawals, dropping topic, or standoff) (Jensen-Campbell, Graziano, & Hair, 1996). Negotiation and coercion represent the extreme ends of relationship maintenance, where the former promotes interpersonal harmony and the latter runs the potential of disrupting relationships (Laursen, Finkelstein, & Betts, 2001). Disengagement falls in between, but mostly considered to be used for fostering positive relationships (Hartup, Laursen, Stewart, & Eastenson, 1988). Previous studies observing preschool children's naturally occurring conflicts at school or in free-play settings demonstrated that preschool children mostly relied on disengagement strategies to resolve conflicts (Hartup et al., 1988; Killen & Turiel, 1991). They also used coercion (i.e., insistence) to some extent (Lieber, 1994). In hypothetical situations, preschool children preferred to resolve conflicts more with negotiation and less with power assertion (Iskander, Laursen, Finkelstein, & Fredrickson, 1995). Conflict resolution did not differ as a function of sex (Hartup et al., 1988; Iskander et al., 1995; Laursen & Hartup, 1989) or age (Iskander et al., 1995).

Children's conflict behavior is related to the context in which oppositions are embedded (Killen, 1989). In the abovementioned studies, conflicts arose about different topics such as object possessions, behavioral control, physical and psychological harm, space use, or rules. In other words, conflicts occurred less frequently over conventional rules than other topics in free-play or peer-group settings (Killen & Turiel, 1991; Lieber, 1994). However, when children are observed in a semi-structured context, different patterns of conflict resolution strategies emerge to enforce conventional norms, particularly in school-age children. For example, assertions were

used more frequently with friends than nonfriends when 9- and 10-year-old children were separately taught conflicting game rules and were later asked to play this game together (Hartup, French, Laursen, Johnston, & Ogawa, 1993).

An interesting, yet unexplored, question pertaining to prevention strategies in norm enforcement is whether they are effective in preventing a potential transgression. Which strategies are more likely to lead to friend's subsequent compliance behavior? In situations that call for persuasion, children use different tactics such as requests, questionings, commands, protests, and explanations to influence their friends (e.g., Bartsch, Wright, & Estes, 2010; Jones, 1985). This is a symbolic process where the persuader tries to change the persuadee's mind in an atmosphere of free choice (Perloff, 2010). Constructive strategies such as requests and explanations, rather than commands or protests, are considered to be effective in changing behavior. Indeed, the success of children's interpersonal influence on friends relies on the use of friendly tactics, such as requests compared to demands or commands (Jones, 1985; Trawick-Smith, 1992). Evidence drawn from mother-child interaction also suggests that lower levels of power assertive strategies including use of clear commands that emphasize do's (i.e., "Share your cookies") over don'ts (i.e., "Don't touch them"), praising, and giving explanation and reasoning are associated with child compliance; whereas high power assertive strategies including physical control, threats, harsh commands and criticisms are related to child noncompliance (Crockenberg & Litman, 1990; Kochanska & Aksan, 1995; Kochanska, Aksan, & Nichols, 2003; Kuczynski & Kochanska, 1995).

The Current Study

We used a semi-naturalistic setting where dyads of same-sex preschool children were asked to follow an adult-set tempting rule. Our first aim was to examine children's strategies to

prevent a potential rule transgression before it occurs and to intervene when an actual transgression occurred. We made a distinction between prevention and intervention strategies used for norm enforcement because we expected to find differences in the degree of power assertiveness in interactive behaviors when enforcing a rule before and after a violation occurs. Children are motivated to maintain and handle interactions in a manner to preserve rewarding relationships (Laursen, Hartup, & Koplas, 1996; Laursen et al., 2001). Thus, when a child decides to prevent a friend from committing a transgression, it is more likely for them to use strategies with low power assertion because these strategies have a potential to mitigate conflict and to allow social relationships to persevere. However, when a rule is violated, previous studies showed that affective intensity increased and children's intervention strategies emerged as protests, critiques, assertions, and even tattling (Hardecker et al., 2016; Hartup et al., 1993; Rakoczy et al., 2009; Rakoczy et al., 2008; Vaish et al., 2011; Yucel & Vaish, in press). To capture varying levels of power assertion, we developed a coding scheme based on previous works (e.g., Jensen-Campbell et al., 1996; Crockenberg & Litman, 1990; Kochanska & Aksan, 1995; Nucci & Nucci, 1982b): *Negative control* (high power assertive strategies), *gentle control* (low power assertive strategies), and *disengagement* (no power assertiveness). We hypothesized that the frequency of gentle control and disengagement would be higher for prevention than for intervention, but the frequency of negative control strategies would be higher for intervention than for prevention.

As a second aim, we examined which strategies were subsequently followed by compliance or noncompliance behavior in friend interactions using sequential analysis. The sequential analytic method allows studying the dynamics of behavioral responses in social transactions (Bakeman & Gottman, 1997). We hypothesized that gentle control strategies were

more likely to increase, whereas negative control strategies were more likely to decrease the likelihood of friend's subsequent compliance. We also hypothesized that disengagement was more likely to increase the likelihood of friend's subsequent noncompliance as there is no effort of precluding the transgression attempt in disengaging. In addition, we explored if sequential association of prevention strategies and compliance behaviors differed as a function of sex and age. Previous studies indicated that sex and age differences in conflict management and persuasion emerged after the preschool period (e.g., Christiansen & Morrongiello, 1997; Hartup et al., 1993, Fonzi, Schneider, Tani, & Tomada, 1997; Miller, Danaher, & Forbes, 1986); while, there was no such differentiation during the preschool period (Hartup et al., 1988; Iskander et al., 1995; Jones, 1985). However, norm enforcement literature suggests that children become more flexible in accepting transgressions of conventional norms (Levy, Taylor, & Gelman, 1995). Hence, we expected that the hypothesized sequential association between prevention strategies and compliance behavior would be similar for girls and boys, but might be different for younger and older children.

Finally, as a third aim, we investigated whether children repeated the same or shifted to another strategy when their previous prevention strategy was not effective in leading to compliance behavior. To illustrate, if a child used low power strategy to prevent his/her friend's touching of the forbidden toys but then failed, would this child then use the same strategy or a high power strategy in the following turn? Siegler's (2000) overlapping waves theory claims that when solving a problem, children use a variety of strategies that coexist over prolonged periods of time. Children change their strategies based on their experiences in a given situation. Employing Siegler's (2000) overlapping waves theory to norm enforcement, children might consider different strategies simultaneously when they need to influence their friends. Thus,

children's subsequent strategy might change as a function of their ineffective previous strategy. This is an exploratory goal of the present study.

Methods

Participants

The sample consisted of 90 same-sex friend dyads, 47 male-male and 43 female-female pairs of children. The age range of the children was between 48 and 83 months of age (M = 64.18, SD = 9.32). The mean age difference between the members of dyad was 5.69 months (SD = 4.12, *Range* = 0-16 months). The mean duration of friendship between pairs as reported by their mothers was 23.62 months (SD = 19.34, *Range* = 2-72 months). Fifteen percent of mothers had a secondary school degree or below, 32% had a high school degree, 31% had a college degree, and 22% had a graduate degree ($M_{mother\ education}$ = 14.12 years, SD = 4.73). The Institutional Review Board approved this study (Project Name: Rule Violation and Deceptive Communication among Peer-Dyads, Protocol Number: 2014.068.IRB3.052).

Procedure and Measures

Children who knew each other were invited to the laboratory as pairs. The assessment consisted of a dyadic context that simulated everyday settings where children were together asked to follow a rule. The entire assessment was videotaped and transcribed for later verbal and behavioral coding.

We used a modified version of the temptation resistance paradigm (Kochanska & Aksan, 1995) to examine norm enforcement strategies and rule compliance/noncompliance. Children were introduced to a room where there were two different tables, one with the unforbidden toys and one with the forbidden toys. Children were informed that touching the forbidden table and the toys on it were prohibited, while they were allowed to touch the other table with the

unforbidden toys. Children were asked to repeat the rule to make sure they understood the rule. Then, children were asked to work together on a plastic cutlery sorting task while the experimenter (E1) left to the adjoining room. After a minute of being left alone, an unfamiliar female experimenter (E2) entered the room and played with the forbidden toys for one minute to increase the temptation of the children to touch the toys. Then, the children were left alone for another six minutes. The session ended when E1 came back to the room.

Coding

Strategies: Prevention and intervention strategies were coded with a system derived from categories used in previous research (Jensen-Campbell et al., 1996; Kochanska & Aksan, 1995; Nucci & Nucci, 1982b), further developed from a preliminary examination of the current data. The coding was done only for the phase where children were left alone, lasting 8 minutes. The categories included gentle control, negative control, and disengagement.

1. *Gentle control:* The child controlled friend's behavior in a manner that was not power assertive. Rule restatements/reminding (e.g., "Did you forget that touching these toys is forbidden?"), comments about the rules (e.g., "Something could be broken"), and suggestions leading to distraction (e.g., "Let's play with these unforbidden toys") were included under this category. Commands or directives were also included only if there was no accompanying anger or annoyance or harsh physical intervention; such directives were considered to be instances of negative control.
2. *Negative control:* The child controlled the friend's behavior by using commands/directives (e.g., "Come here!") or criticisms/threats (e.g., "I will tell on you to the teacher!).
3. *Disengagement:* The child provided no response.

We coded strategies as *prevention* if they were used to preclude a potential transgression of the friend. Hints of a potential transgression could lie in verbal statements (e.g., "I will touch them", "I will play with them") or behavioral tendencies (e.g., reaching forward to touch the toys, standing up from the chair to approach/touch the toys). We coded the strategies as *intervention* if they were used as a response to an actual transgression. When two or more strategies were used simultaneously, we coded those strategies separately. To illustrate, "Hey, don't touch! Don't you remember the rule?" included the strategies of command/directive (Hey, don't touch!) and rule restatement/reminding (Don't you remember the rule?). Thus, these responses were coded separately. Only 5 children used 2 different strategies simultaneously to prevent their friends' transgression (a total of 12 strategies[1] constituting 6% of all preventive strategies).

Compliance and Noncompliance: We defined *compliance* as following, accepting, not rejecting or objecting to what the friend suggests. When exact opposite behavior than was suggested occurs, it was coded as *noncompliance.*

To examine whether children's subsequent strategy was changing as a function of their previous strategy, we further differentiated between two types of noncompliance. The first type of noncompliance, *opposition*, included rejections to or unacceptance of the friend's prevention attempt. Note that actual transgression (i.e., touching the toys) is not considered as opposition. The second type of noncompliance, *transgression,* included touching of the forbidden toys. Then, we identified event chains (Strategy1 → Noncompliance → Strategy2). We included subsequent strategy (Strategy2) if it was used within 10 seconds following the noncompliance. Depending on the type of noncompliance, the type of Strategy 2 was also different. Given that

[1] One child used 2 different strategies twice.

there was no actual violation of the rule in opposition, the subsequent strategy was still preventive (Strategy1: Prevention → Opposition → Strategy2: Prevention). However, there was touching of the forbidden toys in transgression. Thus, the subsequent strategy was interventive because children reacted to their friend's transgression (Strategy1: Prevention → Transgression → Strategy2: Intervention). There was a total of 26 events for opposition and 21 events for transgression. We present four different excerpts from conversations between two children, demonstrating the two forms of noncompliance.

Excerpt-1: Opposition

Child1:	Hayır olmaz. *No, no way.*	[Prevention-Gentle Control]
Child2:	Koruyacağız koruyacağız. *[We will] protect them, protect them.* *(continues approaching the forbidden toys)*	[Noncompliance-Opposition]
Child1:	Hayır olmaz. *No, no way.*	[Prevention- Gentle Control]

Excerpt-2: Opposition

Child2:	Küserim bak! *I'll not talk with you then!*	[Prevention-Negative Control]
Child1:	Küçücük bir civciv sarı! *A very small chick, yellow!* *(still stays close to the forbidden toys)*	[Noncompliance-Opposition]
Child2:	Haydi gel. *Ok, come [here].*	[Prevention-Gentle Control]

Excerpt-3: Transgression

Child1:	Hayır yoksa dokunduğumuzu öğrenir. *No [if you touch] she will learn that we touched.*	[Prevention-Gentle Control]
Child2:	*(touches the forbidden toys)*	[Noncompliance-Transgression]
Child1:	*(no response)*	[Intervention-Disengagement]

Excerpt-4: Transgression

Child1:	Hemen geliyor hemen çabuk! *Hurry [she is] coming hurry up!*	[Prevention-Negative Control]

Child2:	*(touches the forbidden toys)*	[Noncompliance-Transgression]
Child1:	Yoksa bizim çatallarımızı kafamızdan atar. *Otherwise [she will] throw our forks over our head.*	[Intervention-Negative Control]

Interrater reliability

The recordings of 2 dyads (4 children) included technical problems in the sound files; thus, they were excluded. All sessions (N = 88 dyads) were coded using both the videotapes and the transcriptions by the first author. A second independent observer coded a random sample of 15% of the sessions for reliability. The interrater reliability for the raters were calculated with Cohen's kappa. For gentle control, it was κ = .84 (95% confidence interval [CI] = .816-1.00); for negative control κ = .83 (95% CI = .693-.972); for disengagement κ = .91 (95% CI = .789-1.00); for compliance κ = .94 (95% CI = .830-1.00); for noncompliance κ = .88 (95% CI = .737-.1.00).

Analytic Plan

Three sets of analyses were conducted. First, we presented the frequencies of prevention and intervention strategies. Second, we carried out chi-square analyses to determine if there was any association between different types of strategies and their use as prevention or intervention. To explore which strategies were more or less likely to be used as prevention and intervention, we ran post-hoc tests and examined adjusted residuals. Adjusted residuals are standardized raw residuals, which reveal if the cell-specific relation is significantly above the chance level. Adjusted residuals above +1.96 indicates a significant positive association while below -1.96 indicates a negative association. Third, to determine the sequential association between prevention strategies of one child and the compliance behavior of the other child, we used the Generalized Sequential Querier (Bakeman & Quera, 1995). Following the procedures outlined in Bakeman and Quera (2011), we generated chi-square statistics to test whether certain strategies

are followed more or less frequently by compliance or noncompliance behavior. Then, we examined cell-specific associations via adjusted residuals and Yule's Q's. Even though adjusted residuals are useful to understand if the observed joint frequency is above the chance level; they are sensitive to the overall sample size of the transition matrix. Therefore, it is not possible to compare effects across tables. Thus, we computed Yule's Q's to determine the strength of association for different groups (i.e., sex and age). Yule's Q is an index of effect size and ranges from +1 for a positive relation to -1 for a negative relation. Fourth, to examine whether children continued to use the same or another strategy following the previous prevention strategy which failed to prevent a potential transgression, we run chi-square statistics and examined adjusted residuals.

Results

Prevention and intervention strategies

A total of 340 codable events were observed where one child reacted to other child's behavior either in prevention or intervention mode (N = 78 children from 53 dyads). The rest of the sample (N = 98 children from 64 dyads) did not produce any codable events because they never attempted to transgress when they were alone in the room. We presented the distribution of the joint frequencies and adjusted residuals of prevention and intervention strategies in Table 1. The overall association between types of strategies and their use as prevention or intervention was significant ($\chi^2(2) = 41.67$, $p = .001$). Post-hoc analyses revealed that children used gentle control strategies more as a prevention strategy than intervention. Children disengaged more after the transgression as an intervention than prevention. In the frequency of negative control, there were no differences between prevention and intervention.

Sequential association between prevention strategies and compliance

In Table 2, we presented the joint frequencies, adjusted residuals, and Yule's Q's for all sample, for sex and for age, separately. There was an overall significant non-random pattern for the entire sample ($\chi^2(2) = 25.73$, $p < .001$). Cell-specific associations indicated that gentle control strategies facilitated subsequent compliance behavior; whereas disengagement inhibited compliance behavior ($p < .01$).

Table 1.

Descriptive statistics for the type of strategies used for prevention and intervention

	Strategies			
	Gentle control	Negative control	Disengagement	Total
Prevention				
Frequency	94	76	28	198
Adjusted Residual	4.1*	1.7	-6.3*	
Intervention				
Frequency	36	42	64	142
Adjusted Residual	-4.1*	-1.7	6.3*	

* $p < .001$

Next, we examined whether this overall significant association was present for sex and age groups, separately. The overall sequential association was significant for both girls ($\chi^2(2) = 13.49$, $p < .01$; $N = 28$) and boys ($\chi^2(2) = 13.31$, $p < .01$, $N = 41$). For both girls and boys, gentle control strategies inhibited the likelihood of subsequent noncompliance behavior, while disengagement increased the likelihood of noncompliance behavior.

To explore age differences, we created a categorical age variable with two levels based on median split. Children below 64 months of age were considered as young ($M = 57.33$, $SD = 4.66$, *Range* = 48-64 months; $N = 34$, 49%); while, children above 65 months of age were regarded as old ($M = 72.18$, $SD = 5.06$, *Range* = 65-83 months; $N = 35$, 51%). The overall

Table 2

Joint frequencies, adjusted residuals, and Yule's Q for all sample, and across sex and age groups

	All Sample		By sex				By age			
	Lag-1: Target Behavior		Lag-1: Target Behavior				Lag-1: Target Behavior			
	Compliance	Noncompliance	Compliance		Noncompliance		Compliance		Noncompliance	
Lag-0: Given Behavior			Girls	Boys	Girls	Boys	Young	Old	Young	Old
Gentle control										
Joint Frequency	70	24	27	43	8	16	33	37	9	15
Adjusted Residual	3.67*	-3.67*	2.25*	2.92*	-2.25*	-2.92*	3.28*	1.93	-3.28*	-1.93
Yule's Q	.50	-.50	.51	.51	-.51	-.51	.63	.38	-.63	-.38
Negative control										
Joint Frequency	45	31	21	24	12	19	23	22	14	17
Adjusted Residual	-.43	.43	.00	-.61	.00	.61	.31	-.89	-.31	.89
Yule's Q	-.06	.06	.00	-.12	.00	.12	.07	-.18	-.07	.18
Disengagement										
Joint Frequency	6	22	1	5	8	14	0	6	14	8
Adjusted Residual	-4.65*	4.65*	-3.49*	-3.21*	3.49*	3.21*	-4.99*	-1.58	4.99*	1.58
Yule's Q	-.77	.77	-.90	-.69	.90	.69	-1.00	-.42	1.00	.42

* $p < .01$

sequential association was significant only for the younger group ($\chi^2(2) = 27.16$, $p < .01$). Gentle control strategies increased the likelihood of subsequent compliance behavior, whereas disengagement increased the likelihood of subsequent noncompliance behavior in the younger group. The pattern between gentle control and compliance behavior was also similar for the older group; however, it remained nonsignificant (*adjusted z* = 1.93).

As indicated in Yule's Q values in Table 2, the strength of association was very strong (between .77-1.00) between disengagement and noncompliance for all significant associations. The positive effect of gentle control strategies on compliance behavior was substantially strong (between .50-.63) for all significant associations.

Sequential association between prevention and intervention strategies

Here we examined whether children's subsequent strategy was changing as a function of their previous prevention strategy that resulted in either opposition or transgression. We presented the joint frequencies and adjusted residuals between strategies for opposition and transgression in Table 3. The overall association between previous and subsequent strategy was significant for transgression ($\chi^2(2) = 9.24$, $p = .05$), but not for opposition ($\chi^2(4) = .04$, *ns*). Cell-specific associations indicated two different patterns of strategy use from prevention to intervention: (1) negative control strategies were more likely to be followed by negative control strategies and less likely to be followed by disengagement; (2) disengagement was more likely to be followed by disengagement but less likely to be followed by negative control strategies. In other words, children continued to use the same strategy to react (or not react) to the violation even if this strategy failed to prevent a transgression.

Discussion

Table 3.

Joint frequencies and adjusted residuals between strategies for opposition and transgression

	Opposition				Transgression			
	Lag-1: Target Prevention Strategy				Lag-1: Target Intervention Strategy			
Lag 0: Given Preventive Strategy	Gentle control	Negative control	Disengagement	Total	Gentle control	Negative control	Disengagement	Total
Gentle control								
Joint Frequency	3	5	0	8	0	1	2	3
Adjusted Residual	.21	-.21	.00		.00	.20	-.20	
Negative control								
Joint Frequency	6	12	0	18	0	3	0	3
Adjusted Residual	-.21	.21	.00		.00	2.96*	-2.96*	
Disengagement								
Joint Frequency	0	0	0	0	0	6	15	21
Adjusted Residual	.00	.00	.00		.00	-2.44*	2.44*	

* $p < .001$

The present study examined whether preschool children between 4 and 6 years of age employed different strategies in enforcing norms to prevent a potential rule violation and to intervene with actual transgression. Results revealed several novel findings about children's norm enforcement behaviors during real interactions with friends in a rule observance situation.

We expected to find that no-to-low power assertive strategies including disengagement and gentle control would be used more frequently as prevention in comparison to intervention. The rationale was that children would rely on softer tactics to mitigate conflict and to influence their friend's behavior while at the same time trying to preserve the relationship (Laursen et al., 2001; Trawick-Smith, 1992). We found that children used only gentle control strategies more frequently as prevention rather than intervention. In a norm enforcement context where children were explicitly and collectively asked by an adult to follow a prescribed rule, children *actively* attempt to prevent a potential transgression by engaging in a behavior. So, rather than disengaging (i.e., giving no response), children used low power assertive behaviors such as rule reminding or distracting to alleviate their friend's urge of violating the rule.

Previous studies showed that children reacted against norm violations of puppets by protesting, criticizing, punishing or tattling (e.g., Hardecker et al., 2016; Rakoczy et al., 2008; Vaish et al., 2011; Yucel & Vaish, in press). Following this, we expected that children would use negative control strategies more frequently as intervention rather than prevention. However, we found that disengagement was more frequent for intervention than for prevention. One possibility is that puppet's violation of norms was experimentally made especially salient to the children in the prompts provided in these studies. In general, the intention or the action of norm violation was presented repeatedly so that children were provided by several occasions to protest. Such repeated and clearly marked incidents of rule violation may not occur in real life settings.

Previous studies demonstrated that disengagement is reported to be one of the most common forms of resolving conflict between preschool friends (e.g., Hartup et al., 1988). Disengagement in conflict resolution includes dropping the topic, taking no action, and walking away (Jensen-Campbell et al., 1996). It is considered to sustain continued social interaction because disengagement is not disruptive for friendship relations as coercive strategies are (Hartup et al., 1988). Hence, it is likely that the children in our study did not respond to their friend's actual transgression and disregarded such behavior to maintain their current and even future social interactions.

However, disengagement against a rule violation in rule observance contexts could be driven by different motivations. Though our research design could not tease apart these motivations; we examined 64 disengagement strategies used for intervention to probe why children were silent. In 28 (44%) of these, children ignored what their friend was doing when they decided to transgress the rule. In 11 (17%), children's previous efforts to prevent their friend from transgressing the rule or to cease the transgression behavior by using other strategies were unrequited, so they just did not exert any verbal or behavioral effort for intervention. In another 11 (17%) of these events, children just did not seem to care about what their friend was doing, hence did not give any responses. In 8 (13%) events, transgression behaviors occurred so fast that children were very surprised by their friend's misconduct as reflected in their facial expressions and could not even react to the situation. In 6 (9%) events, children appeared exclusively attentive to the cutlery sorting task, so, they lost awareness of their friend's behavior. This distribution suggests that the majority of disengagement occurred when children also decided to transgress the rule as their friend did. In other words, it might be that children do not take any action against their friend's misbehavior when they also intend to play with the

tempting toys. Further experimental research is needed to understand the function of disengagement behavior in norm enforcement contexts.

How effective were each of the prevention strategies in leading to compliance? The sequential analysis showed that disengagement increased the likelihood of subsequent noncompliance. Children may consider themselves free to obey the rule when there was no verbal or behavioral restrictions from their friends. In contrast, gentle control strategies facilitated subsequent compliance behavior. The use of constructive tactics such as verbal requests in peer interactions (Jones, 1985; Trawick-Smith, 1992) and gentle control strategies in parent-child interactions (Crockenberg & Litman, 1990; Kochanska & Aksan, 1995) are associated with desirable outcomes. These strategies are influential as they enable a sense of autonomy in making a choice (Erikson, 1963). Additionally, friendship relations rely on the expectations to "be nice" and support one another (Youniss & Volpe, 1978). These expectations affect not only the persuasive attempts made to friends in hypothetical situations (Lonigro, Baiocco, Baumgartner, Sette, & Laghi, 2016), but also in real-life situations (Jones, 1985). Our findings extended this finding by showing that controlling gently achieves compliance from the friend.

Contrary to the studies demonstrating parental use of negative control behaviors to be associated with children's noncompliance, we could not find a sequential pattern between these two variables among friends. We also could not find an association of the use of negative control strategy with predominantly prevention or intervention mode. A possible explanation is that friends of similar ages are in horizontal relationships such that they share social power and engage in voluntary interactions (Adams & Laursen, 2001; Younnis, 1980). Thus, negative

control behaviors of friends might not come across as harsh and coercive, as well as have power of sanction in conventional rule compliance.

The sequential associations between gentle control and compliance, and disengagement and noncompliance did not vary as a function of sex, but were present only for the younger children, as we expected. For the older group, there was not a significant association between any of the strategies and compliance behavior. It is possible that the older children have already started to figure that conventional norms are alterable and flexible without any permission from an authority figure (e.g., the experimenter in our setting). A previous study comparing 4- and 8-year-olds demonstrated that there was an increase with age in flexibility in accepting conventional transgressions (Levy et al., 1995). Given this flexibility, the older children's stance might not be affected by their friend's behaviors once they made a decision about transgressing or obeying the rule.

However, it is important to mention that this is a limited context to test the sequential association of persuasive behavior control strategies with subsequent behavior. The effectiveness of norm enforcement strategies in preventing conventional rule violation might change as a function of context. In this study, we only observed children's adherence to a conventional rule set by an adult. Would similar sequential associations emerge when children follow their own created rules in a game or a rule of a familiar adult such as parent or teacher? For example, Göckeritz and colleagues (2014) found that when 5-year-old children created their own social norms about a new game, they taught these new social norms with generic normative language to novices. This creates a pressure to comply with the rule. Similarly, children could be more power assertive when they want others to obey their own rules. Future research should consider these different contexts to examine the influence of prevention in altering subsequent behavior.

Considering that that children's subsequent strategy might change as a function of their previous strategy, we additionally examined the sequential association between the sequences of prevention-prevention strategies and prevention-intervention strategies. Results demonstrated that a previous strategy influenced the subsequent strategy only for the transgression type of noncompliance. Children who used negative control strategy as prevention (i.e., to prevent a transgression) continued to use negative control strategy also as intervention (i.e., to react to the transgression), even though this strategy was ineffective in obstructing the transgression. Moreover, children who gave no response (i.e., disengagement) to a potential violation attempt persisted not to give any responses after the violation. Taken together, these patterns suggested that children maintained the same behavioral strategy before and after a transgression.

Why did not children switch to another strategy to react to their friend's violation while they are capable of making situation-based adjustment in their existing strategies (Siegler, 2000)? For children who used a negative control strategy, the elevated affective intensity due to the conflict (Hartup et al., 1993) might impede using alternative strategies (e.g., Schwarz & Skurnik, 2003). However, for children who used disengagement, their own motivation to touch the forbidden toys might be a reason for not reacting to their friend's violation. There was a total of 15 events where disengagement as prevention was followed by disengagement as intervention. In 40% of these events, children who used disengagement both as prevention and intervention also touched the forbidden toys. This suggests that children might prefer to stay quiet both against potential or actual transgression when these children are also tempted to transgress the rule as their friend also did.

These results provide new insight into the importance of making a distinction between pre-violation and post-violation reactions while enforcing conventional norms. When children

are interacting with their friends in tempting rule observance context, they rely on strategies with no-to-low, but not high, degree of power assertiveness while preventing a potential rule violation and intervening with an actual violation. Several alternative explanations have been raised to illustrate why children might engage in such behaviors. Future studies should test those explanations with experimental designs to further understand children's norm enforcement behaviors while interacting with their friends in semi-naturalistic setting.

CHAPTER 3

TRUTHS, LIES, AND CONFESSIONS: COLLECTIVE INTERVIEWING OF PRESCHOOL DYADS

Şen, H. H. & Küntay, C. A. (submitted). Truths, lies, and confessions: Collective interviewing of preschool dyads. *Merrill-Palmer Quarterly.*

Abstract

In this study, we examined the diversity and consistency in children's lying-related responses when they were interviewed in an unanticipated and collective way. The sample consisted of 90 dyads of 4- to 6-year old children. Transgressors included self-motivated liars, confessors, and reticents; whereas, non-transgressors included truthful deniers, secret-keepers, and tattlers. The majority of the children were able to retain their lies (dubbed lie maintainers) throughout the collective interview. Individual differences analyses in socio-cognitive skills and temperamental domains demonstrated that secret-keepers were better at backward digit span than self-motivated liars and confessors, while they were lower in impulsivity and higher in falling reactivity and soothability than confessors. Lie maintainers were lower in impulsivity and higher in theory of mind than lie non-maintainers. The heterogeneity in children's responses and the lack of robust differences between response groups suggest that the structure of the interview plays an important role in children's deceptive behaviors.

Truths, Lies, and Confessions: Collective Interviewing of Preschool Dyads

Current work on children's lie-telling behavior for concealing wrongdoing focuses on individual children (e.g., Bottoms, Goodman, & Schwartz-Kenney, 2002; Ding, Wellman, Wang, Fu, & Lee, 2015; Evans & Lee, 2013; Gordon, Lyon, & Lee, 2014; Lee, 2013; Talwar & Lee, 2002; Talwar, Lee, Bala, & Lindsey, 2004). Studies with 3- to 12-year-old children indicate that lying for self is prevalent, but lying for another occurs less frequently when children are interviewed individually. However, children are often surrounded by other children in real-life situations where they are expected by adults to follow specific rules. When the adult leaves, some children follow the rule, while others disobey. If children are interviewed together about their rule observance behavior, do they act differently than when they are alone? An unexpected collective interview may be a challenge for children because children have no opportunity to prepare a false alibi beforehand. Rather, children have to spontaneously determine their response during the interview in the presence of their friend. The result may be heterogeneous responses such as truthful denying, secret-keeping, tattling, lying for self or confessing. To examine this diversity in children's responses when they are with their friends, we used a semi-naturalistic context where two familiar preschool friends were asked to follow a rule and later were interviewed together about their observance behavior of this rule. Here we investigated (1) the frequency of children's initial responses, (2) the consistency in responding throughout the interview (i.e., lie maintenance), and (3) individual differences in socio-cognitive skills and temperamental dimensions for different response groups.

Following conventional norms such as behaving in the classroom is important for regulating our social activities (Rakoczy & Schmidt, 2013). These conventional norms are arbitrary and context-dependent; yet, children follow these rules because they want to conform and do things properly, often to avoid disapproval or punishment of others (Schmidt

& Tomasello, 2012). When a conventional rule is violated, the frequency of children's lies is quite high when they are directly questioned about their violation of rule in individual experimental contexts. For example, between 75-81% among 4-to 6-year-old children lied in the study of Talwar and Lee (2002). These self-serving lies are motivated by self-interest (DePaulo, Kashy, Kirkendol, Wyer, & Epstein, 1996). Children lie to protect themselves from any potential disapproval or punishment, and from embarrassment or loss of face. In this context, lying has an adaptive function for transgressors. Given such motivation, the frequency of self-serving lies may also be high among transgressors when they are collectively interviewed in our study.

How would a non-transgressor who had a friend violating the rule respond to the interview questions? On the one hand, rule-abiding children are motivated to do things properly and to conform (Schmidt & Tomasello, 2012). Thus, it is quite likely to expect these children to tattle on the friend who breaks a rule. However, previous naturalistic and experimental studies indicated that children are more likely to report violations when there is a harm (Ingram & Bering, 2010; Vaish, Missana, & Tomasello, 2011). For example, children tattled on property entitlement (i.e., someone taking something that belongs to another child) and physical aggression (i.e., hitting) in school-setting, as well as harm to the protagonist's possession in experimental setting. These findings highlight that children are selective in what to tattle on. Thus, tattling may not be very frequent in our study because a conventional rule violation does not pose much harm to any interactants and is not a strong conflict-arising situation for children.

On the other hand, interactions are motivated toward maintaining future relationships. Children are no exception-- they are also motivated to maintain and invest in positive relationships with their friends (Laursen, Finkelstein, & Betts, 2001). Friendship is a communal relationship that involves mutual recognition of one another's needs with the

assumption that temporary inequalities occurring during need-based distribution will be balanced over time (Laursen & Pursell, 2008). Thus, reciprocities define friendship expectations at all ages and are important for friendship maintenance (Younnis, 1980). Children's interaction before middle childhood is characterized by direct reciprocity where matched contributions of each party are expected (e.g., equal distribution of sources). Across middle childhood and adolescence, direct-reciprocity turns into cooperative reciprocity where the need of interactive partner is taken into account to achieve long-term equality. Loyalty and intimacy are more pronounced during this stage (Hartup, 1993). Even though earlier interactions are considered to include equality-matched norms, there might be variability in the actual social exchanges that occur between friends as a function of context (Hartup & Laursen, 1993; Laursen & Bukowski, 1997). In the context of collective interviewing, lying for a partner may be a sign of cooperative reciprocity. Lying for another person[2], or secret-keeping, is a way to retain friendship because it serves prosocial purposes such as protecting or showing loyalty to another person (Bok, 1983).

Previous studies on children's lie-telling behavior to conceal another's wrong-doing included lying for an unfamiliar adult (Lyon et al., 2014; Pipe & Wilson, 1994), unfamiliar peer (Greenglass, 1972), classmate (Fu, Evans, Wang, & Lee, 2008), or parent (Bottoms et al., 2002; Gordon et al., 2014; Talwar et al., 2004). Taken together, findings suggested that children were reluctant to lie for another person when interviewed individually (and even in the presence of transgressor, see Talwar et al., 2004). This was the case despite an explicit request from the partner for not telling on the transgression or assurance of confidentiality before the interview.

[2] Lying for another person is named as "altruistic lying" (e.g., Greenglass, 1972), "secret-keeping" (e.g., Gordon et al., 2014) or "blue-lying" (e.g., Fu, Evans, Wang, & Lee, 2008) in previous research. We use secret-keeping and lying for another person interchangeably in this study.

The lack of a strong motivation for keeping secrets can be linked to the issue of reciprocity and relationship maintenance. When having to lie for unfamiliar individuals, there is usually no history of rewarding exchanges and no emotional investment in one another (Laursen, Hartup, & Koplas, 1996). Participants are just in a transitory relationship; there is not any need for initiating and maintaining a relationship. In the case of classmates, children are together by social rules and sanctions (Laursen et al., 1996). When interviewed about a group cheating, classmates may prioritize personal gain and authority, and be unconcerned about future interactions. In the case of parents, family relationships are durable and resistant to disruption because future social relationships continue regardless of any behavior including conflicts or lie-telling (Laursen & Bukowski, 1997). Thus, preferring not to lie for a parent's transgression is not a threat to the relationship itself. However, in the case of familiar friends, lying on behalf of a friend who transgressed a rule might indicate showing loyalty, and investing in an unfolding friendship. Even though lying for another person is a potential threat for self-presentation as it could damage a favorable positive self-image, children still may prefer to lie for benefiting their friend. Previous studies indicated that when an individual's cheating behavior could benefit another person or charity, the level of dishonest behavior increased (Gino, Ayal, & Ariely, 2013; Lewis et al., 2012).

As a first objective of the present study, we examined how dyads of preschool children would initially respond to a question about observance of a rule in the context of a collective interview about rule violation. Regarding transgressors, we expected to find the frequency of self-serving lies to be higher than confessing. As for non-transgressors, we expected the majority to tell the truth about their own behavior (i.e., truthfully denying that they violated the rule). However, if a non-transgressor had a friend who violated the rule, we expected that the frequency of secret-keeping would be higher than tattling on this friend.

A second objective of this study was to examine consistency in children's responses throughout the interview. Once a lie is initiated, it is important to sustain this lie by not disclosing any critical information. Previous findings of lying as an individual indicated that the frequency of self-serving lies and secret-keeping decreased in response to follow-up questions (Evans, Xu, & Lee, 2011; Gordon et al., 2014; Talwar & Lee, 2002; 2008; Talwar et al., 2004; Wilson & Pipe, 1989). Children may even find it harder to maintain lying during a collective interview since it is already difficult to maintain lies individually. This is especially true when interviewees do not get to discuss a potential testimony beforehand, so they have to decide on the fly how to respond during the interview. As such, interactants need to monitor both their own and their friend's responses while attempting to withhold the information of breaking a rule. There are circumstances under which children may choose to discontinue lying in a dyadic context. For example, children who initially lied to cover their friend's transgression may not maintain lying because of the possibility that they would also be under suspicion for the transgression. Similarly, children who lied about their own transgression initially may also prefer to confess either because they could not give a coherent response to follow-up questions with their friends or because they may not risk themselves for being disclosed by their friend. We investigated the change of responses over the course of collective interview to understand if children did or did not maintain initial lies.

The third objective of this study was to explore individual differences between lying and non-lying children, as well as between lie maintainers and non-maintainers in socio-cognitive and temperamental characteristics. Previous studies with individually observed children demonstrated that age, theory of mind understanding, and executive function skills are related to initiating and sustaining lies (e.g., Ding et al., 2015; Gordon et al., 2014; Talwar & Lee, 2008). Age has a well-established association with lying for self, as children develop more sophistication with socio-cognitive skills with increasing age. As children grow-up, the

frequency of initiating self-serving lies increases (Lee, 2013; Talwar & Lee, 2002, 2008), whereas confessing decreases (Evans & Lee, 2013; Talwar & Lee, 2002). Regarding the effect of age on secret-keeping or tattling, studies provide mixed results (e.g., Pipe & Wilson, 1994; Talwar et al., 2004); yet, older children are more likely to conceal information for same-age unfamiliar peers or familiar classmates (Fu et al., 2008; Greenglass, 1972). Children also become more successful in their ability to sustain lying with age; particularly, this success becomes more pronounced after 6 years of age (Talwar & Lee, 2008).

Theory of mind understanding is another significant factor for initiating and maintaining lying. Lying involves (1) instilling a false belief in the mind of another person, and (2) reasoning about what another person might conclude from the information the child provides (Ding et al., 2015; Talwar & Lee, 2008). Thus, first-order theory of mind understanding is related to deciding to lie, whereas second-order theory of mind understanding is associated with giving plausible explanations while sustaining lying (Talwar, Gordon, & Lee, 2007; Talwar & Lee, 2008). Interestingly, theory of mind understanding was not found to be associated with secret-keeping behavior (Gordon et al., 2014).

Executive function skills are also involved in the tendency to lie. Particularly, inhibitory control and working memory are associated with lie-telling as children need to suppress the dominant tendency to tell the truth and to maintain coherence in their fabricated story while temporarily holding the contents of lie in memory (Carlson & Moses, 2001; Evans & Lee, 2011; Talwar & Lee, 2002; 2008). While keeping a secret for another person, children also need to suppress responses that disclose the secret, keep multiple pieces of information in mind, and keep behaving in accordance with the secret (Gordon et al., 2014). There is only one study examining the role of executive function in children's secret-keeping of their parent's transgression (Gordon et al., 2014). A global composite score of executive function was found to be associated with secret-keeping. When the dimensions of execution function

were examined; however, it was only the emotional control dimension of executive function that contributed to secret-keeping because the ability to not to tell on other people requires control over the expression and regulation of one's emotion. This also supports emotion regulatory function of secret-keeping (Carlson & Wang, 2007).

These findings indicate that age, theory of mind understanding, inhibitory control, working memory, and emotional control are related to successful lying for self and for another person. In this study, we further investigated if these socio-cognitive differences observed in individual contexts carry over to a collective interviewing context. Imagine a child with a potential to be an effective liar in the individual context given his/her good theory of mind and executive function skills. What would this child do during collective interview if his/her friend tattles or confesses? It is quite likely that contextual constraints might override those socio-cognitive differences observed in the individual context. It is an exploratory goal of the present study to find out whether socio-cognitive characteristics of individual children are associated with lying behavior in a dyadic context.

We included the measures of first-order theory of mind understanding, working memory, and inhibitory control. We only used first-order theory of mind understanding task because our procedure has a similar structure with Evans et al. (2011) that reduces the requirement of second-order theory of mind understanding. In Evans et al.'s study (2011), children were left alone in a room and asked not to lift a cup to see the contents. If they lifted the cup, then the contents would be spilled, which was a physical evidence of transgression. In our study, following the original procedure (Kochanska &Aksan, 1995), an unfamiliar female experimenter entered the room in the second minute and played with the forbidden toys for one minute to increase the temptation. This manipulation created physical evidence that the forbidden toys were touched, giving children the opportunity to explain in the follow-up questions why the toys moved. Because of the physical evidence of transgression, children

do not need to give plausible explanations to the follow-up questions consistent with their initial false claims (e.g., "No, we did not touch the toys"). To illustrate, when children were asked at follow-up "It seems that the locations of these toys have changed, haven't they?", they just need to give a logical and plausible explanation with the existing physical evidence such as "A woman came and played with them". In this context, "the need to make inferences about what the lie recipient might believe based on the lie-teller's initial verbal statement is reduced" (Evans et al., 2011, p. 40). As a result, we considered measuring only first-order theory of mind understanding was adequate.

In terms of executive function measures, previous studies suggested that Stroop task was related to giving plausible explanations while maintaining lie-telling behavior (Evans et al., 2011; Talwar & Lee, 2008). However, this measure taps into both inhibitory control and working memory skills (Evans et al., 2011). Our follow-up questions did not specifically target the plausibility in children's lies after their initial false claim (see procedure); rather they aimed to determine if the children could give explanations consistent with the physical evidence of the transgression. Thus, we selected tasks that most specifically measured working memory and inhibitory control in order to more clearly understand which dimension drives the differences between response groups. For example, complex working memory might be more relevant in collective interview context because interactants need to keep the track of not only their responses but also other individual's responses. A previous study also showed that complex working memory was related to lie maintenance (Evans & Lee, 2011). We used the Digit Span (Wechsler, 2004) to measure both forward (i.e., short-term) and backward (i.e., complex) working memory.

Following the same reason of specifically measuring the desired concept, we included two inhibitory control tasks that place lower demands on working memory (Carlson & Moses, 2001). The Bear-Dragon is a conflict task where the child needs to selectively suppress

commanded actions, whereas the Snack Delay is a delay of gratification task where the child needs to wait for a desirable outcome (Kochanska, Murray, Jacques, Koenig, & Vandegeest, 1996). Both measures require withholding impulsive responses; an ability that is particularly significant during collective interviewing. Impulsivity prevents children from thinking deeply about how to respond, resulting in spontaneous responding in social situations (Arsenio & Lemerise, 2004). Gordon and colleagues (2014) also showed that emotional control was related to lying for another person. Considering this, we extended our measures by including parental rating of temperament to obtain a global assessment of children's individual differences in reactivity and self-regulation.

In sum, the present study examined three questions related to children's lie-telling behavior in a dyadic collective interview context. First, we investigated the frequency of initial response types (truthful denying, self-motivated lying, secret-keeping, being reticent, tattling or confessing) of dyads. Second, we examined whether children maintained their lies during the interview. Third, we explored the differences between different response groups, as well as between lie maintainers and non-maintainers in terms of socio-cognitive skills and temperament dimensions. We observed pairs of familiar children in a modified version of the temptation resistance paradigm (Kochanska & Aksan, 1995), where a collection of inviting toys was placed on a table and pairs of children were collectively instructed not to touch these toys. This context was designed to be as similar as possible to the usual preschool or playground setting. After giving the instructions, the experimenter left the children alone, and later collectively interviewed them about what they did regarding the prohibited toys when they were alone in the room.

Methods

Participants

We tested 90 same-sex peer dyads (N = 43 female dyads). The age range of the children was between 48 and 83 months of age (M = 64.18, SD = 9.32). The mean age difference between dyad members was 5.69 months (SD = 4.12, *Range* = 0-16 months). The mean duration of friendship between pairs as reported by their caregiver was 23.65 months (SD = 19.23, *Range* = 2-72 months). The study was approved by the Institutional Review Board (Project Name: Rule Violation and Deceptive Communication among Peer-Dyads, Protocol Number: 2014.068.IRB3.052).

Procedure and Measures

Children who knew each other were invited to the laboratory as pairs with their parents. After a brief welcoming, Experimenter 1 (E1) informed parents about the study and obtained their written informed consent. Then, E1 took children to introduce the main experimental room. In this room, the attractive off-limit toys were placed on a table in one corner of the room just below a one-way mirror. At the opposite wall, there were materials that would be unforbidden to the children (i.e., one rabbit toy, painting notebook and crayons, coloring books, and puzzles). In the middle of the room, there was one table with two chairs to be used by the children. All procedures in this room were videotaped from behind a one-way mirror by Experimenter 2 (E2) for later behavioral coding and transcriptions.

As E1 opened the main room's door to let the children in, the video recording was initiated by E2. E1 seated the children on the chairs facing towards the one-way mirror. Then E1 sat down just below the one-way mirror next to the "off-limit" table facing the children. E1 told the children that "*In this room, you will play games with me. Before starting our games, I have to tell you the rules of this room. You cannot touch the table at this corner of the room* (pointing and showing the forbidden toys). *That is, touching the table, touching the toys on the table, and touching the toys on the ground in front of the table is forbidden. But, you can touch the toys at this side* (pointing and showing the unforbidden toys). *That is, you*

can get them and play with them. Is this OK?". Then, children were asked to repeat the rules of the room individually to check if they understood. If there was a misunderstanding, E1 repeated the rules once again.

After this brief introduction session, children were separately taken for individual assessments of socio-cognitive measures including first-order theory of mind understanding, memory, and inhibitory control. The Digit Span was applied to only 136 of the children as this test was later added to the procedure. Parents also completed a set of questionnaires about demographics and child temperament. Then, the children were taken together into the main experimental room to examine their rule observance and lie-telling behavior.

Theory of Mind: Unexpected content (Wimmer & Hartl, 1991), unexpected location (Wimmer & Perner, 1983), and an appearance-reality task (Chandler & Helm, 1984) were used to measure theory-of-mind understanding. Each child received a total theory of mind score out of 5 (M = 3.57, SD = 1.44). Higher scores reflect higher theory of mind skills.

Digit Span (Wechsler, 2004): Forward and backward digit span conditions was scored by using the AWMA procedure (Alloway, 2007). The trials were scored as incorrect when the digits were reproduced incorrectly or were skipped. If the child reproduced the first four trials within a block correctly, (s)he received a score of 6 and continued with the next block. The mean score of the forward condition was 18.65 (SD = 5.69) and the backward condition was 3.18 (SD = 3.53).

Inhibitory Control: Two behavioral tasks were used to measure delaying and suppressing ability (Kochanska et al., 1996). The Snack Delay measured children's ability to wait for receiving a candy (or a cracker) in six trials with delays of 0-40 seconds. The Bear-Dragon task measured children's abilities to flexibly suppress a dominant response (i.e., doing what the bear says) in favor of a subdominant response (i.e., not doing what the dragon says). In the Snack Delay task, a 4-point Likert scale was used for pre-trial and trial waiting (Kappa:

.65-1.00), and latencies to wait and fidgeting (ICCs: 1.00) were noted, and a composite score was computed (M = .00, SD = .75). In the Bear-Dragon task, the inhibition trials were separately coded with a scale from 0 to 3 (Kappa: .72-.89) and the scores from these trials were summed (M = 25.92, SD = 6.19).

Children's Behavior Questionnaire (Rothbart, Ahadi, Hershey, & Fisher, 1996): This temperament scale included 6 sub-scales: *Perceptual sensitivity* (α = .71; e.g., detection of slight, low intensity stimuli from the external environment), *discomfort* (α = .70; negative affect related to sensory qualities of stimulation), *attention focusing* (α = .60; the ability to maintain attentional focus), *inhibitory control* (α = .70; e.g., the ability to plan and suppress inappropriate approach responses in novel situations), *impulsivity* (α = .67; speed of response initiation), and *falling reactivity and soothability* (α = .74; rate of recovery from peak general arousal).

Temptation resistance task: A modified version of the temptation resistance paradigm (Kochanska & Aksan, 1995) was used to examine rule observance when children were alone in the room and the diversity of response during a collective interview once the rule observance phase is off. When children were taken to the main room for the temptation resistance task after the completion of individual assessments, they were first asked to repeat the rule of the room to assure that children still remembered the rule. If they did not remember the rule, the experimenter (E1) reiterated the rule briefly once again, stressing that the children were not allowed to touch the forbidden toys. Then, E1 left the children alone in the room saying that she had to prepare some materials for the next game in another room and asked them to carry out a plastic cutlery sorting task while she was out. The paradigm included four phases. In the first phase, children were alone in the room for 1 minute. In the second minute, an unfamiliar female experimenter (E2) entered the room and played with the forbidden toys in front of the children for 1 minute. No interaction was allowed between E2

and the children. In the third phase, children were alone in the room for 6 minutes. Then, in the last phase, E1 entered the room for the collective interview phase and asked questions to both children, addressing them simultaneously. E1 sat facing the children in an equidistant position and asked each question without any eye contact with the children (i.e., looking at the papers in her hand while asking the questions) to make sure that children started the conversation without any enforcement or explicit turn-directing behavior of E1. There were four questions asked in a fixed sequence: "Tell me in detail, what you did together when I was not here?", "When I was not here, did you touch these toys?" (target question), "Were you here around this table [children's table] all the time? (follow-up question-1)", and "It seems that the locations of these toys have changed, haven't they? (follow-up question-2)". The second question was the target question ("When I was not here, did you touch these toys?") where the children decided to lie or confess or tattle spontaneously. After the interview was completed, the pairs of children were allowed to play with the forbidden toys for a few minutes.

Results

To examine lie-telling behavior and its relation to different socio-cognitive skills and temperamental characteristics of children, a series of analyses were conducted. First, descriptive statistical results regarding children's transgression behavior, lie-telling behavior to the target question and during the entire interview, and lie maintenance were obtained. Second, a series of analyses of variances (ANOVAs) and independent sample t-tests were performed to examine socio-cognitive and temperament differences between response groups, and between lie maintainers and non-maintainers.

Transgression behavior

Forty-three (24%) children touched the forbidden toys. Children who touched and did not touch did not differ in sex (χ^2 (1, N = 180) = 2.53, p = .112), age (t(178) = -.34, p = .732), and duration of friendship (t(176) = -.49, p = .619).

Initial Responses: Children's responses to the target question

Children's responses to the target question ("When I was not here, did you touch these toys?") were categorized based on their status of rule observance (no touch vs. touch). Their responses could either be verbal (e.g., "No, we did not touch") or non-verbal (e.g., head-nod, hand shake) or a combination of verbal and non-verbal.

A total of 16 children did not give any verbal or nonverbal responses to the target question. Eight of these non-responders were non-transgressors (6% of non-transgressors) and the other 8 were transgressors (19% of transgressors). We excluded these children from the initial categorization because the meaning of remaining silent after the target question was not clear. For example, 8 transgressors and 2 non-transgressors remained silent while their friends who transgressed were lying. The motivation to remain silent could indicate either being complicit in lying or being reluctant to contradict with their friend, not because they were agreeing on their friend's lying. Although the situation was clearer for 6 silent non-transgressors whose friends did not transgress and truthfully denied, we did not include these children to be consistent with the exclusion criteria. Although all non-respondent children excluded in the categorization of responses for the target question (i.e., initial response), we examined their responses to the other interview questions and included them in the categorization of follow-up questions (see the next section).

Five groups emerged from our qualitative analyses: self-motivated liars, confessors, truthful deniers, secret-keepers, and tattlers. The first two groups were transgressors, while the last three groups were non-transgressors. *Self-motivated liars* were those children who touched the off-limit toys and lied about their behavior by denying their transgression (N =

28, 65% of the transgressors). *Confessors* were children who touched the forbidden toys and disclosed that they engaged in this behavior ($N = 7$, 16% of the transgressors). *Truthful deniers* were children who refrained from touching and truthfully reported their behavior ($N = 118$, 86% of non-transgressors). *Secret-keepers* were children who themselves did not touch the forbidden toys but lied on behalf of their friends who actually touched the toys ($N = 9$, 7% of non-transgressors). Finally, *tattlers* were children who themselves did not touch the forbidden toys but disclosed their friend's touching behavior ($N = 2$, 1% of non-transgressors).

Children's responses to the follow-up questions and lie maintenance

To classify 16 children who did not give any answers to the target question, we examined their responses to the follow-up questions. Of the 8 non-responding children who did not transgress, 1 child lied for his friend, 1 child tattled on his friend, and 6 children truthfully denied that they touched the toys. Of the 8 non-responding children who transgressed, 2 children self-servingly lied, 4 children confessed, and 2 children remained silent.

Of the 137 non-transgressors, 124 children (91%) were truthful deniers,10 children (7%) were secret-keepers, and 3 children (2%) were tattlers. It is noteworthy to mention that not all rule-abiding children had a friend who violated the rule. When these children were compared, there were more secret-keepers (77%) than tattlers (23%) ($\chi^2(1) = 3.77$, $p = .052$).

Of the 43 transgressors, 18 children (42%) were self-motivated liars, 23 children (53%) were confessors, 2 children (5%) were reticents. *Reticents* were children who transgressed the rule, but did not respond to the questions. There were more self-motivated liars and confessors than reticents ($\chi^2(1) = 12.80$, $p = .000$, $\chi^2(1) = 17.64$, $p = .000$, respectively); but the proportions of self-motivated liars and confessors were not significantly different ($p = .280$). Finally, while the majority of the transgressors initially preferred to lie

than to confess ($\chi^2(1) = 11.11$, $p = .000$), the number of confessors increased at the end of the interview ($\chi^2(1) = 8.53$, $p = .003$). In Table 1, we presented the response combinations of dyads.

Based on this categorization of children, we further investigated the frequency of children who maintained their lies. Lie maintainers were those children who initiated a lie at any point during the interview and retained this lie during the interview. There were 28 lie maintainers (70%, including 18 self-motivated liars and 10 secret-keepers) and 12 lie non-maintainers (30%, including 12 self-motivated liars who initially lied but then confessed). Accordingly, there were more children who maintained their lies than those who did not ($\chi^2(1) = 6.40$, $p = .011$).

Individual differences in socio-cognitive and temperament dimensions

Comparing self-motivated liars, secret-keepers, and confessors

As there were only three tattlers and two reticents, we excluded them from the comparison analyses. Moreover, we did not consider truthful deniers for further analyses because of unequal cell size proportions across groups. Thus, the analyses were run for self-motivated liars, secret-keepers, and confessors.

Preliminary comparisons yielded no significant difference between response groups in age ($F(2, 48) = 1.59$, $p = .215$) and the duration of friendship ($F(2, 48) = 1.61$, $p = .210$). Moreover, there was no association between sex and response group ($\chi^2(2, N = 51) = .11$, $p = .945$); thus, all analyses were conducted on data collapsed over sex. The distribution of sex and the descriptive statistics for all measures across response groups were provided in Table 2.

We ran several ANOVAs to examine the differences between self-motivated liars, secret-keepers, and confessors in socio-cognitive and temperament dimensions. Bonferroni correction was made for the post-hoc comparisons. There were significant differences

Table 1.

The response combinations of the members of dyads

			CHILD-2						
			No Touch			**Touched**			
			Truth-telling	Tattling	Lying for friend	Lying for self	Confessing	No response	Total number of dyads
CHILD-1	**No Touch**	Truth-telling	61			1	1		63
		Tattling					3		3
		Lying for friend				7	3		10
	Touched	Lying for self				4	1	1	6
		Confessing					7		7
		No Response					1		
		Total number of dyads	61			12	16	1	90

Table 2.

The distribution of sex and mean scores (standard deviations) of socio-cognitive and temperament measures across response groups and lie maintenance

	Response Groups			Lie Maintenance	
	Self-motivated Liars (n = 18)	Secret-Keepers (n = 10)	Confessors (n = 23)	Maintainer (n = 28)	Non-maintainer (n = 12)
Sex					
Male	11	6	15	17	6
Female	7	4	8	11	6
Measures					
Age (months)	64.50 (9.70)	70.40 (8.17)	64.52 (9.56)	66.61 (9.48)	70.25 (7.79)
Inhibitory Control-Conflict	24.22 (7.63)	26.70 (4.14)	24.26 (10.69)	25.11 (6.62)	24.08 (11.05)
Inhibitory Control-Delay	0.00 (0.34)	0.23 (0.39)	-0.23 (1.18)	0.08 (0.37)	0.22 (0.24)
Forward Memory	16.55 (6.31)	23.13 (4.55)	19.22 (7.07)	19.32 (6.43)	21.20 (6.07)
Backward Memory	1.55 (3.08)	8.25 (4.09)	3.72 (3.18)	4.37 (4.83)	4.80 (3.01)
Theory of Mind	3.17 (1.72)	4.10 (0.99)	3.30 (1.61)	3.50 (1.55)	4.50 (0.67)
CBQ-Perceptual Sensitivity	6.29 (0.57)	6.25 (0.64)	6.26 (0.71)	6.28 (0.58)	6.31 (0.84)
CBQ-Discomfort	5.43 (1.03)	4.54 (1.34)	5.03 (1.03)	5.09 (1.21)	5.05 (0.89)
CBQ-Attention Focusing	4.96 (0.78)	5.34 (0.60)	5.11 (0.80)	5.10 (0.73)	4.99 (0.71)
CBQ-Inhibitory Control	5.19 (0.81)	5.26 (0.79)	5.01 (0.77)	5.22 (0.79)	5.15 (0.82)
CBQ-Impulsivity	4.70 (0.67)	4.28 (0.77)	4.98 (0.65)	4.55 (0.72)	5.29 (0.68)
CBQ-Falling Reactivity & Soothability	4.99 (0.81)	5.26 (0.76)	4.62 (0.61)	5.09 (0.79)	4.59 (0.53)

between response groups in backward digit span ($F(2, 34) = 9.39$, $p = .001$) and impulsivity ($F(2, 46) = 3.62$, $p = .035$), and marginally significant difference in falling reactivity and soothability ($F(2, 46) = 3.04$, $p = .057$). Secret-keepers had higher scores at backward digit span than self-motivated liars and confessors. Secret-keepers were also lower in impulsivity and were higher in falling reactivity and soothability than confessors.

Comparing lie maintainers and non-maintainers

There were no significant differences in age between those children who did and did not maintain their lies ($t(38) = .89$, $p = .380$) and the duration of friendship ($t(38) = -1.31$, $p = .197$). Moreover, there was no association between sex and lie maintenance ($\chi^2(1) = .11$, $p = .746$). Descriptive statistics for all measures across children who maintained their lies and who did not are provided in Table 2.

Independent-samples t-tests were run to compare lie maintainers and non-maintainers. Lie maintainers were lower in impulsivity than those children who did not maintain ($t(36) = 2.90$, $p = .006$). Moreover, scores on first-order theory of mind understanding were higher for lie maintainers than for non-maintainers ($t(37) = 2.84$, $p = .007$). Levene's test indicated unequal variances ($F = 8.02$, $p = .007$); hence, degrees of freedom were adjusted from 38 to 37.

Discussion

We investigated different responses of children while reporting on their rule observance behavior during a collective interview. Almost a quarter of the children transgressed the adult-set rule when they were left alone in the room; the remainder did not. Based on the consistency in children's responses to the target question and follow-up questions, six groups emerged from the sample. Transgressors included self-motivated liars, confessors, and reticents. Non-transgressors included truthful deniers, secret-keepers, and tattlers.

A dyadic deceptive setting is challenging for interactants as participants do not know how their partner would respond to unanticipated questions. Although children were alone in the room for a while and had the opportunity to discuss what to do or say together after the experimenter came back, none of the dyads anticipated and planned on such a potential testimony. Moreover, rule transgressors did not even explicitly request from each other or non-transgressors to conceal their misbehavior. It is quite likely in such a context to expect rule transgressors to confess their own behavior eventually. Supporting this pattern, the number of confessors increased significantly at the end of the interview. Confessors included three different groups of children: children who directly confessed after the target question (N = 7), children who did not respond to the target question but then directly confessed after the follow-up questions (N = 4), and children who initially lied but could not retain their lies (N = 12). Behavioral observations of the last group indicated that the majority (N = 8, 67%) could not sustain their lies because they could not give coherent responses to the interview questions. The rest of the children could not retain their lies because of their friend's responses: 3 children (25%) confessed following their friends' confessions, 1 child (8%) confessed following her friend's tattling.

Interestingly, though, the majority of lie initiators retained their lies throughout the interview. The type of the interview questions might have facilitated lie maintenance. To illustrate, once a child gave a false response (e.g., "No, we did not") to the target question, this child could maintain lying by responding "Yes, we were around this table" to the first follow-up question and by responding "No, we did not touch the toys, another woman came and touched them" to the second follow-up question. The structure of the interview questions did not call for complex answers; responding simply in yes or no form was adequate. Moreover, the questions did not target the plausibility of children's initial false claims and their follow-up responses. Rather, giving a plausible explanation consistent with the physical

evidence of transgression was enough to maintain a lie. Due to these reasons, it was possible to sustain a lie in our collective interview context.

We were particularly interested in rule-abiding children whose friend violated the rule. The study context embodies a dilemma of risking or preserving friendship. Children might risk their future relationship by tattling, or they might invest in their friendship by lying for their friend. Children were cautious of creating any burden on their friendship because only 23% of rule-abiding children tattled on their partner, supporting our expectation. Previous studies showed that tattling is more prevalent when there is a conflict about property entitlement or physical aggression between peers in school settings (Ingram & Bering, 2010), and when there is harm to the recipient's possession in experimental settings (Vaish et al., 2011; Yucel & Vaish, in press). In general, conventional rules are arbitrary and situation-dependent; so, they do not have as much prescriptive force as moral rules (Turiel, 1983). Children may not consider the violation of this rule as a moral issue and might be more flexible in accepting this transgression as the violation of the rule has no harm to any interactive partner.

Lying for friend, on the other hand, was more frequent than tattling among the non-transgressors. This suggests that showing loyalty to friends is not limited to middle-childhood and after as Hartup (1993) suggested, but is instigated at earlier ages as a function the context. We argue that children engage in altruistic lying for their friend to preserve their friendship. Anecdotally reporting, a few secret-keeping children threatened their rule-transgressing friends with tattling on them when they were alone in the room. However, those children did not actually carry out a tattle; rather, they protected their friend by lying. Even though lying for another person was a potential threat for their own self-presentation, 10 out of 13 children (77%) still preferred to lie for their friend. This also supports the finding that the level of

dishonest behavior increased when there is a benefit to another person or charity (Gino et al., 2013; Lewis et al., 2012).

All secret-keeping children had a friend who lied about their own transgression while responding to the target question. This indicates secret-keepers and self-motivated liars put collaborative effort to lie together against the target question. A recent finding showed that 7-year-old children kept cheating behavior of an adult as secret when they were in a collaborative context (Ikeda, Okumura, Kobayashi, & Itakura, 2018). The collaborative effort of individuals working together to deceive another party is apparent in two situations. First, when there is a third-party punishment, individuals increase their cooperation (Fehr & Gächter, 2002; Shinada & Yamagishi, 2002). A study with 7- to 11-year-olds demonstrated that a threat of third-party punishment increased cooperation rates between children (Lergetporer, Angerer, Glätzle-Rützler, & Sutter, 2014). Following this pattern, secret-keepers could have lied to increase cooperation with their friend to avoid any potential punishment from the experimenter. Second, people collaboratively deceive a third-party when there is a self-gain in doing so. Adult studies demonstrated that groups lied more than individuals when their lying behavior was guaranteed to have more economical gain, but lied less than individuals when there was no such certainty (Cohen, Gunia, Kim-Jun, & Murnighan, 2009). Moreover, when there was a win-win situation for both parties (i.e., when the outcomes are perfectly aligned for both players), lying percentages increased dramatically (Weisel & Shalvi, 2015). In brief, maximizing self-gain is the underlying motive to engage in cooperative deceptive behavior. In our context, 10 out of 13 rule-abiding children whose friend violated the rule might have considered preserving friendship by lying as a self-gain, a way to maximize their friendship outcome.

We defined reticents as those children who violated the rule but did not respond to the target question while their friend was lying and did not give any clear codable answers during

the interview. The motivation for remaining silent could be to connive with their lying friend or not to contradict their friend's lying, not because they were colluding. Whichever the motivation is, the reticents benefit from the situation without reciprocating because their friend lied also on behalf of them. Previous studies named those benefiters as "freeloaders" and mostly focused on the strategies for preventing, punishing, or eliminating freeloaders because selfish interests of freeloaders are seen as an obstacle for cooperation (Shinada & Yamagishi, 2007; Suchak et al., 2016; West, Griffin, & Gardner, 2007). Indeed, benefiting from the behavior of the other friend and securing themselves without putting any verbal or nonverbal effort could play a central role in reticents' silence in our study. It is also possible that reticents did not respond because they could not be sure what their friend would say. However, they could support their friend's response after hearing what they had said. Alternatively, reticents might be considering confessing; yet, because their friend already initiated a lie, they chose to stay silent not to contradict with and tell on their friend. In this sense, reticents engaged in an effort to stay in tune with their friends; so, keeping quiet still could be considered a cooperative action in a dyadic context.

We also examined differences between (1) self-motivated liars, secret-keepers, and confessors, and between (2) lie maintainers and non-maintainers in terms of first-order theory of mind understanding, memory, inhibitory control, and temperament domains. The findings demonstrated that secret-keepers exhibited better backward digit span than self-motivated liars and confessors and lower impulsivity but higher falling reactivity and soothability than confessors. Lie maintainers were lower in impulsivity and higher in first-order theory of mind understanding than lie non-maintainers.

Working memory is a prerequisite for all lying children (e.g., Alloway, Callum, Alloway, & Hoicka, 2015; Evans & Lee, 2011) because lying children need to process multiple pieces of information in mind (e.g., the researcher's knowledge about the situation

and the transgression) and recall the appropriate information when interviewed (e.g., a fake story for covering up the transgression). Backward digit span is more challenging as children need to recall items in reverse order. Secret-keepers were distinctively better in this dimension than self-motivated liars and confessors. Complex working memory skill might be required when lying for another person because secret-keepers need to keep in mind not only what they say, but also what their friend says, while at the same time they need to keep track of the previous responses. Moreover, lower levels of impulsivity but higher levels of falling reactivity and soothability might help secret-keepers to modulate their emotional responses appropriately and get involved in less peer conflict while being interviewed. Consistently, Gordon et al. (2014) found that better emotional control skills contributed to secret-keeping behavior of children. Carlson and Wang (2007) also reported that secret-keeping has an emotion regulatory function.

In comparing lie maintainers to non-maintainers, lie maintainers were lower in impulsivity and higher in first-order theory of mind understanding than non-maintainers. By being less impulsive, lie maintainers were not fast in response initiation which might help them to think about consistency in their responses. Regarding theory of mind, children were only required to instill false belief in experimenter's mind and maintain this false belief without making inferences about what the interviewer would think based on their initial false claim. They just needed to provide answers that were consistent with the physical evidence of transgression (e.g., "A woman came and played with these toys"). Thus, lie-telling children with better first-order theory of mind understanding sustained their lies during interview. Evans and Lee (2011) also found that when there was a physical evidence of transgression, first-order theory of mind understanding was associated with lie maintenance.

To our knowledge, this study is the first to compare groups of (1) self-motivated liars, secret-keepers, and confessors and (2) lie maintainers and non-maintainers on the measures of

socio-cognitive skills and temperament dimensions. Our findings highlighted that the differences between these groups were not robust as the groups did not differ on many dimensions. Part of the issue might be that some of the measures were not challenging enough to discriminate between groups. For example, we observed the ceiling effect for older children in inhibitory control measures. In the snack-delay measure, 47.6% of 5-year-olds and 50% of 6-year-olds received the highest score. Similarly, the mean of bear-dragon score across age group was 27.09 for 5-year-olds and 26.63 for 6-year-olds where the maximum score was 30. The measurement tools might be a factor for not detecting individual differences in response types. However, it is important to mention that the context under which lie-telling behavior is examined may be more relevant than measurement tools for the lack of individual differences. In a dyadic context, the initiation and maintenance of a lie requires successful contribution of each party rather than individual differences between children. It is difficult to continue lying for a child if this child's friend prefers to confess during the interview. In sum, it is important to consider contextual influence, rather than individual differences while investigating children's deceptive behaviors. More research is needed to better understand in what social circumstances children lie for themselves, lie for or tattle on their peer.

CHAPTER 4

NONVERBAL MARKERS OF LYING DURING CHILDREN'S COLLECTIVE INTERVIEWING WITH FRIENDS

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Abstract

To examine nonverbal behaviors that may differentiate between lie- and truth-tellers, recent studies have relied on collective interviews (e.g., Vrij & Granhag, 2014), where participants were solicited to fake their responses about an unexperienced event. In this study, we made participants experience actual events that involved a potential rule violation, and later interviewed them collectively and unanticipatedly about these previously experienced events. Ninety same-sex preschool dyads were observed in a temptation resistance paradigm, where an adult experimenter proscribed touching of attractive toys and left the children alone. The dyads of children were later interviewed by the experimenter about how they handled this rule. Nonverbal behaviors were coded during the entire interview phase where they could lie by withholding transgression (i.e., lying by omission) and right after a target question where children chose to lie or tell the truth (i.e., lying by commission). Truth-tellers and lie-tellers showed (1) differences in response latency, looking at friend, and use of gestures right after the target question, but were (2) similar in their interactive nonverbal behaviors during the entire interview (i.e., speech transition, looking at friend, and utterance rate). This is the first study showing that nonverbal behaviors accompanying lie-telling behavior are different when a collective interview is carried out in a spontaneous deceptive context as opposed to planned deceptive contexts.

Keywords: spontaneous lying, nonverbal indicators of lying, collective interview, lying by omission, lying by commission, dyadic context

Nonverbal Markers of Lying during Children's Collective Interviewing with Friends

The detection of deceivers has gained considerable attention due to implications for social workers, judges, and juries in legal settings (e.g., Talwar & Crossman, 2012; Vrij, 2002; Vrij & Granhag, 2014). Several findings with adults and children indicate that there is no easily recognizable nonverbal deceptive behavior (e.g., Talwar & Crossman, 2012; Vrij, 2000). However, there is room for more work tapping various contexts that may elicit deceptive behavior. For example, research in nonverbal deceptive behavior when multiple people interviewed together (i.e., collective interviewing) has gained a growing interest recently (e.g., Driskell, Salas, & Driskel, 2012; Jundi, Vrij, Hope, Mann, & Hillman, 2013a; Vrij & Granhag, 2014). In this study, we also examined children's nonverbal cues to deception when they decided to lie *spontaneously* in a collective interviewing context.

Potential nonverbal communicative cues to deception lie in facial and bodily movements (e.g., facial expressions, eye-contact/gaze, head, hand or leg movements), and paralinguistic features in speech (e.g., latency to respond, speech duration, pauses, speech transition, tone of voice) (Burgoon, 2005; DePaulo, 1988; DePaulo et al., 2003; Ekman, 2009; Mann et al., 2013; Sporer & Schwandt, 2006; Vrij et al., 2012; Williams, Bott, Patrick, & Lewis, 2013). Past research within different theoretical approaches has suggested that certain nonverbal behaviors are likely to accompany lying during deception in individual context (DePaulo et al., 2003; Sporer & Schwandt, 2006). For example, the attempted control approach asserts that lie-telling people tend to control their behaviors by minimizing their bodily behaviors and sustaining eye-contact with the interviewer to create an honest impression and come across as persuasive (e.g., Burgoon & Floyd, 2000; DePaulo & Kirkendol, 1989). The cognitive load/working memory approach, on the other hand, claims that there are higher processing capacity demands for lie-tellers than truth-tellers (e.g., paying attention to not contradicting a previous statement, monitoring the listener's knowledge about

the reported event), and working memory capacity is more taxed as lie-tellers cannot draw as readily as truth-tellers on existing memory contents when reporting an event (Sporer & Schwandt, 2006; Vrij, 2000; Zuckerman et al., 1981). This leads to reduced working memory capacity available for speech production, manifesting itself in a less detailed and shorter story, slower speech, and delayed responses to questions.

Children are considered to be successful in manipulating their nonverbal behaviors. The reason that leads to this claim is that naïve adults cannot differentiate between lying and non-lying children (Crossman & Lewis, 2006; Lewis, Stranger, & Sullivan, 1989; Liu et al., 2010; Talwar & Lee, 2002; Vrij, 2002). Indeed, it has been shown in direct observations of lie- and truth-telling children, that they are not significantly different from each other on some bodily, facial, and paralinguistic behaviors such as gaze aversion from the experimenter, latency to respond, speech disturbances (i.e., speech hesitations and speech errors), speech rate, and pauses during responding (Vrij, Akehurst, Soukara, & Bull, 2004); eye movements (i.e., eye-contact with experimenter, and looking down or away), appearance (i.e., looking confident/relaxed), body language (i.e., leaning forward, fidgeting, and shaking head), and prosody of vocalization (i.e., positive tone of voice and no vocalization) (Talwar & Lee, 2002); gaze aversion, soberness of mouth, and hand movements (Lewis et al., 1989).

What is common in these studies was that child participants were solicited or explicitly motivated to engage in lie-telling behavior. That is, children either played a guessing game where they were either explicitly prompted by the experimenter to lie to an adult confederate in order to win the game and get a present (Serras Pereira et al., 2014), or motivated to lie either for a promised prize (Talwar & Lee, 2002), or for getting to play with the toy itself (Lewis et al., 1989). Alternatively, children were explicitly prompted by the experimenter to fake their responses such that children were given time to prepare themselves for an interview where they would lie about an event that they had never experienced (Vrij et

al., 2004). These explicitly elicited, pre-motivated, or a priori planned lies are useful to understand which nonverbal behaviors accompany lying behavior; yet, they do not tap into the on-the-fly nature of spontaneous lying as we do not observe participants lying of their own volition. Moreover, and crucially, our knowledge that children are good manipulators of their nonverbal behaviors during lying is limited to contexts where they are tested or observed individually. In fact, young children frequently find themselves having to conceal their own or their friends' transgressions in coordination with or in the presence of another child such as with siblings at home or with peers at school. To this date, however, interactive behaviors of children during collective interviewing have not been systematically researched in spontaneously produced lying that involves more than one child. Here we fill this gap by investigating whether lie-telling and truth-telling children differ in interactive behaviors from each other in preparation for and during spontaneous deceptive communication during collective interviewing in a dyadic context.

Collective interviewing of suspects, where two or more individuals are interviewed simultaneously, has gained recent interest in the literature about adult deception (e.g., Vrij & Granhag, 2014). These studies focus on the interactive nonverbal communicative behaviors between group members such as eye-gazing or conversational verbal exchanges (i.e., interruptions or adding information) (Driskell et al., 2012; Jundi et al., 2013a, 2013b; Vernham, Vrij, Leal, & Mann, 2014; Vrij et al., 2012). From the transactive memory system approach (Hollingshead, 1998), truth-telling pairs are expected to be more interactive when interviewed together because the members experience a truthful event together and have a socially shared representation of that event. While recalling their activities, pairs of truth-tellers work together to access that information and do this in a more interactive fashion such as by looking at each other, making interruptions and corrections, or adding information to each other's turns. Lie-tellers, on the other hand, do not rely on the memory of a shared

event; rather they rely on individual cognitive abilities to construct a story that is in line with what other person says (Hollingshead, 1998). Thus, they are less interactive in recalling a fabricated event, possibly to avoid raising any suspicions. A few available results support such divergent communicative patterns between truth- and lie-telling adult dyads. Members of lie-telling pairs gazed less at their partner, asked fewer questions to one another, made fewer interruptions and corrections, added less information to each other's stories, and had more eye-contact with the interviewer compared to truth-telling adult pairs (Driskell et al., 2012; Jundi et al., 2013b; Vrij et al., 2012).

To our knowledge, no studies have been conducted on children's nonverbal behaviors that accompany their lie-telling behavior during collective interviewing. However, the literature on co-narration of children presents useful findings, which speak to transactive memory in children. Co-narrations or collaborative narratives refer to joint construction of a shared experience, mostly observed in conversations among friends and family members (Blum-Kulka, 1997; Burger & Miller, 1999; Leung, 2009). While co-narrating, multiple narrators contribute to the development of a story by adding events, providing details about the context and people, interrupting to provide additional information, overlapping, or rephrasing of main points (Bogetic, 2011; Coates, 2005; Leung, 2009). These elements are considered to be an inherent part of co-narration, indicating collaborative effort and mutual involvement (Bogetic, 2011). Preschool children were observed to contribute to the construction of co-narrations in an interactive way by using confirmation, repetition, negation, modification, or adding new information while making transitions (Bokus, 1992).

It is noteworthy to mention that speakers contribute interactively during collective interviewing or co-narrating when speakers experience the event together. In previous collective interviewing studies, the members of lying dyads did not actually experience the event; rather, they were asked by researchers to prepare a false alibi for the interview.

However, lying does not require faking one's own responses throughout the entire interview. People can lie by concealing important information while talking about other actually experienced events. Accordingly, previous research distinguishes between lying by omission and lying by commission (Bok, 1978; Spranca, Minsk, & Baron, 1991). *Lying by omission* includes a statement that itself is not factually false but omits critical information. *Lying by commission*, on the other hand, refers to on-purpose actual lying where individuals produce false statements. In real-settings, talking about half-truths while withholding some critical information is possible if one is not asked directly about that critical information (Schweitzer & Croson, 1999). Thus, nonverbal behaviors accompanying lying by omission and lying by commission may be different. We were able to examine whether there was such a difference in this study.

The Current Study

Lies are ecologically more valid when we make people experience actual events that involve a potential rule violation, and are later interviewed collectively and unanticipatedly about these previously experienced events. In the present study, we argue that when a collective interview is carried out about actual events, people get an opportunity to talk about their shared experiences interactively, irrespective of the veracity status of the reported events (Coates, 2005; Hollingshead, 1989). Thus, people who lie by omission and who tell the truth may not necessarily differ in their interactional nonverbal behaviors during the entire interview. However, nonverbal cues to deception may emerge right after when people decide to lie by commission to an unanticipated question (Vrij & Granhag, 2014). Asking a direct question about a misbehavior puts people in spotlight in a context where people may display nonverbal behaviors to check on potential reactions of their interactive partners or to make a bid to their partner to cooperate before deceitful answers.

We tested these predictions with preschool children's nonverbal behaviors during lying and truth-telling in a semi-structured context. We simulated children's everyday settings where dyads of familiar children were collectively instructed to follow a rule. Having recorded children's observance or violation of this rule, we then carried out an unanticipated collective interview to examine nonverbal cues to lying therein. The interview included a general question, a target question, and two follow-up questions. We observed lying by commission as a response to the target question where children decide to lie or tell the truth about whether they followed or violated the prescribed rule. For the entire interview, children who transgressed the rule also had an opportunity to lie by omitting the critical information of rule violation.

As our unit of analysis was observations from each child, we selected nonverbal measures that reflect the interactional nonverbal behaviors at child-level for the entire interview. We included speech transitions, utterance rates, and looks at friend, adopting measures used in previous studies (Bogetic, 2011; Coates, 2005; Driskel et al., 2012; Sporer & Schwandt, 2006; Vrij et al., 2004). In our setting, children who transgressed the rule might lie by withholding the transgression. So, regardless of their veracity status (i.e., lying vs. truth-telling), this setting gives an opportunity for each child (1) to engage in speech transition with their friends such as adding information, agreeing with or making correction to what their partner says, (2) to have similar amount of talk and (3) to look at friend while engaging in conversation. Hence, we did not expect any differences in the level of interactive patterns of communication as indexed by speech transition, utterance rate, and looking at friend between truth- and lie-telling children during the entire interview (H_1).

To code responses that immediately follow the target question (i.e., "When I was not here, did you touch these toys?"), we selected measures that are often associated with individual factors such as cognitive load and behavioral control while lying. These measures

might also reflect interactional behaviors as for this question, children lie of their own volition (Burgoon, Kelly, Newton, & Keeley-Dyreson, 1989; Coates, 2005; Sporer & Schwant, 2006; Vrij, 2000; Vrij et al., 2004). These variables included latency to respond, overlap between responses, looking direction (friend, experimenter, or away), and the presence of gesture.

Children who followed the rule could report the actual events and had no reason to conceal any information as a response to the target question; thus, truth-telling children would be more likely to respond fast and almost simultaneously with their friend. However, as children who transgressed the rule cannot estimate how they would position themselves with their friends against the target question, they would be more likely to respond relatively later and to wait to give an appropriate response after hearing their friend's reply. Waiting to determine a partner's response may hold children from answering fast and simultaneously with their friend, potentially adding to the higher cognitive load of having to lie. Accordingly, we expect that lying children would be more likely to respond later and less likely to overlap with their friend while answering the target question compared to truth-telling children (H_2).

In addition to a longer pause before responding, children may also monitor their friend to coordinate their responses jointly. Looking at the friend right after the target question is more likely to occur for children who are embarking on a lie. Looking at someone has a communicative function which facilitates coordination with others towards joint goals (e.g., Wyman, Rakoczy, & Tomasello, 2012). Thus, we expected that lie-telling children would be more likely to look at their friend during responding than truth-telling children (H_3). Considering previous findings that did not find differences between lying and looking at the experimenter or away (e.g., Talwar & Lee, 2002), we also did not expect to find any significant association between looking at the experimenter or away during responding and response group (i.e., truth-teller vs. lie-teller) (H_4). Finally, as individuals try to make a

credible impression while lying, they tend to decrease their movements by over-controlling them (Buller & Burgoon, 1996). We coded if there were any gestures (i.e., head, hand, or arm movements) accompanying children's responses to the target question. We expected that lie-telling children would be less likely to gesture while responding than their lie-telling counterparts (H_5).

Method

Participants

The sample consisted of 90 same-sex friend dyads, 47 male-male and 43 female-female pairs of children. All children were recruited from local preschools and through social media calls. The age range of the children was between 48 and 83 months of age (M = 64.18, SD = 9.32). The mean age difference between dyad members was 5.69 months (SD = 4.12, *Range* = 0-16 months). Fifteen percent of the children's caregivers had a secondary school degree or below, 32% had a high school degree, 31% had a college degree, and 22% had a graduate degree. The mean year of education of caregivers was 14.12 years (SD = 4.73). The present study was approved by the Institutional Review Board (Project Name: Rule Violation and Deceptive Communication among Peer-Dyads, Protocol Number: 2014.068.IRB3.052).

Procedure and Measures

Children participated in pairs in a session. We used a modified version of the temptation resistance paradigm (Kochanska & Aksan, 1995) to examine children's rule observance behavior and lie-telling status. After a brief welcoming, Experimenter 1 (E1) took the children to the main experimental room with three different tables. The attractive off-limit toys were placed on a table in one corner of the room just below a one-way mirror. At the opposite wall, there were materials that would be unforbidden to the children (i.e., one rabbit toy, painting notebook and crayons, coloring books, and puzzles). In the middle of the room, there was one table with two chairs to be used by the children. All procedures in this room

were videotaped from behind a one-way mirror by Experimenter 2 (E2) for later behavioral coding and transcriptions.

As E1 opened the main room's door to let the children in, the video recording was initiated by E2. E1 seated the children on the chairs in the middle of the room facing towards the one-way mirror. Then E1 sat down just below the one-way mirror next to the "off-limit" table facing the children. E1 told the children that "*In this room, you will play games with me. Before starting our games, I have to tell you the rules of this room. You cannot touch the table at this corner of the room* (pointing and showing the forbidden toys). *That is, touching the table, touching the toys on the table, and touching the toys on the ground in front of the table is forbidden. But, you can touch the toys at this side* (pointing and showing the unforbidden toys). *That is, you can get them and play with them. Is this OK?*". Then, children were asked to repeat the rules of the room individually to check if they understood. If there was a misunderstanding, E1 repeated the rules once again.

The current study was conducted as a part of a larger study on children's lie-telling behavior in dyadic context. Thus, after this brief introduction session, children were separately taken for individual assessments of socio-cognitive correlates of lie-telling behavior (e.g., theory of mind understanding, executive function), lasting about 45 minutes on average. At the end of the individual assessment, both children were taken into the main room again for the temptation resistance task.

Temptation resistance task: When the children re-entered the room, they were first asked to repeat the rule of the room to assure that children they still remembered the rule. If they did not remember the rule, E1 reiterated the rule briefly once again. Then, E1 informed the children that she had to leave as she had to prepare materials for the next game in another room. E1 also asked the children to carry out a plastic cutlery sorting task while she was out. Then, E1 left the room and the children were alone with their friend partner.

This modified version of the temptation resistance paradigm (Kochanska & Aksan, 1995) was divided into four phases. In the first phase, children were alone in the room for 1 minute. In the second minute, E2 (a female experimenter, who was unfamiliar to the children) entered the room and started to play with the forbidden toys in sight of the children for 1 minute. No interaction was allowed between E2 and the children, meaning that if any of the children said anything to her, she did not reply. Then, E2 left the room. In the third phase, children were alone in the room for 6 minutes. These three phases lasted for 8 minutes in total. Then, in the last phase, E1 entered the room to carry out a collective interview asking questions to both children, addressing them simultaneously. E1 sat facing the children in an equidistant position and asked each question without any eye contact with the children (i.e., looking at the papers in her hand while asking the questions). This was to make sure that the children started the conversation of their own will within their own dynamics, rather than by enforcement or explicit turn-directing behavior of E1. E1 asked the following questions in a fixed sequence to all the pairs: “Tell me in detail, what you did together when I was not here?” (general question), “When I was not here, did you touch these toys?” (target question), “Were you here around this table [children’s table] all the time?” (follow-up question 1), and “It seems that the locations of these toys have changed, haven’t they?” (follow-up question 2). If the children did not answer the questions, E1 repeated them or asked “anything else?”. After the collective interview was completed, the pairs of children were allowed to play with the forbidden toys for a few minutes.

Coding

Classification of children. Frequencies for approach and touch behavior for the forbidden toys across children’s different responses during the interview were provided in Table 1. We classified children as truth-teller or lie-teller based on their status of rule transgression/obedience and truth-/lie-telling behavior during the entire collective interview.

Lie-tellers were consistent while responding throughout the interview; that is, lie-telling children maintained their lies and did not disclose any information about their rule violation throughout the interview.

Table 1.

Frequencies of approach and touch behavior for the forbidden toys across response types during the entire collective interview

		Lie-Teller						
Touch	Approach	Truth-teller	Lied for self	Lied for friend	Confessor	Tattler	No response	Total
No Touch	No approach	85		3		1		89
	Approach	39		7		2		48
Touch	Approach		18		23		2	43
	Total	124	18	10	23	3	2	180

We excluded 28 children from the classification. First, there were 2 children who transgressed the rule but did not respond to any of the interview questions. Their silence could be driven by different motivations. For example, they may be supporting the concealment of their friend by being silent. Alternatively, they may be surprised by their friend's lie but would not verbally respond in order not to contradict their friend, not because they were supporting the lying friend. As our design could not tease apart these motivations, we excluded these non-responding transgressors[3]. Second, we excluded confessors ($N = 23$) and tattlers ($N = 3$) since we were only interested in lie-tellers vs. truth-tellers. Confessors were those children who touched the prohibited toys and admitted their wrong-doing throughout the interview. This group included children (a) who directly confessed their transgression to the target question ($N = 7$), (b) who initiated a lie as a response to the target question, but could not maintain their lies ($N = 12$), and (c) who did not initially respond to

[3] Of 43 transgressors, a total of 8 children did not respond to the target question. While we excluded 2 non-responding children; we included the other 6 children because they responded to other interview questions. This way, we were able to classify them as liar or confessor.

Table 2.

Responses of children (CHILD-1) in relation to their partner's (CHILD-2)

			CHILD-1						
			No Touch			**Touched**			
			Truth-telling	Tattling	Lying for friend	Lying for self	Confessing	No response	Total number of dyads
CHILD-2	**No Touch**	Truth-telling	61			1	1		63
		Tattling					3		3
		Lying for friend				7	3		10
	Touched	Lying for self				4	1	1	6
		Confessing					7	1	8
		No Response							
		Total number of dyads	61			12	15	2	90

the target question, but then disclosed their wrongdoing ($N = 4$). Tattlers, on the other hand, were those children who themselves did not touch the toys, but told on their friend's misbehavior. In Table 2, we presented the frequency of different kinds of responses of the dyads.

The resulting sample size for further analyses was 152 individual children from 79 dyads[4]. Truth-tellers ($N = 124$) included children who did not touch the forbidden toys and truthfully responded during the interview. Lie-tellers ($N = 28$) comprised of two groups of children: (1) children who touched the forbidden toys and concealed the situation by lying ($N = 18$) and (2) children who themselves did not touch the forbidden toys but lied for their friends who touched the toys ($N = 10$) during the entire interview.

Coding of nonverbal behaviors. The coding of the entire collective interview phase included the categories of speech transition, utterance rate, and looking at friend; while the coding of the post-target-question phase included latency to respond, presence of overlap, looking direction during responding, and presence of any gesture during responding. In Table 3, we presented the frequencies of overlap, looking direction, and gesture use for truth-tellers and lie-tellers.

Speech transition is defined as any utterance providing an elaboration, correction, or agreement that immediately followed a preceding friend's turn. Example 1, an excerpt from conversations between two children, demonstrates two speech transitions from each child.

The number of times each child contributed speech transitions were identified. The number of transitions each child contributed were then divided to the total number of their utterances to obtain a proportion ($M = .21$, $SD = .17$, *Range* = 0 - .75).

[4] The recordings of 2 dyads (4 children) included technical problems in the sound files. These children did not touch the forbidden toys and truthfully responded to E1. These participants were only included for some of the analyses.

Table 3.

Frequencies of overlap, gesture use, and looking direction after the target question for truth-tellers and lie-tellers

	Truth-Tellers	Lie-Tellers
Presence of overlap		
No overlap	16	8
Overlap	92	14
Presence of look		
Friend		
No look	117	20
Look	3	8
Experimenter		
No look	32	9
Look	88	19
Away/other place		
No look	35	9
Look	85	19
The presence of gesture use		
No gesture	34	15
Gesture	80	10

Example 1:

E1:	Evet ben burada yokken neler yaptınız böyle ayrıntılı olarak bir anlatır mısınız? *Yes, could you tell me in detail what you did when I was not here?*	
Child1:	Böyle bunları [kaşıklık] topladık. *Like we collected them [spoonbox].*	
Child2:	Bunlara [unforbidden toys] dokunduk. *We touched them [unforbidden toys].*	[Child2: Transition 1]
Child1:	imm kalem kalemleri alıp boyama yaptık. *Um we took pen pencils painted.*	[Child1: Transition 1]
Child2:	Sonra da kitapları aldık. *After we took books.*	[Child2: Transition 2]
Child1:	Bunlarla bunlarla bu bu tavşanı sevdim. *With these with these I petted this this rabbit.*	[Child1: Transition 2]

Utterance rate is calculated by dividing the child's total number of utterances during the interview phase to the total duration of the interview. This way, the average proportion of talk for each child was obtained (M = 6.34, SD = 2.36, Range = 1.08 – 11.80).

Looking at friend is defined as child's explicit look towards the friend's face or eye. We coded the frequency of looking at friend for the entire interview. Then, we excluded looking at friend right after the target question and created a proportion score for looking at friend for the rest of the interview by dividing this number to the duration of interview (M = 1.29, SD = 1.56, Range = 0 – 10.78).

To measure *latency to respond*, the boundaries for turn-ends (i.e., the end of E1's target question) and turn-starts (i.e., the child's response) of each child were identified, using Audacity (2012) for verbal responses and ELAN (Sloetjes & Wittenburg, 2008) for nonverbal responses. When verbal and nonverbal response co-occurred, whichever comes first was considered as starting a turn. The range of response latency was from -.63 to 1.93 seconds. The *presence of any overlap* between friends' responses was also noted. Eighty one percent of the children overlapped with their friend.

Looking direction during responding reflected where the child was looking during his/her own responding. The categories were looking at friend, experimenter, and away. The choice of coding was not mutually exclusive since some children present a combination of these categories (e.g., looking at the experimenter then to the friend or looking at the friend then away).

The *presence of any gestures* (e.g., head-nods, body movements to mean "no") during responding was coded on a binary system to indicate whether there were any kinesthetic gestures or not (no gesture, N = 57, 37.7%; gesture, N = 94, 62.3%).

Interrater reliability

All sessions (N = 152 children) were coded using both the videotapes and the transcriptions. The first author trained 3 different research assistants to carry out the main coding. One research assistant coded interactional nonverbal behaviors during the entire interview, while the others coded the nonverbal behaviors that followed the target question (one assistant coded latency and the other assistant coded the rest of the variables). The first author then coded 20% of all sessions independently for reliability. The interrater reliability for the raters were calculated with Cohen's kappa for categorical variables and with intraclass correlation coefficient for continuous variables. For speech transition, ICC was .89 (95% confidence interval [CI] = .77-.94); for looking at friend ICC was .87 (95% CI = .75-.93). For latency to respond, ICC was .99 (95% CI = .993-.997); for looking at friend, κ was .79 (95% CI = .63-.95); for looking at experimenter, κ was .84 (95% CI = .77-.90); for looking away/another place κ was .70 (95% CI = .62-.77); for the presence of gesture κ was .83 (95% CI = .77-.89).

Results

Preliminary analyses yielded no association between children's sex and response group (truth- vs. lie-teller) ($\chi^2(1) = .81$, $p = .370$). In addition, there was no difference between truth-tellers (M = 22.72 months, SD = 18.79) and lie-tellers (M = 27.86, SD = 21.14) in the duration of friendship ($t(151) = -1.41$, $p = .162$). Lie-telling children (M = 67.65, SD = 1.53) were on average older than truth-telling children (M = 63.64, SD = .88), ($t(153) = -2.25$, $p = .026$). The duration of interview was about the same length for the lie-telling (M = 1.36 min, SD = .39) and the truth-telling children (M = 1.42 min, SD = .41) ($t(146) = .78$, $p = .439$).

To examine the differences in nonverbal behaviors of truth-telling and lie-telling children, we run a series of linear mixed models (LMM) for continuous outcomes and generalized linear mixed models (GLMM) with binomial error distribution for binary

outcomes. We used the lme4 package (Bates, Maechler, Bolker, & Walker, 2015) in the R environment (R Core Team, 2017). In all models, the unit of analysis was the observation from each child. To examine the main effect of response group (truth-teller vs. lie-teller), we compared the fit of full model with a null model. The null model included age in months, the duration of friendship in months, and the random factor of dyad as children were observed in dyads. We added the predictor variable of response group to examine whether the model showed improvement over the null model. We present model comparison statistics, estimates and standard errors of variables in Table 4.

For the nonverbal interactional behaviors during the entire collective interviewing, we did not expect to find any differences between lie-telling and truth-telling children in speech transition, utterance rate, and looking at friend. The full model did not improve the fit as compared to the null model for any of these nonverbal behaviors, providing support for H_1 (see Table 5 for means and standard deviations).

Table 5.

Means and standard deviations of nonverbal behaviors during collective interviews

	Truth-Telling Children		Lie-Telling Children	
	M	*SD*	*M*	*SD*
Speech Transition	.21	.17	.24	.16
Utterance Rate	6.27	2.29	6.66	2.64
Looking at Friend	1.43	1.71	1.12	1.18

For the post-target question, we expected that lie-tellers would be more likely to respond later and less likely to overlap with their friend compared to truth-tellers. The full model improved the fit as compared to the null model for response latency but not for the presence of overlap, which partially supported H_2. Accordingly, compared to truth-telling children (*M* = .178 sec, *SD* = .42), lie-tellers were slower in initiating their response (*M* = .354 sec, *SD* = .45). However, both groups overlapped at similar rates.

Table 4.

Estimates (standard errors) for each predictor and model comparison statistics

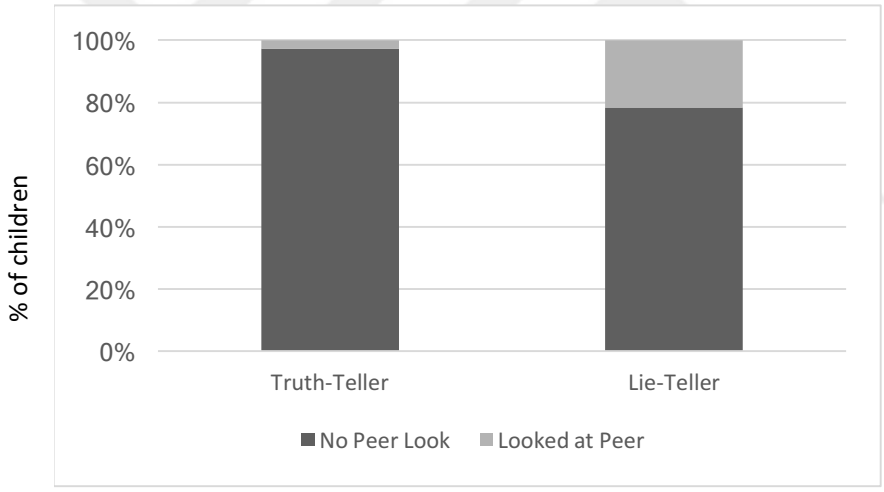
	Outcome Variables								
	Entire Interview				Target Question				
Predictors	Speech transition	Utterance rate	Looking at friend	Latency to respond	Presence of overlap	Looking at friend	Looking at experimenter	Looking away	Gesture use
Age	.02 (.01)	.26 (.19)	-.05 (.15)	-.06 (.04)	.38 (1.59)	-.36 (.36)	.30 (.24)	.26 (.21)	-.04 (.28)
Friendship	-.02 (.01)	.23 (.19)	-.01 (.15)	-.01 (.04)	-.17 (1.66)	.28 (.32)	-.21 (.22)	-.25 (.19)	.15 (.29)
Duration									
Response Type	.02 (.04)	.28 (.49)	-.25 (.38)	.22 (.10)**	-1.27 (3.48)	2.82 (.75)*	-.38 (.56)	-.16 (.25)	-2.01 (.89)**
Model comparison	($\chi^2(1) = 0.48, p = .487$)	($\chi^2(1) = 0.32, p = .571$)	($\chi^2(1) = 0.42, p = .515$)	($\chi^2(1) = 4.35, p = .037$)	($\chi^2(1) = 0.12, p = .726$)	($\chi^2(1) = 11.32, p = .001$)	($\chi^2(1) = 0.46, p = .499$)	($\chi^2(1) = 0.09, p = .763$)	($\chi^2(1) = 7.61, p = .006$)

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

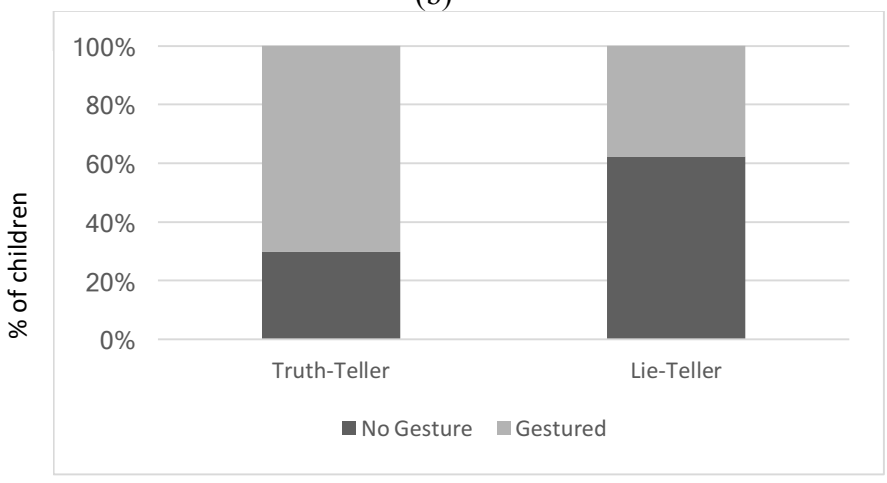
For looking direction, we expected to find differences between lie-telling and truth-telling children in looking at friend, but not in looking at experimenter or away. The full model did not improve the fit as compared to the null model for looking at the experimenter or away, supporting H_3 and H_4. Whether a child was a lie- or a truth-teller made a significant contribution only for whether there were looks at the friend. Although in both groups, the majority of the children did not look at their friend (97% of the truth-tellers and 78% of the lie-tellers), the proportion of children who looked at their friend was significantly higher among the lie-telling children than the truth-telling children (see Figure 1-a).

Figure 1. The percent of truth-telling and lie-telling children for (a) looking at friend, and (b) gesture use

(a)



(b)



Finally, for gesture use, we expected that lie-telling children would be less likely to gesture than truth-telling children. The full model improved the fit as compared to the null model, with the response group (truth- vs. lie-teller) making a significant contribution, supporting H_5. The proportion of children who gestured while responding to the target question was higher among the truth-telling children than the lie-telling children (see Figure 1-b).

Discussion

When an interview is carried about a sequence of actual events during which a transgression was potentially likely, lies are probably more representative of the lies people tell in naturalistic situations. In this context, it is possible to lie not only by omission such as responding to the interview questions without mentioning the transgression, but also by commission such as giving false statements to a direct questioning of the transgression. Hence, we argue that rather than interactional nonverbal behaviors during the entire interview, nonverbal behaviors during the post-target-question phase where people consider lying might differentiate between lie-telling and truth-telling people. We examined this differentiation between lie-telling versus truth-telling children during a collective interview, which followed a play episode where breaking of an adult-imposed rule was potentially likely.

Results demonstrated that truth-telling and lie-telling children did not significantly differ from each other in interactive nonverbal communicative behaviors that included speech transition, utterance rate, and looking at friend. While lying by omission (i.e., not disclosing the transgression), lie-telling children talked about other actual events in a similar way as truth-tellers did. To illustrate, Dyad 2 included two lie-telling children because they transgressed the rule and responded to the target question by saying “No, we did not touch the toys” and they maintained their lies throughout the interview. They responded to the first

open-ended question as “We sorted the cutlery task and talked about our friends. Then we looked at the unforbidden toys.” To the last two questions, they responded as “Another woman came and played with the toys. So, she is the one who might have changed the places of the toys”. Thus, these children are lying by omission by mentioning the other actual truthful events while at the same time leaving out the important information about their rule violation. This is the advantage of our setting, which simulated a real-life-like lying context. This way, we are able to show that truth-tellers and lie-tellers who experienced a sequence of events together and lied while withholding an important piece of information from the interviewer were similar in their interactive nonverbal behaviors during the interview.

Nonverbal behavioral differences between lie-telling and truth-telling children emerged right after the target question, though. We found that the lie-tellers were almost 2 times slower than truth-tellers in initiating a response to the target question. This finding is in line with the previous adult literature showing that lying adults took longer to start answering than truth-tellers did when interviewed individually (e.g., DePaulo et al., 2003; Sporer & Schwandt, 2006). This is particularly evident when participants had no time to plan their answers in advance because lying individuals need to construct a new event at that moment as they do not rely on an existing memory of an actual event. This is a burden for speech production, possibly leading to later responding (Sporer & Schwandt, 2006). A recent meta-analysis with adult’s reaction times to lying vs. truth-telling responding on computerized paradigms also supported that lying is more effortful than truth-telling (Suchotzki, Verschuere, van Bockstaele, Ben-Shakhar, & Crombez, 2017). This was demonstrated by longer reaction times in deceptive compared to truthful responses. Our finding is the first to expand this pattern from the individual context to a dyadic context with lying children.

In a dyadic context, an additional burden for lie-tellers is simultaneous processing of their own and their friend’s potential responses. In other words, they need time to initiate a

response not only for deciding on what they would say but also for keeping track of what their friend would say. This demand is not present for the truth-telling children. As truth-tellers have no reason to conceal any information in our setup, they are confident and relatively faster in responding.

In general, children's proper turn-taking skills to questions are immature (Ervin-Tripp, 1979), they initiate their response too late. For example, it takes ~0.75 sec for children to give an answer to mothers' question (Casillas, Bobb, & Clark, 2016); whereas it is around .20 sec to give an answer in adult-adult conversation (Stivers et al., 2009). Later or earlier responding is a function of many other factors such as question type (e.g., yes/no vs. wh- questions), answer complexity (e.g., simple yes/no, complex yes/no vs. wh- answers), the presence of recently mentioned word (Casillas et al., 2016). It is argued that this is a maturational process because planning an answer requires both comprehension (e.g., understanding ongoing speech, dissecting linguistic information) and production (e.g., deciding on an answer with proper content tailored for the prior turn). This is why it takes longer for children to initiate a turn. Typically, children begin to produce adult-like turn-taking around age six or later (Ervin-Tripp, 1979; Hilbrink, Gattis, & Levinson, 2015). Surprisingly, in our study, both lie-teller and truth-tellers demonstrated rapid turn-taking patterns compared to their typical response patterns: .178 sec for truth-tellers and .354 sec for lie-tellers. More interestingly, truth-tellers responded with almost the same latency as adult's average response latencies for answering questions (~.20 sec) (ten Bosch et al., 2005; de Ruiter et al., 2006; Stivers et al., 2009). Thus, we speculated that lie-tellers' later responding than truth-tellers – but still not so much longer than their typical turns as shown in other settings (e.g., Casillas et al., 2016) – is due to a consideration of cooperation or acting together while responding during collective interviewing.

We expected truth-telling children to be more likely to commit overlaps with their friends while responding to the adult's questioning compared to lie-tellers. The members of truth-telling dyads rely on the same shared memory structures (Hollingshead, 1998); thus, they do not need to hesitate to answer or monitor their friend's responses. They can easily initiate their responses simultaneously with their partner. However, just as in the case of late responding, lie-tellers may need to have a hint about what their friend would say. We argued that minimizing overlap could be a way to avoid giving contradictory simultaneous responses in a dyadic context. However, we could not find such a pattern. There was a tendency for lie-tellers to overlap less, as the proportion of children who did not overlap with their friends was higher for liars (36%) than truth-tellers (15%); however, the difference did not reach to significance level due to the low number of lie-tellers. Alternatively, it is possible that lie-tellers engage in conversation with their friends as quickly as possible to support their friend's response. The average overlapping time between friends was .292 ms for both lie-tellers and truth-tellers. This duration is long enough to comprehend and monitor what the other is saying (Stivers et al., 2009); thus, within this time frame, lie-telling children would be able answer the target question similarly to their friend without any contradiction.

In terms of looking direction (friend, experimenter, or away), lie-tellers were more likely to look at their friend right after the target question compared to truth-tellers. And this pattern was specific to the time right after the target question, as there was no association between being a lie- and truth-teller and looking at friend during the entire interview (excluding post-target-question looks to the friend). Looking at someone has a communicative function in dyadic contexts (e.g., Wyman et al., 2012); however, the design of our study does not allow us to determine the exact meaning of looking at friend in our task. It might mean "follow me now" or "what should we do?" or "don't tattle on me" or a combination of such signals. Nevertheless, this finding from our semi-naturalistic setting

supports the finding of experimental studies examining the association between communicative looks and cooperation during Stag Hunt Games. Communicative looks facilitate coordination with others towards joint goals (Siposova, Tomasello, & Carpenter, 2018; Wyman et al., 2012) or at least reflect expectations that one's partner would cooperate (Siposova et al., 2018). Even though the looks in this naturalistic setting are not always eye-to-eye as they were in experimental studies, looking at someone, albeit briefly, may signal collaborative efforts.

Finally, the lie-telling children were less likely to use gestures while responding compared to the truth-telling children. As the attempted control approach asserts, lie-tellers tend to minimize their bodily activation to control their behaviors and make an impression of being reliable (Burgoon & Floyd, 2000). Thus, they are more inhibited than truth-tellers (DePaulo & Morris, 2000). Our results further showed that lie-telling children gesture less frequently than truth-tellers while spontaneously lying.

More frequent use of gestures by truth-tellers than lie-tellers might also indicate utilization of gestures to support their verbal responding. For rule-abiders, being questioned about their behavior when the experimenter was not in the room may induce stress because of the fear that they may not be found credible since rule violation was imminent in the context of the temptation resistance context that they were part of (Bond & Fahey, 1987). As a result, they may put extra effort to make sure they are not guilty by producing reinforcing gestures (saying "no" and producing "no" gesture either with hand or head or both) to accompany their replies. In other words, reinforcing gestures produced along with speech may serve to strengthen the veracity of the message provided to the experimenter by the truth-tellers.

The present study was the first to examine spontaneous lying during collective interviewing with children. The procedure was kept as simple and realistic as possible for children; yet, three methodological twists merit attention. First, the entrance of another

experimenter to play with the forbidden toys might raise the issue of the legitimization of the transgression for the children. Following the original procedure of Kochanska and Aksan (1995), we included this phase to increase the temptation of children to touch the toys. Because the children were given a cutlery sorting task to work on together, they might be exclusively attentive to their sorting task. Thus, they might forget the presence of the forbidden toys or might not notice how interesting or attractive some of the toys were (e.g., a walking talking robot). A manipulation such as entrance of an unfamiliar experimenter was thought to be useful to tempt children and observe children's rule observance behavior before and after this temptation.

This phase of an experimenter entering the room and playing with the toy might create a situation that legitimizes the transgression. However, it is noteworthy to mention that the majority of the children did not transgress the rule (N = 137 out of 180), even though they sometimes said to each other things such as "that women touched the toy, so, why don't we?". The fact that most children did not transgress indicates that this phase is not a strong legitimizing situation for most of the children. Moreover, 2 of the transgressors (5%) had already started to play with the toys before E2 entered the room ($M_{time\ to\ E2's\ entrance}$ = 11.5 sec, SD = 3.54 sec). This also potentially indicates that some children do not need a legitimization for violating a rule.

For the rest of the transgressors, 8 children violated the rule while E2 was playing with the toys ($M_{time\ to\ play\ after\ E2\ entered}$ = 42.13 sec, SD = 23.23 sec) and 33 children transgressed after E2 left ($M_{time\ to\ play\ after\ E2\ left}$ = 189.39 sec, SD = 103.08 sec). This does not necessarily indicate that it is either legitimization or temptation because these two issues are not mutually exclusive in this context. Thus, what is important was that there was no explicit legitimization for lie-telling behavior; rather, children decided to tell a lie of their own volition.

Second, the duration of collective interviewing was short for both truth-telling and lie-telling children. The average length of the interview sessions was 1.40 minutes in our study, where it was on average 4.50 minutes in an adult study (Driskel et al. 2012). Even though we repeated the questions or asked "What else?" to make children talk for a longer duration, children did not extend their speech and turns much during the interview. So, it is important to examine to what extent nonverbal differences between truth- and lie-telling children that we reported for this short duration of interview can be extended to longer interviews. One way could be to increase the total duration of the shared event. In our study, recall of children was limited to an 8-minute sequence of events followed by four questions in total. Hence, future studies might benefit from a longer duration of shared experiences and a higher number of interview questions.

Third, we observed a semi-naturalistic allocation between lie-tellers and truth-tellers in a specific context of participation in an event with potential rule violation and post-event collective interviewing. Thus, this is not experimental allocation, but more like self- or dyad-allocation. For example, age might be a potential factor for self-allocation. Previous studies with similar age range indicated that age is a significant correlate of lie-telling behavior (Talwar & Lee, 2002; 2008). By age, not only children initially lied more, but also, they became better at sustaining their lies. In our study, we also found that lie-tellers were older than truth-tellers. However, we controlled for age in our analyses along with controlling for the duration of friendship in months, and dyad factor. Thus, the results of this study reflect the differences between truth-telling and lie-telling children; not between younger and older children. However, when we study behavior in relatively more naturalistic contexts, self-allocation of participants between different types of behaviors (or groups) is unavoidable. Future research should consider experimental allocation to minimize the influence of potential confounding factors in lie-telling behavior.

In summary, lying does not necessarily need active faking of one's own responses during the entire interview; concealing some critical information while talking about other actual events is possible. In such a context, nonverbal differences between lie-telling and truth-telling children emerge right after the target question where children are now put in a position to choose to lie or tell the truth based on their own volition in the presence of a friend. The differences were not observed during the entire interview where they had the option to lie by omission. Several researchers turn to the question of how to best discriminate between lie-tellers and truth-tellers for its practical implications. Our findings highlight the importance of paying attention to the constraints of the specific context where lie-telling behavior is examined.

CHAPTER-5:

GENERAL CONCLUSION

In this dissertation, we combined two different, but complementary domains (i.e., norm enforcement and lie-telling behavior) to examine children's behaviors when they are surrounded by their same-sex friend. To simulate children's daily interactions with their friends in real-life settings, we used a semi-naturalistic context where two children were asked to follow a tempting rule (i.e., refraining from touching the off-limit toys). We focused on two different segments during this procedure: when children were left alone in the room once the experimenter left, and when children were later interviewed together (i.e., collective interview) about their behaviors when they were alone.

In the first study, we examined how children handled this rule when they were alone in the room. Specifically, we investigated children's norm enforcement strategies when preventing a potential transgression and when intervening with an actual transgression. Children used strategies with low power assertiveness (i.e., gentle control) to prevent a transgression; whereas children preferred to give no response (i.e., disengagement) to intervene with an actual transgression. Among prevention strategies, gentle control was more likely to be followed by compliance behavior, whereas disengagement was less likely to be followed by compliance behavior. When a prevention strategy was unsuccessful in preventing a potential transgression, children continued to use the same strategy (i.e., negative control and disengagement) in the next turn to intervene with actual transgression. In other words, children maintained the same behavioral strategy before and after a transgression for negative control and disengagement. Taken together, this study implies that the nature of norm enforcement strategies used as

prevention or intervention is qualitatively different from each other in degree of power assertiveness in the temptation resistance context.

In the second study, we examined diversity and consistency in children's responses during collective interview. Transgressors included self-motivated liars, confessors, and reticents; whereas, non-transgressors included truthful deniers, secret-keepers, and tattlers. Secret-keeping was more frequent than tattling on. Once a lie initiated, the majority of children retained their lies during the interview. We further explored socio-cognitive and temperamental differences between response groups (i.e., self-motivated liars, confessors, and secret-keepers) and between lie maintainers and non-maintainers. Secret-keepers were better at backward digit span than self-motivated liars and confessors. Moreover, secret-keepers were lower in impulsivity and higher in falling reactivity and soothability than confessors. On the other hand, lie maintainers were lower in impulsivity and higher in first-order theory of mind than lie non-maintainers. These findings suggest that children's responses are diverse and individual differences between groups are not robust in unanticipated and collective interview context.

In the third study, we focused on nonverbal differences between lie- and truth-telling children during the entire interview. Lie-tellers and truth-tellers differed in their nonverbal behaviors right after the target question where they chose to lie or tell the truth. Lie-tellers were slow in initiating a response, looked more at their friend, and used more gestures compared to truth-tellers. However, both lie- and truth-tellers were similar in their interactive nonverbal behaviors during the entire interview as indexed by speech transition, looking at friend, and utterance rate. These findings suggest that when a collective interview is carried out about actual events, children get an opportunity to talk about their shared experiences interactively during the entire interview, irrespective of the veracity status (lying vs. truth-telling). However, nonverbal

cues to deception emerge right after when children decide to actively lie to an unanticipated question.

Social Norms, Lying, and Shared Intentionality

Expecting other people to follow social norms and enforcing them to do so are considered to be an outcome of our tendency of group identification (Schmidt & Tomasello, 2012). When we are a member of a cultural group, we jointly accept social norms (Gilbert, 1989) – and children are no exception. We develop an understanding of "we do things in a certain way". While developing this shared intentionality, children do not need explicit instructions from adults to enforce norms; rather, seeing that adults expect things to work in a certain way is enough to correct others (Casler, Terziyan, & Greene, 2009).

When children work together to achieve an end in a collaborative context, they can form joint commitments to this task either explicitly or implicitly. In explicit joint commitments, children agree to play the game together in the presence of each other verbally or nonverbally (Kachel, Svetlova, & Tomasello, 2018). In implicit joint commitments, children know that they are dependent on each other to succeed in the task but just do not explicitly state this (e.g., Kachel & Tomasello, 2019). Starting from 3 years of age, whether the commitment is explicit or implicit, children protested in a normative way (e.g., "No, you should not do this!) against their partner when this partner defected (Kachel et al., 2018) or children helped one another more if they were collaborating than if they were not collaborating (Hamann, Warneken, & Tomasello, 2012). Moreover, when there are temptations to defect (i.e., bribes), children resisted these temptations both in explicit or implicit joint commitments (Kachel & Tomasello, 2019). These results imply that children from young ages on show a common-ground understanding that they are interdependent with one another to achieve joint tasks or strive for joint success.

Whether it is enforcing norms on others in a collaborative context (e.g., Kachel et al., 2018) or non-collaborative context (e.g., Rakoczy et al., 2008), children form this group identification to achieve a shared goal, which is doing the task properly (Schmidt & Tomasello, 2012). Findings of our first study further demonstrates that children develop this shared intentionality in a context where the rule sounded arbitrary with no reasoning, and following of such a rule did not really request children's joint contribution. Still, children developed a shared goal of complying with the rule even in in this loosely structured context. In other words, children took action to enforce the norm by using gentle or negative control strategies during pre- and post-violation phases.

Yet, there were situations where children did not appear to enforce norms, which we called disengagement. Why did these children remain silent when their friend was violating the rule? Our further examination showed that the majority of children preferred to disengage when they also would violate the rule. This finding may be a indication of another shared goal: "I will not give any reaction to my friend's violation because I am going to follow course and violate the rule, as well." In this sense, disengagement points to another side of shared intentionality, which is collaboration to achieve personal gain. Previous adult studies also highlight that people engage in collaboration to attain personal profits by joint acts of rule violation (e.g., Weisel & Shalvi, 2015).

The second study explored how children reported their behaviors when one child or both children violated the rule. An interesting finding was that children preferred to lie for their friend during collective interview, even though they reacted to their friend's violations when they were alone in the room. This might indicate that secret-keepers and self-motivated liars engage in a collaborative effort to deceive a third-party (i.e., experimenter) in order to avoid any punishment.

Lergetporer and colleagues (2014) also experimentally showed that 7- to 11-year-olds increased their cooperation when there was a threat of third-party punishment.

Overall, human cooperation is a product of our tendency both to follow and enforce social norms (e.g., Schmidt & Tomasello, 2012), as well as to keep misbehavior under wraps (e.g., Lergetporer et al., 2014; Weisel & Shalvi, 2015). The current dissertation contributes to a growing body of work focusing on this cooperation with a method that relied on naturalistic observation in a semi-structured context. This enabled us to outline patterns of behaviors when children were allowed to initiate their behaviors – either norm enforcement or lie-telling behavior – on their own volition.

Future Directions

Despite the strength of naturalistic observation, this methodology is limited to explain "why and when" norm enforcement and lie-telling behaviors occur. We did not compare children's behaviors when they were alone vs. together; thus, we did not know how children's baseline behaviors were like. We raised different plausible explanations for the reported behaviors in each study of this dissertation. But, more research with the expansion of measurement tools and experimental designs is needed to elucidate factors or conditions that systematically influence children's propensity to engage in norm enforcement and lie-telling behavior with their friends. For example, there is a recent interest in factors contributing to children's cheating behavior (i.e., violating a rule). Five-year-old children were less likely to cheat than 3-year-old children in order to maintain their positive reputation for being good (i.e., "I know kids in your class and they told me you are a good kid") (Fu, Heyman, Quian, Guo, & Lee, 2016). However, when smartness is targeted, both 3- and 5-year-old children were more likely to cheat to maintain their reputation for being smart (i.e., "I know teachers and kids in your

class and they told me you are a smart kid" or "You are so smart") (Zhao, Heyman, Chen, & Lee, 2016, 2017). This line of research can be extended and combined with the current dissertation's findings to uncover answers to different research questions, some of which are listed below:

- Is setting one's own rule more binding? A comparison between the conditions of adult-set rule, another unknown child-set rule vs. children's own-set rule might elucidate whether children use similar or different strategies across those contexts.
- What is the function of disengagement in norm enforcement? Does it lead to personal benefit by joint action of rule violation or just being ignorant of the situation? A comparison between the conditions where both children have an opportunity to violate a rule vs. only one child is allowed to violate might shed light on this question.
- What is the overall function of secret-keeping in human cooperation? When a shared goal is violated, do children lie for their friend at similar rates when a threat of third-party punishment is made salient to both children vs. to only the child who violated the rule?
- Which factors influence children's secret-keeping behavior for a peer?
    - When the levels of likability and trustworthiness are manipulated, do children engage in similar or different rates of secret-keeping behavior?
    - Does compassion affect children's rates of lying for a friend vs. for an acquaintance?
    - Do children lie at similar rates for their friend vs. acquaintance when they have a psychological reward (e.g., preserving self-image) vs. an economic reward (e.g., having more materials).

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