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What Parents Don't Know: Disclosure and Secrecy in a Sample of Urban Adolescents

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Abstract

Research with two-parent European households has suggested that secrecy, and not disclosure of information *per se*, predicts adolescent adjustment difficulties. The present study attempted to replicate this finding using data from a 4-wave study of 358 poor, urban adolescents (47% male; M age = 12 yrs) in the United States, most of whom (> 92%) were African American. Adolescents self-reported secrecy, disclosure, depressive symptoms, and delinquency at each wave.

Confirmatory factor analyses revealed that a two-factor model with secrecy and disclosure as separate, but correlated, factors was a better fit than a one-factor model. However, predictive models differed from previous research. Secrecy did not predict depressive symptoms, rather depressive symptoms predicted secrecy. For delinquency, there were significant paths from both secrecy to delinquency and delinquency to secrecy, as well as from delinquency to disclosure. These results did not differ by age or sex. Comparisons with previous findings are discussed.

Keywords

secrecy; disclosure; replication; depressive symptoms; delinquency

An extensive body of research over the last 15 years has demonstrated the importance of adolescent disclosure on adjustment (Frijns, Keijsers, Branje, & Meeus, 2010; Kerr, Stattin, Biesecker, Ferrer-Wreder, 2003; Stattin & Kerr, 2000). Researchers have noted that adolescents' disclosure of information is the key contributor to parental knowledge of their behavior (Kerr & Stattin, 2000), and the single most powerful predictor of adolescent adjustment (Stattin & Kerr, 2000). Recently researchers have argued that disclosure has been confounded with another construct, secrecy (Frijns et al., 2010). Presenting data from two-parent households in the Netherlands, they suggest that secrecy, and not disclosure *per se*, predicts adjustment difficulties (Frijns et al., 2010).

Parental monitoring, child disclosure, secrecy, and overall relationship quality between children and their parents are heavily influenced by the larger context in which they happen.

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Previous research focusing on parenting in high poverty neighborhoods indicates that parents compensate for the heightened violence in the community by more closely monitoring their offspring and engaging in more restrictive practices compared to parents from middle-class families (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Jones et al., 2008; Pinderhughes, Nix, Foster, & Jones, 2001; Rankin & Quane, 2002). Given the variability in parenting across contexts, the present study investigated whether the results reported by Frijns et al. (2010) could be replicated in a different cultural context – that of poor, urban adolescents in the United States – using a similar design and sample size. Using procedures similar to Frijns et al. (2010) we evaluated (1) the factor structure of the disclosure measure, and (2) tested whether secrecy or disclosure was more strongly associated with internalizing and externalizing behaviors of adolescents living in this poor, urban context. Further, because patterns of child disclosure and secrecy change across development, and youth may be more at-risk for varying outcomes as a result of age (e.g., Frijns et al., 2005; Frijns et al., 2010; Laird, Bridges & Marsee, 2013b), moderator analyses of these relations based on age were conducted.

The Importance of Adolescent Disclosure

Adolescence is marked by biological, social, and cognitive changes, including puberty, increased perspective-taking abilities, and the shift from concrete to formal operational thought (Arnett, 2010). It is also the developmental stage where youth move to developing moral reasoning that follows principles of reciprocity, justice, and mutual respect rather than following rules laid down by authority figures (Kohlberg, 1963; Piaget, 1965). Thus, it is not surprising that parent-child conflict intensity tends to increase with the beginning of adolescence (Laursen, Coy, & Collins, 1998). Those early conflicts typically are about everyday issues like household chores, curfews, homework, and choice of activities; all issues that mostly occur at home and are easily monitored by parents. As adolescents grow older and strive for more autonomy, however, they start spending increasing amounts of time away from the direct supervision of their parents. At the same time, conflict frequency decreases and conflict intensity peaks (Laursen et al., 1998; Smetana, Metzger, Gettman, & Campione-Barr, 2006; Smetana, 2008). Along with increased perspective-taking ability and the capacity to conceal true emotions, adolescents also get better at withholding information or lying to their parents, particularly when conflicts with parents are intense. It appears that as adolescents age, they choose to conceal information rather than being confronted by their parents (Darling, Cumsille, Caldwell, & Dowdy, 2006). Consequently, child disclosure becomes increasingly important in determining how much information parents can access (Perkins & Turiel, 2007). For example, during mid-adolescence teenagers are more often in the position to decide to either disclose or withhold information about their activities from their parents and sharing shifts to more voluntary and spontaneous exchange (Frijns, Finkenauer, Vermulst, & Engels, 2005; Smetana, Metzger, Gettman, & Campione-Barr, 2006). Ample research has shown that non-disclosure increases in middle adolescence, and even in good relationships, parents overestimate their adolescents' disclosure, particularly with regard to peers (Laursen et al., 1998; Smetana et al., 2006; Smetana, 2008).

However, there is a substantial body of research showing that adolescents do apply their ability for advanced moral reasoning in evaluating justifications for lying (Smetana, 2008).

Perkins and Turiel (2007) found that adolescents differ in what they would lie to parents or friends about, and only think it is morally correct to conceal matters which they perceive to be outside of their parents' jurisdiction. These findings suggest that adolescents base their decisions about deception on complex moral evaluations (Smetana, 2008).

Numerous studies have found that high parental monitoring (i.e., knowing where and with whom one's children are and what they are doing) is associated with better adjustment outcomes through adolescence (Smetana, 2008). However, the recent research around selective disclosure has suggested that by mid-adolescence, protective parental monitoring mainly refers to high parental knowledge about their child's activities, and this knowledge largely is determined by child disclosure (Stattin & Kerr, 2000). In their seminal work reconsidering the child-driven aspects of parental monitoring, Stattin and Kerr (2000) found that high child disclosure increased parents' knowledge about adolescents' whereabouts, friends, and activities, and this, in turn, led to less norm breaking and delinquency. In contrast, children of parents who sought information by asking questions, increasing their supervision or exerting control, were more likely to break norms. This research suggests that the main protective power of high monitoring does not necessarily lay in parents' active attempts to set limits and control behavior, but in maintaining a relationship that invites adolescents to share their experiences voluntarily (Smetana, 2008). In support of this idea, Tilton-Weaver (2014) found that perceived parental support predicted more disclosure in a cross-lagged model with 874 Swedish adolescents aged 12 to 16. Further, delinquency positively predicted and support negatively predicted secrecy.

In summary, research shows that as they age, adolescents become more differentiated in their judgment regarding when and how withholding information or lying is acceptable. While it is true that parents overestimate the extent to which their children disclose information to them, the majority of adolescents do not endorse a global view that it is acceptable to deceive parents. Research reveals that even older students believe it is within a parent's legitimate jurisdiction to give directives regarding academic welfare, like expecting homework to be finished (Smetana, 2008; Smetana et al., 2006; Perkins & Turiel, 2007). However, providing an environment that encourages disclosure has been hypothesized to be a stronger protective factor against adjustment difficulties than high parental control (Stattin & Kerr, 2000; Tilton-Weaver, 2014).

Distinguishing Between Disclosure and Secrecy

In a recent study by Frijns and colleagues (2010), the mechanism of the protective relationship between child disclosure and adjustment has been called into question. In their study, the authors suggest that the common operationalization of adolescent disclosure incorporates the two separate constructs of secrecy and disclosure, which are based on distinct cognitive processes. In this theory, mere non-disclosure is comparatively more effortless, whereas keeping a secret requires a conscious decision to conceal information and can be hard work. In accordance with that hypothesis, cross-lagged models of secrecy and disclosure with internalizing behaviors and delinquency showed that more secrecy was associated with higher levels of delinquency and depression; less disclosure, however, was not associated with greater problem behaviors. Based on these findings the authors

concluded that it is not the presence of spontaneous disclosure in relationships with parents, but the absence of secrecy that drives the link with adjustment.

Context as a Contributor to Parenting, Adolescent Disclosure and Secrecy

Socioeconomic context

The socioeconomic context of a community shapes parental and, to a lesser degree, adolescent behavior. For example, in urban, low-income communities there is evidence that parents engage in stringent monitoring and restrictive practices as a way to protect youth from danger (Jones et al., 2008; Pinderhughes, Nix, Foster, & Jones, 2001; Rankin & Quane, 2002). These practices may include following their children, screening their children's friends, enforcing strict curfews, and having firm time limits for their children to travel to and from school (Horowitz, McKay, & Marshall, 2005). The findings from this body of research suggest that, in contrast to findings from middle-class samples from both the United States and Europe, in high-violence neighborhood contexts parental monitoring remains high throughout adolescence because parents make a concerted effort to shield youth from physical harm and the dangers of living in extreme poverty. This data is corroborated by research by Dinizulu et al. (2014) in their study of urban African American children exposed to violence. Dinizulu et al. found that a key reason youth did not disclose their experiences with violence to adults was due to concerns about restriction of activity. In a study testing a cognitive processing model of exposure to violence in youth, Kliewer and Lepore (2015) found that witnessing community violence was associated with changes in constraints in talking about violence, which in turn was associated with adjustment difficulties. Collectively, these data suggest that there could be systematic differences not only in levels of parental control, but also in child disclosure and secrecy, across environmental contexts. Further, such differences could alter relations between disclosure and secrecy, adjustment, and other outcomes for adolescents in urban, high-violence contexts in the United States.

Developmental Context

As noted, as youth progress through adolescence the amount and context of disclosure and secrecy evolves, as adolescents move towards independence from their parents (e.g., Frijns et al., 2005; Smetana et al., 2006). Indeed, age related differences have been supported in previous research investigating the relations between disclosure, secrecy, and different outcome behaviors. For example, Frijns and colleagues (2005), found that among early adolescents secrecy from parents had a direct longitudinal influence on depressive mood. Similarly, Laird and colleagues (2013b) found that among a sample of ethnically diverse early adolescents coming from primarily two-parent households with at least some parental college education, keeping more secrets from best friends was associated with more depression, especially when adolescents also kept secrets from parents, but not with more antisocial behavior. Frijns and colleagues (2010), found that secrecy predicted depression only over the first assessment interval, thus during early adolescence exclusively. These findings suggest that the research on disclosure and frequency needs to take a developmental perspective that accounts for changes in the parent-adolescent relationship over the course of adolescence.

The Present Study

First, in order to examine the cross-cultural replicability of the Frijns et al. (2010) study linking secrecy, but not disclosure, to poor adolescent outcomes, we tested whether secrecy and disclosure were indeed separate constructs in our sample of urban, low-income adolescents living in the United States. We tested basic fit and invariability over time of distinct constructs for disclosure and secrecy. Second, we investigated whether secrecy or disclosure would be more strongly associated with internalizing and externalizing behaviors of these adolescents. Third, we studied the moderation effects of age and sex on the associations between disclosure, secrecy, internalizing, and externalizing behaviors.

Method

Data for the present study was drawn from a four-wave longitudinal study on violence and substance use in a sample of urban, low-income adolescents in (city blinded). Funded by the National Institute on Drug Abuse (NIDA), the study was built on a model of risk and resilience, with attention to risk factors for adjustment difficulties, and individual-, family-, and community-level protective factors. For additional information on the procedures of the primary study see (reference blinded for review).

Participants

Participants included youth (47.3% male) and their maternal caregivers ($N = 358$ dyads) recruited from areas of moderate to high violence, based on police statistics within (city blinded) and the surrounding counties. At wave 1, all youth participants were enrolled in either the 5th ($n = 191$) or 8th ($n = 167$) grades. This two-cohort design was employed to follow youth in their transition into middle school or high school, respectively. At wave 4, most youth were in the 8th or 11th grades. At the start of the study, the fifth graders ranged in age from 9 to 12 years ($M = 10.77$, $SD = 0.65$) and the eighth graders ranged from 10 to 16 years ($M = 13.68$, $SD = 0.82$). The majority of participants were African American (91.9%). Most (>85%) of the maternal caregivers were the youth participants' biological mothers. Most (88.0%) of the youth reported they lived with mom most of the time, while only 20.4 % reported they lived with dad most of the time. Socioeconomic status (SES) varied, but most of the sample came from low SES backgrounds. Median weekly household income at wave 1 was \$401–500, with 22.8% reporting household earnings of \$200 or less per week.

Procedure

The Institutional Review Board at (blinded for review) approved all study procedures. Parents provided written consent and adolescents provided written assent for participation in the study. Families were recruited through community events and agencies, by participant referral and through flyers posted door-to-door in eligible neighborhoods. To be eligible, participants had to be the female caregiver of a 5th or 8th grade child during the first wave of data collection. Sixty three percent of the approached eligible families enrolled in the study.

Interviews were conducted in families' homes unless otherwise requested by the family. Two trained interviewers interviewed the caregiver and adolescent separately in different rooms.

Interviews were conducted face-to-face and lasted approximately 2–3 hours. Except for a small portion of the adolescent interview that was presented in booklet form for sensitive items, all questions were read aloud using visual aids. Unless the child demonstrated difficulty in reading, the youth was asked to complete the booklet independently. Families were compensated with \$50 in Wal-Mart gift cards at each wave they participated. Additionally, families were eligible to be entered in a monthly drawing for a \$25 Wal-Mart gift card if they returned monthly post cards with address updates. Lottery prizes of \$100, \$200 and \$300 were distributed at the end of the study. Interviewers for the project included undergraduate and graduate students and community professionals. Interviewers completed approximately 20 hours of training, during which they observed actual interviews and were provided with written and verbal feedback on their performance. Randomly selected 10% of families were contacted as a quality control measure, to ensure that interviewers maintained professional standards when interacting with the participants.

Measures

Adolescent disclosure and secrecy—The disclosure subscale from the Parenting Practices Scale (Stattin & Kerr, 2000) was used to assess adolescent disclosure and secrecy. The Parenting Practices Scale is a child- and parent- report measure comprised of four subscales. The four subscales include (1) child disclosure, (2) parental control, (3) parental knowledge, and (4) parental solicitation. Participants completed all four of the subscales, consisting of a total of 24 items on a scale of 1 (*no, never*) to 5 (*yes, always*). For the present study, only the child-reported responses were analyzed to replicate the Frijns and colleagues (2010) study.

The child disclosure subscale consists of five items which were separated into disclosure and secrecy subscales as suggested by Frijns and colleagues (2010). For a list of items pertaining to secrecy and disclosure, respectively, see Table 1. Internal consistency of the full measure in our study was similar to previously reported values for all subscales (Cronbach's alpha ranging from 0.69–0.82; Stattin & Kerr, 2000) with α s = 0.75–0.81 over the 4 waves. Across the four waves, reliabilities for the separated 3-item adolescent disclosure scales ranged from $\alpha = 0.72$ to $\alpha = 0.80$ and the correlations between the secrecy items ranged from $r = 0.47$ to $r = 0.64$. Correlations between the secrecy and disclosure scales ranged from $r = -0.42$ to $r = -0.52$.

Outcome variables—Adolescents' current *depressive symptoms* were assessed with the Children's Depression Inventory (CDI; Kovacs, 1992), a 27-item self-report measure of cognitive, affective, and behavioral symptoms of depression in school-aged children and adolescents. Each item consists of three statements graded in order of increasing severity (ranging from 0 = *absence of symptoms* to 2 = *definite symptoms*). For example, youth select the sentence that best describes them for the past 2 weeks from *Things will work out for me O.K.*; *I am not sure if things will work out for me*; to *Nothing will ever work out for me*. The total depression score is a summation of all items. The CDI has demonstrated good sensitivity and specificity (Kovacs, 1992); internal consistency in the present study ranged from $\alpha = .83 - .85$ across waves. Higher scores indicated higher levels of depressive symptoms.

Adolescent delinquency was assessed with the delinquency subscale from the Problem Behavior Frequency Scales, (Farrell, Kung, White, & Valois, 2000), an 8-item self-report measure that assesses the frequency of minor delinquency, such as shoplifting, being on suspension, and vandalism, over the last 30 days. Responses were rated on a six-point scale ranging from *never*, *1–2 times*, *3–5 times*, *6–9 times*, *10–19 times*, to *20 times or more*. Reliabilities of this scale were between $\alpha = .62 - .72$ across the four waves. Higher scores indicated higher levels of delinquent behavior.

Analyses

Over the four waves of the study, 63% of respondents had no missing values. A maximum of 35.2% of cases was missing per item. The results from Little's chi-square statistic (Little, 1988), $\chi^2 = 365.37$, $df = 324$, $p = .06$, suggested that the missing data was missing completely at random (MCAR), providing support for the interpretation that the results are likely not biased due to missing data. A descriptive overview and correlations between all study variables are included in Table 2.

We tested whether there was discriminant validity of the two-factor solution by conducting a series of cross-sectional and a longitudinal confirmatory factor analysis on our data. The differential longitudinal associations between secrecy and disclosure were investigated with two nested cross-lagged path analyses per outcome. In addition, for each outcome a nested group comparison by age cohort was performed to assess possible moderation by age. Results of the best fitting model per outcome are presented for the entire sample and by age cohort where warranted. Model fit was assessed using the Root Mean Square Error of Approximation (RMSEA) and the Comparative Fit Index (CFI). Values of 0.90 or above for the CFI (Bentler, 1992) and 0.08 or below for the RMSEA (Browne & Cudeck, 1993) indicated that the model adequately fit the data. The fit of constrained versus unconstrained models were compared by examining differences in the models based on RMSEA, the CFI and the Sample size adjusted Bayesian Information Criterion (SSA BIC). Lower SSA BIC and RMSEA and higher CFI indicate a better model fit.

All analyses were conducted in Mplus version 6.11 (Muthen & Muthen, 2010). Due to non-normality of the data, MLR, a maximum likelihood estimator robust to non-normality and non-independence of observations was used for all analyses (Muthen & Muthen, 2010). The MLR standard errors were computed using a sandwich estimator, while the MLR chi-square test statistic is asymptotically equivalent to the Yuan-Bentler T2* test statistic. All nested model comparisons thus were calculated using the Satorra-Bentler scaled chi-square difference test (Muthen & Muthen, 2010). Respondents with missing data were included in the model estimations testing factorial invariance and in the cross-lagged path analyses using Full Information Maximum Likelihood (FIML) techniques.

Results

Factor Analyses

A first set of confirmatory factor analyses was conducted at wave 1 to test whether a two-factor structure would fit the data better than the 1-factor solution used in previous studies.

Consistent with the findings from Frijns and colleagues (2010), results showed that the model with two factors had a better fit than the model with one factor (see Figure 1). Confirmatory factor analyses with two correlated factors conducted for waves 2–4 separately consistently showed a good model fit and discriminant validity of the 2-factor solution (see Table 2). Despite moderate to high correlations between the two factors (ranging from $r = -0.51$ to -0.69 , $p < 0.001$), none of the confidence intervals of the correlation between the factors ($r \pm 2 \times SE$) included 1, showing discriminant validity of the two factors (Torkzadeh, Koufteros, & Pflughoeft, 2003). Across all waves, factor loadings for both secrecy and disclosure were well above 0.45 and can thus be considered good (Tabachnick & Fidell, 2001). Overall, the two factor-structure, separating disclosure and secrecy, fit the data better across all waves of data compared to a one-factor structure.

To assess consistency and comparability of the factor structure across waves, the longitudinal factorial invariance was tested by comparing a constrained versus free (unconstrained) model. In the unconstrained model, all parameters were allowed to vary freely, while in the constrained model factor loadings were constrained to be equal across times. In both models, errors of identical items were allowed to correlate across waves. Thus, we first estimated an unconstrained model with four two-factor structures (one per wave). Then we estimated a model where the second and third factor loadings of the disclosure items and the second item of the secrecy scale were constrained to be equal across the four waves. Adding the constraints did not significantly alter model fit (Change in corrected $\chi^2(13) = 6.08$, $p = 0.94$; Unconstrained SSA BIC = 17149.17, RMSEA = 0.028 [90% CI = .010, .041], CFI = 0.982; Constrained SSA BIC = 17132.49, RMSEA = 0.025 [90% CI = .003, .038], CFI = 0.984), showing no added benefits of letting factor loadings vary over time and thus lending support to the equivalence of the factorial models at each wave. Taken together, these results show that adolescent disclosure and secrecy are distinct but related constructs across all four waves of the present study. See supplemental tables 1–4 for detailed results of these analyses.

Longitudinal Associations between Disclosure, Secrecy and Adolescent Adjustment

To test the distinct predictive value of secrecy versus disclosure, we estimated a number of nested cross-lagged path models. Specifically, we compared a model that constrained the regression weights of secrecy and disclosure to be equal with a model where the weights were allowed to vary (for a full depiction of the model see Figure 2). In order to compare constrained and unconstrained models, we recoded the secrecy and disclosure variables so both were associated with outcome variables in the same direction.

First, we estimated an unconstrained model where secrecy and disclosure independently predicted depression. This model was compared to a constrained model where all paths from and to secrecy and disclosure were constrained to be equal between the two constructs. Results for the analyses with depression showed no significant difference in model fit for the unconstrained model, thus favoring the more parsimonious constrained model (Change in corrected $\chi^2(6) = 11.19$, $p = .082$; Constrained SSA BIC = 17,768.22; RMSEA = .075 [90% CI = .058, .093]; CFI = .929; Unconstrained SSA BIC = 17,773.55; RMSEA = .081 [90% CI = .062, .101]; CFI = .934). In contrast, results for the analyses with delinquency showed a

significant improvement in fit for the unconstrained model (Change in corrected $\chi^2(6)=13.30, p<0.05$). However, other fit indices indicated little difference in fit between the models or favored the constrained model (Constrained SSA BIC = 16,116.45; RMSEA = .077 [90% CI = .059, .095]; CFI = .897; Unconstrained SSA BIC = 16,118.10; RMSEA = .082 [90% CI = .062, .101]; CFI = .907). These results indicate that although the factor analyses suggest that secrecy and disclosure are separate constructs, from a purely mathematical perspective there is little difference in terms of their associations with outcomes if they are treated as one versus two constructs in a model. However, because one of our aims in this study was to replicate the Frijns et al. (2010) study, we retained secrecy and disclosure as separate constructs in the following four-wave, longitudinal, cross-lagged models, even though in absence of theoretical reasons, the equivalence of the two models would favor the more parsimonious model with a combined construct.

To further investigate differences in the relations between secrecy, disclosure and adjustment over the course of adolescence, we compared a series of nested models where cross-lagged paths were allowed to vary or were constrained to be equal across the four waves. Results for the analyses with delinquency showed a significant improvement in fit for the unconstrained model that allowed the cross-lagged paths to vary across time (Change in corrected $\chi^2(8)=15.99, p<0.05$). Fit indices indicated little difference in fit between the models or favored the constrained model (Constrained SSA BIC = 16,116.07; Unconstrained SSA BIC = 16,118.10). However, investigation of the structural paths showed substantial variation across the waves and since we were interested in investigating potential changes in the associations between delinquency, secrecy and disclosure over the course of adolescence, we decided to retain the unconstrained model where cross-lagged associations were allowed to vary over time. Results for the final model with delinquency are presented in Figure 3.

The model was an adequate fit to the data ($N=358$; $\chi^2(24)=81.20, p<.001$; RMSEA = .082 [90% CI = .062, .101]; CFI = .907). In addition to stability paths, wave 1 secrecy predicted wave 2 delinquency ($b=.25, p<.001$), wave 2 delinquency predicted wave 3 disclosure ($b=-.16, p<.001$), and wave 3 delinquency predicted wave 4 secrecy ($b=.13, p<.05$) overlapping somewhat with the results of the Frijns et al. (2010) study.

In contrast, results with depression as an outcome showed no significant difference between the constrained and unconstrained models (Change in corrected $\chi^2(8)=8.05, p=0.43$), and an increased model fit for the constrained model (Constrained SSA BIC = 17,761.40; Unconstrained SSA BIC = 17,773.55), indicating that there was no significant change in the associations between depression, secrecy and disclosure over the course of adolescence. As seen in Figure 4, the final model with depression was an adequate fit to the data ($N=358$; $\chi^2(32)=87.07, p<.001$; RMSEA = .069 [90% CI = .052, .087]; CFI = .936). In addition to stability paths, depressive symptoms predicted secrecy at the next wave across all four waves. Contrary to the results reported by Frijns et al. (2010) there were no significant paths from depressive symptoms to disclosure or from secrecy to depressive symptoms at the next wave.

Age and Sex Differences in Associations between Secrecy, Disclosure and Outcomes

To investigate age differences in the relationship between secrecy, disclosure to parents, and delinquency and depression, we conducted two sets of nested model group comparisons. Results for the analyses with depression showed no significant change in fit for the model that allowed for variation of the cross-lagged paths by age cohort (Change in corrected χ^2 (4) = 1.40, $p = .844$; Constrained SSA BIC = 17,758.44; RMSEA = .060 [90% CI = .039, .079]; CFI = .948; Unconstrained SSA BIC = 17,767.60; RMSEA = .064 [90% CI = .043, .084]; CFI = .944).

This indicates that the relationship between disclosure, secrecy, and depression is similar across age cohorts. In contrast, results for the analyses investigating delinquency showed significant differences between the models, indicating a possible moderation of the relationship by age cohort (change in corrected χ^2 (12) = 21.29, $p < 0.05$). However, again investigation of other fit indices indicated little difference in fit between the models or favored the constrained model (Constrained SSA BIC = 16,024.51; RMSEA = .088 [90% CI = .070, .107]; CFI = .876; Unconstrained SSA BIC = 16,031.81; RMSEA = .093 [90% CI = 0.073, 0.114]; CFI = .888). Investigation of model results separately by group showed that out of the 12 structural paths, only 3 differed from the constrained model (see supplemental Table 5). Considering the whole of these results we thus concluded that there is not enough evidence for substantial moderation of the relations between, disclosure, secrecy and delinquency.

Finally, to investigate sex differences in the relationship between secrecy, disclosure to parents, and delinquency and depression, we conducted a last set of two nested model group comparisons. Results for the analyses with depression showed no significant change in fit for the model that allowed for variation of the cross-lagged paths by sex (Change in corrected χ^2 (4) = 8.29, $p = .081$; Constrained SSA BIC = 17,812.92; RMSEA = .072 [90% CI = .053, .090]; CFI = .930; Unconstrained SSA BIC = 17,814.50; RMSEA = .072 [90% CI = .052, .091]; CFI = .935). This indicates that the relationship between disclosure, secrecy, and depression is similar for males and females. Similarly, results for the analyses investigating delinquency showed no significant difference in model fit between the models (change in corrected χ^2 (12) = 19.22, $p = .083$; Constrained SSA BIC = 16,140.136; RMSEA = .077 [90% CI = .057, .096]; CFI = .905; Unconstrained SSA BIC = 16,152.35; RMSEA = .081 [90% CI = .060, .102]; CFI = .915), indicating that there are no sex differences in the relations between, disclosure, secrecy and delinquency in the present sample.

Discussion

The present study revisited the secrecy-disclosure distinction that has been found in a commonly used measure of self-reported adolescent disclosure (Stattin & Kerr, 2000) and attempted to replicate findings of an earlier study conducted with a sample of Dutch adolescents from two-parent homes (Frijns et al., 2010). To our knowledge this is the first study to examine whether disclosure and secrecy can be distinguished as separate factors in a sample of urban, predominantly African American adolescents from high-violence neighborhoods. Our results can be summarized as follows: in both cross-sectional and

longitudinal confirmatory factor analyses over four consecutive waves of data collection, the proposed two-factor structure of the adolescent disclosure measure consistently was supported and appeared stable over the four waves of measurement. This lends further support to the hypothesis that disclosure and secrecy should be treated as two separate constructs in adolescent information management (Frijns et al., 2010). However, comparisons of unconstrained models where secrecy and disclosure independently predicted adjustment, versus models where secrecy and disclosure were constrained to be equal in their associations with adjustment outcomes revealed no significantly improved model fit when treating secrecy and disclosure as two distinct constructs.

One reason for the lack of a practical difference between treating secrecy and disclosure as one or two constructs in our sample may be that in contrast to the Frijns et al. (2010) study, secrecy and disclosure were much more highly correlated in the present sample. It may be the case that as a group the youth in our study were more homogenous than the youth in the Frijns et al. (2010) sample, and thus this affected how they answered the secrecy and disclosure items.

The results of our cross-lagged models with secrecy and disclosure in the same model predicting adolescent adjustment were generally not consistent with that of the Frijns et al. (2010) study when depressive symptoms was the adjustment variable, and partially consistent when delinquency was examined. In our model predicting depressive symptoms, depressive symptoms predicted secrecy at the next wave across all four waves. No other cross-lagged paths were significant. These data suggest that consistent with Frijns et al. (2010), secrecy was more relevant than disclosure to adolescents' adjustment. However, in contrast to the Frijns et al. (2010) study, depression affected secrecy in our sample, rather than the obverse, and this continued over several waves, not merely in the transition from wave 1 to wave 2. The linkage between depression and subsequent non-disclosure is consonant with other studies of adolescent-parent communication (Hamza & Willoughby, 2011; Laird & Marrero, 2010). For example, Hamza and Willoughby (2011) found that depressive symptoms lead to diminished levels of adolescent's willingness to disclose and thus to lower parental knowledge. Our results, however, suggest that in this sample, the consequences reach further and adolescents do not simply withdraw and stop communication, but actively hide their activities as they are more depressed. Our results show that that higher levels of adolescent depressive symptoms predicted decreased adolescent willingness to disclose over time. Our findings are in line with those of Laird and Marrero (2010), who reported that depressed adolescents disclosed less to parents in their sample of American adolescents. Given that withdrawal is a characteristic of depressive symptoms (American Psychiatric Association [APA], DSM-V, 2013), it is not surprising that we found that as adolescents' reports of depressive symptoms increased, disclosures to parents decreased. Importantly for parents, reduced disclosures also resulted in lower levels of parental knowledge, meaning that parents of more depressed adolescents might get fewer opportunities to provide support and guidance to their struggling adolescents. This cycle may be reinforcing, as Tilton-Weaver (2014) has found that lower levels of perceived parental support predicted more secrecy in cross-lagged models with middle-school Swedish students.

There are several possible explanations for this. First, the youth in our urban, low-income sample were much more depressed, and levels of depression varied much more, than youth in the Frijns et al. (2010) study, which is not surprising since the youth in our sample likely were exposed to more environmental stressors. Adolescents also reported more secrecy at baseline in our urban sample than in the Frijns et al. (2010) study. Being exposed to more events about which to be secretive may set in motion a cycle of depression, followed by withdrawal from the family, and then predicting even more secrecy. This difference in parent-adolescent communication may be a function of family structure or stressors unique to the urban, low-income context. Smetana et al. (2006) note that adolescents may conceal information from parents for a variety of reasons, one of which is the extent to which the information may elicit parental concern. Given that the adolescents in our sample lived in objectively more dangerous neighborhoods this could be a factor driving this difference. In a recent study with urban African American 6th through 8th grade children living in high-violence neighborhoods, Dinizulu and her colleagues (2014) found that especially older youth withheld information about their experiences with violence from their parents for fear of their reactions, and that this non-disclosure was positively associated with both violence exposure and internalizing symptoms, suggesting that youth may not want to disclose exposure to violence to parents for fear of their reactions. Second, the inner-city context places considerable importance on reputation, and maintaining “respect” (Farrell et al., 2010; Jäggi & Kliever, 2016). Following such a “code of the street,” results in more pressure to hide weaknesses and fear, which may extend to parents, such that youth do not let their guard down, even at home (Rich & Grey, 2005). This pretense also might be used to mask loneliness associated with not having friends to avoid the stigma associated with that type of isolation. Third, youth may not want to “burden” their already struggling parents with their problems in resource-poor environments, and thus end up withdrawing even more in the face of their own emotional struggle. All three of those mechanisms would prompt youth to hide their true feelings and prevent them from reaching out and seeking help when feeling depressed, potentially intensifying such feelings in a negative spiral. More research is needed, but this is a potentially important finding because this mechanism might result in parents in high poverty contexts being less aware of their offspring’s mental state, which further diminishes the youths’ chances to get help and services in an already service-poor environment.

In our model predicting delinquency, wave 1 secrecy predicted wave 2 delinquency, and wave 3 delinquency predicted wave 4 secrecy, both findings that were consistent with Frijns et al. (2010). Different from that study however, we also found that wave 2 delinquency predicted less disclosure at wave 3. The consistency in our findings and that of Frijns’ et al. (2010) predicting delinquency suggest that the underlying mechanisms linking secrecy and delinquency may be similar across very different ecological contexts. Engaging in risky or delinquent behavior is probably more uniformly met with consequences from parents across contexts than responses to internalizing symptomatology. It is likely a universal reaction of parents to punish “bad” behavior, while the stigma or expected strain associated with internalizing symptoms can vary more across cultural and economic contexts, suggesting a more important role of the environment in internalizing versus externalizing symptoms.

Although past research has revealed mean-level differences in disclosure, depression, and delinquency across age, our results suggest that the pattern of associations between these constructs is fairly consistent. Further, our data indicate that there were no sex differences in the pattern of associations between disclosure, depression, and delinquency. This may suggest that the urban context of our study was a bigger contributor to these associations than maturation and that the socialization forces that heighten sex differences in other contexts may diminish them here.

Limitations of the Current Study

Although the current study utilized sound theory, and a 4-wave longitudinal design with a moderately sized difficult to recruit sample, the sole reliance on adolescent self-report for the assessment of the constructs was a study limitation. However, based on our decision to replicate the Frijns et al. (2010) study, we determined to retain this analytic strategy. Further, our study focused only on maternal caregiver-child relationships, and evaluated this dyadic relationship even though it was embedded in a broader family system.

Suggestions for Future Research

Future research should investigate the extent to which secrecy and disclosure are differentially associated with adjustment outcomes other than depression and delinquency; should examine these associations in different samples that have varied environmental demands on parents; and should assess the extent to which the patterns of associations – both in the factor structure of the measure and in the structural paths – are consistent across sex and across age during adolescence in relationships with parents and in other important relationships. Further, emerging research suggest that secrecy and disclosure should be evaluated within the context of other important relationships, like friends and siblings, along with the traditional parent-child dyad (e.g., Campione-Barr et al., 2015; Laird et al., 2013b; Villalobos Solís et al., 2015). Future work should investigate how these longitudinal relations vary when other key players are involved. Answers to these questions will advance our understanding of changes in parent-adolescent relationships across the period of adolescence, and the unique contextual influences on those relationships.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

- American Psychiatric Association. Diagnostic and statistical manual of mental disorders: DSM-V. 5th. Arlington, VA: American Psychiatric Publishing; 2013.
- Arnett, JJ. Adolescence and emerging adulthood: A cultural approach. 4th. Upper Saddle River, NJ: Prentice Hall; 2010.

- Bentler PM. On the fit of models to covariances and methodology to the Bulletin. *Psychological Bulletin*. 1992; 112:400–404. [PubMed: 1438635]
- Browne, MW.; Cudeck, R. Alternative ways of assessing model fit. In: Bollen, KA.; Long, JS., editors. *Testing structural models*. Newbury Park, CA: American Book; 1993.
- Campione-Barr N, Lindell AK, Giron SE, Killoren SE, Greer KB. Domain differentiated disclosure to mothers and siblings and associations with sibling relationship quality and youth emotional adjustment. *Developmental Psychology*. 2015; 51:1278–1291. [PubMed: 26192042]
- Collins WA, Maccoby EE, Steinberg L, Hetherington EM, Bornstein MH. Contemporary research on parenting: the case for nature and nurture. *American Psychologist*. 2000; 55:218. [PubMed: 10717969]
- Darling N, Cumsille P, Caldwell LL, Dowdy B. Predictors of adolescents' disclosure to parents and perceived parental knowledge: Between- and within-person differences. *Journal of Youth and Adolescence*. 2006; 35:667–678.
- Dinizulu SM, Grant KE, McIntosh JM. The influence of nondisclosure on the mental health of urban African-American adolescents exposed to community violence. *Journal of Prevention & Intervention in the Community*. 2014; 42:208–220. [PubMed: 25050605]
- Farrell AD, Kung EM, White KS, Valois R. The structure of self-reported aggression, drug use, and delinquent behaviors during early adolescence. *Journal of Clinical Child Psychology*. 2000; 29:282–292. [PubMed: 10802836]
- Farrell AD, Mays S, Bettencourt A, Erwin EH, Vulin-Reynolds M, Allison KW. Environmental Influences on Fighting Versus Nonviolent Behavior in Peer Situations: A Qualitative Study with Urban African American Adolescents. *American Journal of Community Psychology*. 2010; 46:19–35. <http://doi.org/10.1007/s10464-010-9331-z>. [PubMed: 20526663]
- Frijns T, Finkenauer C, Vermulst AA, Engels RCME. Keeping Secrets From Parents: Longitudinal Associations of Secrecy in Adolescence. *Journal of Youth and Adolescence*. 2005; 34:137–148. DOI: 10.1007/s10964-005-3212-z
- Frijns T, Keijsers L, Branje S, Meeus W. What parents don't know and how it may affect their children: Qualifying the disclosure–adjustment link. *Journal of Adolescence*. 2010; 33:261–270. DOI: 10.1016/j.adolescence.2009.05.010 [PubMed: 19573902]
- Jäggi L, Kliwer W. Cause That's the Only Skills in School You Need" A Qualitative Analysis of Revenge Goals in Poor Urban Youth. *Journal of Adolescent Research*. 2016; 31:32–58. DOI: 10.1177/0743558415569728
- Jones DJ, Forehand R, Rakow A, Colletti CJM, Mckee L, Zalot A. The specificity of maternal parenting behavior and child adjustment difficulties: A study of inner-city African American families. *Journal of Family Psychology*. 2008; 22:181–192. [PubMed: 18410205]
- Horowitz K, McKay M, Marshall R. Community Violence and Urban Families: Experiences, Effects, and Directions for Intervention. *American Journal of Orthopsychiatry*. 2005; 75:356–368. DOI: 10.1037/0002-9432.75.3.356 [PubMed: 16060732]
- Kerr M, Stattin H. What parents know, how they know it, and several forms of adolescent adjustment: further support for a reinterpretation of monitoring. *Developmental Psychology*. 2000; 36:366–380. [PubMed: 10830980]
- Kerr, M.; Stattin, H.; Biesecker, G.; Ferrer-Wreder, L. *Handbook of Psychology*. John Wiley & Sons, Inc.; 2003. *Relationships With Parents and Peers in Adolescence*. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1002/0471264385.wei0616/abstract>
- Kliwer W, Dibble AE, Goodman K, Sullivan TN. Physiological correlates of peer victimization and aggression in African American urban adolescents. *Development and Psychopathology*. 2012; 24:637–650. DOI: 10.1017/S0954579412000211 [PubMed: 22559136]
- Kliwer W, Lepore SJ. Exposure to violence, social cognitive processing, and sleep problems in urban adolescents. *Journal of Youth and Adolescence*. 2015; 44:507–517. DOI: 10.1007/s10964-014-0184-x [PubMed: 25218396]
- Kohlberg L. The development of children's orientations toward a moral order. *Human Development*. 1963; 6:11–33.
- Kovacs, M. *The Children's Depression Inventory*. Tonawanda, NY: Multi-Health Systems; 1992.

- Laird RD, Marrero MD, Melching JA, Kuhn ES. Information management strategies in early adolescence: Developmental change in use and transactional associations with psychological adjustment. *Developmental psychology*. 2013a; 49:928–937. [PubMed: 22686172]
- Laird RD, Bridges BJ, Marsee MA. Secrets from friends and parents: Longitudinal links with depression and antisocial behavior. *Journal of Adolescence*. 2013b; 36:685–693. [PubMed: 23849663]
- Laursen B, Coy KC, Collins WA. Reconsidering Changes in Parent-Child Conflict across Adolescence: A Meta-Analysis. *Child Development*. 1998; 69:817–832. [PubMed: 9680687]
- Little RJ. A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*. 1988; 83:1198–1202.
- Muthen, B.; Muthen, L. Mplus (Version 6.11). Los Angeles, CA: Muthen & Muthen; 2010. [Computer Software]
- Perkins SA, Turiel E. To lie or not to lie: To whom and under what circumstances. *Child Development*. 2007; 78:609–621. [PubMed: 17381793]
- Piaget J. The stages of the intellectual development of the child. *Educational Psychology in Context: Readings for Future Teachers*. 1965:98–106.
- Pinderhughes EE, Nix R, Foster EM, Jones D. Parenting in context: Impact of neighborhood poverty, residential stability, public services, social networks and danger on parental behaviors. *Journal of Marriage and Family*. 2001; 63:941–953.
- Rankin BH, Quane JM. Social contexts and urban adolescent outcomes: The interrelated effects of neighborhoods, families, and peers on African-American youth. *Social Problems*. 2002; 49:79–100.
- Smetana JG. It's 10 O'Clock: Do You Know Where Your Children Are?" Recent Advances in Understanding Parental Monitoring and Adolescents' Information Management. *Child Development Perspectives*. 2008; 2:19–25. DOI: 10.1111/j.1750-8606.2008.00036.x
- Smetana JG, Metzger A, Gettman DC, Campione-Barr N. Disclosure and Secrecy in Adolescent–Parent Relationships. *Child Development*. 2006; 77:201–217. DOI: 10.1111/j.1467-8624.2006.00865.x [PubMed: 16460534]
- Stattin H, Kerr M. Parental monitoring: A reinterpretation. *Child Development*. 2000; 71:1072–1085. [PubMed: 11016567]
- Tabachnick, BG.; Fidell, LS. Using multivariate statistics. 5th. Boston, MA: Pearson; 2001.
- Tilton-Weaver L. Adolescents' information management: Comparing ideas about why adolescents disclose to or keep secrets from their parents. *Journal of Youth and Adolescence*. 2014; 43:803–813. [PubMed: 24002679]
- Torkzadeh G, Koufteros X, Pflughoeft K. Confirmatory analysis of computer self-efficacy. *Structural Equation Modeling*. 2003; 10:263–275.
- Villalobos Solis M, Smetana JG, Comer J. Associations among solicitation, relationship quality, and adolescents' daily disclosure and secrecy with mothers and best friends. *Journal of Adolescence*. 2015; 43:193–205. [PubMed: 26142840]

Highlights

Secrecy and disclosure are best represented by a two-factor structure.

Across sex and age cohorts, depression predicts secrecy and not the obverse in our urban US sample.

Context mattered more in predicting internalizing versus externalizing symptoms.

Cultural differences exist in relations between secrecy, disclosure, and adjustment.

Fit:
 $\chi^2(5) = 32.660, p\text{-value} < 0.001$
 RMSEA = 0.125
 CFI = 0.890
 TLI = 0.779
 SS Adjusted BIC = 5509.513

Fit:
 $\chi^2(4) = 9.743, p\text{-value} = 0.0450$
 RMSEA = 0.064
 CFI = 0.977
 TLI = 0.943
 SS Adjusted BIC = 5479.530

Figure 1.

Confirmatory factor analysis for one and two-factor models of secrecy and disclosure at wave 1.

Note. ** $p < .01$ All factor loadings are standardized. $N=586$.

Figure 2. Longitudinal cross-lagged path model. *Note.* Two- and three-year stability paths were included in the model but are not displayed.

Figure 3.

Longitudinal unconstrained path model of secrecy, disclosure, and delinquency. Significant paths are represented by solid lines and non-significant paths are represented by dashed lines. Two- and three year stability paths were included in the analyses but are not displayed.

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 4.

Longitudinal path constrained model of secrecy, disclosure, and depression. Significant paths are represented by solid lines and non-significant paths are represented by dashed lines. Two- and three year stability paths were included in the analyses but are not displayed.

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 1

Descriptive Information on and Correlations among all Study Variables at Wave 1

Variables	Descriptives		Correlations							
	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.
1. Item 1 (D)	2.13	1.21								
2. Item 2 (D)	2.19	1.29	0.60							
3. Item 3 (D)	2.16	1.38	0.41	0.38						
4. Item 4 (S)	3.84	1.36	-0.39	-0.25	-0.31					
5. Item 5 (S)	4.34	1.15	-0.40	-0.31	-0.34	0.47				
6. Disclosure	6.48	3.10	0.82	0.82	0.76	-0.39	-0.44			
7. Secrecy [^]	1.81	2.15	0.46	0.32	0.38	0.88	0.83	0.48		
8. Depression	8.96	6.84	0.33	0.22	0.21	-0.31	-0.30	0.32	0.36	
9. Delinquency	1.41	2.46	0.30	0.22	0.25	-0.24	-0.19	0.32	0.25	0.21

Note. All correlations are significant at $p < .001$.

[^] Secrecy is reverse scored for interpretability. D=Item belonging to disclosure subscale. S=Item belonging to secrecy subscale.

Table 2

Measurement Invariance Model: Longitudinal Correlated Two-Factor Model with Correlated Errors Between Repeated Measures

Disclosure Scale Items	Disclosure		Secrecy	
	Factor Loading	SE	Factor Loading	SE
Item 1: Do you talk at home with your parents about how you are doing in different subjects in school?	1.000	0.000		
Item 2: Do you usually tell your parents how school was when you get home (how you did on different exams, your relationships with teachers, etc.)?	0.958	0.046		
Item 3: If you are out at night, when you get home, do you tell what you have done that evening?	0.853	0.056		
Item 4: Do you keep a lot of secrets from your parents about what you do during your free time?			1.000	0.000
Item 5: Do you hide a lot from your parents about what you do during nights and weekends?			0.893	0.074
Model fit (CFI; TLI; RMSEA)	0.984	0.975	0.025	

Note: $N=356$. P-value for all estimates $<.001$. Factor loadings are unstandardized and constrained to be equal across the four waves.