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Original Investigation

The Family Talk About Smoking (FTAS) Paradigm: New Directions for Assessing Parent–Teen Communications About Smoking

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Abstract

Introduction: Smoking experimentation represents transient risk taking for some youth, whereas for others, it is the onset of a chronic smoking trajectory. However, distinguishing these groups during the experimentation phase has proved challenging. We theorized that variations in parent and teen discourse about smoking might be informative for characterizing this heterogeneity. However, standardized methods for direct assessments of these family processes have been lacking.

Methods: We examined the predictive utility of directly observed facets of smoking-specific communication for predicting persistence of teen smoking experimentation using a novel method, the Family Talk About Smoking (FTAS) paradigm. The FTAS was tested in a sample of 344 teens with a history of smoking experimentation during interactions with their mothers and fathers. *Level of disapproval, smoking expectancies, elaboration of consequences*, and *quality of personal disclosure* were coded during videotaped parent–teen discussions about smoking.

Results: Patterns of observed smoking-specific communication varied by teen and parent smoking status. Predictive validity of the FTAS for teen persistent experimentation was demonstrated, net effects of reported smoking-specific socialization, general quality of communication, and parental smoking status. Teen *smoking expectancies*, *disclosure*, and *disapproval* predicted teen persistent experimentation with some differences based on whether interactions were with mothers or fathers. Prediction of persistent experimentation by observed maternal *disclosure* and *elaboration of consequences* was moderated by maternal smoking status.

Conclusions: Direct observations show promise for generating detailed characterization of individual differences in patterns of family communication about smoking. Implications for targeted prevention and future research are discussed.

Introduction

Smoking experimentation may represent normative adolescent risk taking or mark the onset of chronic smoking (Chassin, Presson, & Sherman, 1989). Family processes are theorized to discriminate transient from persistent pathways (Graber & Brooks-Gunn, 1999; Schulenberg, Maggs, & Hurrelman, 1997). Empirically based methods that enable this distinction are critical for the development of effective targeted intervention (Dierker, Avenevoli, Goldberg, & Glantz, 2004).

Parental behavior (parenting and smoking status) is particularly influential in determining whether experimentation escalates to regular smoking (Bricker et al., 2007; Darling & Cumsille, 2003). Recently, "smoking-specific socialization" (e.g., discussion, punishment, and consequences) has demonstrated incremental utility in prediction of youths' smoking trajectories (Chassin et al., 2005; Middlecamp-Kodl & Mermelstein, 2004). However, the direction of effects is inconsistent, perhaps due to variations in measurement and moderation by parental smoking status. For example, positive effects of frequency and quality of communication are greater when parents are nonsmokers, whereas punishment has positive effects when parents are nonsmokers and negative effects when parents are smokers (Chassin et al., 2005; Harakeh, Scholte, de Vries, & Engels, 2005). In addition, more frequent parent–teen communications

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about smoking are associated with increased risk of smoking; however, longitudinal findings suggest that higher frequency may be a *reaction* to experimentation rather than a risk factor (Ennett, Baumann, Foshee, Pemberton, & Hicks, 2001; Harakeh et al., 2005). Questionnaire measures of qualitative aspects of smoking-specific communications (e.g. responsive, constructive) also exert a protective effect on youth smoking (Engels & Willemsen, 2004; Harakeh et al., 2005). Thus, deepening understanding of individual differences in smoking-specific communication patterns is promising for specifying mechanisms by which varying family processes exert their influence.

Standardized direct observations methods have unique potential to advance this line of inquiry. Observation methods generate a nuanced characterization of the communication processes by which messages and attitudes about smoking are transmitted and responded to within families. While parental smoking-specific socialization is a critical aspect of smoking-related family processes, it occurs within a dynamic conversational context (Ary, James, & Biglan, 1999). Relatedly, the variability of teens' smoking-specific communications and their implications for teen smoking patterns has not been adequately considered (Engels & Willemsen, 2004; Harakeh, 2006).

Perhaps, the value of standardized observational methods is most evident in the case of parental smokers. Clearly, parental smokers have a particular challenge to provision of effective antismoking messages. This includes the obvious conundrum that these parents must socialize their children to "do what I say, not what I do" (den Exter Blokland, Hale, Meeus, & Engels, 2006; Jackson & Henriksen, 1997). However, there may also be a variety of subtle "mixed messages" communicated by smoking parents. For example, there is evidence that parental smoking status does not necessarily differentiate the type of smoking messages parents provide but does predict substantial variability in parental self-efficacy for preventing teen smoking (den Exter Blokland et al., 2006; Middlecamp-Kodl & Mermelstein, 2004). Because quantitative observational methods typically code behavior along a continuum and in terms of its quality, they are particularly valuable for capturing such dynamic complexities.

The overarching goal of the present study was to utilize the Family Talk About Smoking (FTAS) paradigm, a novel observational method to characterize theorized heterogeneity in parent–teen discourse about smoking in families of youth at early stages of the smoking continuum. In so doing, we aimed to elucidate individual differences in persistence of experimentation for this group that has often been treated homogenously, despite substantial heterogeneity in smoking outcome. In order to demonstrate the utility of this paradigm, we had two central goals. One was to demonstrate descriptively that the paradigm was "working. Specifically, we wanted to establish whether the FTAS observational method yielded high levels of variability and qualitatively meaningful variations in the nature and content of the discussions. The second was to demonstrate the incremental utility of the FTAS above and beyond existing approaches. In particular, we aimed to test whether the more intensive and smoking-specific approach of the FTAS provided substantial added predictive value above and beyond more "efficient" paper-and-pencil measures and more general facets of observed family process.

Aim I: Demonstrate meaningful variability in observed family communications in relation to baseline differences in teen smoking status and parental smoking status, utilizing scores derived from direct observations during the FTAS.

IA. Examine the distribution and range of FTAS scores.

IIB. Test for individual differences in FTAS scores based on teen baseline and parental smoking status.

Aim II: Establish whether observed variability in smoking-specific communications incrementally predicts teen smoking patterns over time.

Aim IIA. Test whether observed family communications about smoking predict teen persistent experimentation across baseline and 6-month follow-up with observed general quality of communication and teen reported smoking-specific socialization controlled.

Aim IIB: Test whether parental smoking status interacts with observed family communications about smoking in prediction of teen persistent experimentation across baseline and 6-month follow-up.

Methods

Participants

Family Talk is an observational substudy of the large "*Social Emotional Contexts of Adolescent Smoking Patterns*" longitudinal study of 1,263 youth, which was oversampled for youth smoking. Figure 1 provides a flow chart of recruitment into this larger study and the derivation of the Family Talk sample. All 9th–10th graders at 16 Chicago area high schools ($N = 12{,}970$) were screened for participation via a brief smoking survey. Students were eligible to participate in the larger study if they fell into one of three categories along the smoking uptake continuum: (a) never-smokers, (b) experimenters (smoked in past year but <100 cigarettes in lifetime), and (c) regular smokers (smoked in the past thirty days and have smoked more than 100 cigarettes in their lifetime). Invitation/recruitment packets were then mailed to eligible students and their parents ($N = 3{,}695$; valid $N = 3{,}654$, as 41 packets were returned due to an incorrect address). This included a random sample of the never-smokers and former experimenters and all current and regular smokers. Youth were enrolled into the longitudinal study after written parental consent and student assent were obtained. Of those invited, 1,344 agreed to participate (36.8%). Of these, the 1,263 (94.0%) youth who completed the baseline measurement wave comprised the full study cohort. Seventeen percent of these 1,263 youth ($n = 213$) were never-smokers, 71% were experimenters ($n = 898$), and 12% were regular smokers ($n = 152$).

Eligibility for the Family Talk subsample was based on being in the experimenting group. Thus, never-smokers and regular smokers were excluded. Optimally, we would have systematically sampled subgroups of youth along the full smoking continuum. However, given sample size constraints and our interest in individual differences, we theorized that we would get the most traction with a sampling strategy emphasizing within-group rather than cross-group variation. We focused on experimenting youth in particular based on prior work, suggesting that family influences are likely to be most salient for youth who are not at the

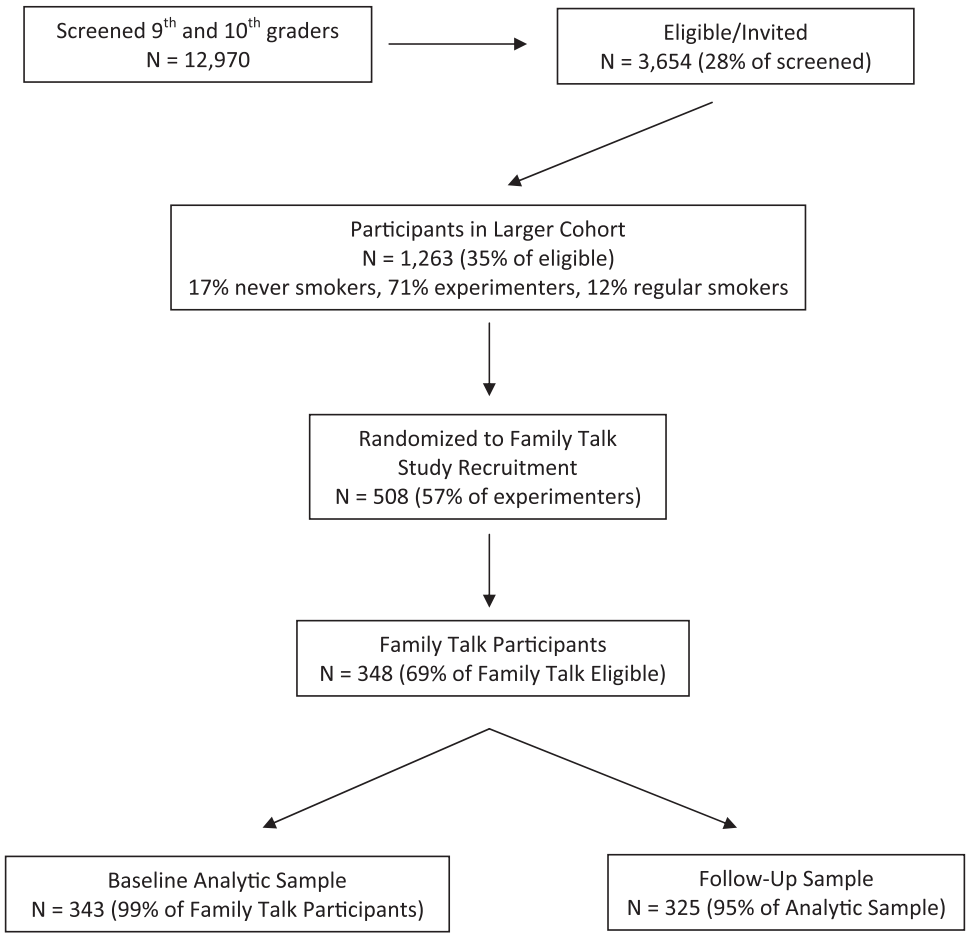

Figure 1. Flow chart of Family Talk sample ascertainment.

extremes (Lewinsohn, Brown, Seeley, & Ramsey, 2000). In particular, experimenters are conceptualized at being "at the cusp," with heightened susceptibility to contextual factors at the critical juncture in which they either escalate to regular smoking or desist. We also theorized that variations in teen communications with their parents about smoking might help "unpack" the heterogeneity of this group.

Five hundred and eight teens (58%) of the experimenters from the full cohort were randomized for potential participation in Family Talk; 348 (69%) agreed to participate. Of these 348, 70% had smoked within the last 90 days and 30% had smoked prior to the last 90 days but within the past year. There were no significant demographic differences between eligible Family Talk participants and nonparticipants in terms of teen age, sex, ethnicity and self-reported grade point average, parental marital status, parental smoking status, and parental education level. Family Talk participants also did not significantly differ from full cohort participants on these demographic factors. Participants and nonparticipants also did not differ in their smoking level (*M* days smoked past thirty days—participants = 1.51 cigarettes/day nonparticipants = 1.92 cigarettes/day, not significant) or self-reported quality of parent–teen communication on the Parent–Adolescent Communication Scale (Barnes & Olson, 1982).

Fifty-five percent of the Family Talk teens participated with two parents (n = 191) and 45% with one parent (n = 157). (Three teens participated with two female caregivers, e.g., mother and grandmother. For these teens, only interactions with mothers were used.) Eighty-one percent of the teens who participated with only one parent did so with their mothers (n = 127), 14% with their fathers (n = 22), and the remaining 5% with another relative (n = 8). (For simplicity, we will refer to female caregivers as *mothers* and male caregivers as *fathers*.) Due to technical difficulties, four participants did not have usable FTAS data. Thus, the analytic sample for baseline analyses (Aim I) was 344 teens and their parents (529 FTAS segments: 321 with *mothers* and 208 with *fathers*). The key outcome in the longitudinal analyses was patterns of persistent smoking across baseline and a 6-month follow-up. Ninety-five percent of the analytic sample participated the 6-month follow-up (n = 325). These youth comprised the analytic sample for the longitudinal analyses.

The Family Talk sample was demographically diverse. The mean age of the teens was 15.62 years (range: 13.9–17.5), and 58% were girls. Slightly more than half were non-Hispanic White (56%), with the remainder predominantly either Black (20%) or Hispanic (15%). Most parents were married (76%) and had some post–high school education (77%). Close to half (48%) of parents had a history of regular smoking.

Procedures

Assessment Overview

Parent and teen questionnaire data were collected at baseline. Smoking was assessed again at a 6-month follow-up. Seventy-five percent of Family Talk observations were conducted within four months of baseline, and all were completed prior to the 6-month follow-up (*mean* = 99 days; range: 33–172). Teens and parents each received $20 for completing the questionnaires and $50 for the Family Talk discussion visit (with a $50 family bonus when both available parents participated).

Family Discussion Procedures

The FTAS was the second of three observational segments in between a discussion of day-to-day family experiences (Cui & Conger, 2008) and a problem-solving task (Wakschlag, Chase-Lansdale, & Brooks-Gunn, 1996). Data presented here are from the FTAS. Parent–teen discussions were conducted separately for each parent, with order of administration randomly determined. Ninety-three percent were conducted in families' homes (with the remaining families choosing to conduct the visit in the University library or nearby public spaces, such as a library meeting room).

Measures

FTAS Paradigm

The FTAS is a 10-min semistructured family interaction paradigm. It employs a flip-card methodology (Cui & Conger, 2008) as a means of jump-starting family conversations about salient facets of smoking. Each flip card included a "conversational trigger," designed to directly elicit or "press" for variability on smoking-related topics. The five FTAS triggers were "*Let's talk about . . .* " (a) *How people in our family feel about cigarette smoking" (teen),* (b)"*My experiences with cigarettes and smoking" (parent),* (c) "*How today's teens make decisions about cigarette smoking" (teen);* "*What parents do if they find out that their teen is smoking" (parent),* and (d) "*What parents do if they find out that their teen has become a regular smoker" (parent)*.

Families were encouraged to try and discuss all five questions and to use the full 10 min for their discussions. Thus, some families moved through all five questions rapidly, whereas others lingered on a particular question and moved more rapidly through others. The triggers were alternated by parent and teen. Several steps were taken to enhance the ecological validity of the FTAS. First, discussions occurred at home. Second, a neutral warm up task focused on general aspects of "family life" was used to foster a sense of ease prior to the FTAS. Third, field staff left the room during the discussions and remotely monitored the discussions from another room.

The FTAS did not prompt teens to disclose their smoking behavior. Thus, parental knowledge of teens' smoking behavior was derived from prior knowledge and parental solicitations and/or teens' spontaneous disclosures during the FTAS.

FTAS Coding System

The FTAS is a global rather than event-based coding system. Coding is based on observation of the full discussion segment. Codes are integrative judgments that include both qualitative (e.g., intensity, pervasiveness) and quantitative (e.g., frequency) aspects of conversational behavior. Behavior is coded along a 9-point scale ranging from "*Not at all characteristic*" to "*Mainly characteristic*." FTAS code development was based on theory (e.g., Darling & Cumsille, 2003; Dierker et al., 2004; Graber & Brooks-Gunn, 1999; Schulenberg et al., 1997), operationalization of key constructs from questionnaire studies (e.g., Chassin et al., 2005; Harakeh, 2006; Middlecamp-Kodl & Mermelstein, 2004), and refinement via observation of FTAS pilot tapes.

Three of the FTAS codes drew on central constructs from prior research: (a) *level and consistency of disapproval* about smoking was defined as strength, consistency, and pervasiveness of expressed disapproval about smoking as conveyed both verbally and nonverbally. Low scores (ratings of 1–3) were rated when there was an absence of disapproval and/or even approval, moderate scores (4–6) reflected "mixed messages" and less affectively intense expressions of disapproval, and high scores indicated that disapproval was intense, consistent, and pervasively evident. (b) *Establishment and elaboration of consequences for smoking* (parents only) were defined as the clarity with which parents communicated specific, realistic, and firm consequences for smoking and/or violation of household smoking rules. At low levels, contingencies for teen smoking-related behaviors were absent or minimally expressed; moderate ratings reflected some articulation of consequences that was vague, unelaborated, or unrealistic; and high levels were rated when consequences were clearly linked to behavior, well elaborated, and reflected a clear plan for implementation. (3) *Smoking expectancies* were defined as the degree to which teens and parents expressed explicit expectations about the likelihood that teens, in general, and this teen, in particular, would smoke now or in the future. (This code was conceptualized in the opposite direction of the other FTAS codes, i.e., high expectancies indicated greater likelihood of smoking.) At the low end, no expectancies and/or strong expectancies that smoking would not occur were conveyed; at the moderate level, both positive and negative expectancies were expressed, and at the high level, probable or definite expectancies were expressed. A fourth FTAS code, *Quality of Personal Disclosure*, is a novel facet of smoking-specific communication and was designed to capture the *quality* of communications about smoking, including elaboration, openness, spontaneity, reflectiveness, and complexity of personal disclosure. Although the majority of parents (89%) and all the teens had personal experiences with smoking, the code was designed to have face validity for individuals with and without a smoking history (see Supplementary Material for examples of high *disclosure* across parental smoking status groups). Thus, it pressed for a range of smoking-related personal experiences such as contexts in which smoking by self or others occurred, family history of smoking, and/or decisions not to smoke. At the low end, disclosure was minimal and terse, at the moderate level, disclosure was more elaborated but lacked complexity and spontaneous elaboration, and high levels reflected freely elaborated and complex disclosures, including how decisions were made, coherence of explanations, and reflection on the challenges incumbent in the process.

Observational Coding Procedures

Coding was done by a team of 17 coders who were blind to study hypotheses. All coders were trained to reliability standards. To monitor interrater reliability, 19% of segments were double coded with disagreements resolved consensually. A dynamic Latin

square-based random system was used to reduce bias by ensuring that coding was evenly distributed across type of dyad (mother vs. father) and segment (see Supplementary Material). Coders coded only one segment per family to avoid "spillage" across segments. Reliability coders always coded target participants in opposite sequence from the primary coder to avoid order effects.

Interrater reliability was assessed using intraclass correlations (ICCs). We first computed ICCs in the traditional manner utilizing the average estimates coefficient. The mean ICC was .74 (range = .59–.83). Based on established guidelines (Cicchetti et al., 2006), all ICCs were in the acceptable range, and all but the parent expectancies code (ICC = .59) were in the substantial to outstanding range (ICCs: consequences = .74 [parent only]; disclosure = .76 [parent and teen]; disapproval = .76 [parent] and .83 [teen], expectancies [teen] = .73). We also developed a more stringent approach to calculating reliability to account for between-coder variability using a random effects model (details available from the senior author). All ICCs generated by this random effects model were in the moderate to substantial range (M = .56, range = .40–.66). Correlations among FTAS codes were small to moderate and in the expected direction, suggesting that FTAS codes tapped into distinct but related facets of smoking-specific communication: teen codes mean r = .42 (range = .26–.57); mother codes mean r = .23 (range = .00–.47), and father codes mean r = 23 (range = .02–.45). In terms of validity, the FTAS was correlated modestly but in the expected direction with more general facets of observed family communication and questionnaire assessments of smoking-specific socialization (methods described below; for detailed report of intercorrelations, see Supplementary Material). In support of the FTAS' ecological validity, 83% of teens, 89% of mothers, and 88% of fathers rated the discussions as typical or highly typical (Campione-Barr & Smetana, 2004).

General Family Process Codes

The Iowa Family Rating Scales (IFIRS: Melby & Conger, 2001) were also applied during the FTAS to measure interactional quality: (a) general *Communication Style* (i.e., rating of *assertiveness, listener responsiveness, and communication;* α for parents = .78 and for teens = .83) and (b) parent–teen *relationship quality*. Adequate interrater reliability was also demonstrated for IFIRS codes (M ICC = .76, range = .72–.83).

Teen Smoking Status

At baseline and 6-month follow-up assessments, teens reported on number of days smoked in the past thirty days. Based on this, 43% of youth were identified as current smokers at baseline (M = 3.34 days smoked) and 38% at 6 months (M = 5.50 days smoked; range = 1–30 days smoked).

For the longitudinal analyses, we created two subgroups of youth to capture patterns of persistent experimentation over time from baseline to 6-month follow-up: (a) *transient experimenters* (n = 241); —youth who experimented only prior to study onset and teens who were currently smoking (defined based on past thirty days) at one but not both study timepoints and (b) *persistent experimenters* (n = 84)—teens who were actively smoking at baseline and 6 months. Validity analyses confirmed that these groups differed significantly on multiple elements of smoking behavior (all $ps < .001$). Persistent experimenters: smoked more days in the past thirty days (baseline t = 8.63, persistent M = 3.76, transient M = .60; 6 month t = 12.91, persistent M = 6.97, transient M = .40), were more likely to have smoked daily (baseline χ^2 = 13.78, 6-month χ^2 = 39.44), and demonstrated higher levels of nicotine dependence on the modified Fagerstrom (baseline t = 6.40; 6-month t = 8.79; Prokhorov, Koehly, Pallonen, & Hudmon, 1998).

Parental Smoking Status

Parents' smoking status was derived from responses to the questions *"Have you ever tried smoking a cigarette?" "Have you ever smoked cigarettes on a daily basis?"* and *"Do you currently smoke cigarettes on a regular basis?"* Parents were classified as *current smokers* (mothers = 23% and fathers = 26%), *former smokers* (mothers = 22% and fathers = 28%), and "nonsmokers" (combining parents who had experimented but never smoked regularly and those who had never smoked: mothers = 55% and fathers = 46%). Of note, nearly 90% of mothers and fathers had experience with smoking.

Smoking-Specific Socialization

Parental smoking messages were measured with seven items (Henriksen & Jackson, 1998; Middlecamp-Kodl & Mermelstein, 2004). Adolescents were asked to rate the frequency of verbal antismoking statements voiced by their parents (e.g., "smoking can give you cancer"; "smoking is addictive") on a 3-point scale (1 = *never*, 2 = *once-twice*, and 3 = *several times*). Responses were averaged to create the overall score—higher scores indicated a greater frequency of antismoking messages. *Parental reactions to youth smoking* (Chassin, Presson, Todd, Rose & Sherman, 1998; Middlecamp-Kodl & Mermelstein, 2004) were assessed with 14 items (e.g., "If you found out your child tried smoking . . . would you . . . "act disappointed," "talk to your child about why s/he did it," "take something away like treats or allowance"). Responses ranged from 1 (*yes, definitely*) to 5 (*no way*). Principal axis factor analyses yielded three factors: Consequences (three items, α = .87), Emotional Reactions (eight items, α = .75), and communication (three items, α = .81).

Results

Aim I: Demonstrate meaningful variability in observed family communications about smoking between experimenting teens and their parents

IA: Examine distribution and range of FTAS scores

FTAS means, *SD*s, and trichotomized frequencies are presented in Table 1. Parents and adolescents exhibited behavior across the range of the codes, indicating good variability. All codes used the full 9-point range of the scale. Comparison of patterns of scores on the three observed behaviors coded for both parents and teens (*disapproval, disclosure*, and *expectancies*) indicated similar patterns for mothers and fathers but some differences between parents and teens (all $ps < .001$). For example, parents expressed higher levels of *disapproval* (t = 12.90; parent M = 6.19, and teen M = 4.62), *disclosure* (t = 14.50, parent M = 6.16, teen M = 4.72), and expectancies (t = 7.05, parent M = 4.12, teen M = 3.42). There were also differences in patterns of *disapproval* and *disclosure*. Both observed behaviors were fairly normally distributed for teens. In contrast, the distribution was negatively skewed for parents, with approximately 90% of mothers and fathers expressing moderate-to-high levels of

Table 1. Descriptive Statistics for Teen[a] and Parent[b] Family Talk About Smoking Codes

	Teen				Mother				Father			
	Mean (*SD*)	1–3, %	4–6, %	7–9, %	Mean (*SD*)	1–3, %	4–6, %	7–9, %	Mean (*SD*)	1–3, %	4–6, %	7–9, %
Disapproval												
w/mom	4.63 (2.18)	36.8	38.0	25.2	6.31 (1.81)	9.7	35.2	55.1	5.99 (2.04)	15.9	37.0	47.1
w/dad	4.60 (2.17)	38.0	36.1	26.0								
Disclosure												
w/mom	4.77 (1.93)	33.3	46.8	19.9	6.21 (1.65)	7.4	49.6	43.0	6.09 (1.79)	10.6	45.7	43.8
w/dad	4.65 (1.89)	34.6	45.7	19.7								
Consequences	—	—	—	—	5.18 (2.06)	22.1	50.2	27.7	5.14 (1.87)	18.3	55.3	26.4
Expectancies												
w/mom	3.50 (2.05)	49.2	45.8	5.0	4.24 (1.83)	35.8	55.8	8.4	3.95 (1.85)	42.3	50.5	7.2
w/dad	3.31 (1.97)	51.0	45.7	3.4								

Note. [a]Five hundred and thirty-two teen interactions.
[b]Three hundred and twenty-four mothers and 208 fathers.

disapproval and *disclosure* about their smoking experiences. *Expectancies* were positively skewed for both parents and teens, with less than 10% expressing high *expectancies*.

IIB: Test for individual differences in FTAS scores based on teen baseline and parental smoking status

In order to ensure that variations in parental smoking status did not lead to restricted range on certain FTAS codes (e.g., parental personal disclosure), we first analyzed the distribution of parental *expectancies*, *disclosure*, *disapproval*, *and consequences* across smoking status subgroups. Levene tests indicated homogeneity of variance, indicating that systematic differences in patterns were not artifactual to restricted range.

Significant differences were found in FTAS scores based on teen and parent smoking status. We used multivariate analyses of covariance to test whether FTAS codes varied by teen baseline smoking status and parental smoking status. Teen age, sex, and ethnicity were covariates. Current smokers at baseline expressed lower levels of *disapproval*; $F(2, 319) = 7.25$, $p < .01$; and higher expectancies; $F(2, 319) = 15.09$, $p < .001$; with their mothers. Mothers of current smokers at baseline also conveyed less *elaboration of consequences* than those of teens who were not smoking at baseline; $F(2, 319) = 7.26$, $p < .01$. There were no significant differences by teen smoking status during interactions with fathers. However, FTAS codes varied by parental smoking status. When fathers were current smokers, teens conveyed higher levels of *disapproval* compared with teens whose fathers were former or nonsmokers, with a parallel trend for mothers; teens with fathers = $F(2, 203) = 5.85$, $p < .01$ and teens with mothers = $F(2, 319) = 2.69$, $p = .08$. Compared with non smoking or former smoking parents, currently smoking parents conveyed lower levels of *disapproval*; mothers' $F(2, 319) = 30.99$, $p < .001$ and fathers' $F(2, 203) = 7.88$, $p < .01$; and less *elaboration of consequences*; mothers' $F(2, 319) = 6.12$, $p < .01$ and fathers' $F = 5.63$, $p < .05$. Former smokers conveyed *higher* levels of *disclosure* than current smoking and nonsmoking parents; mothers' $F(2, 319) = 9.14$, $p < .001$ and fathers' $F(2, 203) = 5.46$, $ps < .01$.

Aim II: Establish whether observed variability in smoking-specific communications incrementally predicts teen smoking patterns

Aim IIA: Test whether observed smoking-specific communications predict teen persistent experimentation above and beyond observed general quality of communication and teen reported smoking-specific socialization

We used hierarchical logistic regression to examine the incremental utility of FTAS codes. Teen persistent experimentation was the dependent variable (0 = *transient* and 1 = *persistent*). Adolescent age, ethnicity (0 = *youth of color* and 1 = non-Hispanic White) and sex (0 = male and 1 = female), parental smoking status, and teen questionnaire reports of parental smoking messages and reactions were entered into the first block. Parent and teen FTAS codes were entered in the second block. We examined FTAS validity separately for teens' interactions with mothers and fathers.

All three teen FTAS codes predicted persistent experimentation (Table 2). Teens who expressed higher *smoking expectancies* with their mothers were more likely to be persistent experimenters (adjusted odds ratio [*AOR*] = 1.21). During interactions with fathers, higher levels of observed teen *disapproval* to fathers were associated with reduced risk of persistent experimentation (*AOR* = 0.79), whereas higher levels of teen *disclosure* were associated with increased likelihood of persistent experimentation (*AOR* = 1.44). There were no main effects of FTAS observed parenting on persistent experimentation, with the exception of trends for maternal *disclosure* and *elaboration of consequences* (Table 2).

Aim IIB: Test whether parental smoking status interacts with observed family communications about smoking in prediction of teen smoking patterns

Parental smoking status interacted with FTAS codes to predict persistent experimentation during interactions with both mothers and fathers. Teen *disclosure* interacted with paternal smoking status ($B = .41$, $p < .05$; Figure 2). Higher levels of teen *disclosure* increased the likelihood of persistent experimentation when

Table 2. Predicting Teen Persistent Experimentation From Observed Teen and Parent Behavior on the FTAS[a]

	Interactions with mothers			Interactions with fathers		
	B	*SE*	*OR* (95% *CI*)	*B*	*SE*	*OR* (95% *CI*)
Covariates						
Teen sex	−0.31	0.29	0.74 (0.41–1.31)	−0.06	0.36	0.94 (0.47–1.90)
Teen ethnicity (reference = White)	0.20	0.30	1.22 (0.67–2.20)	−0.26	0.37	0.77 (0.38–1.59)
Teen age	−0.11	0.24	0.89 (0.56–1.42)	−0.09	0.28	0.91 (0.52–1.59)
Parental smoking status (reference = nonsmokers)						
Current smokers	0.34	0.40	1.41 (0.65–3.06)	−0.43	0.54	0.65 (0.23–1.87)
Former smokers	0.05	0.37	1.06 (0.51–2.20)	−0.13	0.46	0.88 (0.36–2.15)
Parental smoking messages (teen report)	−0.47	0.28	0.62 (0.36–1.08)	−0.16	0.34	0.85 (0.44–1.67)
Parental reactions to smoking (teen report)	0.10	0.21	1.11 (0.74–1.66)	0.05	0.25	1.05 (0.64–1.72)
FTAS observed behaviors						
Teen disapproval	−0.09	0.08	0.91 (0.78–1.07)	−0.23	0.11	0.79* (0.63–0.99)
Teen disclosure	0.10	0.09	1.11 (0.93–1.33)	0.36	0.13	1.44** (1.12–1.85)
Teen expectancies	0.19	0.08	1.21* (1.03–1.42)	−0.08	0.10	0.92 (0.76–1.12)
Parental disapproval	0.05	0.10	1.06 (0.86–1.29)	0.10	0.11	1.10 (0.89–1.37)
Parental disclosure	0.22	0.12	1.24^{+} (0.99–1.56)	−0.03	0.14	0.97 (0.74–1.28)
Parental expectancies	−0.04	0.08	0.96 (0.82–1.13)	0.07	0.10	1.07 (0.89–1.29)
Parental consequences	−0.16	0.09	0.85^{+} (0.72–1.01)	−0.15	0.12	0.87 (0.69–1.09)

Note. FTAS = Family Talk About Smoking; *OR* = odds ratio.
$^{+}p < .10$; $*p < .05$; $**p < .01$; $***p < .001$.

fathers were former smokers (*AOR* = 1.49, 95% *CI* = 1.07–2.08, $p < .05$) but not current (*AOR* = 1.12, *CI* = 0.79–1.57, ns) or nonsmokers (*AOR* =1.00, *CI* = 0.78–1.28, ns). Both maternal *disclosure* ($B = -.60$, $p < .01$) and *elaboration of consequences* ($B = .33$, $p < .01$) interacted with maternal smoking status in predicting persistent experimentation. Higher levels of maternal *disclosure* were associated with *decreased* likelihood of persistent smoking when mothers were current smokers (*AOR* = 0.71, *CI* = 0.50–0.94, $p < .05$), whereas there was a trend for maternal *disclosure* to be associated with *increased* likelihood of persistent smokers when mothers were former smokers (*AOR* = 1.42, *CI* = 0.95–2.08, $p < .10$) with no significant difference when mothers were nonsmokers (*AOR* = 1.19, *CI* = 0.94–1.50, ns; Figure 3). In contrast, higher *elaboration of consequences* was associated with decreased likelihood of persistent smoking when mothers were nonsmokers (*AOR* = .80, *CI* = 0.67–0.95, $p < .05$) but not current (*AOR* = 1.20, *CI* = 0.90–1.61, ns) or

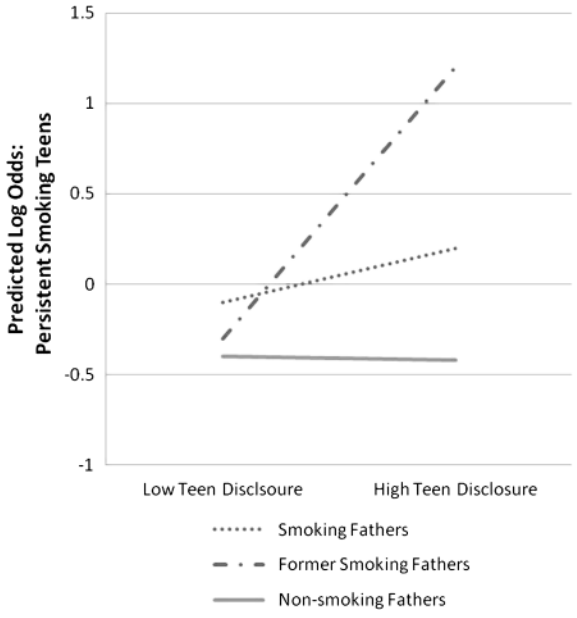

Figure 2. Interaction of teen disclosure to fathers and paternal smoking status in prediction of teen persistent experimentation with smoking (odds ratios converted to log odds).

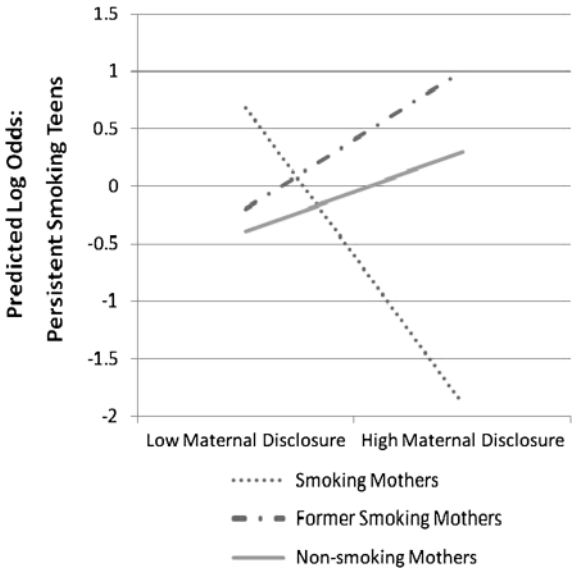

Figure 3. Interaction of observed maternal disclosure and maternal smoking status in prediction of teen persistent experimentation with smoking (odds ratios converted to log odds).

former smokers (*AOR* = .96, *CI* = .72–1.27, ns). (Findings were similar when parental reports of smoking messages and reactions were entered as covariates.)

Discussion

We demonstrated meaningful heterogeneity in family processes for youth at early stages of smoking uptake, with variations by youth and parental smoking status. To our knowledge, the FTAS is the only direct observation method for assessing adolescent–parent conversations about smoking. By providing a standard paradigm for assessment of smoking-specific family processes, the FTAS may enable more nuanced characterization of critical facets of family communications about smoking. As hypothesized, FTAS codes predicted persistence of smoking experimentation over and above questionnaire reports of smoking-specific socialization and observations of general quality of family communication. The differential patterns found for varying facets of smoking-specific communication are consistent with prior work (e.g., Chassin et al., 2005; den Exter Blokland et al., 2006). Thus, the preliminary utility of these direct observations shows promise for demarcating early experimenters who are at highest risk for persistent smoking.

A novel contribution of the FTAS is going beyond parental smoking-specific socialization to consider teen smoking-specific communications within family context. We have demonstrated the incremental utility of teen smoking-specific communications for predicting persistence. Interestingly, salient teen behaviors varied depending on whether conversations were with mothers or fathers. With mothers, variations in teens' observed *expectancies* significantly predicted persistent experimentation. Teens with high *expectancies* often expressed qualified attitudes toward smoking (e.g., social smoking not being "real smoking"), the inevitability of teens smoking if parents smoke, and low self-efficacy for resisting smoking. Furthermore, nearly half of the teens who expressed moderate-to-high *expectancies* also expressed moderate-to-high *disapproval*. This provides direct evidence that teens' smoking cognitions are complex and may combine contradictory elements such as expressed disapproval and expressed predisposition to smoke (Jackson & Dickinson, 2003). With fathers, observed teen *disapproval* reduced the likelihood of persistent experimentation and observed teen *disclosure* increased it. However, this latter pattern was moderated by paternal smoking status. Higher teen *disclosure* increased the odds of persistence only when fathers were former smokers.

Contrary to expectation, there was not a pattern of main effects for FTAS parenting behaviors. This may reflect the powerful effect of parental smoking status on parental socialization of youth smoking behavior. Alternatively, FTAS parenting behaviors may have an effect on longer term youth smoking patterns, which were not captured within the short-term interval in which persistence was assessed. However, striking differences in the relation of maternal behavior were observed based on maternal smoking status for *disclosure and elaboration of consequences*. Thus, higher levels of maternal *disclosure* were associated with reduced likelihood of teen persistent experimentation only if mothers were current smokers. In contrast, increased maternal *elaboration of consequences* was only associated with teens' reduced likelihood of persistent experimentation when mothers were nonsmokers. While interactions of paternal FTAS behaviors with paternal smoking status were not observed, this may reflect reduced power to detect such differences due to the smaller sample of fathers.

Findings warrant replication in representative samples with large numbers of parents and teens along the full smoking continuum. However, they do underscore that the valence of various facets of smoking-specific communication may depend on the interactional context in which they are embedded (e.g., Blatt-Eisengart, Drabick, Monahan, & Steinberg, 2009; McFadyen-Ketchum, Bates, Dodge, & Pettit, 1996). For example, current smoking mothers who are highly disclosing may acknowledge their own struggles around smoking and their difficulty asking their teens to "do what I say not what I do." Openness about this struggle may help adolescents deal with the issue of "mixed messages" when a parent is a smoker. In contrast, the impact of maternal *elaboration of rules* may be attenuated when mothers have been active smokers because the parents' own behavior is contradictory. Fathers who were former smokers were more highly disclosing (including elaboration of quitting narratives), and it is within this interactional context that teen *Disclosure* was associated with increased risk. This suggests the possibility of a modeling effect. Variation in direction of effects for different facets of smoking-specific socialization based on parental smoking status is consistent with prior work (e.g., Chassin et al., 2005; den Exter Blokland et al., 2006). For example, smoking parents report *more* communication about smoking with their teens, whereas nonsmoking parents express more confidence that they can influence their children's behavior (den Exter Blokland et al., 2006).

We conceptualize the FTAS as an "additional informant" rather than as a replacement for questionnaire methods. Varying methods each contribute unique information as well as having systematic sources of bias (Campione-Barr & Smetana, 2004; Eton et al., 2003). For example, questionnaire assessments of smoking-specific communications provide invaluable information about individuals' perceptions of behavior. However, they may also be influenced by reporting biases and are typically not contextualized. In contrast, direct observations capture the *interactive process* of communication. However, they are constrained by the artificial nature of the structured situation, which reduces ecological validity and may introduce reactivity to being observed. Establishing the unique and combined contributions of these methods will importantly inform decisions about their utility within varying samples and study designs.

Content from the FTAS also provides an interesting window on the varied information solicited by different methods. Although we did not directly ask parents if their teen was a smoker, we did ask "*How many cigarettes do you think your child has smoked?*" Averaged across mothers and fathers, approximately 40% of parents said that they believed their teens had never smoked, 30% thought that their teens might have had a few puffs but never a whole cigarette, and 30% reported that they believed their teens had smoked one or more ciga-

rettes. Thus, within a homogenous group of teenage experimenters, fully 70% of parents believed that their teen had not smoked a single cigarette! Furthermore, although the FTAS coding system does not directly code whether teens openly disclosed their own smoking behavior, post-hoc content coding provided this information (Metzger et al., in press). As noted above, teens were assured that they would not be asked to reveal their own smoking behavior on the FTAS, and FTAS triggers were structured accordingly (e.g., "How do today's teens [rather than 'how do you?'] make decisions about cigarette smoking?"). Nevertheless, teens' own smoking behavior was raised for discussion (by parent and/or teen initiation) in slightly more than half of the FTAS discussions with both mothers and fathers (Metzger et al., in press). Within this group, approximately 30% of teens lied about the fact that they had smoked with the remainder of teens fully or partially disclosing the extent of their smoking experimentation (Metzger et al., in press). The implications of these patterns of disclosure for longitudinal prediction of teen smoking patterns remain to be explored.

The present findings must be understood within the context of study limitations. Smoking persistence was assessed over a relatively brief period, so generalizability to long-term smoking trajectories is not clear. Relatedly, our sample was restricted to youth at the experimentation stage. Longitudinal studies that examine the predictive utility of the FTAS from prior to onset through the transition to regular smoking are critical since there is evidence that family influences vary at different stages of the smoking continuum (den Exter Blokland et al., 2006). In addition, we have focused on the predictive utility of individual FTAS codes. Future work that applies latent modeling approaches will be important for elucidating the way in which these facets "fit together" as a *pattern* of smoking-specific communication, how they are embedded in the broader context of family interactions, and the implications of these patterns for individual differences in smoking trajectories.

The present findings have important implications for prevention. "Family Talk" about smoking appears to vary in meaningful ways, including variations in families' capacity for mutually elaborated discourse on smoking. However, these individual differences in family communications have generally not been incorporated into family-based interventions (but see Jackson & Dickinson, 2003). By taking individual differences of parents and teens into account, such tailored approaches have substantial promise for enhancing the capacity of families to reduce the risk of teen smoking for youth at highest risk.

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Declaration of Interests

None declared.

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References

Ary, D., James, L., & Biglan, A. (1999). Parent-daughter discussion to discourage tobacco use: Feasibility and content. *Adolescence*, *34*, 275–282.

Barnes, H. L., Olson, D. H. (1982). Parent-adolescent communication scale. In H. Barnes, H. McCubbin, D. Olson, A. Larsen, M. Muxem, & M. Wilson (Eds)., *Family inventories: Inventories used in a national survey of families across the family life cycle* (pp. 33–48). St. Paul, MN: Family Social Science, University of Minnesota.

Blatt-Eisengart, I., Drabick, D., Monahan, K., & Steinberg, L. (2009). Sex differences in the longitudinal relations among family risk factors and childhood internalizing symptoms. *Developmental Psychology*, *45*, 491–502.

Bricker, J., Peterson, A., Andersen, M., Sarason, I., Rajan, B., & Leroux, B. (2007). Parents' and older siblings' smoking during childhood: Changing influences on smoking acquisition and escalation over the course of escalation. *Nicotine & Tobacco Research*, *9*, 915–926.

Campione-Barr, N., & Smetana, J. (2004). In the eye of the beholder: Subjective and observer ratings of middle-class African-American mother-adolescent dyads. *Developmental Psychology*, *40*, 927–934.

Chassin, L., Presson, C., Rose, J., Sherman, S., Davis, M., & Gonzalez, J. (2005). Parenting style and smoking-specific parenting practices as predictors of adolescent smoking onset. *Journal of Pediatric Psychology*, *30*, 333–344.

Chassin, L., Presson, C., & Sherman, S. J. (1989). "Constructive" vs. "destructive" deviance in adolescent health-related behaviors. *Journal of Youth and Adolescence*, *18*, 245–262.

Chassin, L., Presson, C., Todd, M., Rose, J., & Sherman, D. (1998). Maternal socialization of adolescent smoking: The intergenerational transmission of parenting and smoking. *Developmental Psychology*, *34*, 1189–1202.

Cicchetti, D., Bronen, R., Spencer, S., Haut, S., Berg, A., Oliver, P., et al. (2006). Rating scales, scales of measurement, issues of reliability: Resolving some critical issues for clinicians and researchers. *Journal of Nervous and Mental Disease*, *194*, 557–564.

Cui, M., & Conger, R. (2008). Parenting behavior as mediator and moderator of the association between marital problems and adolescent adjustment. *Journal of Research on Adolescence*, *18*, 261–284.

Darling, N., & Cumsille, P. (2003). Theory, measurement, and methods in study of family influences on adolescent smoking. *Addicition*, *98*(Suppl. 1), 21–36.

den Exter Blokland, E., Hale, W., Meeus, W., & Engels, R. (2006). Parental anti-smoking socialization: Associations between parental anti-smoking socialization practices and early adolescent smoking initiation. *European Addiction Research*, *12*, 25–32.

Dierker, L. C., Avenevoli, S., Goldberg, A. E., & Glantz, M. (2004). Defining subgroups of adolescents at risk for experimental and regular smoking. *Prevention Science*, *5*, 169–183.

Engels, R., & Willemsen, M. (2004). Communication about smoking in Dutch families: Associations between anti-smoking socialization and adolescent smoking-related cognitions. *Health Education Research*, *19*, 227–238.

Ennett, S., Baumann, K., Foshee, V., Pemberton, M. & Hicks, K. (2001). Parent-child communication about adolescent tobacco and alcohol use: What do parents say and does it affect youth behavior? *Journal of Marriage and the Family*, *63*, 48–62.

Eton, D., Fairclough, D., Cella, D., Young, S., Bonomi, P., & Johnson, D. (2003). Early changes in patient-reported health during lung cancer chemotherapy predicts clinical outcomes beyond those predicted by baseline report: Results from the Eastern Cooperative Oncology Group Study 5592. *Journal of Clinical Oncology*, *21*, 1536–1543.

Graber, J., & Brooks-Gunn, J. (1999). Developmental transitions: Linking human development with tobacco prevention research. *Nicotine & Tobacco Research*, *1*, S73–S78.

Harakeh, Z. (2006). *Adolescents as chameleons: Social-environmental factors involved in the development of smoking*. Nijmegen, The Netherlands: Radboud University.

Harakeh, Z., Scholte, R., de Vries, H., & Engels, R. (2005). Parental rules and communication: Their association with adolescent smoking. *Addiction*, *100*, 862–870.

Henriksen, L., & Jackson, C. (1998). Anti-smoking socialization: Relationship to parent and child smoking status. *Health Communication*, *10*, 87–101.

Jackson, C., & Dickinson, D. (2003). Can parents who smoke socialise their children against smoking? Results from the Smoke-Free Kids intervention trial. *Tobacco Control*, *2003*, 52–59.

Jackson, C., & Henriksen, L. (1997). Do as I say: Parent smoking, antismoking socialization, and smoking onset among children. *Addictive Behaviors*, *22*, 107–114.

Lewinsohn, P., Brown, R., Seeley, J., & Ramsey, S. (2000). Psychosocial correlates of cigarette smoking abstinence, experimentation, persistence and frequency during adolescence. *Nicotine & Tobacco Research*, *2*, 121–132.

McFadyen-Ketchum, S., Bates, J., Dodge, K., & Pettit, G. (1996). Patterns of change in early childhood aggressive-disruptive behavior: Gender differences in prediction from early coercive and affectionate mother-child interactions. *Child Development*, *67*, 2417–2433.

Melby, J., & Conger, R. (2001). The Iowa Family Interaction Rating Scales. Instrument summary. In P. Kehrig & K. Lindahl (Eds.), *Family observational coding systems: Resources for systemic research* (pp. 33–58), Mahwah, NJ: Erlbaum.

Metzger, A., Wakschlag, L., Anderson, R., Darfler, A., Price, J., Flores, Z., et al. (in press). *Observed patterns of parental solicitation, adolescent disclosure, and adolescent information management strategies within conversation about cigarette smoking*.

Middlecamp-Kodl, M., & Mermelstein, R. (2004). Beyond modeling: Parenting practices, parental smoking history and adolescent cigarette smoking. *Addictive Behaviors*, *29*, 17–32.

Prokhorov, A., Koehly, L., Pallonen, U., & Hudmon, K. (1998). Adolescent nicotine dependence measured by the Modified Fagerstrom Tolerance Questionnaire at two time points. *Journal of Child and Adolescent Substance Use*, *7*, 35–47.

Schulenberg, J., Maggs, J., & Hurrelman, K. (1997). Negotiating developmental transitions during adolescence and young adulthood. Health risks and opportunities. In J. Schulenberg, J. Maggs & K. Hurrelman Eds. *Health risks and developmental transitions during adolescence* (pp. 1–22), Cambridge: Cambridge University Press.

Wakschlag, L., Chase-Lansdale, P. L., & Brooks-Gunn, J. (1996). Not just "ghosts in the nursery": Contemporaneous intergenerational relationships and parenting in young African-American families. *Child Development*, *67*, 2132–2147.