The Early Use of Alcohol and Tobacco: Its Relation to Children's Competence and Parents' Behavior

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ABSTRACT

Objectives. Use of tobacco and alcohol during childhood predicts heavy use of these substances and use of illicit drugs during adolescence. This study aims to identify developmental correlates of tobacco and alcohol use among elementary-school children.

Methods. Cross-sectional surveys were used to measure tobacco and alcohol use, multiple indicators of child competence, parenting behaviors, and parental modeling of tobacco and alcohol use in a sample of 1470 third- and fifth-grade children. Both self-report and teacher-rated assessments were obtained, which allowed collateral testing of study hypotheses.

Results. Children's tobacco and alcohol use was strongly related to low scores on several measures of child competence, both self-reported and teacher rated. Children's tobacco and alcohol use was also associated with less effective parenting behaviors and with parental use of tobacco and alcohol.

Conclusions. Children's early experience with tobacco and alcohol is associated with weak competence development and exposure to socialization factors that promote risk taking. Interventions to prevent early use of tobacco and alcohol are needed. (*Am J Public Health.* 1997; 87:359–364)

Introduction

Use of tobacco and alcohol during childhood is associated with unresponsiveness to school-based prevention programs and greater risk of substance use during adolescence and adulthood. Demonstration studies of middle-school prevention programs consistently find that children most likely to report substance use after completing such programs are those who reported prior use at baseline.[1–4] Elementary school–aged initiators of cigarette smoking are least likely to attempt to quit or to succeed in quit attempts,[5] and are most likely to smoke as adults.[6] Similarly, the earlier children begin alcohol use, the greater their risk of alcohol misuse during adolescence.[7] According to Kandel's 20-year cohort study of stages of drug use,[8] early use of tobacco and alcohol is the strongest predictor of progression to the use of marijuana and other illicit drugs. Indeed, Kandel et al.[8] conclude that early intervention to delay the onset of tobacco and alcohol use should constitute our principal approach to drug-use prevention.

Although Kandel and other researchers[9–13] advocate early intervention to prevent or delay onset, the field has continued to concentrate on preventing use by adolescents. There is need for research that examines the initial phase of tobacco and alcohol use. Specifically, there is need for research that identifies modifiable risk factors for early use. This study uses child development constructs to broaden the public health model of substance use. Our premise is that certain socialization experiences predispose some children to the early use of alcohol and tobacco. Identifying such predisposing variables may facilitate efforts to develop early-intervention strategies for substance-use prevention.

Socialization, Competence, and Early Use

Socialization is a developmental process through which children learn and internalize the normative beliefs, values, knowledge, skills, and behaviors important to members of their social groups.[14,15] During childhood, socialization processes are fundamentally given over to the development of competencies, including behavioral self-regulation, a positive work orientation, interpersonal skills, and a positive self-image.[14,15] These and other competencies enable children to establish warm and supportive relationships with significant others, to act autonomously, to respond to challenges in their environment, and to achieve at school and elsewhere.[14–17] Children with poorly developed competencies are more likely to develop behavior problems, including conduct problems and social delinquency.[18]

Applied to the present study, the socialization model posits an inverse association between competence and the risk of early use of tobacco and alcohol. Although competence has been widely studied, and has been linked to risk behaviors among adolescents,[18,19] the relation between competence and early substance use by children requires investiga-

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tion.[10,13,20,21] In this study, we examine the association between competence and early use of tobacco and alcohol. We hypothesize inverse associations between measures of children's personal, social, and academic competence and their risk of early use of alcohol and tobacco.

Parental Influence and Early Use

The child-rearing practices of parents or other adult caregivers strongly influence children's competence development. Parents maximize their child's potential to develop competencies by being nurturing and responsive and by exercising firm, assertive control without being permissive or intrusive.[15–17,22] These parenting behaviors have been shown to foster independence, self-esteem, academic achievement, social maturity, and other competencies.[22–27] Thus, an assessment of parenting behaviors may enhance our understanding of children's substance use. On the basis of our hypothesis about the association between child competence and the use of alcohol and tobacco, we expect to find an inverse association between parenting that fosters competence (which we term *effective parenting*) and children's use of alcohol and tobacco.

Parental modeling of tobacco and alcohol use has been widely studied and is generally found to predict adolescents' use of tobacco[28,29] and alcohol.[30–32] In this study, we test whether a similar association exists between parental modeling and use of tobacco and alcohol among elementary-school children. In addition, we assess the relative strength of parenting behaviors and parental modeling as predictors of early use of alcohol and tobacco.

Methods

Sample

The sample included all third- and fifth-grade children enrolled in 12 elementary schools composing a county school district in central North Carolina. Students in this district live in a small city (population 10 500) or in the surrounding rural areas, where population density is approximately 80 people per square mile. Within the district are high-, middle-, and low-income areas; the median family income is approximately $32 000. Of the initial sample (n = 1631), 4% of parents refused permission, 5% of children were absent on the day of the survey, and 1% of children chose not to participate. The study sample includes 90% of third- and fifth-grade children in the school district (n = 1470). The composition of the study sample is 80% White, 18% Black, and 2% other ethnic groups, and 49% of the sample is female.

The sample also includes all third- and fifth-grade teachers (n = 68) in the district. All teachers participated, providing a 100% completion rate for the teacher survey.

Measures

Measures of alcohol and tobacco use, child competence, parenting behaviors, and parental modeling were developed for this study. New measures were used because we could find no measures of alcohol and tobacco use appropriately worded for a third-grade reading level. In addition, as has been noted elsewhere,[33] parenting behaviors and child competencies have been measured with the use of lengthy surveys or interviews, or observation protocols lasting several hours. These formats were not feasible in the present survey research study.

Child tobacco and alcohol use. A conservative cross-check method was used: tobacco or alcohol use was coded a *yes* when children consistently reported values indicating some level of use (e.g., smoking "one or two puffs" or more; drinking "most or all of one can of beer, glass of wine, or other drink with alcohol" or more) in response to questions about lifetime use, most use in one day, and grade at first use. Tobacco or alcohol use was coded as *no* when children consistently reported values indicating nonuse (i.e., "never" or "none"), had sipped a drink with alcohol but consistently reported no additional use, or were inconsistent in their reporting of any use. Because third-grade children require more time to complete surveys, we did not collect data on alcohol use from them. Thus, we report on tobacco use for both grades, and on alcohol use only for fifth grade.

Competence. The child survey included 27 items measuring self-regulation, self-esteem, work orientation, peer acceptance, and resistance to peer pressure. Item selection was guided by an earlier study in which we used factor analysis to develop measures of self-esteem, work orientation, and peer acceptance.[33] Sample items are "I argue a lot with other kids" (self-regulation); "I feel good about who I am" (self-esteem); "I try hard at school" (work orientation); "I feel left out by other kids" (peer acceptance); and "I let other kids tell me what to do" (resistance to peer pressure). Students responded to all statements using a 4-point scale labeled "Just Like Me," "A Lot Like Me," "Sort of Like Me," and "Not Like Me." Cronbach's alpha was used to assess the reliability of the competence measures; the coefficients for self-regulation, self-esteem, work orientation, peer acceptance, and resistance to peer pressure were .74, .82, .76, .79, and .66, respectively.

Parenting behaviors. Children completed 20 items measuring effective parenting behaviors. These items assess various aspects of effective parenting identified in the literature,[15–17,22] such as parental acceptance, rule setting, and supervision behaviors. Perceived parenting is measured because what children believe to be true about their parents' treatment of them will affect their attitudes and behaviors. All items pertained to mothers' (or stepmothers' or female guardians') behaviors because there was insufficient time to record separate responses about both parents, and we expected that children living with one parent were more likely to live with a mother (or stepmother) than with a father.[34] Sample parenting items are "She likes me just the way I am," "She has rules that I must follow," and "She knows where I am after school." Children responded to all statements using a 4-point scale labeled "Just Like Her," "A Lot Like Her," "Sort of Like Her," and "Not Like Her." Consistent with our earlier description of the effective-parenting construct, items measuring permissive or intrusive behaviors were reverse coded so that higher scores indicate more effective parenting. Cronbach's alpha for the effective parenting measure was .83.

Parental modeling. Children who reported that one or both parents were current cigarette smokers were coded as having exposure to parental modeling of smoking; children who reported that both parents were nonsmokers were coded as having no current exposure to parent modeling of smoking. Similarly, children who reported that one or both parents drank alcohol daily or weekly were coded as having frequent exposure to parental modeling of alcohol use; children who reported that both parents drank alcohol once a month or less often were coded as having infrequent exposure to parental modeling of alcohol use.

Teacher-rated competence. The teacher survey is a brief checklist instrument developed to obtain teachers' global assessments of students' academic abilities, social skills, and self-confidence. Teachers ranked each of their students as

having high, moderate, or low levels of each competence.

Teacher-rated parental support. The teacher survey also obtained teachers' global assessments of parental support. Teachers ranked each of their students as having high, moderate, or low levels of parental support.

Survey Protocol

A passive consent protocol was used to obtain parental permission, followed by an active consent protocol to obtain children's permission. Both mail and take-home channels were used to deliver consent forms to parents, and postage-paid refusal postcards were included with each form. All data were collected in the classroom. A tear-off page with children's names was used to deliver surveys to children with parental permission. An active consent transcript informed children that they could choose not to participate in the survey, that they could skip any questions they did not want to answer, and that they could stop participating at any time. The survey items were read aloud by graduate students who underwent extensive training to standardize the pace and modulation of their reading and to standardize their responses to predicted questions from students. Teachers were present in the classroom during administration, but they stayed at their desks to protect the confidentiality of student responses.

Analyses

For the attrition analysis, *t* tests were used to compare respondents with nonrespondents, and for a construct validity check, correlations between the competence and parenting measures are reported. The study hypotheses are tested with both the teacher and child data. Logistic regression analysis is used to accommodate the dichotomous tobacco and alcohol use variables; specifically, we regress (1) tobacco and alcohol use on each competence or parenting variable, (2) tobacco and alcohol use on all competence variables, and (3) tobacco and alcohol use on the parenting and parental modeling variables. All of the regression analyses are adjusted for age and gender differences in tobacco and alcohol use.

Results

Attrition Analysis

Using the school district's student information database, we found no differences in the grade, gender, and race distributions of responding (n = 1470) and nonresponding (n = 161) students. Because we obtained teacher-rated competence and teacher-rated parental support data on all students, we compared responding and nonresponding students on these variables. When all 161 nonrespondents (including 97 children with learning disabilities) were analyzed, *t* tests indicated that nonrespondents had significantly lower academic competence ($t = 3.4$; $P < .001$), social skills ($t = 2.9$; $P < .01$), and self-confidence ($t = 2.7$; $P < .01$), but did not differ in parental support. We also compared nonrespondents who did not have learning disabilities (n = 64) with respondents and found that this subgroup of nonrespondents had significantly lower academic competence ($t = 2.5$; $P < .05$) and social skills ($t = 2.4$; $P < .05$), but did not differ from respondents in self-confidence and parental support. Although these data indicate an attrition bias, the percentage of nonrespondents in the sample is low, and because competence levels are inversely related to early substance use, these differences would probably exert a conservative bias on the proportion of children reporting use and on associations between use and academic competence and social skills.

TABLE 1—Rates and Adjusted Odds Ratios for Tobacco and Alcohol Use among Third- and Fifth-Grade Students, by Level of Teacher-Rated Child Competence and Parental Support

	Tobacco Use[a]			Alcohol Use[b]		
	%	OR[c]	95% CI	%	OR[d]	95% CI
Academic abilities						
High	9.7			17.5		
Moderate	17.0	1.9***	1.3, 2.7	31.5	2.1***	1.4, 3.2
Low	20.6	2.3***	1.5, 3.5	35.3	2.4**	1.4, 4.0
Social skills						
High	10.1			18.1		
Moderate	17.3	1.8**	1.3, 2.6	32.8	2.1***	1.4, 3.2
Low	20.3	2.1**	1.3, 3.2	33.3	2.0**	1.1, 3.5
Self-confidence						
High	11.4			21.0		
Moderate	15.8	1.4	0.97, 2.0	28.5	1.4	0.92, 2.1
Low	19.2	1.8**	1.2, 2.7	35.0	1.8*	1.2, 3.0
Parental support						
High	9.9			17.6		
Moderate	18.1	2.0***	1.4, 2.8	33.7	2.4***	1.6, 3.6
Low	21.7	2.6***	1.7, 3.9	36.9	2.7***	1.6, 4.5
All students	15.3			27.5		

Note. OR = odds ratio; CI = confidence interval.
[a]All third- and fifth-grade students with complete data (n = 1441).
[b]All fifth-grade students with complete data (n = 640).
[c]Adjusted for age and gender; referent category is high-competence group.
[d]Adjusted for gender; referent category is high-competence group.
*$P < .05$; **$P < .01$; ***$P < .001$.

Parenting and Competence

As a check on the construct validity of the effective parenting and child competence measures, we first examined the correlations between these variables. Consistent with other studies[23,25,26] and our conceptual model, we find positive correlations between effective parenting and child self-esteem ($r = .35$; $P < .01$), self-regulation ($r = .42$; $P < .01$), work orientation ($r = .37$; $P < .01$), peer resistance ($r = .14$; $P < .01$), and peer acceptance ($r = .26$; $P < .01$).

Child Competence and Early Use

Use of tobacco was reported by 10.3% of third-grade children (n = 788), 21% of fifth-grade children (n = 682), and 15.3% of all children (n = 1470). Alcohol use was reported by 27.5% of fifth-grade children. Using the teacher-rated competence variables, we compared tobacco and alcohol use of children identified by teachers as having high, moderate, or low levels of each competence (Table 1). The results, adjusted for age and gender, clearly reveal the hypoth-

TABLE 2—Adjusted Odds Ratios for Tobacco and Alcohol Use among Third- and Fifth-Grade Students, by Child-Rated Competence Variables

Competence Variables	Tobacco Use[a]		Alcohol Use[b]	
	OR[c]	95% CI	OR[d]	95% CI
Self-regulation	1.19****	1.15, 1.23	1.14****	1.08, 1.18
Self-esteem	1.11****	1.07, 1.14	1.08***	1.03, 1.12
Work orientation	1.14****	1.09, 1.17	1.10****	1.05, 1.14
Resistance	1.11**	1.02, 1.19	0.95	0.85, 1.06
Peer acceptance	1.04*	1.01, 1.09	1.01	0.96, 1.07

Note. OR = odds ratio; CI = confidence interval.
[a]All third- and fifth-grade students with complete data (n = 1441).
[b]All fifth-grade students with complete data (n = 640).
[c]Adjusted for age and gender.
[d]Adjusted for gender.
*$P < .05$; **$P < .01$; ***$P < .001$; ****$P < .0001$.

TABLE 3—Logistic Regressions of Tobacco and Alcohol Use among Third- and Fifth-Grade Students on Teacher-Rated and Child-Rated Competence Variables

	Tobacco Use[a]		Alcohol Use[b]	
	OR[c]	95% CI	OR[d]	95% CI
Teacher-rated competence				
Academic abilities	1.42**	1.11, 1.83	1.47**	1.09, 1.99
Social skills	1.33*	1.02, 1.77	1.37	0.97, 1.94
Self-confidence	0.93	0.69, 1.25	0.92	0.64, 1.31
Child-rated competence				
Self-regulation	1.15****	1.10, 1.21	1.12****	1.06, 1.19
Self-esteem	1.07****	1.03, 1.12	1.08***	1.03, 1.13
Work orientation	1.03	0.98, 1.08	1.02	0.96, 1.08
Resistance	0.99	0.92, 1.09	0.88	0.78, .99
Peer acceptance	0.97	0.92, 1.02	0.95	0.89, 1.01

Note. OR = odds ratio; CI = confidence interval.
[a]All third- and fifth-grade students with complete data (n = 1441).
[b]All fifth-grade students with complete data (n = 640).
[c]Adjusted for age and gender.
[d]Adjusted for gender.
*$P < .05$; **$P < .01$; ***$P < .001$; ****$P < .0001$.

esized relationship—use of tobacco and alcohol increases as competence levels decrease. With the high-competence group as the referent category, the odds ratios in Table 1 indicate that children with low levels of competence are at least twice as likely to report early use of tobacco and alcohol as children having high levels of competence.

The association between child competence and early use was also examined with the children's self-report data. The results also support the study hypothesis (Table 2). The odds of tobacco use show significant increases associated with unit changes in scores on the competence measures. (Scores on the competence measures were reverse coded so that higher values indicate lower competence.) Thus, the lower children's self-reported competence, the greater their odds of reporting tobacco use. For alcohol, the odds of use show significant increases associated with unit changes in scores on the self-regulation, self-esteem, and work-orientation measures. Again, the lower children's self-reported competence, the greater their odds of reporting alcohol use. Interestingly, the peer-related competencies (resistance to peer pressure and peer acceptance) were not associated with alcohol use.

The results in Tables 1 and 2 are affected by the level of measurement of the predictor variables. The teacher-rated competence measures were dummy coded; the results in Table 1 indicate the change in the odds ratios of tobacco or alcohol use for children in the moderate (or low) group when compared with children in the high group. The child-rated competence measures are interval measures; the results in Table 2 can be interpreted as the expected multiplicative effect on the odds of tobacco or alcohol use per unit change in the factor in the table. For example, for a unit increase in self-regulation, the expected odds of tobacco use increase by 1.19 (all other factors being held constant; Table 2).

Four logistic regression analyses were conducted to examine the relative strength of the competence variables in predicting use (Table 3). First, tobacco use was regressed on the set of teacher-rated competencies; second, tobacco use was regressed on the set of child-rated competencies. These models also included age and gender as predictors. Third, alcohol use was regressed on the set of teacher-rated competencies; fourth, alcohol use was regressed on the set of child-rated competencies. These models included gender as a predictor (not age, since only fifth-grade students reported alcohol use).

As expected, these analyses indicate that age and gender are significant predictors, with males and older children being more likely to report tobacco use and, among fifth-grade students, males being more likely to report alcohol use. The regression models with all teacher-rated competence variables indicate that academic competence is most strongly associated with both tobacco and alcohol use (Table 3). The regression models with all child-rated competence variables indicate that self-regulation and self-esteem are most strongly associated with tobacco and alcohol use (Table 3).

Parenting and Early Use

To examine variation in children's tobacco and alcohol use across levels of effective parenting, scores on the effective parenting index were standardized and sorted into high, moderate, and low levels (with high and low levels including scores greater than 1 or −1 SD from the mean, respectively). The proportion of children reporting tobacco and alcohol use was computed for the levels of effective parenting. When high and low levels of effective parenting were compared, 9.2% and 28.5% (respectively) of children reported tobacco use, and 14.4% and 47.7% (respectively) of children reported alcohol use.

We hypothesized inverse relationships between tobacco and alcohol use and teacher-rated parental support or child-rated effective parenting. The teacher ratings of parental support, adjusted for age and gender, have a strong inverse association with tobacco and alcohol use (Table 1). Children with a low level of teacher-rated parental support are more than twice as likely to report tobacco and alcohol use than children with a high level of support. With the child data, we find that the odds of tobacco or alcohol use show significant increases associated with unit changes in scores on effective parenting. Specifically, the lower children's perceptions of effective parenting behaviors, the more likely children are to report use of tobacco and alcohol (models A1 and B1, Table 4).

TABLE 4—Logistic Regressions of Tobacco and Alcohol Use among Third- and Fifth-Grade Students on Parental Modeling and Effective Parenting

	Tobacco Use[a]		Alcohol Use[b]	
	OR[c]	95% CI	OR[d]	95% CI
	Model A1		**Model B1**	
Effective parenting	1.05*	1.03, 1.07	1.05*	1.03, 1.07
	Model A2		**Model B2**	
Parental modeling	2.45*	1.79, 3.36	2.86*	1.97, 4.16
	Model A3		**Model B3**	
Effective parenting	1.04*	1.03, 1.06	1.05*	1.03, 1.07
Parental modeling	2.21*	1.61, 3.06	2.69*	1.84, 3.95

Note. OR = odds ratio; CI = confidence interval.
[a]All third- and fifth-grade students with complete data (n = 1441).
[b]All fifth-grade students with complete data (n = 640).
[c]Adjusted for age and gender.
[d]Adjusted for gender.
*$P < .0001$.

Parental Modeling and Early Use

Parental modeling is known to influence adolescents' experimental and regular use of tobacco and alcohol. Our results show that children's use of tobacco and alcohol is also strongly associated with parental modeling. Specifically, 9.8% of children report tobacco use when neither parent is a current smoker, and 21% of children report tobacco use when one or both parents are current smokers. Compared with children of nonsmoking parents, children with at least one parent who smokes are more than twice as likely to report tobacco use (model A2, Table 4). When both parents drink alcohol monthly or less frequently, 20.7% of children report alcohol use; when one or both parents drink weekly or daily, 43.6% of children report alcohol use. Compared with children of infrequent drinkers, children whose parents drink frequently are nearly three times as likely to report alcohol use (model B2, Table 4).

Effective Parenting, Parental Modeling, and Early Use

Our final analysis examines the relative strength of the associations of parental modeling and effective parenting with early substance use. We regressed tobacco use on parental modeling of smoking, effective parenting, age, and gender. The results indicate that each of the parent variables is significantly associated with early use of tobacco. In a second model, we regressed alcohol use on parental modeling, effective parenting, and gender. This model similarly indicates that parental modeling of alcohol use and effective parenting have independent associations with children's alcohol use (models A3 and B3, Table 4).

Discussion

The results of our study indicate that use of tobacco and alcohol during childhood has a strong inverse association with several measures of child competence, both self-reported and teacher rated. Early use was also inversely associated with perceived effective parenting and positively associated with parental modeling of use. The child development literature indicates that competence level and parenting behaviors remain relatively stable during childhood. Thus, early use is related to weak competence development and socialization factors that are likely to have persistent negative consequences for substance-use behaviors.

Early use of alcohol has not been widely studied. An important finding of this study is that alcohol and tobacco use are associated with child competencies, effective parenting, and parental modeling in basically the same manner. The similarity of results for alcohol and tobacco is consistent with the socialization model, which posits that problems in social development underlie tobacco use, alcohol use, and other risk-taking behaviors of children.

This study is the first to compare the combined association of parental modeling and parenting behaviors with early use. We were somewhat surprised to find that effective parenting is as strongly associated with child tobacco and alcohol use as parental modeling. These findings underscore a shortcoming of current prevention programs, which generally do not have as a primary objective changing parenting behaviors or parental modeling to prevent children's substance use.

Direct modeling of how to use tobacco and alcohol is only one of several ways that parental use may influence children's use of these substances. Parental use also may provide children easier access to tobacco and alcohol, communicate information about the physical and psychological effects of use, and convey positive norms about tobacco and alcohol. Research is needed to determine which aspects of parental use are most important in influencing children's attitudes and behaviors. Research on parental use must also address the fact that adult use of tobacco and alcohol carry different implications for health. For adults, moderate and responsible alcohol use is not regarded as unhealthful and may even be health promoting. How, then, can parents engage in such use without tacitly encouraging alcohol use by their children? A related issue, also in need of investigation, is the effect of allowing children to consume alcohol at home, which some parents believe will reduce the likelihood of excessive use of alcohol in other social contexts. Many questions remain about the effects of such *substance-specific* socialization—a process that encompasses much more than direct modeling by parents of tobacco and alcohol use.

The principal limitations of the present study are its cross-sectional de-

sign, the lack of information on fathers' parenting behaviors and on actual parenting behaviors, and the lack of information on children's social class. With cross-sectional data, we are limited to testing relational hypotheses and cannot infer causal links between the study variables. Lacking prospective data, we cannot determine whether early substance use results from, or is the cause of, weak competence development. We also cannot determine how much of the relationship between parenting and early use is direct and how much is mediated by the effects of parenting behaviors on competence development. Because this study includes no information on fathers' parenting and uses measures of perceived rather than actual parenting behaviors, the study results are not directly applicable to programs aiming to influence parenting behaviors. Without data on social class, we lack knowledge of a critical dimension of children's social environment.

The findings of this study provide strong support for the hypothesized associations between child socialization variables and early use of tobacco and alcohol. Early use is significantly less likely to occur among children with strong competence development, high levels of effective parenting, no exposure to parental modeling of tobacco use, and infrequent exposure to parental modeling of alcohol use. Additional research to establish causal connections between parenting behaviors, children's competence, and early use is needed to clarify objectives for intervention strategies to prevent substance use in childhood. □

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