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Perceived vs. Actual Friends' Use of Alcohol, Cigarettes, Marijuana, and Cocaine: Which Has the Most Influence?

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Determinants of the use of alcohol, alcohol without parental knowledge, cigarettes, marijuana, and crack were assessed in predominantly black, urban, fourth- and fifth-grade students. Each subject identified three best friends. Logistic and least-square regression analyses indicated that children's perceptions of friends' use, perceptions of family use, and actual use of classmates were better predictors of substance use than friends' actual use. The pattern of predictors suggested that peer behaviors and attitudes are more influential for children's socially censured behaviors such as using alcohol without parental permission than for more socially approved behaviors such as using alcohol with parental permission. The importance of perceived friends' use vs. friends' actual use supports Behavioral Intention Theory and Cognitive Developmental Theory, while the importance of classroom use supports Social Learning

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Theory or may reflect social and environmental conditions including neighborhood availability of drugs and neighborhood values regarding substance use.

INTRODUCTION

Use of abusable substances usually begins before the senior year in high school (Baumrind, 1985; Kandel, 1978; Johnston, 1985; Johnston *et al.*, 1989). Evidence suggests that early age of first use is associated with later problem use (Flay *et al.*, 1989) and psychiatric disorders (Robins and Przybeck, 1985), with increased probability when first use occurs before age 15. Knowledge of the correlates of early substance use should contribute to intervention efforts directed at prevention.

Among the dominant theoretical approaches to the development of children's health behaviors, including substance use, are Social Learning Theory (SLT), Behavioral Intention Theory (BIT), and Cognitive Developmental Theory (CDT) (Bush and Iannotti, 1985). SLT (Bandura, 1972) has been used to explain the association between environmental factors, such as the substance use of peers and family, and the incidence and prevalence of substance use from late childhood to early adulthood. BIT (Fishbein and Ajzen, 1975) suggests that environmental factors contribute to the development of attitudes toward these behaviors, particularly normative beliefs, which affect intentions and subsequent behaviors. In CDT (Inhelder and Piaget, 1958), the actual environment is not as important as the child's perception or understanding of this environment; it is this pattern of understanding that is believed to influence the child's behaviors such as those related to health and substance use. Few studies have compared SLT and CDT by examining whether the influence of peer and family use on a child's use is dependent on the family and peers' *actual* behavior, or on the child's *perception* of their behaviors.

Johnson (1989) and Kaplan (1975) provide support for a causal sequence in which early deviant behaviors lead to association with deviant peers, which then contributes to further deviant behavior. However, the assessment of peer behavior was based on subjects' perceptions rather than the self-report of their peers. These findings are consistent with other studies examining the influence of perceptions of friends' substance use on both incidence and prevalence of substance use in children (Brook *et al.*, 1983, 1989; Chassin *et al.*, 1986; Mittelmark *et al.*, 1987; Richardson *et al.*, 1989). Sheppard (1989) reported that perceptions of the general use of agemates were not related to substance use or intentions to use, but the influence of perceptions of friends' use was not evaluated. A composite measure of peer drug associations that included perceived peer use, per-

ceived peer pressure to use, and reported peer offering of drugs was shown to have a significant association with adolescent drug use (Swain *et al.*, 1989). In one of the few studies in which both perceived and actual use of friends and family were measured, Wilks *et al.* (1989) provided support for the hypothesis that perceived friends' substance use is more important than their actual use as an influence on adolescents' substance use.

In prior research (Bush and Iannotti, 1985, 1988, 1990), elementary school students (stratified by socioeconomic status, gender, and Grade, K–6) were interviewed twice in three years, and their primary caretakers were interviewed during the second phase. However, no information was obtained in either phase from identified friends. In the first phase, perceived family use of alcohol, cigarettes, and marijuana were related to children's use and expectations to use these substances. The number of family users was correlated with the children's use and use expectations for alcohol and marijuana, but not for cigarettes. One family member who smoked doubled the probability that a child had tried smoking or expected to smoke, but the probability did not increase if there were more smokers in the home.

The Children's Health Belief Model (CHBM; Bush and Iannotti, 1985, 1990) was developed to guide the prediction of children's health behaviors and behavioral intentions. As described elsewhere (Bush and Iannotti, 1985), the CHBM integrated elements of the major theoretical models, particularly SLT, into the classic Health Belief Model (HBM). Factors consistent with theories of the development of children's health behaviors were found to impact on children's abusable substance use and use intentions. The CHBM explained 42% of the adjusted variance in children's use and intentions to use alcohol, and 28% of the variance in children's use and intentions to use cigarettes (Iannotti *et al.*, 1986). Family use explained more variance in the alcohol use variable than perceived peer use, whereas perceived peer use explained more variance in the cigarette use variable than family use, providing insight into differences in family influence relative to different substances. Perceived peer substance use was more influential when children were three years older. Also, alcohol use in the second phase was predicted by perceived peer use, i.e., an estimate of the number of classmates who used alcohol, assessed when the children were three years younger.

Parental attitudes and use or perceptions of these may be significant predictors of children's substance use (Chassin *et al.*, 1986; Newman and Ward, 1989); however, the influence of parents relative to peers may be negligible in older children (Mittelmark *et al.*, 1987; Needle *et al.*, 1986; Smith *et al.*, 1989). According to Glynn's (1981) review, the relative influence of family and peers varies with the substance, but there is no point where the drug behavior of most adolescents is wholly influenced by either

alone. It seems likely that perception of family use would be more important in predicting alcohol use with family members than in predicting cigarette or marijuana use, or alcohol use without parental knowledge.

Although the previous work has shown that both family use and perceived peer use influence preadolescent's use and expectations to use alcohol, and that perceived peer use of cigarettes may have a stronger influence on preadolescent's use and expectations to use cigarettes than family cigarette use, questions remain about the relative importance of perceived vs. actual use of family and peers. It is assumed that a child's family and peers are the most important persons in the child's environment, providing a source of normative beliefs and expectations as well as modeling behaviors. Which has more influence, the actual behaviors and attitudes of these persons as suggested by SLT, or the child's perceptions of their behavior and attitudes, as suggested by CDT?

SLT suggests that behavior is directly determined by specific environmental influences including learning by direct observation (modeling). SLT would predict that peer behavior has a direct effect on children's behavior. According to CDT, children's beliefs and attitudes develop through social experiences and the accommodation of personal attitudes to these experiences when there is a discrepancy between the two (Youniss, 1980). At the same time, children assimilate social experiences into their existing attitude structures, i.e., their attitudes interpret social events. Children's perceptions of peers and peer behaviors are developed within the context of their own beliefs and attitudes. It is children's beliefs and attitudes that are ultimately the basis for actions. Perceptions of peers' use and attitudes may provide a justification or rationale for the child's behavior, so that these perceptions are little more than surrogates for measures of the child's attitudes. Based on CDT, it is hypothesized that children's perceptions of peers' behaviors, reflecting assimilation or interpretation of the behavior of others, are better predictors of children's behaviors than the actual behavior of their peers.

A second hypothesis is based on the notion that the closer the peer association the stronger the influence. Therefore, it is hypothesized that the child's friends' use of abusable substances is more strongly associated with the child's use than the child's classmates' use.

The third and fourth hypotheses involve the relative influence of peer attitudes vs. peer use. For preadolescent children, the attitudes of their classmates may have more influence than the actual behavior, especially when the behavior is generally disapproved, i.e., use of abusable substances. Peers may verbalize a position against substance use in the classroom, while expressing different attitudes or actually using substances in private or with close friends. Thus, it was hypothesized that children's use is more strongly

associated with classmates' attitudes than with actual classmates' use. If the peers are close friends, however, their behaviors are likely to be known and to be more important than any attitudes they may have. Thus, it was hypothesized that the substance use of close friends is more strongly associated with children's use than the attitudes of close friends.

METHODS

Overview

For this study, surveys were used to identify attitudes, use, and use intentions for abusable substances (alcohol, cigarettes, marijuana, crack cocaine, and alcohol without parental knowledge), as well as perceptions of attitudes and use of family and friends. Subjects identified their three best friends in their class on sociometric questionnaires. Cross-referencing the sociometric questionnaires and the surveys permitted identification of the actual reported use and attitudes of the friendship groups.

Subjects

Surveys and sociometric questionnaires were administered to 2078 fourth grades and 1082 fifth graders in 81 schools; about 12% of the students were absent or had transferred, less than 1% refused, and 30 surveys were discarded because of inconsistent responses. Of the surveyed students, 90% were black, 2% white, 3% Hispanic, 1% Asian, and 4% other. The median and modal ages were 10 (range 8–12), with 51% of the children females.

Survey

Following assurances of confidentiality, students completed the survey, consisting of fixed-choice questions, in their classrooms. Each item with corresponding choices was projected on a slide screen and read to the class by a member of the research staff. Children marked their responses on special answer sheets created to correspond to these questions without containing any indication as to the content of questions or answers. Items were read as often as necessary until all children had an opportunity to mark their answer sheets. The answer sheets, which did not contain identifiers, were placed by the children in envelopes bearing identifying codes; the en-

Table I. Frequency of Fourth- and Fifth-Grade Children Reporting Use of Individual and Multiple Abusable Substances (N = 3073)

Item	Frequency of positive response (%)
Reported substance use	
Alcohol	51.5
Alcohol without parent knowledge	14.9
Cigarettes	18.5
Marijuana	2.3
Multiple substance use	
Zero	40.6
One	42.4
Two	15.3
Three	1.5
All four	0.3

velopes were then sealed and dropped through a slot in a box for transport to the research site.

Behaviors assessed were use of *cigarettes, alcohol* (beer, wine, liquor, wine cooler), *marijuana, cocaine/crack,* and *alcohol without parental knowledge.* Age of first use and frequency of use were assessed for each abusable substance. To increase validity of responses, questions relating to substance use were posed in a way that assumed the child has used the substance, e.g., "How old were you when you first . . . ?" with the option *Never have* following the choices for age of first use. An abusable substance use score (range of 0–4) was created by summing the number of substances — cigarettes, alcohol, marijuana, or crack — that each child had tried.

Perceived friends' use and *perceived family use* were assessed for each of the four substances. Each child also indicated his/her degree of *concern about* a best *friends' use* of each abusable substance and perceived *peer pressure* from friends to use these substances. Concern and peer pressure were measured with a 5-point Likert scale ranging from 1 *(not at all)* to 5 *(a lot).*

Socioeconomic status (SES) was based on the percentage of children eligible at each school for the school lunch program supported by the federal government (Title 1); schools were ranked and the list divided into thirds. This measure was significantly associated with the average income of families in the school census tract ($F[2,106] = 14.8, p < .0001$), and the percentage of adults graduating from high school ($F[2,106] = 6.9, p < .01$). The average family income was $21,625, $19,343 in the schools designated as lower SES, and $24,569 in the schools designated as higher SES.

Table II. Correlations with Number of Abusable Substances Used as Reported by Fourth- and Fifth-Grade Children (N = 3073)

Variable	r
Gender[a]	−.11[h]
Socioeconomic status[b]	.11[h]
Age[c]	.07[h]
Race[d]	.00
Perceived use of friends[e]	.29[h]
Friends' use[f]	.12[h]
Perceived family use[e]	.26[h]
Perceived peer pressure[e]	.01
Friends' concern for friends'use[f]	−.12[h]
Classroom use[g]	.25[h]
Classroom concern[g]	−.02

[a]Coded male = 0, female = 1.
[b]Coded 1, 2, or 3, low to high.
[c]Age in years.
[d]Coded other = 0, black = 1.
[e]Perceived friends' use, perceived family use, and perceived peer pressure were based on subject's response.
[f]Friends' use and friends' concern for friends' use were based on responses of three friends designated by the subject.
[g]Classroom variables were based on the response of all classmates excluding subject.
[h]$p < .0001$.

RESULTS

The frequency of children who reported use of each of the four abusable substances or use of multiple substances is presented in Table I. Alcohol has been tried by a majority of these elementary schoolchildren and a small percentage have tried marijuana or crack. Of all children, 14.9% indicated they have used alcohol without their mothers knowing about it.

Pearson correlations between the variables of interest and children's use of abusable substances are presented in Table II. The most notable first-order correlation was between the perceived substance use of friends and the substance use of the target student ($r = 0.29, p < .0001$), accounting for 8.3% of the variance in substance use. Other variables significant at the $p < .0001$ level and accounting for more than 6% of the variance included perceived substance use of family members and the use reported by the child's classmates. Personal variables associated with substance use ($p < .0001$) included male gender, higher SES, and older age.

Table III. Change in Logistic Regression Model Chi-Squares and Least-Square Regression R^2 for Three Abusable Substances

Independent variables	Alcohol[a] χ^2	*df*	Alcohol[b] χ^2	*df*	Cigarettes χ^2	*df*	Marijuana χ^2	*df*	Multiple substances Adjusted R^2	*df*
Demographic variables[c]	117.8^k	4	54.6^k	4	27.4^k	4	11.4^h	4	$.028^k$	4,3069
Additional Independent Variables[d]										
Perceived friends' use[e] (A)	137.5^k	5	32.4^k	5	144.9^k	5	51.9^k	5	$.077^k$	5,3068
Friends' use[f] (B)	13.3^j	5	0.4	5	10.8j	5	6.4^i	5	$.007^k$	5,3068
A and B	$147.6_{A,B}$	6	32.6_A	6	$151.8_{A,B}$	6	$59.9_{A,B}$	6	$.082_{A,B}$	6,3067
Perceived family use[e] (C)	210.3^k	5	21.1^k	5	72.9^k	5	26.9j	5	$.064^k$	5,3068
A and C	$301.1_{A,C}$	6	$45.2_{A,C}$	6	$194.8_{A,C}$	6	$63.8_{A,C}$	6	$.116_{A,C}$	6,3067
Perceived peer pressure[e] (D)	1.4	5	2.1	5	0.2	5	1.0	5	.000	5,3068
B and D	14.5_B	6	2.4	6	11.1_B	6	7.2_B	6	$.007_B$	6,3067
Friends' concern for friends' use[f] (E)	33.7^k	5	25.1^k	5	15.7^k	5	12.7^j	5	$.011^k$	5,3068
B and E	$47.4_{B,E}$	6	25.6_E	6	$26.4_{B,E}$	6	$17.9_{B,E}$	6	$.017_{B,E}$	6,3067
Classroom use[g] (F)	118.3^k	5	18.2^k	5	120.3^k	5	44.8^k	5	$.053^k$	5,3068
B and F	118.5_F	6	18.5_F	6	120.5_F	6	45.3_F	6	$.053_F$	6,3067
Classroom concern for friends' use[g] (G)	7.4^i	5	5.1^h	5	0.1	5	0.3	5	$.001^h$	5,3068
F and G	118.8_F	6	20.2_F	6	120.4_F	6	45.0_F	6	$.052_F$	6,3067

[a]Alcohol use.
[b]Alcohol use without parental knowledge.
[c]Demographic variables included in all analyses: gender, male = 0, female = 1; socioeconomic status, 1, 2, or 3, low to high; age in years; race, other = 0, black = 1.
[d]Except for the regression for multiple substance use, variables refer to the target substance only; for single independent variables, significance levels indicate the contribution of that variable; for combinations of independent variables, $_{A,B,C,D,E,F,G}$ indicate those variables making a contribution to the model at $p < .05$.
[e]Perceived friends' use, perceived family use, and perceived peer pressure were based on subject's response.
[f]Friends' use and friends' concern for friends' use were based on responses of three friends designated by the subject.
[g]Classroom variables were based on the response of all classmates excluding subject.
[h]$p < .05$.
[i]$p < .01$.
[j]$p < .001$.
[k]$p < .0001$.

Table IV. Logistic Regression Odds Ratios and Least-Square Regression Betas for Three Abusable Substances

Independent variables	Odds ratios				Beta: Multiple substances
	Alcohol[a]	Alcohol[b]	Cigarettes	Marijuana	
Gender[c]	.66[m]	.59[m]	.89	.43[j]	−.085[l]
Socioeconomic status[d]	1.20[k]	1.18[j]	1.03	1.10	.047[l]
Age[e]	1.06	1.13[j]	1.03	1.10	.038[j]
Race[f]	1.16	1.10	.74	.51	−.011
Perceived friends' use[g]	1.36[m]	1.17[m]	1.63[m]	2.12[m]	.211[m]
Friends' use[h]	1.03	.91	.86	4.21	.018
Perceived family use[g]	1.67[m]	1.18[k]	1.38[m]	1.83[l]	.196[m]
Perceived peer pressure[g]	.98	1.05	1.00	.94	.003
Friends' concern for friends' use[h]	.91[l]	.87[m]	.87[l]	.85	−.084[l]
Classroom use[i]	17.31[m]	4.03[l]	81.97[m]	60,827.70[m]	.211[m]
Classroom concern for friends' use[i]	1.09	1.00	1.20	1.15	.035[j]

[a]Alcohol use.
[b]Alcohol use without parental knowledge.
[c]Male = 0, female = 1.
[d]Coded 1, 2, or 3, low to high.
[e]Age in years.
[f]Coded other = 0, black = 1.
[g]Perceived friends' use, perceived family use, and perceived peer pressure were based on subject's response.
[h]Friends' use and friends' concern for friends' use were based on responses of three friends designated by the subject.
[i]Classroom variables were based on the response of all classmates excluding subject.
[j]$p < .05$.
[k]$p < .01$.
[l]$p < .001$.
[m]$p < .0001$.

Logistic regressions with reported use of alcohol, alcohol without parental knowledge, cigarettes, and marijuana as outcome measures, and least-square regression with number of substances used including crack cocaine as the outcome measure were performed to test each of the hypotheses. To examine the relative contribution of the variables in Table II toward predicting children's use of abusable substances, the change in the logistic regression chi-square and in the least-square regression R^2 with each comparison variable alone and each pair of variables together were assessed (see Table III). The odds ratios for the logistic regressions and the standardized beta for the least-square regression, of equations that included all of the variables of interest, are presented in Table IV.

Hypothesis 1

This hypothesis, that children's perceptions of peers' behaviors are better predictors of children's behaviors than the actual behavior of their peers, was not rejected. For each of the abusable substances except alcohol use and for the multiple substances variable, the variable making the strongest contribution to prediction of use is perceived friends' use (A in Table III). Actual friends' use (B) makes a significant contribution alone and with perceived friends' use in the equation (A and B) for all but alcohol use without parental knowledge, but the size of this contribution is quite small relative to perceived friends' use.

Hypothesis 2

Contrary to expectations, the child's friends' use was not a stronger predictor than the child's classmates' use. Classroom use (F) made a significant contribution to each of the outcome variables, and was the second strongest predictor for cigarettes, marijuana, and multiple substance use. When child's friends' use and classmates' use were included in the same equation (B and F), only classmates' use made a significant contribution.

Hypothesis 3

The concern of classmates for the substance use of their friends, classroom concern (G), was a weak but significant predictor for both forms of alcohol use and for use of multiple substances. However, when classroom use was included in the equation (F and G), classroom concern was not a significant predictor. Therefore, Hypothesis 3, that children's use is more strongly associated with classmates' attitudes than with actual classmates' use, was rejected.

Hypothesis 4

Perceived peer pressure and friends' concern for friends' use were two measures of the attitudes of close friends, the first from the child's perspective, the second based on the friends' reported attitudes. Perceived peer pressure was not a significant predictor of use for any of the substances alone or in combination. Contrary to the hypothesis, friends' concern for friends' use was a significant predictor for all of the

outcome measures and made a more significant contribution than friends' use for each individual substance.

Family Influences

Perceived family use was a significant predictor for all of the outcome variables and the best single predictor of alcohol use. While accounting for less of the variance than perceived friends' use, perceived family use contributed to the prediction when perceived friends' use was in the equation and was clearly a significant influence for children this age.

Influences on the Use of Multiple Substances

The adjusted R^2 for the least-square regression equation for use of multiple substances regressed on all of the independent variables was 0.19. The best predictors were classroom use and perceived friends' use, both with standardized betas of 0.21 (see Table IV). Perceived family use also was a strong predictor with a standardized beta of .20. The odds ratios based on the logistic regression on each of the individual substances are in the expected direction. With all of the variables in the equation, friends' use was not a significant predictor.

DISCUSSION

The majority of the fourth- and fifth-grade elementary school children in this study reported they already have used an abusable substance, and more than one sixth reported they have used more than one substance. Rates of substance use were likely to be under- rather than overreported, and absentees and those whose surveys were unusable may have different rates of use than those completing the survey. Abusable substances were used in the homes of many of the children. In their everyday lives, children not only witnessed the use of legal abusable substances, but approximately 20% witnessed the use and sale of illegal substances by family members and family friends (Iannotti and Bush, 1989).

The significance of children's perceptions of their friends' use is consistent with previous research results (Brindis *et al.*, 1989; Brook *et al.*, 1989; Johnson, 1989) and with CDT (Inhelder and Piaget, 1958) The cross-sectional results reported here suggest that the child's perception of friends' use is more important that actual friends' behavior. The question remains as to the origin of these perceptions, whether they are stable, and whether

they change with age or with changing peer associations. Britt and Campbell (1977) and Fisher and Bauman (1988) examined changes in adolescents' selection of friends and the influence of their friends' substance use on the adolescents' substance use. Both studies found the process of the selection of friends to be complex, with somewhat stronger evidence that the selection of friends is dependent on current substance use behavior and attitudes toward use than that friends are selected for other qualities and then initiate the subject into substance use.

In addition to theory, instrumentation is another reason to hypothesize that a child's perceptions of family or peer use and attitudes are more strongly associated with the child's own use than the actual use and attitudes of these significant others. If, as is usually the case, both use and perceptions of use are obtained with the same method, response sets are more likely to occur than if information is obtained by different methods (Anastasi, 1982).

Classroom use was another major predictor of substance use. Contrary to predictions, classroom use, the reported use of the members of the class without the subject, was a much better predictor of substance use than the use of the child's friends. The significance of classroom use is also noteworthy because, unlike perceived friends' use or perceived family use, it is based on reports independent of the child's own self-reported use.

The size of the odds ratios for classroom use may be unusual even though the error terms for these odds ratios were large. For those events that are relatively rare such as marijuana use, when the behavior exists in an individual there is a high probability that others within the classroom engage in the same behavior. Modeling as suggested by SLT may account for the effect of classroom use but it would not predict the weak effect of friends' use.

Contrary to expectations, at the classroom level behavior was much more important than attitudes, and within the child's group of friends, friends' concern for friends' use, an attitude, was more important than friends' use. These mixed findings do not provide strong support for any particular theoretical approach, SLT, BIT, or CDT. It may be that the more influential friends of the child were not classmates. However, this would not explain the strong effect of classroom use. Classroom use may reflect social and environmental conditions including neighborhood availability of drugs and neighborhood values regarding substance use that exert social pressure for or against use.

Use of illegal substances, such as marijuana and use of alcohol without parental knowledge, may be under a more peer-driven set of influences than use of alcohol with the family (see Tables III and IV). Parents' knowledge of the use of a substance may significantly influence

the relationships between use of that substance and other predictors. Family use and higher SES appear to be more likely to influence general alcohol use than to influence alcohol use without parental knowledge or marijuana use. The pattern in the logistic regressions suggests that use of alcohol with and without parental knowledge is influenced by different sets of determinants. While both family and peer use appear important determinants of substance use at this age, the role of family and personal variables are more evident for general alcohol use than for the more private use of alcohol, cigarettes, or marijuana.

The importance of perceptions of peer and family norms in predicting substance use is consistent with Behavioral Intention Theory (BIT; Fishbein and Ajzen, 1975). Longitudinal analyses are necessary to evaluate the link between these normative beliefs, intentions to use abusable substances, and subsequent initiation into and use of abusable substances. Longitudinal analyses with subsequent waves of data collection from the same subjects will permit further evaluation of BIT and comparison of the predictive ability of perceived peer opinions and perceived peer behaviors with actual peer opinions and behaviors.

The major value of etiological abusable substance research is in suggesting mechanisms for intervention. With regard to smoking prevention, one strategy, consistent with current findings, is to apprise subjects of the actual rather than the perceived smoking rates of their peers (Flay, 1985). Of course this is only likely to be successful when peer use is perceived unrealistically to be much greater than actual peer use. But what shall the strategy be when children are accurate about peer and family behavior? Rates of family use and sales of illegal drugs suggest that children living in drug-using communities may need intervention programs that go beyond those that advocate "Just Say No," or that label drug users and sellers as self-destructive social outcasts, criminals, and deviants. Children cannot be expected to reject family members and family friends upon whom they are physically and emotionally dependent, but may need special help in dealing with the behavior and resisting it themselves.

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