COMPARING THE INFLUENCE OF PARENTS AND PEERS ON THE CHOICE TO USE DRUGS

A Meta-Analytic Summary of the Literature

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This literature summary, using meta-analysis, compares the influence of parents versus peers on substance use. The data indicated that the average relationship for peer effects on substance use was larger than the effect for parental influence. Several moderating influences (such as youth age and type of substance) are considered. The findings indicate that the relative size of parental and peer influence varies with the age of the adolescent and the type of substance. The results indicate that both parents and peers influence decisions about substance use. Future educational interventions concerning substance use should consider how best to combine these two sources of influence.

Keywords: *meta-analysis; substance use; drug education; peer pressure; parental influence*

Despite increased interventions intended to decrease adolescent drug use, alcohol use, and smoking, adolescents continue to use illegal substances. The academic and community action paradigm for

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confronting substance use is in the midst of shifting from a focus on risk factors to factors that build resiliency to substance use. Such perspectives as Communities that Care (Hawkins, Farrington, & Catalano, 1992) and the Search Institute (Scales, Benson, Leffert, & Blyth, 2000) promote asset development as the primary means of building youth resiliency. These approaches outline important conceptual frameworks that seek to explain how youth succeed despite risks faced during adolescence. The programs provide resources that communities use to develop and implement strategies for healthy youth development based on these frameworks. The net result of these efforts appears to be a broad-based acceptance of the asset perspective and the use of positive constructive messages.

As the asset perspective continues to gain both academic and community acceptance, it is important to ask questions that might strengthen the scientific basis for the strategic value to communities. Specifically, it is important to start asking questions about the role that particular assets play in building resilience. Approaches focusing on adolescent assets build a conceptual foundation around the role of parents and peers in the adolescent's decision to use substances. The Communities that Care approach championed by Hawkins, Farrington, and Catalano (1992) generates a conceptual foundation focusing on an adolescent bonding with parents and positive peers. Although hundreds of studies have explored the relationship between parental and peer bonding and substance use, there is currently no meta-analytic research available to expand this dialogue concerning the bonding issue and influence on resiliency. This article compares the influence of parents versus peers on substance use by using meta-analytic techniques to summarize the relevant scientific literature. We will summarize some of the major asset perspectives on the role of parents and peers.

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THEORIES OF YOUTH RESILIENCY

The Social Development Model. Perhaps the most well developed theoretical framework for understanding protective factors grows from the work of Hawkins, Farrington, and Catalano's (1992) Communities that Care perspective. Their Social Development Model (SDM) contends that deviance results when preventive mechanisms fail to operate effectively. Youth with weak bonds to society (in the form of poor relationships with others, little commitment to conventional lines of activity, and an inability to discriminate right from wrong) become "free" to engage in delinquent behavior. SDM argues that an adolescent's level of bonding to a social unit reflects (a) the amount of opportunity for involvement, (b) the skills that one applies in participating in the social unit, and (c) the reinforcements provided by the unit for the individual's behavior (learning theory).

The strength of SDM theory is the specification of factors driving the development of bonds (opportunity to be an active contributor, skills to contribute, and recognition for contributing) and the factors that make up the bonding process (attachment to others, a commitment to invest in the future, and a belief about the difference between right and wrong). When these parental and positive peer bonds are in place, social control emerges from the role-taking process, and the individual makes healthy choices. This model, supported by previous research (e.g., Hawkins, Catalano, et al., 1992), serves as a cornerstone for some substance abuse and violence prevention programs (Hawkins, Farrington, & Catalano, 1999) because the model identifies the most important protective factors and specifies how the factors interact.

Garbarino's anchors. A second theory generating considerable interest is Garbarino's (1999) development of the anchor concept. The anchor concept reflects an understanding of how boys move toward and away from delinquency. Garbarino asserts that young boys need spiritual, social, and psychological anchors to reduce antisocial tendencies. The spiritual anchor refers to an attachment to religion. Social anchors refer to the external forms of support for the adolescent male such as having committed parents and other adults in his life, economic equality, stability, security, and public institutions that pro-

tect human rights. Psychological anchors are the internal mechanisms the individual needs such as the desire to participate in life's activities, basic intellect, self-esteem, coping strategies, and the ability to seek social support. Garbarino posits that these anchors exist in families, peers, schools, and throughout the general community.

Anchor development is consistent with the SDM in the emphasis on the need for social bonding, primarily with parents and positive peers, to create the spiritual and psychological anchors necessary to make healthy choices. Garbarino (1999) did not explicitly address how the anchors grow, when compared to the views specified in the SDM. However, anchor theory does provide a parsimonious description of what factors contribute to healthy choices and a description of how the factors intertwine to produce positive effects.

Peer Cluster Theory. A third theory focuses more narrowly on how peer groups influence decision making by drawing on the key construct of socialization. Peer Cluster Theory (Oetting & Beauvais, 1987) contends that a strong predictor of adolescent drug use is peer influence. Among these socialization characteristics, peer drug associations would be most proximal to drug use. However, other socialization characteristics relate to drug use indirectly by creating other patterns of influence related to the promotion or inhibition of peer drug associations. Peer clustering represents a different process than peer pressure because pressure reflects a view that adolescents act passively and innocently but become drug users as a result of social pressure that pushes the adolescent into trying drugs. Peer clusters represent active participative agents in shaping the norms and behaviors of the peer cluster in deciding whether, when, and how to use drugs. The adolescent voluntarily acts to identify with and become part of the cluster.

Although peer clustering focuses on a very powerful developmental agent for youth, the approach avoids making claims about which factors intensify or weaken peer clusters. According to the SDM, the lack of bonds beyond the peer cluster, brought about by minimal opportunities, skills, and reinforcements for creating such bonds, contributes to more emphasis on peer clustering. Garbarino's (1999) anchor concept makes a similar observation. Anchors outside the peer cluster minimize the willingness to participate in and shape the peer

cluster. These additional theoretical moves outside of peer clustering are important because the models provide a strategy to avoid the negative influences precipitated by the peer cluster.

Youth Asset Development Theory. The Search Institute proposes a broader theoretical framework about youth development. In two monographs (Benson, Leffert, Scales, & Blyth, 1998; Scales et al., 2000), Benson and colleagues have demonstrated how 20 internal and 20 external youth development assets predict measures of thriving. As assets accumulate, deficits decline. A close look at the external deficits generally supports a social development perspective in many ways. The external assets seek to bond youth to their environment with parents and positive peers as the main influencing agents. In many ways, the internal assets derive from the success of these bonding endeavors.

The goal of the asset approach is the identification and construction of asset systems for youth that work to minimize substance use. A central question in dealing with the identification and function of assets is the contribution of parents and peers in substance use decisions. The literature review considers to what degree these sources of influence are complementary or competitive.

PARENTS AND PEERS OR PARENTS VERSUS PEERS?

These four major theoretical perspectives draw heavily on the notion of bonding with parents and positive peers. However, the nature of bonding with parents may be very different than bonding with peers, particularly when involving the decision to use an illegal substance. An examination of this issue involves both the source of the influence and relative size of the influence. The focus of this investigation was an examination of two groups of influence: (a) peers, which can include friends, acquaintances, or siblings, and (b) parents, but not other adults such as faith leaders, coaches, employers, and so on. A complete test of the various asset approaches would involve considering all sources of influence such as other significant adults. However, this investigation limits the analysis for a more manageable proportion and future meta-analyses should address the issue of other sources of adult influence in the community.

The purpose of this study was to determine what kind of influence peers and/or parents have on the attitudes of adolescents and the decision to use illegal substances (including alcohol, tobacco, narcotics, marijuana, amphetamines, barbiturates, inhalants, cocaine, etc.).

Educational and counseling interventions need to address the dynamic properties of these sources of influence. An educational effort that incorporates ineffective sources of influence may undermine the eventual effectiveness of the intervention. The focus of interventions needs to be on how to best incorporate parents and peers to provide a more diverse set of sources of influence. The degree of emphasis and the relative impact of the various sources of influence may require more adaptation to the needs of the situation, as the child grows older.

Drug use may be the result of social modeling by a person or group that the person views as an authority or inspiration. Social modeling describes the process of a person identifying with the actions of someone and then internalizing the value and adopting the behavior. The model and the behavior should be evaluated as desirable because the action produces some outcome that the person views as advantageous. The adolescent would be using drugs to generate a response to an image, imitating a respected image, and rejecting the behavior of a negative model. According to social learning theory, persons will not model behaviors that are associated with a negative evaluation or perceived cost. Research on substance use has suggested just such a model (Bailey & Hubbard, 1991; Brook, Lukoff, & Whiteman, 1980; McAlister, Krosnick, & Milburn, 1984). However, it is unclear what type of impact that peers and parents have in comparison to each other. The size of the impact each group has and the relevant moderating variables of such a model have yet to be determined.

Peers identify themselves as members of a particular group on the basis of the adoption of particular behaviors. The definition of a group is often predicated on the assumption that common symbols, language, clothing, and behavior will mark this membership. However, not all behaviors are adopted by all peers; the purpose is to identify the nature of those substance use patterns that are most susceptible to peer influence and pressure of conformity from others.

A peer group is distinguished by the presence of pressure to conform or be identified as a member of the group. Peer pressure to con-

form to a group norm or to gain acceptance by the members of the peer group may focus attention on the need to adopt certain behaviors. The perception that pressure exists for conformity may contribute to the adoption of substance use (Alexander & Campbell, 1967; Huba & Bentler, 1980; Pruitt, Kingery, Mirzaee, Heuberger, & Hurley, 1991). Hence, substance use is viewed as a mechanism to gain acceptance. In fact, Kaplan, Martin, and Robbins (1984) state, "The use of illicit drugs persists as part of ongoing peer subculture(s) which may endorse, if not require, use of illicit drugs" (p. 271). If this is the case, then peers may be the most influential source in an adolescent deciding to use illegal substances. For example, research indicates that the perceptions of friends' smoking also predicted beliefs about popularity, enjoyment beliefs, and relevant health beliefs (McAlister et al., 1984). Moreover, Brook et al. (1980) examined initiates of drug use (defined as those who had never used drugs at one time but had used drugs at least twice at a later point in time) and indicated that initiates were more oriented toward peers than parents. Menon, Barrett, and Simpson's (1990) investigation indicated that when adolescents associated with a "convention[al]" peer group, their odds of being a substance user decreased by a factor of .57. Conversely, associating with a nonconventional group increased substance use. A goal of conformity to group norms may be to terminate the unwanted attention as a person operating as someone independent of the group. Adolescents may decide that it is easier to use (or not use) a substance rather than suffer the messages associated with deviance from group norms.

If the influence of various sources of information and contact changes during the lifespan of a child, then educational interventions may need to reflect these changes. A comparison of the influence over time for the various sources permits any informational campaign to incorporate those elements that would maximize the effectiveness of the intervention. Moreover, research needs to consider the age of the child relative to the source of the influence. As a child grows older, there may be a change in emphasis in sources. A child at age 10 may be more greatly influenced by one source (e.g., parent), whereas at age 18, a child may be more influenced by a different source, such as a peer group. Tracking the various strengths of the different influences as they relate to age would provide greater insight into the decision to use a substance.

Research has repeatedly indicated that although peers demonstrate a robust effect on substance use, parents also play a key role. In particular, parents with little control or discipline over children are more likely to have substance-using children (Brook et al., 1980; Dishion & Loeber, 1985).

In addition, parental or peer influence may vary based on the particular substance under consideration. Instead of a uniform drug education program, various substances may require a different set of information and/or approach. Parents may be influential on attitudes and behaviors for the use of some substances and not others. In the presence of the child, the parents may use substances that are illegal for juveniles but legal for adults (tobacco and alcohol) with full social approval. Parental influence on these substances may be greater, particularly because of the social model exhibited that legitimizes the use of alcohol and tobacco, as opposed to other substances that are illegal for anyone to use (marijuana, cocaine, heroin, etc.). In fact, Melby, Conger, Conger, and Lorenz (1993) found that mothers' tobacco smoking behavior significantly increased kids' smoking behavior. Mothers' drinking and parental rejection was positively correlated with kids' multiple substance use (Simons & Robertson, 1989). However, the impact of parents may vary depending on the status of the substance under study.

The answer to this question of peer and parent influence in adolescent substance use has profound implications for the asset literature. If parental influence in the choice to use substances declines relative to peer influences, then perhaps a more narrowly focused approach to assets such as the peer clustering theory might be more effective at understanding asset development. If both influences remain relatively high throughout the developmental range, then perhaps the more global SDM theory might appear more powerful in explaining youth development. However, if the nature of the influence changes dramatically from substance to substance, then it might be necessary to focus on theories about parental and peer bonding toward particular domains of adolescent decision making. One theory may not fit all. A more complex and tightly focused perspective might be needed.

To distinguish and compare parental and peer influences, meta-analysis may be employed. Meta-analysis is the technique of quantitatively synthesizing available literature. As the number of investiga-

tions grows larger in any given body of literature, the need to identify the findings that are the result of Type I (false positive) and Type II (false negative) error increases (Preiss & Allen, 1995). Meta-analysis permits a systematic assessment by averaging across estimates to generate an average estimate (Hunter & Schmidt, 1990). This technique also corrects for artifacts and bias as well as permits assessment of potential moderating influences (Hunter & Schmidt, 1990). Compared to traditional narrative reviews, the results of the meta-analysis are more accurate (Cook & Leviton, 1980).

Because meta-analysis allows for the assessment of the relative size of a source of influence on the adolescent decision to use a substance, the method permits a comparison of magnitude. The advantage of meta-analysis is that no investigation is required to have all elements present to conduct a test. The analysis provides a conversion to a common metric that permits comparisons. Any comparison can involve different age groups and different substances to determine the size of the influence. Meta-analysis provides the basis for the comparison of various features of influence by conversion to a common metric and then, through the process of averaging, the data are aggregated. This average generates an estimate that effectively combines the sample size of the various investigations, which reduces the impact of sampling error.

METHOD

LITERATURE SEARCH METHOD

A literature search was conducted dealing with issues of substance use and education. Various indexes (ERIC, Psychlit, Socabstracts) as well as existing literature reviews were consulted to obtain relevant material. Existing meta-analyses of the drug treatment literature were included and examined for potential sources of information as well. The current examination of more than 2,700 manuscripts does not necessarily indicate an exhaustive search of the available literature. The use of family and peer variables as factors in substance use is often not reflected in the title of a manuscript entitled "Factors in Substance Use" or even an abstract provided for that text. This makes reli-

ance on electronic data search engines incomplete. The key in this examination was a focus on the inclusion of a large number of manuscripts.

Some studies, although containing relevant information, could not be included for the following reasons: (a) insufficient reporting of statistical information, (b) the research dealt with general delinquency and not substance abuse per se, (c) contained information on attitudes toward substance use but not a measure of substance use, or (d) used qualitative methods. The most common reason for exclusion was statistical reporting, which involved the use of multiple regression or multivariate techniques without reporting a zero order correlation matrix. Because there are an infinite number of potential relations among variables that will generate the particular solutions, the estimation of the zero order effect is not possible. The impact of the use of multivariate or other statistics that require the calculation of covariates or other control variables is the creation of measures of influence that are not recoverable for the purposes of conducting a meta-analysis. Essentially, such data could not be incorporated in the analysis and were therefore discarded.

For a study to be included in this analysis, it had to have the following characteristics: (a) the manuscript had to demonstrate a relationship between either peer or parental factors on substance use,[1] (b) the subject population had to be adolescents who had not graduated from high school,[2] and (c) the report of data had to contain sufficient information to permit the calculation of a statistical association. The criteria produced a total of 364 effects that were incorporated in the analysis.

CODING OF STUDIES

Source of influence. The measurement had to indicate the source of the influence. The broad categories of interest in this analysis were parents and peers. This distinguishes the influence from the media, self-esteem, religion, academic interests, or any host of potential personality or social features that might influence the using of illegal substances. Sources of influence were coded as (a) peer/friends/sibling or (b) parents.

Type of substance. The type of substance that the study examined was considered as a potential moderator variable. Substances were coded as (a) overall drug use, (b) tobacco, (c) alcohol, (d) marijuana, or (e) hard drugs (heroin, pills, cocaine, crack, LSD, etc.). The codes reflect the categories used by investigators who are sometimes interested in very specific substance use versus investigators who are interested in a more general substance use behavior. Studies were coded on the basis of as many different drugs as possible. Multiple coding means that a study may contribute multiple effect sizes as the investigator provides data and associations for the various kinds of substances.

Age. The average age of the participant was entered in the analysis. When multiple samples were used, the data were entered for each specific age group. The analysis correlates the size of the association and the age of the sample. A positive correlation indicates that as the age of the sample increases the size of the association increases, whereas a negative correlation indicates that the size of the influence diminishes with age.

STATISTICAL ANALYSIS

This analysis used a variance-centered form of meta-analysis developed by Hunter and Schmidt (1990). This analysis differs from other methods of meta-analysis (Glass, McGaw, & Smith, 1981; Hedges & Olkin, 1985; Rosenthal, 1984) on the basis of the decision to correct for various forms of measurement error. Because measurement error is not uniform, different levels of measurement error from study to study can contribute to divergent results among the estimates. Correction for measurement error makes the comparison among studies more uniform by creating a better basis for comparison.

Meta-analytic techniques involved three statistical steps. First, the individual investigations were converted to a common metric. The metric chosen in this case was the correlation coefficient due to the ease of interpretation and ability to use various correction formulas for various artifacts. The second step involved the averaging of the various effects. The averaging process took the estimate and weighed it by

the sample size; the effect was a sample-weighted estimate of the average effect. The final procedure was a comparison of the observed variability in the sample of studies to the expected distribution due to sampling error. This test examined whether the effects across the sample of studies could be said to be homogeneous or not. A nonsignificant chi-square test indicated that the sample of correlations was homogeneous, that is, a sample coming from a distribution where the differences among the various estimates are the result of sampling error. A heterogeneous finding, indicated by a significant chi-square, indicates the estimate of an average correlation where there may exist multiple distributions (necessitating a search for potential moderator variables).

A final consideration was that of the "file drawer" effect. The file drawer effect considers the probability that there could be research not included that would make the current finding nonsignificant. The typical reason for noninclusion would be the existence of data reports that were not published. Attempts were made to include known unpublished data, but it is possible that many are not indexed and thus remain unknown. In addition, studies might have included appropriate peer or parent variables but they simply did not appear when searching indexes. Rosenthal (1984) suggests a statistic called the "fail-safe N," which calculates how many unincluded studies would have to exist to make the effect nonsignificant (pp. 107-110). That estimate was provided for each result.

RESULTS

The overall analysis of influence found a significant effect across the sample of 364 effects (average $r = .279$, $SD = .150$, $k = 364$, $N = 1{,}234{,}193$) such that there was a correlation between the influence of family on substance use and the influence of peer groups on substance use. This effect was across both parents and peers, indicating a connection between parental and peer influence and the use of substances. The distribution of effects exhibited significant heterogeneity, χ^2 (363, $N = 1{,}234{,}193$) = 27,040.33, $p < .05$, which indicated the probable existence of a moderator variable. Using Rosenthal's (1984) proce-

dures for estimating fail-safe N, there would need to have been 12,821 additional studies to make this finding nonsignificant.

PEER AND PARENT AS SOURCES OF INFLUENCE

Influence of peers. The overall influence of peers on the use of substances was positive (average r = .298, SD = .151, k = 230, N = 1,000,713). The sample of effects demonstrated significant heterogeneity, χ^2 (229, N = 1,000,713) = 39,341, $p < .05$. This effect indicated a small rise from the average combined across parents and peers (r = .279). The estimates of unincluded studies that would make this finding nonsignificant are large, k = 7,548.

The next step in the analysis was to break down the type of influence on the basis of the particular substance reported that the person was using. The goal was to determine if the size of the influence was more or less for the various potential substances that an adolescent might consider using.

The first category was a general substance use category that considered the overall use of substances. The average effect was larger (average r = .408, SD = .232, k = 34, N = 68,830) than the overall influence of peers and continued to demonstrate heterogeneity, χ^2 (33, N = 68,830) = 3,708.47, $p < .05$. The increased size of the effect indicated some basis for considering that the influence of peers was not uniform across the various substances under investigation. The fail-safe number of included studies for this effect was large as well, k = 1,442.

The second category of substances dealt with the use of tobacco. The influence of peers was large (average r = .365, SD = .111, k = 41, N = 150,262) for this category, indicating that the impact of peers on the use of tobacco was large but the studies were heterogeneous, χ^2 (40, N = 150,262) = 1,788.49, $p < .05$. The fail-safe number of studies that would have had to exist was relatively large for this set of findings, k = 2,804.

The third category dealt with the use of alcohol by adolescents and the relationship to peer influence. Peer influence provided a smaller relationship to the use of alcohol (average r = .271, SD = .148, k = 61, N = 185,572) when compared to overall drug use or tobacco consumption. The heterogeneous results, χ^2 (61, N = 185,572) = 3,888.79, $p <$

.05, indicated that adolescents are influenced by peers on the use of alcohol, but that influence was less than other substances like tobacco. The fail-safe number of studies for this estimate ($k = 493$) was large and should be considered as unlikely.

The fourth category was the use of marijuana, which appeared in 51 investigations, demonstrating a positive correlation (average $r = .382$, $SD = .161$, $k = 51$, $N = 176{,}102$) that was based on a heterogeneous set of correlations, χ^2 (50, $N = 176{,}102$) = 4,543.43, $p < .05$. The correlation indicated that the influence of peers on this substance was one of the largest on the decision to engage in the use of this drug. The fail-safe number of studies was more than 1,000 ($k = 1{,}941$).

The fifth and last category, hard drugs, indicated that the size of the effect was positive (average $r = .230$, $SD = .075$, $k = 31$, $N = 400{,}884$). The use of the hard drugs was positively related to the influence of peers but should still be considered heterogeneous, χ^2 (30, $N = 400{,}884$) = 203.33, $p < .05$. The fail-safe sample statistic indicated that more than 2,000 studies ($k = 2{,}326$) would have been necessary to change this value into one that was nonsignificant.

Parental influence. A total of 81 studies examined the influence of parents on the use of drugs and the average effect indicated that parents contribute to the decision to use drugs by an adolescent. The average correlation (average $r = .163$, $SD = .108$, $k = 81$, $N = 121{,}709$) demonstrated that parents do provide an influence on children about the decision to use substances. This sample of correlations was not homogeneous, χ^2 (80, $N = 121{,}709$) = 1,332.90, $p < .05$. The fail-safe estimate indicated that 872 studies would have needed to exist to make the observed correlation nonsignificant.

The correlation between the overall use of drugs and parental influence over that decision indicated a positive association (average $r = .232$, $SD = .142$, $k = 11$, $N = 16{,}792$). This indicated that parents exhibit an influence on the decision of a child to use drugs. However, this effect should be interpreted cautiously because of the heterogeneity, χ^2 (10, $N = 16{,}792$) = 339.20, $p < .05$. The fail-safe analysis indicated that 330 additional studies would have had to exist to make the finding nonsignificant.

An analysis of tobacco use indicated a smaller influence than the overall use of drugs (average $r = .137$, $SD = .097$, $k = 25$, $N = 37{,}479$)

based on a heterogeneous set of effects, homogeneous χ^2 (24, N = 37,479) = 303.18, $p < .05$. The Rosenthal procedure for estimating fail-safe N indicated that another 583 studies would have had to exist to make the current finding nonsignificant.

An analysis of the use of alcohol indicated that parents exhibit an influence (average $r = .172$, $SD = .111$, $k = 24$, $N = 31{,}724$) that was observed from a heterogeneous set of associations, homogeneous χ^2 (23, $N = 31{,}724$) = 73.13, $p < .05$. The fail-safe sample size of studies necessary to make this finding nonsignificant indicated that another 784 studies would have had to be included.

The fourth category, marijuana use, indicated that although parents do influence the decision, the influence was the smallest of either category of drug measure or for either parental or peer influence (average $r = .079$, $SD = .040$, $k = 12$, $N = 29{,}913$). The sample of effects was considered heterogeneous, χ^2 (11, $N = 29{,}913$) = 47.86, $p < .05$. The fail-safe statistic indicated that 174 studies would have had to exist to change the average effect into a nonsignificant finding.

The last area of drug use, hard drugs, indicated that parents do operate as a source of influence (average $r = .197$, $SD = .048$, $k = 5$, N = 4,553) as generated from a heterogeneous set of effects, χ^2 (4, N = 4,553) = 10.47, $p < .05$. The fail-safe statistic indicated that 89 studies would have had to exist to make the effect nonsignificant.

ANALYSIS CONSIDERING THE AGE OF ADOLESCENT

The correlation for influence between the size of the effect and age was positive, $r = .123$, indicating that the influence increased as the age of the participant increased. Considering peer influence, the size of the correlation was largest for tobacco ($r = .173$), followed by marijuana ($r = .157$), all drug use ($r = .111$), hard drugs ($r = .032$), and alcohol ($r = .023$). This association indicated that the influence for hard drugs and alcohol was relatively stable, but for other drugs the influence of peers increased as children get older.

The influence of parents demonstrated a different pattern of relationships with age. Parents had, in order of effect, the largest increase with tobacco ($r = .194$), followed by alcohol ($r = .115$), all drugs ($r = .106$), and marijuana ($r = .096$), and a negative relationship with hard drugs ($r = -.357$). The results indicated that the influence of parents on

the decision to use substances increased as the child grew older. However, the number of samples for hard drugs was relatively small ($n = 5$) and the association may have been the result of sampling error.

The results indicated that for almost all substance choices, the influence of parents and peers grew with age for both sources. However, for a drug like marijuana, the influence of peers grew faster, compared to alcohol, where impact of parents grew faster.

DISCUSSION

The results demonstrated that peers, siblings, and friends are a greater source of influence than parents on substance use. However, parents do exhibit an influence on the use of substances. The argument states that peer group affiliation is more important than parental influence. However, that does not mean that parents lack influence in the decision of an adolescent to use substances. The inhibitory influence of these sources does make a difference in the decision to use substances. The use of Rosenthal's (1984) fail-safe estimates indicated that it was probably unlikely that a level of data not included in this report exists that would fundamentally alter the outcome.

The examination of the type of substance was very important because the influence of a peer, family, or parental associate may vary based on the particular substance of interest. The recognition that influence varied based on the substance may indicate that educational programs that incorporate only some sources of influence will be less effective in curtailing the use of certain substances. The identification of the nature of peer pressure, as it relates to particular drugs, indicates the need to examine the possibility of a different set of social dynamics for different substances. Of particular note is the relatively smaller influence for harder drugs (LSD, heroin, etc.) when considering the impact of peers ($r = .230$) versus parents ($r = .197$) on the probability of taking those drugs. This contrasts with the largest influence of peers on marijuana use ($r = .382$) relative to parents ($r = .079$). The underlying dynamics of these observed effects is unknown and why the effects would differ based on the particular source of influence is unclear.

One would reasonably expect that the influence of parents would differ based on whether using the substance is a status crime. For

example, alcohol and tobacco are illegal only for juveniles but legal for adults to buy and consume. A parent or older sibling may be consuming these substances in the presence of the adolescent without any sense of obligation to conceal the behavior because the action is legal for an adult but not legal for a child. One would expect that the endorsement of the behavior (on the basis of actually performing the behavior) would create a larger basis of influence than if the behavior were not present.

One limitation in the area of research involves the use of self-report instruments to assess the various features of drug use and influence. The problem with the reliance on self-reports is that even when assured that the response will be considered anonymous, the desire to maintain a self-image of independence or to fit in may distort the responses. The participant is rating a perception of the relationships or influence that may or may not in fact reflect the social pressures or exposure that a person in fact feels. The difficulty of obtaining actual behavioral confirmation of this kind of influence remains difficult and would necessitate designs with far smaller sample sizes than those typically found in survey research in this area.

Interventions and educational efforts need to examine how best to incorporate this material into the design of any program. Children growing up have a variety of influences that contribute to their development. Any intervention program requires a full understanding of how these influences combine during the person's development. Programs also need to incorporate parental influence and establish a set of peer dynamics that diminishes the level of substance abuse. The meta-analysis by Tobler (1997) on drug abuse prevention programs indicates that those programs with the greatest level of effectiveness focused on life skills and interactive topics. The general model argues that the most effective efforts involve the community in prevention. The influence of significant figures, mentors, coaches, parents, teachers, clergymen, and other adult role models and advisers should not be ignored. Future meta-analyses should examine how important these other adult sources of influence are for an adolescent in decisions to use substances. This examination would broaden the understanding of the theoretical approaches outlined earlier.

This meta-analysis indicated that although peer approaches are effective, parents represent a necessary and vital influence to reduce

substance use as well. This finding adds to the growing body of meta-analyses (Prout & Demartino, 1986; Rundall & Bruvold, 1988) indicating that interventions, particularly those involving schools, can produce improvements.

Our meta-analysis does not provide direct information with regard to the process of why the various sources of social influence vary. The analysis does not articulate the actual process that generates the impact; instead the focus was on the relative size of the influence of various sources. Further analysis, most likely in the form of some type of structural modeling technique, is necessary to understand the potential structural elements in the analysis. In addition, a host of other potential sources of influence are not included in this analysis and deserve consideration before any full recommendation can proceed. The next step in this project requires the evaluation of how potential sources of influence (religion, competitive athletics, family structure and interaction, community groups) contribute to the decision to use substances. Understanding the network of social and personal relations of an adolescent permits an examination of how potential interventions could be targeted at dealing with social issues.

Further research must examine the sources of social influence in terms of those influences that act as sources of resistance or inhibition against the use of substances. Although there are clearly relationships that operate to promote the use of substances, more attention needs to focus on the sources of resistance. An exploration of the development of those sources or attitudes of resistance could contribute to the development of an effective intervention that reduces the probability of substance use.

NOTES

1. The measures involved either the attitude or use of the peer/parent toward substance use. The term *parent* is a bit of a misnomer because many children live with adults who are not their biological parents. *Parent* in this case should be viewed as a function that an adult serves for the child.

2. The choice to use persons 18 years and younger having not graduated from high school reflects a methodological artifact that most studies focus on educational settings and draw samples from schools. The sample does not include persons graduated from high school 18 years or younger who are substance users.

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