Adolescent Cigarette Smoking: A Commentary and Issues for Pediatric Psychology

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The articles in this special issue reflect the development and maturation of a field of research that has seen rapid growth in the last two decades. From a research area that has become complex and multifaceted, the articles in this special issue were selected to illustrate some important topics that are of particular relevance to pediatric psychology and to point to some opportunities for reducing tobacco use among adolescents. Although the articles address a diverse set of questions, we will try to use them to highlight some themes in the development of adolescent tobacco use1 research as a field of study.

A striking mark of the growing sophistication of research in adolescent smoking is the move from studies that identify simple correlates of smoking to multivariate tests of theory-based, prospective, mediational models, which attempt to capture the processes underlying smoking initiation. Twenty years ago, most studies were restricted to simple, cross-sectional descriptive or demographic correlates of smoking, without consideration of the mediators and processes of smoking risk. In contrast, in this special issue, there are multiple examples of mediational process models. Gerrard, Gibbons, Gano, Vande Lune, and Cleveland focus on dispositional (academic orientation), contextual (neighborhood characteristics), and familial (parental smoking) distal risk factors for smoking initiation. These distal factors combine to affect adolescents’ prototypic representations of a smoker, which in turn impact on their willingness to take a risk in terms of trying a cigarette. This willingness prospectively predicts smoking initiation. Interestingly, this prototype/willingness model of adolescent smoking includes both a path that is based on a reasoned decision (Ajzen & Fishbein, 1973) and a more automatic path that involves reactions to the prototypes. One of the most recent developments in studies of adolescent smoking is an interest in these more automatic, implicit cognitions or attitudes (e.g., Sherman, Rose, Koch, Presson, & Chassin, 2003; Swanson, Rudman, & Greenwald, 2001). Implicit cognitions are not only likely to be distinct from explicitly stated attitudes and beliefs, but also require different methods of attitude change (Fazio & Olson, 2003).

Another example of a mediational process model in the current special issue is seen in the article by Molina, Marshal, Pelham, and Wirth, who focused on attention deficit hyperactivity disorder (ADHD) as a distal risk factor. They found that the effects of ADHD on smoking initiation were partially explained by lower levels of parental support and of behavioral and cognitive coping. Children who are impulsive, inattentive, and hyperactive elicit lower levels of support from their parents and are less likely to employ adaptive and effective coping (an example of their lessened abilities for self-regulation). These characteristics in turn elevate their risks for smoking (and perhaps for a wide spectrum of other problem behaviors). An interesting question in this study is the extent to which smoking serves a coping function for these children, either to self-medicate their cognitive/behavioral inhibition deficits (Potter & Newhouse, 2004) or to reduce the deleterious effects of stress (Wills, Sandy, Yaeger, Cleary, & Shinar, 2001). The extent to which smoking is used as a strategy to cope with stress (and the extent to which smoking is effective in this function) is controversial in the literature (Kassel, Stroud, & Patronis, 2003). For example, smoking may serve to reduce stress-induced negative affect, but it may also reduce negative affect that is caused by withdrawal (Baker, Brandon, & Chassin, 2004). This illustrates the complexity of adolescent smoking by

1Although we refer to the broader construct of tobacco use, the articles in this issue focus on cigarette smoking. Other forms of tobacco use (e.g., smokeless tobacco use) are also important health behaviors, which may share common predictors with smoking but also have unique etiologies and consequences.
showing the need to integrate pharmacological effects into more typical models of psychosocial influences.

A final example of a mediational process model of smoking initiation in this special issue is found in the article by Chassin et al., which focuses on parenting processes. Historically, early research focused far more on peer influences than on parent influences on adolescent smoking. However, a recent interest in family processes has been influenced by renewed interest both in the genetic underpinnings of smoking risk, as smoking is transmitted intergenerationally within families (Lerman & Berrettini, 2003), and in the family as a context for preventive intervention (Bauman et al., 2002). Chassin et al. (this issue) found that parents who are disengaged (i.e., show low levels of acceptance and behavioral control) have children who are more likely to initiate smoking. They then tested whether smoking-specific socialization mediated these effects, hypothesizing that disengaged parents would be less likely to discuss and/or punish smoking in their children. However, in contrast to the other articles, these data produced less evidence of mediation, and the impact of parental acceptance and behavioral control could not be explained by the types of antismoking messages that parents provided to their children. This illustrates the complexity of familial influences and represents a potential dilemma for intervention. Studying parents’ explicitly stated messages about smoking may not be sufficient for understanding parenting effects on adolescent smoking, and intervening in these messages may not be sufficient to reduce it.

Another hallmark of recent research on adolescent smoking has been the reconceptualization of smoking as an addictive behavior. Early research viewed smoking primarily as an instance of a rebellious or “problem” behavior (e.g., Chassin et al., 1981). This has been a productive approach that embeds smoking within a wider spectrum of age-graded behaviors that are adopted precociously in violation of age norms and that also co-occur with smoking (Turbin, Jessor, & Costa, 2000). Recently, however, conceptualizations have become more complex in also distinguishing cigarette smoking from other kinds of problem behaviors because of its addictive potential. Research has distinguished among stages of smoking behavior from initiation to dependence and has recognized that different stages may have different determinants (Mayhew, Flay, & Mott, 2000). These conceptualizations have sharpened the distinction between prevention and cessation because, whatever the initial reasons for adolescents’ smoking onset, once adolescents have begun to smoke, processes of dependence (including the development of tolerance and withdrawal) may come to motivate smoking behavior. In addition, recent studies have empirically identified important heterogeneity in trajectories of progression through these stages, with different trajectories associated with differences in risk factors and outcomes (e.g., Chassin, Presson, Pitts, & Sherman, 2000; Colder et al., 2001). This reconceptualization of smoking as an addictive behavior has produced research interest in the pharmacokinetics of smoking in adolescence, in comorbidities with other addictive behaviors, and in individual differences in the development of tolerance and withdrawal, including heritable individual differences (Baker et al., 2004). Framing smoking as an addictive behavior also provides a potential opportunity for prevention campaigns. For example, population reductions in adolescent smoking in 2001 compared with 1990 were related to adolescents’ increasing perceptions of cigarette smoking as addictive (Chassin, Presson, Sherman, & Kim, 2003).

Considering smoking as an addictive behavior requires reliable and valid measures of nicotine dependence, and a major challenge has been to develop methods that are appropriate for adolescents (Colby, Tiffany, Shiffman, & Niaura, 2000). For example, because adolescents are constrained by parental and school prohibitions, items that ask about smoking at certain times or places may not be good indicators of nicotine dependence for adolescent populations. An important contribution to understanding the measurement of nicotine dependence is found in this special issue in the article by Kandel et al., who compared the performance of two of the most widely used measures (a modified Fagerström Tolerance Questionnaire and the criteria from the Diagnostic and Statistical Manual of Mental Disorders [DSM], fourth edition). Interestingly, there was only modest agreement between the two measures except at high levels of daily smoking (at least 16 cigarettes per day), and the DSM measure identified more adolescents as dependent than did the modified Fagerström measure. Adolescents who smoked at low levels but were still identified by the DSM as dependent had elevated levels of depression. Thus, as in the adult literature, the DSM criteria are sensitive to depression (Breslau & Johnson, 2000). The implications of these findings for reliable and valid diagnosis are complex. These data raise the possibility that using the DSM criteria may overdiagnose nicotine dependence (particularly among adolescents who are depressed), perhaps because their depression magnifies their perceptions of impairment and dependence. However, the fact that the modified Fagerstrom measure is heavily influenced by smoking intake raises the opposite concern that it
might miss dependence that occurs at lower levels of intake.

Another feature of recent research represented in this special collection of articles is a recognition of the diversity of adolescents and a consideration of important special populations, including groups that are of particular interest to pediatric psychologists. For example, Molina et al. focus on adolescents with ADHD, Gerrard et al. focus on African American pre-adolescents, and Kandel et al. examine ethnic differences in a diverse sample. Tyc, Lensing, Klosky, Rai, and Robinson illustrate this interest in special populations with their focus on pediatric cancer patients, for whom smoking would create an especially serious risk. It is encouraging that they found quite low rates of smoking among adolescents who were currently being treated for cancer and who were studied relatively early after their diagnosis. Nevertheless, even these adolescents, who had strong reason to be concerned with their health, still reported substantial frequency of intentions to smoke in the future, suggesting that even ill populations might benefit from tobacco-prevention intervention. As Tyc et al. note, there are few studies of adolescent cancer patients, and studies of adult cancer patients suggest that up to one third of smokers continue to smoke after a cancer diagnosis (Schnoll et al., 2003). A cancer diagnosis may provide an important opportunity for smoking intervention, not only for the patient but for family members as well. At present, little is known about the beliefs, attitudes, smoking-relevant parenting, and smoking behaviors of family members of pediatric cancer patients, and this is an important future direction.

Despite the consideration of special populations, the current articles also illustrate the potential for generalizability across subgroups. Kandel et al. found that controlling for level of cigarette consumption greatly attenuated any ethnic differences in the performance of measures of dependence. Tyc et al.’s findings demonstrate that well-established predictors from the general adolescent literature were also significant predictors of smoking intentions for cancer patients (e.g., rebelliousness, peer smoking, positive attitudes toward smoking), suggesting substantial generalizability of these models. Similarly, Gerrard et al.’s findings suggest that the prototype/willingness model, which has been successful in prediction for other populations, also predicts smoking among African American pre-adolescents; and Molina et al.’s findings suggest that coping styles, which also predict smoking in the general population (Wills et al., 2001), predict smoking among adolescents with ADHD. It is important to note that the studies in this special issue have not been designed to provide strong tests of whether the processes underlying adolescent smoking are the same for these special populations as for the general adolescent population. Nevertheless, the fact that well-established predictors of adolescent smoking also operate in these special populations suggests that there might be significant generalizability and that preventive interventions for special populations might draw on previous successes from the general population while also tailoring interventions to the population of interest.

One potential need for tailoring can be seen in the problem of designing interventions for preventing tobacco use among adolescents with ADHD. Although these adolescents might benefit from developing more adaptive coping skills, traditional cognitive-behavioral interventions aimed at developing reflective, planful strategies will be difficult to implement for children with ADHD, given their symptomatology. Moreover, as noted by Molina and her colleagues, the treatment needs of this group must be considered in the context of other interventions that they receive, particularly stimulant medication, which is widely prescribed for treating ADHD. The controversial data concerning the effects of stimulant medication on later tobacco use (and substance use more broadly) are extremely important to resolve. Stimulant medication itself might have a preventive effect on smoking, particularly if tobacco use serves to self-medicate attentional deficits. However, if stimulant medication has long-term neurobiological effects that increase risk for substance use, then other interventions will be required. The need to consider symptomatology and medication when studying tobacco use among ADHD children also illustrates the importance of considering psychopathology in the broader literature on adolescent tobacco use. An interest in the role of psychopathology in adolescent smoking represents another recent trend in the field, and studies have begun to consider psychopathology both as a prospective predictor and as a consequence of adolescent tobacco use (McMahon, 1999).

All of the articles in this issue also have implications for interventions to reduce adolescent tobacco use. Most directly, of course, the article by McAfee et al. illustrates an attempt to reduce adolescent smoking within a health care setting, using parents and health care providers as change agents. Their findings illustrate the complexity of trying to achieve change using the health care system, either in enlisting physicians to deliver antismoking messages or in delivering these messages in ways that are perceived and remembered by adolescents. Health care settings present multiple challenges, including the
limited time availability of health care professionals, their lowered self-efficacy in terms of skills to change smoking behavior, and their need to preserve an accepting, supportive alliance with their adolescent patients (as well as with these patients’ parents, who themselves might be smokers). An important direction for future research is to further operationalize the role of health care professionals in assessing tobacco use (including diagnosing dependence) and in intervening in adolescent tobacco use (including psychosocial intervention and/or the use of pharmacotherapy, such as bupropion or nicotine replacement therapy). The clinical practice guideline of the U.S. Department of Health and Human Services (Fiore et al., 2000) suggests that, in the absence of an extensive database on adolescents, health care professionals should assess and treat adolescent smokers using methods shown to be effective for adults, with modifications to make these interventions developmentally appropriate. However, more work is required to provide empirical support for these interventions in health care settings for adolescents, including what exactly is required to make these interventions developmentally appropriate.

The other articles in this special issue also illustrate directions for tobacco prevention research, particularly in terms of identifying potentially modifiable mediators. Some of the distal risk factors that were studied may be difficult to modify in preventive interventions. For example, neighborhood characteristics, personality variables, general parenting, and attention deficit disorder symptomatology are all relatively difficult to modify in the context of a tobacco-prevention intervention. However, an important feature of these articles is that they assess the role of potentially modifiable mediators of these risk factors, such as prototypes of smokers, coping strategies, or smoking-specific parenting. The results of these studies suggest that attempts to change adolescents’ prototypes or images of smokers (Gerrard et al.) as well as improving coping strategies (Molina et al.) could provide important preventive benefits. However, the benefits of altering parents’ antismoking messages (without changing more general parental acceptance and control) might be more limited, because smoking-specific parenting did not predict smoking among families with a parent who him/herself smoked. (Chassin et al., this issue).

Finally, it is important to note that although the articles in this special issue were selected to illustrate themes of importance for pediatric psychologists, they are certainly not comprehensive in their coverage of the field of adolescent smoking. The growing sophistication and maturation of this area of research inquiry has included a recognition of multiple influences, interacting at multiple levels, in complex biopsychosocial models. In terms of etiology, the articles in this volume do not cover questions of genetic risk and its mediators or moderators, including individual differences in the effects of nicotine or its pharmacokinetics, heritable individual differences in personality/temperament, or differences in pubertal timing, nor do they consider interactions between these factors and social context. Although peer influences are critical to adolescent smoking, the current articles do not examine the processes underlying peer influences or differentiate among close friendships, clique memberships, or romantic relationships. In terms of broader social factors, the articles do not address classroom or school influences, or the influence of school policies. They do not deal with cultural-historical trends in cigarette smoking, nor do they address how societal changes in the image of smoking might influence smoking prevalence and progression. Moreover, in considering intervention implications, the articles in this volume have focused on those that might be most relevant for pediatric health care settings. In so doing, we have not addressed the very large literature on school-based interventions or broader social policy changes such as increasing cigarette taxes, regulating smoking advertising, limiting smoking in public places like restaurants or workplaces, and eliminating vending machine sales. Although our coverage of the field of adolescent smoking has of necessity been selective, we hope that the articles in this special issue will serve to highlight particular topics that link to the agendas of pediatric psychologists.

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References


