HHS Public Access

Author manuscript

J Atten Disord. Author manuscript; available in PMC 2019 September 02.

Published in final edited form as:

J Atten Disord. 2018 July ; 22(9 Suppl): 3S–9S. doi:10.1177/1087054718763729.

Introduction: Just Say No? New Insights About Change Versus Constancy in Substance Use Behavioral Decisions in Youth With and Without ADHD

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Abstract

Despite enormous social-psychological and economic consequences of substance abuse in youth and young adults, too little is known about effective interventions among substance users, both with and without ADHD. This special issue reports on four linked investigations that employed a novel research strategy when the Multimodal Treatment Children with ADHD Study (MTA) participants were between ages 21.7 and 27.3 years old (14–16 years after initial assessments). Using combination of in-depth qualitative narrative interviews and quantitative analyses ("mixed methods") of 183 participants from four to six original MTA sites, investigators sought to obtain a more complete understanding of factors contributing to youths' substance use (SU) initiation, maintenance, and desistence, (both among youth with ADHD and control participants). The articles in this special issue illuminate important new insights about possible influences contributing to SU, particularly persistent use/abuse. Findings also illustrate the benefits of mixed-methods studies, not only to better understand the linkages between ADHD and SU, but also to understand other areas of child/adult psychopathology.

Keywords

ADHD; substance use; turning points; decision-making; stages of change; theory of reasoned action; unified theory of behavior; self-efficacy; mixed methods

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Authors' Note

The opinions and assertions contained in this report are the private views of the authors and are not to be construed as official or as reflecting the views of the Department of Health and Human Services, the National Institutes of Health, or the National Institute of Mental Health.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: In the past 2 years, Dr. Jensen has received royalties from several publishing companies: Random House, Oxford, and APPI, Inc. He also is a part owner of a consulting company, CATCH Services, LLC. He is the CEO/President of a nonprofit organization, the REACH Institute, but receives no compensation. None of the other authors have any additional declarations.

Background

Despite the enormous social-psychological and economic consequences of substance abuse in young adults, both with and without ADHD, too little is known about effective interventions for long-term substance use/abuse (SU/A; for example, see Fanshawe et al., 2017; Hoch et al., 2014; Lee et al., 2013; Litt, Kadden, & Petry, 2013; Stanton & Grimshaw, 2013). Reasons for this lack of progress are manifold, but one major reason may lie in our traditional research methods that depend, largely, on researchers' selection of (a) predefined study variables and (b) statistical analytic models that attempt to capture accurately how multiple explanatory variables "behave," in concert or alone. Regarding the former, like most research involving psychiatric disorders and psychological phenomena, research on ADHD-related risk of substance use disorders (SUD) has relied primarily on highly structured clinical interviews of DSM-based mental health disorders, paper-and-pencil checklists about presumed mediators and moderators, and/or measures of presumed biological mechanisms (e.g., neuroimaging and genetics).

Although these "quantitative" measures, coupled with null-hypothesis significance testing, are powerful and essential research tools, they suffer from a number of important limitations. That is, they generally assume that predefined study variables operate on all participants in a similar fashion, that is, as "main effects" (see Loftus, 1996; Meehl, 1978; Ragin, 1997). As a general rule, they have limited capacity to explore individual differences in how such variables operate, particularly if there are multi-way interactions with respect to potential moderator effects. As a result, they have limited ability to identify novel variables that are of importance to individual participant outcomes that lie outside of investigators' awareness or planned statistical approaches.

Important complementary strategies that address limitations of such quantitative approaches in health research and developmental science are qualitative study methods—or studies that combine both methods (so-called "mixed-methods" studies; see Creswell, Klassen, Plano Clark, & Smith, 2011; Weisner, 2014; Weisner & Duncan, 2014; Yoshikawa, Weisner, Kalil, & Way, 2008). Qualitative study methods, such as in-depth interviews, offer a more open-ended examination of specific factors that contribute to individual variations in substance onset, persistence, or desistence, to changes in clinical course, and to ultimate outcomes. Such conversational interviews provide information using the categories, contexts, narrative accounts and language, intentions, and points of view of the participants in the study. Thus, the same variable (such as taking a stimulant medication for ADHD) might operate as a risk factor for eventual SA for some youth and as a protective factor for others. As a result, identifying the variations of youths' and parents' perceptions of how, when, and why such factors have affected them specifically may contribute to a more complete understanding of quantitative data results, and enhance the development of sounder hypotheses and more effective interventions.

Obtaining such an in-depth, person-specific, and context-informed understanding using rigorous qualitative interview methods actually bears a great deal of similarity to the clinical interviews of expert clinicians, who first elicit a patient's story and then carefully explore the patient's perceptions, beliefs, and causal attributions. Expert clinicians then augment/cross-

check the patient's own story with narrative interviews from other informants. They finally integrate this information with data from rating scales, laboratory studies, and physical examination findings. This clinical expert-assessment process is used to arrive at an overall case formulation and presumed causal "life story" of how and why the patient's illness may have emerged. Although such approaches have their own set of limitations (Meehl, 1978), in research, a similar strategy can be implemented (mixed methods) that integrates quantitative and qualitative approaches to arrive at a more complete understanding of important clinical phenomena.

Given the many sources of information available to clinical interviewers, and the opportunities for obtaining in-depth understanding of specific patients, it is not surprising that the typical approaches used by most researchers (i.e., the use of pencil/paper questionnaires and exclusive reliance on statistical analyses of tightly defined variables across a sample) frustrates many clinicians who, based on their own, in-depth, person-specific experience, find that most research fails to capture the richness and complexity of what they observe. They may easily identify many clinical exceptions to the sometimes simplistic quantitative research results that trumpet the findings of basic correlations, or mean differences between predefined groups, across a diverse sample of individuals.

These criticisms can be easily applied to studies of youth with childhood histories of ADHD and later substance use (SU). Even the most complex statistical analyses of a group of research participants' closed-end survey responses or circled responses to questionnaire items may fail to reveal many other relevant aspects of youths' experience, many of which often may not have even been queried within the tight constraints of traditional quantitative methods. At best, researchers may be fortunate to identify mediators or moderators of a main effect in a large sample—but even those findings are presumed to apply equally to all members of a given subgroup. Indeed, there is no other way to use such categorical data. These methods may well fail to identify the many individuals who constitute exceptions to the overall findings, even within the subgroup of interest. Thus, sole reliance on traditional "variable based" statistical approaches (a) neglects systematic, person-specific evidence from life narratives and (b) risks missing important individual differences in how specific risk and protective factors operate differently across individuals.

To counteract these problems, and given the diversity of outcomes—some even counterintuitive—seen in the MTA study findings to date (e.g., Jensen et al., 2007; Molina et al., 2013), investigators decided to seek more in-depth understanding of individual differences in youth outcomes (focusing on ADHD, SU, and stimulant treatment history). Our goal was to achieve a better understanding and interpretation of the study's quantitative findings by using a mixed-method approach—That is, tacking back and forth between qualitative and quantitative findings to understand our complex longitudinal dataset.

Thus, for this Special Issue, we have employed both qualitative and quantitative methods to represent different aspects of the same concepts: ADHD, treatment histories, SU, outcomes, family and patient experiences, and the like. Importantly, to this point, all previous MTA articles and analyses have relied solely or mainly on traditional quantitative methods. Given the limitations of such methods, we sought to apply qualitative methods (much like expert

clinical interviews) as rich sources of new hypotheses, unseen or unanticipated by investigators when the MTA study was first designed.

There are many ways to analyze and report qualitative and mixed-methods data (Levitt et al., 2018). After listening to our MTA study participants, their narratives were subjected to rigorous, reliable coding of the critical themes and constructs arising the from the participants' life narratives. Such analyses constitute the crucial methods in the four articles in this special section.

Follow-Up of Young Adults With ADHD in the MTA: Design and Methods for Qualitative Interviews

During the follow-up reports of MTA participants after 8 years, (ages 15–19.9 years old), Molina et al. (2013) found that most youth with ADHD denied high levels of SU, largely giving instead verbal accounts or questionnaire reports of brief periods of relatively mild adolescent "experimentation" (Weisner et al., IN PRESS). Subsequently, when the MTA participants were between ages 21.7 and 27.3 years old (14–16 years after initial assessments), investigators conducted the present National Institute on Drug Abuse (NIDA)-funded mixed-method sub-study to obtain a more complete understanding of the extent and causes of youths' SU initiation, maintenance, and desistence, in both youth with ADHD (n = 125) versus participants (n = 58) from the Local Normative Control Group (LNCG), drawing upon four of the six original MTA sites.

As many readers may be unfamiliar with the research methods in this special section, this first article by Weisner et al. acquaints readers with qualitative research methods as well as "mixed-methods" study designs. Thus, this article presents the methodological and conceptual basis for all of this Special Section's mixed-methods articles. The authors describe how the study design facilitates person- and context-specific understanding of MTA study participants' SUD outcomes—focusing on issues related to individual participants' SU histories since their original enrollment in the MTA. Key factors from the contexts of youths' lives (e.g., school histories, peer relations, parental and family circumstances, and the meaning and impact of these factors on individual youth) were explored in a semi-structured, conversational, clinical style interview, not achievable with typical quantitative methods. For example, the interviews elicited youths' perceptions about key "turning points" in their lives—factors that may have affected their decisions to start, stop, abstain, or persist in SU.

Given the MTA's original design as a randomized trial of multiple treatment approaches including stimulant medication and behavior therapy during childhood, Weisner et al. described how the 183 participating youth and their caregivers were selected to participate in our in-depth qualitative interviews. Participants were recruited via stratification procedures to obtain roughly equal numbers of youth from each of the original study treatment arms and the LNCG, balanced to obtain optimal numbers of youth for significant versus minimal/no SUD histories.

The study methods detailed include (a) sample selection and stratification; (b) the qualitative interview design and format; (c) initial pilot studies to test and refine the interview and coding methods; (d) finalization of codes, coding manuals, and procedures; (e) training of interviewers and coders; (f) reliability of the codes and procedures; (g) demographic description of participants; (h) description of attitudinal, social, ecological, and cultural factors identified within the interviews; and (i) the frequency with which various key factors were spontaneously mentioned by participants. Sixteen main topics were coded as follows: SU, possible protective/risk factors, stressors, current social supports, early support and stressors, positive social involvement of youth, self-knowledge and goals, ADHD effects and perceptions, memories of prior participation in MTA, life turning points, school, work, future plans, parenting memories, relationships with families and friends, and mentions of emotional functioning. To ensure coverage of all intended domains and avoid false negatives, every topic was prompted if it did not come up during the conversation. Evidence from narrative accounts of SUD persistence and desistence are presented, contrasting youth with ADHD versus participants within the LNCG. Young adult narratives regarding their ADHD and SUD experiences show the added value of these qualitative research methods to improve our understanding of SUD risk and protective factors in this population. Many youth with ADHD who experienced multiple risks nonetheless did not develop problems with SA or dependence, and their accounts suggest a number of shared beliefs associated with desistance, unidentified resilience, and new pathways for intervention.

The Qualitative Interview Study of Persistent and Nonpersistent SU in the MTA: Sample Characteristics, Frequent Use, and Reasons for Use

The second report nicely illustrates a “mixed-methods” strategy (Swanson et al., IN PRESS). Funding for this overall add-on study did not allow examining all participants from all sites and even required selection of only a subset of participants from these four sites (see Weisner et al., IN PRESS, for a complete description of the selection process). Given the possibility of selection biases, Swanson et al. first used the quantitative data from the standard MTA longitudinal assessments to examine all participants from the four participating sites, comparing those who were selected for participation versus those not selected. These analyses demonstrated that those selected for participation did not differ significantly from those not selected.

Investigators then “drilled down” further into the qualitative study sample (n = 183), comparing youth with persistent versus nonpersistent SU across the participating sites. Specifically, Swanson et al. described the ADHD treatment histories of the participants, including patterns of treatment with stimulant medication from childhood into adulthood based upon the quantitative data collected during earlier assessment points. Grouping participants both by original random treatment assignment (Medication management [Med], Behavioral treatment [Beh], Combination [Comb], and Community Comparison/Treatment as Usual [CC]) and by their levels of stimulant medication use over time, they then compared their narrative accounts of their drug use histories, attitudes about ADHD medication treatments, and current SU-related beliefs and perceptions. For example, by comparing the qualitative interview findings of youth with negligible use versus those

reporting consistent use of stimulants over time, they explored the extent to which stimulant treatment histories either protected from or predisposed to later persistent or nonpersistent SU. No meaningful differences were found on any of the possible causative variables of SU, including minority status, family educational status, percentage female, or percentage on public assistance at baseline (see Table 3 in Swanson et al., IN PRESS).

Within the above-described subgroups, Swanson et al. then examined youths' narrative descriptions, beliefs, and attitudes about their own personal SU histories, including drugs of choice, amount/extent of drug use, and their stated reasons for SU initiation/desistence/persistence. These analyses revealed that neither the original MTA randomized treatment group assignment (Med, Beh, Comb, and CC) nor subsequent patterns of stimulant use (negligible, inconsistent, consistent) predicted persistent versus nonpersistent SU by young adulthood (see Table 4 in Swanson et al., IN PRESS). For ADHD versus LNCG status, however, youth with ADHD were more likely than LNCG participants to spontaneously report that they used cannabis because it provided them "stability."

Exploring possible two-way interactions between diagnostic status (ADHD vs. LNCG) and SU persistence versus nonpersistence, persistent users with ADHD reported significantly higher rates of four out of five possible "reasons" why they used cannabis (stability, negative peer influences, improvement of quality of life, and addiction) than did nonpersistent users with ADHD. In contrast, LNCG participants with persistent SU reported higher rates of only one of the five possible reasons (recreational use), compared with LNCG nonpersistent substance users.

These novel findings may have important implications for designing future SU prevention or treatment programs, particularly for youth with ADHD.

Turning Points in the Lives of Youth of With/Without ADHD: Are They Linked to Changes in SU?

Four decades of behavioral research have identified common underpinnings of how and why individuals change—that is, abandon one behavior for another (Jensen et al., IN PRESS). This research has been informed by self-efficacy theory as well as the theories of reasoned action and planned behavior. The established elements of change (expected values, behavioral beliefs, normative beliefs, self-efficacy beliefs, and behavioral intentions) have been circumscribed within the Unified Theory of Behavior Change (UTB; Fishbein, 2008; Jaccard, 2012; Jaccard, Dodge, & Dittus, 2002). Despite the sound empirical and theoretical underpinnings of UTB, these basic-science predictors of change have been rarely applied to studying behavior change and decision-making in individuals who start, stop, or persist in SUD.

The narrative histories obtained in this mixed-method sub-study allow us to examine whether spontaneously reported predictors of change were present in the narrative histories of youth who abstain, persist, desist from, or intermittently relapse in use/abuse of illicit substances. Thus, for this report we identified 60 youths (½ ADHD, ½ LNCG), from the 183 participants, drawing equal numbers of participants across three different SU groups

(abstainers, persisters, and desisters). These groups were based on lifetime histories of behavioral "decisions," derived from the quantitative longitudinal checklist data as well as participants' narrative descriptions of past and current use/nonuse at the time of the qualitative interviews The UTB theory-driven behavior-change elements noted above (expected values, etc.) were identified and coded for these 60 individuals prior to their personally identified behavioral "turning points" (Teruya & Hser, 2010)— that is, before they embarked on new SU-related behaviors (abstinence, initial use, restarting use, desistence).

Overall, we found that basic-science models of behavior change (UTB and stages of change [turning points]) helped explain and possibly predict youths' SU/A decisions, among those both with and without ADHD. Both positive and negative behavioral beliefs about SU/A distinguished abstainers from persisters and desisters. For example, beliefs in the psychological/physiological benefits of SU/A distinguished between desisters and persisters, with persisters attributing greater benefits to SU/A than desisters. Additional research may be needed to address whether such perceptions are simply biased retrospective reports in personal explanations of why they persist—or whether—or whether, in fact, there are indeed benefits for some persisting youth in their functioning (e.g., reduced anxiety, etc.).

Norms and social forces were also found to be key predictors of behavior change. Specifically, Jensen et al. found that youth with ADHD, compared with those without, had fewer positive role models and supportive persons in their lives and reported more negative role models related to their SU/A-related decisions. Such findings suggest the need for and possible benefits from environmental interventions that enhance the positive social networks to which youth with ADHD are exposed.

Our examination of the third key predictor of behavior change within the UTB model (self-efficacy) failed to reveal any significant differences between ADHD and LNCG participants, but did demonstrate differences across the three SU/A groups, with the lowest self-efficacy levels found among persisters. As high self-efficacy is associated with behavior change, these findings suggest that future research should examine self-efficacy among persistent substance users and test strategies to increase self-efficacy to determine whether such approaches increase desistence from continuing SA.

Finally, examination of "turning points" revealed several important differences across subgroups. More negative turning points were found as a function of SU/A status, especially among ADHD persisters—and fewer positive turning points were found for ADHD versus LNCG participants. As turning points are often related to social networks and forces, the fewer available positive social supports in the lives of individuals with ADHD may in turn lead to fewer positive turning points. This possibility will need to be further examined in future prospective studies.

Understanding How SU and Emotional Functioning Are Perceived to Be Related in Persistent Substance Users From the MTA Study

Although inattention and hyperactivity-impulsivity are the core symptom domains of ADHD, disrupted emotional functioning is increasingly identified as an important accompanying feature of the disorder (Mitchell et al., IN PRESS). In addition, such disrupted emotional functioning is considered to play a role in SU, with reports suggesting that SU both modifies emotional states and that emotional states in turn influence SU (Barkley & Murphy, 2010). Although SU is prevalent in longitudinal studies of children diagnosed with ADHD, and although disrupted emotional functioning is a feature of both ADHD and SU, little is known about how emotional functioning and SU interact. Furthermore, no studies have yet characterized emotional functioning in a longitudinally assessed psychiatric sample in the context of SU. A qualitative analysis of the role of disrupted emotional functioning involving SU is needed to guide future quantitative studies by identifying key aspects of emotional functioning/SU linkages.

To address these gaps in knowledge, Mitchell et al. examined 92 young adults' (70 ADHD, 22 LNCG) narrative comments about their emotional functioning leading either to or from SU. Participants were further subgrouped into categories of persistent (ADHD n = 50; LNCG n = 17) or desistent (ADHD n = 20; LNCG n = 5) SU, based on their longitudinal checklist—reported histories of SU and final review of their self-statements during the qualitative interviews collected at age 23 to 24 years old. Comparing all participants within and across these groups, Mitchell et al. then examined participants' beliefs and experiences about whether and how their perceived emotional functioning was either linked to ADHD or affected by SU.

Three specific themes involving emotional functioning in the context of SU were identified. Participants reported that (a) emotional states precipitated SU, (b) SU positively influenced their emotional states, and (c) SU negatively influenced their emotional states. Interestingly, among both ADHD and LNCG SU persisters, more than two thirds of participants perceived that SU (specifically cannabis) positively improved their emotional functioning, with no significant differences between ADHD and LNCG participants. Relatedly, among ADHD persistent substance users, 50% of participants reported that SU improved their ADHD symptoms, compared with only 12% of ADHD SU desisters. Similar patterns of reported benefits were not found for either alcohol or tobacco use.

Overall, results suggest that perceptions about mood do not differentiate ADHD and LNCG participants. However, among persistent substance users, perceptions that cannabis benefits their mood symptoms and possibly even their ADHD symptoms warrants further study, potentially leading to new prevention or intervention strategies.

Conclusions, Clinical Implications, and Future Research

The articles in this Special Section highlight the benefits of qualitative research strategies that complement traditional quantitative research. Weisner et al. showcased how these methods can be utilized to provide new insights about possible causes and contributors to

SU in youth and young adults with ADHD. Then, testing the possible generalizability of findings, Swanson et al. examined the demographic and clinical characteristics of narrative interview participants, demonstrating their comparability with MTA participants not selected for interview participation. Their analyses yielded comparable patterns of SU/nonuse between these two groups. They then highlight new findings from interview participants' "reasons" for SU/nonuse. Jensen et al. identified common and distinguishing factors associated with participants' SU behavioral decisions (to abstain, persist, or desist), comparing ADHD and LNCG participants. Results have potentially important implications for the design and testing of future prevention/intervention strategies. Finally, results from the Mitchell et al. study (as well as Swanson et al.) suggest that at least among some participants with ADHD, marijuana use is perceived as helping them achieve emotional stability.

The new findings achieved in this mixed-methods investigation illustrate how such approaches can be used to develop new insights into possible factors contributing to SU, particularly persistent use/abuse. Although important, such considerations are hypotheses that requiring testing and more in-depth examination in future randomized controlled trials (RCTs). Regardless, these findings illustrate the potential benefits of mixed-methods studies, not just to examine the potential linkages between ADHD and SU but in multiple areas of child and adult psychopathology.

Acknowledgments

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The work reported was supported by cooperative agreement grants and contracts from the National Institute of Mental Health (NIMH) and the National Institute on Drug Abuse (NIDA) to the following: University of California–Berkeley: U01MH50461, N01MH12009, N01DA-8–5550; Duke University: U01MH50477, N01MH12012, N01DA-8–5554; University of California, Irvine: U01MH50440, N01MH12011, N01DA-8–5551; University of Pittsburgh: U01 MH50467, N01MH 12010, N01DA-8–5553; McGill University N01MH12008, N01DA-8–5548.

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