

How Does Parental Monitoring Reduce Adolescent Substance Use? Preliminary Tests of Two Potential Mechanisms

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ABSTRACT. Objective: The purpose of this study was to test two non-exclusive mechanisms by which parental monitoring might reduce teen substance use. The first mechanism (M1) is that monitoring increases punishment for substance use since parents who monitor more are more likely to find out when substance use occurs. The second mechanism (M2) is that monitoring directly prevents/averts teens from using substances in the first place for fear that parents would find out. **Method:** A total of 4,503 teens ages 11–15 years old in 21 communities across the United States completed a survey reporting on parents' monitoring/knowledge and teens' substance use. **Results:** We found no support for M1: Parents with greater parental monitoring were not more likely to be aware when the teen had used substances (odds ratios = 0.79–0.93, $ps = .34-.85$), so they could not have increased the rate of punishment. We

found support for M2: When asked directly, teens identified instances in which they planned to or had a chance to use substances but did not because their parents got in the way or would have found out ($p < .01$). Had all those opportunities for substance use occurred rather than been averted by parents, the prevalence of substance use in the sample would have been 1.4 times higher. **Conclusions:** In this community-based sample of teens, we failed to support prior punishment-centric theories of how monitoring might reduce teen substance use. Rather, monitoring may directly discourage teens from using substances regardless of whether it increases parents' awareness of substance use or results in more punishment. Replication in other samples and contexts is needed. (*J. Stud. Alcohol Drugs*, 85, 389–394, 2024)

MANY STUDIES HAVE LINKED greater parental knowledge and monitoring of teens' whereabouts, companions, and activities with lower alcohol and other

drug use (Lac & Crano, 2009; Ryan et al., 2015; Yap et al., 2017). However, reviewers of this literature have found that the question of how parental monitoring reduces adolescent

Received: September 19, 2023. Revision: November 27, 2023.

William E. Pelham III was supported by grants from the National Institute on Drug Abuse (DA055935) and the National Institute on Alcohol Abuse and Alcoholism (AA030197). Herry Patel and William E. Pelham III were supported by the California Department of Cannabis Control (DCC). Herry Patel was supported by the Banting Postdoctoral Fellowship from the Canadian Institutes of Health Research (CIHR). Data used in the preparation of this article were obtained from the Adolescent Brain Cognitive Development (ABCD) Study (<https://abcdstudy.org>), held in the NIMH Data Archive (NDA). This is a multisite, longitudinal study designed to recruit more than 10,000 children ages 9–10 years old and follow them over 10 years into early adulthood. The ABCD Study is supported by the National Institutes of Health (NIH) and additional federal partners under award numbers U01DA041048, U01DA050989, U01DA051016, U01DA041022, U01DA051018, U01DA051037, U01DA050987, U01DA041174, U01DA041106, U01DA041117, U01DA041028, U01DA041134, U01DA050988, U01DA051039, U01DA041156, U01DA041025,

doi:10.15288/jsad.23-00297

U01DA041120, U01DA051038, U01DA041148, U01DA041093, U01DA041089, U24DA041123, and U24DA041147. A full list of supporters is available at <https://abcdstudy.org/federal-partners.html>. Additional support for this work was made possible from supplements to U24DA041123 and U24DA041147, the National Science Foundation (NSF 2028680), and Children and Screens: Institute of Digital Media and Child Development Inc. A listing of participating sites and a complete listing of the study investigators can be found at https://abcdstudy.org/Consortium_Members.pdf. ABCD consortium investigators designed and implemented the study and/or provided data but did not necessarily participate in analysis or writing of this report. This manuscript reflects the views of the authors and may not reflect the opinions or views of the NIH or ABCD consortium investigators. Gayathri J. Dowling was substantially involved in all the cited grants. The ABCD data repository grows and changes over time. The ABCD data used in this report came from the ABCD 5.0 data release (doi: 10.15154/8873-zj65). Doi can be found at <https://nda.nih.gov/study.html?id=2147>.

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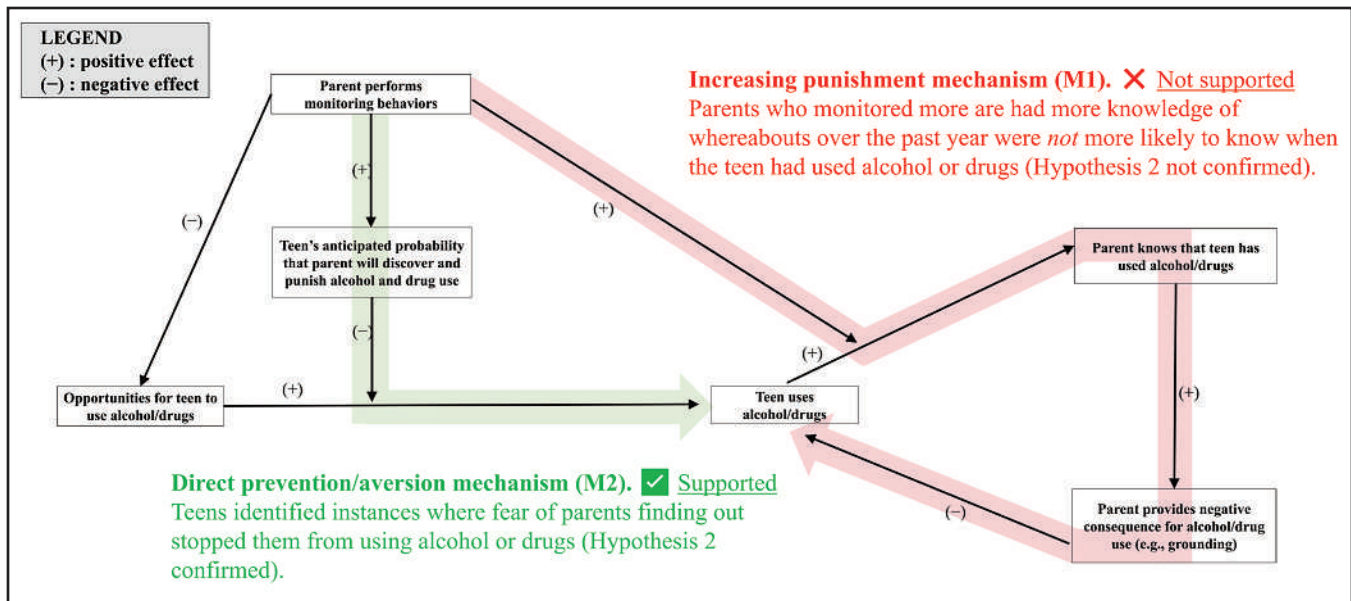


FIGURE 1. Two possible mechanisms explaining how parental monitoring reduces adolescent substance use. *Notes:* Depicts two mechanisms that can explain how parental monitoring reduces teen substance use (Pelham III et al., 2024). The first mechanism, increasing punishment of substance use (M1), comprises the sequence of paths highlighted in red. The second mechanism, directly preventing/averting substance use (M2), comprises the sequence of paths highlighted in green.

substance use remains largely unexplored (Pelham III et al., 2024; Racz & McMahon, 2011; Stattin et al., 2010). A better understanding of the mechanisms that explain monitoring's impact could yield improved accuracy for etiological theories that implicate monitoring (Donovan, 2019) and improved efficacy for clinical interventions that target monitoring (Van Ryzin et al., 2016).

This article investigates two possible mechanisms by which monitoring could reduce teens' substance use, both illustrated in Figure 1. The first possible mechanism, increasing punishment of substance use (M1), is the explanation proposed by two prior theories about how monitoring affects youth behavior (Hayes et al., 2003; Jaccard et al., 2010). These theories conceptualize monitoring as a precondition to effective discipline: Parents who monitor more are more likely to know when youth have engaged in substance use; those parents are in turn more likely to punish a given instance of substance use (e.g., by grounding the youth), and in turn youth who are punished are less likely to use substances in the future. The increasing punishment mechanism is traced by the red sequence of paths in Figure 1. An empirical prediction of the increasing punishment mechanism is that parents who monitor more will be more likely to know when youth have engaged in substance use (Hypothesis 1 [H1]). If H1 is false, then the effect of monitoring on youth substance use cannot be explained by increasing punishment (i.e., M1 must be incorrect)—parents who monitor more are no more likely to know that use has occurred and therefore no more likely to punish it.

The second possible mechanism, direct prevention/aversion of substance use (M2), does not invoke the occurrence

of punishment and was not anticipated in the two prior theories. In this explanation, monitoring directly increases the youths' perception that the parent will find out about and punish any substance use, discouraging the youth from engaging in use regardless of whether the parent actually finds out or punishment actually occurs. The direct prevention/aversion mechanism is traced by the green sequence of paths in Figure 1. An empirical prediction of the direct prevention/aversion mechanism is that youth will identify instances in which they would have used substances but didn't for fear of parents finding out (Hypothesis 2 [H2]). If H2 is false, then the effect of monitoring on substance use cannot be explained by directly preventing/averting substance use from occurring in the first place (i.e., M2 must be incorrect).

M1/H1 and M2/H2 are not mutually exclusive: Both can be true, each explaining part of how monitoring reduces substance use. Each mechanism tells a different story about how monitoring works. Under M1, monitoring is simply an enabler of discipline (the proximal determinant of behavior), and under M2, monitoring exerts its own direct deterrent effect. Under M1, changes to monitoring will affect youth behavior only in the presence of consistent and effective discipline procedures, whereas under M2, more important than any disciplinary response is the inculcation of youths' perception or feeling of being monitored.

Neither M1 nor M2 has been tested in the published literature (Pelham III et al., 2024). To begin probing both mechanisms, we tested H1 and H2 using a survey of 4,503 adolescents ages 11–15 years old at 21 sites across the United States.

Method

Sample

All procedures were approved by the UCSD Human Research Protection Program. Youth provided assent to participate and a legal guardian provided informed consent. Every participant in the ongoing Adolescent Brain and Cognitive Development (ABCD) Study (Volkow et al., 2018) was invited to complete the focal survey. The ABCD Study has followed a cohort of adolescents, recruited primarily from schools, at 21 study sites across the United States (Garavan et al., 2018). Entry criteria were minimal, and the sample was intended to reflect national demographics.

Links to complete a web-based survey were emailed to families on May 17, 2021, during the COVID-19 pandemic. On this date, approximately 37% of adults were fully vaccinated (Mayo Clinic, 2021), cases/deaths were falling (Centers for Disease Control and Prevention, 2021), 83% of employed adults with children were working exclusively in person (U.S. Bureau of Labor Statistics, 2021), and 58% of students in primary education were completing schooling exclusively in person (U.S. Census Bureau, 2021). The supplemental material reports statistical analyses showing that the association between monitoring and substance use in the ABCD sample (a) was unchanged from pre-pandemic to during-pandemic and (b) was unchanged across seven time points spaced throughout the first 12 months of the pandemic, each with differing degrees of pandemic-related disruptions like remote schooling and remote work (Pelham III et al., 2023b). (Supplemental material appears as an online-only addendum to this article on the journal's website.) Thus, we were reassured that this May 2021 survey could be appropriate for studying how monitoring relates to substance use and reflected the typical associations between these constructs.

In all, 4,503 teens ages 11–15 years old ($M = 13.5$, $SD = 0.9$) completed the survey. A total of 51% were female. Seventy-four percent of youth were White, 21% were Black, 3.4% were American Indian or Alaskan Native, 0.6% were Native Hawaiian or other Pacific Islander, and 5.9% were Asian; 21% of youth were of Hispanic ethnicity. A total of 71% of parents held a bachelor's degree, and median annual household income was between U.S. \$75,000 and \$100,000. To address survey nonresponse and improve sample representativeness, data were weighted during analysis to reflect the national sociodemographic composition per U.S. Census data. Inverse probability weights accounting for the attrition from entry to the ABCD were estimated via logistic regression (Seaman & White, 2013) and then multiplied by preconstructed weights created to make the ABCD cohort at study entry reflect the sociodemographic composition of the United States (Heeringa & Berglund, 2020). After data were weighted, survey completers ($n = 4,503$) were similar

to 9-/10-year-olds in the U.S. Census regarding sex and race/ethnicity; family income, structure, and employment; U.S. Census region; and household size (see the supplemental material for further details).

Measures

Substance use and related constructs. Teens reported the number of days in the past 30 days on which they (a) had a drink containing alcohol; (b) used a nicotine product (cigarette; electronic nicotine delivery system; cigar, hookah, pipe; smokeless tobacco, chew/snus); (c) smoked, vaped, or ate a cannabis product (flower, concentrate, edible); (d) misused any prescription drug; (e) sniffed liquids, sprays, or gases to get high; or (f) used other drugs not listed. Using these items, we created a dichotomous indicator of whether teens had used any substances in the past 30 days. If teens reported use of any substance in the past 30 days, they then reported whether their parents/guardians knew or found out (response options: *no*, *yes*). Teen report of the parent's knowledge was preferred for two reasons. First, we reasoned that the teen would by necessity be aware that their parent knew about their substance use if the parent found out and implemented a punishment, as suggested in M1. Second, prior research has shown that parents are unaware of a large fraction of teens' substance use (e.g., 45%–82% in Fisher et al., 2006; Williams et al., 2003), making it difficult to interpret parents' reports of what they know. Finally, all teens were asked if there was ever a time in the past 30 days when they planned or had a chance to drink, smoke, or use drugs but they didn't because their parents/guardians got in the way or would have found out (*no*, *yes*).

Parental Monitoring Questionnaire. Teens completed the Parental Monitoring Questionnaire (PMQ; Karoly et al., 2016), a four-item measure assessing parental monitoring and knowledge over the past week. Items asked (a) how often parents knew the teen's whereabouts, (b) how often the teen knew how to contact parents when home alone, (c) how often the parent and teen discussed the teen's plans for the coming day, and (d) how often the teen and parents ate dinner together. Popular measures of monitoring often combine items tapping both parental monitoring behaviors and parental knowledge, and some articles have found that results are sensitive to the item content (Handschuh et al., 2020; Stattin et al., 2010). To verify that our findings were not sensitive to the PMQ's item content, we repeated analyses with each of three scores and checked for differences: (a) a "monitoring" scale score derived from Items 2–4, (b) a combined "knowledge/monitoring" scale score derived from Items 1–4, and (c) a pure "knowledge" score comprising Item 1.

Factor analysis supported a unidimensional conceptualization of both scale scores (see the supplemental material). Consistent with the PMQ's broad conceptualization of the monitoring construct (Clifton, 2020), omega reliability was

TABLE 1. Regression models predicting the probability that parents knew when teen used substances

Predictor	Dependent variable: Did parents know that teen had used substances in past 30 days? (no/yes)			
	OR	Coef.	SE	<i>p</i>
Scale score for monitoring	0.79	-0.24	0.24	.34
Scale score for knowledge/monitoring	0.87	-0.14	0.23	.57
Scale item 1: How often do your parents/guardians know where you are?	0.93	-0.08	0.40	.85

Notes: OR = odds ratio; coef. = coefficient. Each coefficient was estimated in a separate logistic regression, covarying youth age, youth sex, parent marital status, and parent education. Scale scores were standardized ($M = 0$, $SD = 1$). Item 1 was scaled in the raw response metric (5-point Likert scale ranging from *never* to *almost always*). Regressions were fit to $n = 127$ observations.

.45 for the monitoring score and .55 for the monitoring/knowledge score. To improve measurement properties, we fit item response theory models to items from the PMQ (McNeish & Wolf, 2020). The four items had five ordered, discrete response options, so we fit a graded response model (Samejima, 1969). Expected a posteriori latent variable scores were used as the primary measure of parental monitoring and monitoring/knowledge in subsequent analyses.

As expected, both latent variable scores were significantly associated with the probability of substance use ($p < .001$), supporting their validity. Teens in the lowest quartile of mean monitoring score over the six preceding surveys were 2.2 times more likely to have used substances in the past 30 days at the focal survey (prevalence of 4.6% vs. 2.1%).

Analytic plan

Data were analyzed in R using logistic regression, clustering on study site (Lumley, 2003; R Core Team, 2021). To test H1, we regressed whether parents knew about substance use (0/1) on the monitoring, knowledge, and knowledge/monitoring scores and tested the statistical significance of the coefficients. To reduce error variance and improve precision, we covaried four factors that predict both substance use and monitoring: youth age and sex and parent education and marital status. To check for developmental differences, we tested interactions between the monitoring, knowledge, and knowledge/monitoring scores and youth age. To test H2, we estimated the proportion of teens who reported that there was a time they planned to use substances but did not because their parent got in the way or found out and calculated a 95% confidence interval (CI). To check for developmental differences, we tested if this proportion differed by youth age.

Results

Among this sample of teens ages 11–15 years old, 3.6% (95% CI [2.9%, 4.6%]) endorsed alcohol or other drug use in the past 30 days. The prevalence of alcohol or drug use increased with age, as follows: 0.2% among 11-year-olds,

2.0% among 12-year-olds, 3.2% among 13-year-olds, 6.3% among 14-year-olds, and 8.6% among 15-year-olds. Most endorsements were of alcohol (30% of endorsements), nicotine (37%), or cannabis (16%) use. Of those teens endorsing use ($N = 136$), 31% (95% CI [19%, 45%]) reported that parents knew of or found out about their use. As shown in Table 1, parental monitoring, parental knowledge of whereabouts, or combined knowledge/monitoring did not significantly predict whether parents were aware of teens' substance use (odds ratios = 0.79–0.93, $ps = .34$ –.85). These associations did not vary significantly by youth age ($p = .14$ –.23 for interaction terms).

Among all survey completers, 90 teens (2.1% of survey completers, 95% CI [1.5%, 3.0%]) reported that there was a time they planned or had a chance to use substances but did not because their parents got in the way or would have found out. In all, 63 of the 90 teens reported no substance use in the past 30 days and 27 of 90 reported having used on a different occasion besides the one averted by parents. Thus, responses suggest that the prevalence of substance use would have been 1.4 times greater (5.1% vs. 3.6%) had these 90 teens' parents' monitoring not interfered with opportunities to use. Youth who were older were more likely to report parents' monitoring having interfered with opportunities to use ($p = .003$).

Discussion

Parental monitoring is presumed to reduce adolescent substance use, but the mechanism remains unclear. We posited two possible mechanisms—that monitoring increases punishment of substance use (M1, red path in Figure 1) and/or directly prevents/averts substance use from occurring in the first place (M2, green path in Figure 1). Next, we identified an empirical hypothesis that would falsify each mechanism (H1 and H2) and tested each hypothesis in survey data from 4,503 adolescents across the United States.

H2 was confirmed, yielding support for the direct prevention/aversion mechanism (M2). Teens could identify specific instances in the past month in which they planned or had a chance to use substances but didn't because their parents got

in the way or would have found out. Although few respondents endorsed this occurring (2.1%), the rate was substantial in light of the low overall rate of substance use (3.6%). Most adolescents in this age range do not use substances even when receiving very low levels of monitoring (Pelham III et al., 2023a).

H1 was not confirmed, failing to support the increasing punishment mechanism (M1). The level of parental monitoring, parental knowledge of the teen's whereabouts, or combined monitoring/knowledge held no significant association with the probability that parents were aware when the teen had used substances—in fact, the sign on the coefficients was negative (Table 1). Thus, parental monitoring could not possibly increase the rate of punishment for a given substance use episode, contradicting M1.

Altogether, our empirical findings fail to support prior theories of how monitoring might reduce teen substance use (Hayes et al., 2003; Jaccard et al., 2010). In community-based samples of teens with limited engagement in substance use, parental monitoring may reduce teen substance use by directly preventing/averting use in the first place, rather than facilitating punishment responses to use that has occurred. Further testing of both mechanisms is needed to clarify their importance across persons and contexts. The increasing punishment and direct prevention/aversion mechanisms are not mutually exclusive, and each could explain monitoring's effects in different families. In particular, the increasing punishment mechanism could be more important for teens with active, ongoing, and more severe substance use (Henggeler et al., 2009).

Our sample spanned ages 11–15 years old, so developmental differences are important to consider. We covaried age in all regression models to adjust for possible age-related differences in monitoring, rules, or disclosure about substance use. When testing M1/H1, we did not find evidence that the association between monitoring and parents knowing about substance use varied by age. When testing M2/H2, older youth were more likely to report that parents had interfered with an opportunity to use. Future work should recognize that the mechanisms by which monitoring reduces substance use could vary across development.

Strengths of this study include the falsification testing of two specific mechanisms by which monitoring reduces substance use; the use of a large, nationwide sample that was weighted to reflect the sociodemographic composition of the corresponding U.S. birth cohorts; and the focus on early adolescence, during which parental monitoring may be especially important (Mak et al., 2020). There were also limitations. First, we reported preliminary tests that could falsify both mechanisms, but this was a single study. Idiosyncrasies of sample or measurement could explain why H2 was not supported, and replication is needed. Second, we relied exclusively on teen perceptions. Teens may have been unaware that parents knew of their substance use, though

presumably only in instances when no punishment was delivered. Third, the low rates of substance use in this early adolescent sample could have limited power for hypothesis testing. Fourth, the timeframes of questions did not overlap perfectly, which could have introduced some error: Youth reported on substance use in the past month and monitoring in the past week. Fifth, data were collected within the context of the COVID-19 pandemic, in May 2021. Although sensitivity analyses reassured us that typical associations between monitoring and substance use were observed in our data (see the supplemental material), replication outside the pandemic context is needed. These limitations should be addressed in future work exploring the mechanisms by which parental monitoring reduces teen substance use and understanding how these mechanisms may vary by context and development.

References

- Centers for Disease Control and Prevention. (2021). *COVID data tracker*. <https://covid.cdc.gov/covid-data-tracker/>
- Clifton, J. D. W. (2020). Managing validity versus reliability trade-offs in scale-building decisions. *Psychological Methods, 25*(3), 259–270. <https://doi.org/10.1037/met0000236>
- Donovan, J. E. (2019). Child and adolescent socialization into substance use. In R. A. Zucker & S. A. Brown (Eds.), *The Oxford handbook of adolescent substance use* (pp. 345–372). Oxford University Press.
- Fisher, S. L., Bucholz, K. K., Reich, W., Fox, L., Kuperman, S., Kramer, J., Hesselbrock, V., Dick, D. M., Nurnberger Jr., J. I., Edenberg, H. J., & Bierut, L. J. (2006). Teenagers are right—parents do not know much: An analysis of adolescent–parent agreement on reports of adolescent substance use, abuse, and dependence. *Alcoholism: Clinical and Experimental Research, 30*(10), 1699–1710. <https://doi.org/10.1111/j.1530-0277.2006.00205.x>
- Garavan, H., Bartsch, H., Conway, K., Decastro, A., Goldstein, R. Z., Heeringa, S., Jernigan, T., Potter, A., Thompson, W., & Zals, D. (2018). Recruiting the ABCD sample: Design considerations and procedures. *Developmental Cognitive Neuroscience, 32*, 16–22. <https://doi.org/10.1016/j.dcn.2018.04.004>
- Glorfeld, L. W. (1995). An improvement on Horn's parallel analysis methodology for selecting the correct number of factors to retain. *Educational and Psychological Measurement, 55*(3), 377–393. <https://doi.org/10.1177/0013164495055003002>
- Handschuh, C., Mokkink, L. B., & Smaldone, A. (2020). Perceived parental monitoring: A systematic review of monitoring instruments. *Journal of Nursing Measurement, 28*(3), E253–E292. <https://doi.org/10.1891/JNM-D-19-00045>
- Hayes, L., Hudson, A., & Matthews, J. (2003). Parental monitoring: A process model of parent-adolescent interaction. *Behaviour Change, 20*(1), 13–24. <https://doi.org/10.1375/bech.20.1.13.24844>
- Heeringa, S. G., & Berglund, P. A. (2020). *A guide for population-based analysis of the Adolescent Brain Cognitive Development (ABCD) study baseline data*. bioRxiv. <https://doi.org/10.1101/2020.02.10.942011>
- Henggeler, S. W., Schoenwald, S. K., Borduin, C. M., Rowland, M. D., & Cunningham, P. B. (2009). *Multisystemic therapy for antisocial behavior in children and adolescents* (2nd ed.). Guilford Press.
- Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika, 30*(2), 179–185. <https://doi.org/10.1007/BF02289447>
- Jaccard, J., Guilamo-Ramos, V., Bouris, A., & Dittus, P. (2010). A three-process system of parental monitoring and supervision. In V.

- Guilamo-Ramos, J. Jaccard, & P. Dittus (Eds.), *Parental monitoring of adolescents: Current perspectives for researchers and practitioners* (pp. 176–204). Columbia University Press.
- Karoly, H. C., Callahan, T., Schmiede, S. J., & Ewing, S. W. (2016). Evaluating the Hispanic paradox in the context of adolescent risky sexual behavior: The role of parent monitoring. *Journal of Pediatric Psychology, 41*(4), 429–440. <https://doi.org/10.1093/jpepsy/jsv039>
- Lac, A., & Crano, W. D. (2009). Monitoring matters: Meta-analytic review reveals the reliable linkage of parental monitoring with adolescent marijuana use. *Perspectives on Psychological Science, 4*(6), 578–586. <https://doi.org/10.1111/j.1745-6924.2009.01166.x>
- Lumley, T. (2003). Analysis of complex survey samples. *Journal of Statistical Software, 9*(8), 1–19. <https://doi.org/10.18637/jss.v009.i08>
- Mak, H. W., Russell, M. A., Lanza, S. T., Feinberg, M. E., & Fosco, G. M. (2020). Age-varying associations of parental knowledge and antisocial peer behavior with adolescent substance use. *Developmental Psychology, 56*(2), 298–311. <https://doi.org/10.1037/dev0000866>
- Mayo Clinic. (2021). *Coronavirus disease 2019 (COVID-19)*. <https://www.mayoclinic.org/coronavirus-covid-19/vaccine-tracker>
- McNeish, D., & Wolf, M. G. (2020). Thinking twice about sum scores. *Behavior Research Methods, 52*(6), 2287–2305. <https://doi.org/10.3758/s13428-020-01398-0>
- Muthén, L. K., & Muthén, B. (2017). *Mplus user's guide* (8th ed.). Los Angeles, CA: Authors. https://www.statmodel.com/download/usersguide/MplusUserGuideVer_8.pdf
- Pelham, W. E., III, Patel, H., Somers, J. A., & Racz, S. J. (2024). Theory for how parental monitoring changes youth behavior. *Clinical Psychological Science*. Advance online publication. <https://doi.org/10.1177/21677026241232926>
- Pelham, W. E., III, Tapert, S. F., Gonzalez, M. R., Wade, N. E., Lisdahl, K. M., Guillaume, M., Marshall, A. T., Van Rinsveld, A., Dick, A. S., Baker, F. C., Breslin, F. J., Baskin-Sommers, A., Sheth, C. S., & Brown, S. A. (2023a). Parental knowledge/monitoring and adolescent substance use: A causal relationship? *Health Psychology, 42*(12), 913–923. <https://doi.org/10.1037/hea0001245>
- Pelham, W. E., III, Tapert, S. F., Zúñiga, M. L., Thompson, W. K., Wade, N. E., Gonzalez, M. R., Patel, H., Baker, F. C., Dowling, G. J., Van Rinsveld, A. M., Baskin-Sommers, A., Kiss, O., & Brown, S. A. (2023b). Pandemic-related changes in the prevalence of early adolescent alcohol and drug use, 2020–2021: Data from a multisite cohort study. *Journal of Adolescent Health, 73*(2), 338–346. <https://doi.org/10.1016/j.jadohealth.2023.02.040>
- R Core Team. (2021). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. <http://www.R-project.org/>
- Racz, S. J., & McMahon, R. J. (2011). The relationship between parental knowledge and monitoring and child and adolescent conduct problems: A 10-year update. *Clinical Child and Family Psychology Review, 14*(4), 377–398. <https://doi.org/10.1007/s10567-011-0099-y>
- Revelle, W. R. (2017). *psych: Procedures for personality and psychological research*. Northwestern University.
- Ryan, J., Roman, N. V., & Okwany, A. (2015). The effects of parental monitoring and communication on adolescent substance use and risky sexual activity: A systematic review. *The Open Family Studies Journal, 7*(1), 12–27. <https://doi.org/10.2174/1874922401507010012>
- Samejima, F. (1969). Estimation of latent ability using a response pattern of graded scores. *Psychometrika, 34*(Supplement 1), 1–97. <https://doi.org/10.1007/BF03372160>
- Seaman, S. R., & White, I. R. (2013). Review of inverse probability weighting for dealing with missing data. *Statistical Methods in Medical Research, 22*(3), 278–295. <https://doi.org/10.1177/0962280210395740>
- Stattin, H., Kerr, M., & Tilton-Weaver, L. C. (2010). Parental monitoring: A critical examination of the research. In V. Guilamo-Ramos, J. Jaccard, & P. Dittus (Eds.), *Parental monitoring of adolescents: Current perspectives for researchers and practitioners* (pp. 3–38). Columbia University Press.
- U.S. Bureau of Labor Statistics. (2021). *Supplemental data measuring the effects of the coronavirus (COVID-19) pandemic on the labor market*. <https://www.bls.gov/cps/effects-of-the-coronavirus-covid-19-pandemic.htm>
- U.S. Census Bureau. (2021). *Week 30 Household Pulse Survey: May 12–May 24*. Census.Gov. <https://www.census.gov/programs-surveys/household-pulse-survey/data.html>
- Van Ryzin, M. J., Roseth, C. J., Fosco, G. M., Lee, Y. K., & Chen, I.-C. (2016). A component-centered meta-analysis of family-based prevention programs for adolescent substance use. *Clinical Psychology Review, 45*, 72–80. <https://doi.org/10.1016/j.cpr.2016.03.007>
- Volkow, N. D., Koob, G. F., Croyle, R. T., Bianchi, D. W., Gordon, J. A., Koroshetz, W. J., Pérez-Stable, E. J., Riley, W. T., Bloch, M. H., Conway, K., Deeds, B. G., Dowling, G. J., Grant, S., Howlett, K. D., Matochik, J. A., Morgan, G. D., Murray, M. M., Noronha, A., Spong, C. Y., . . . Weiss, S. R. B. (2018). The conception of the ABCD study: From substance use to a broad NIH collaboration. *Developmental Cognitive Neuroscience, 32*, 4–7. <https://doi.org/10.1016/j.dcn.2017.10.002>
- Williams, R. J., McDermitt, D. R., Bertrand, L. D., & Davis, R. M. (2003). Parental awareness of adolescent substance use. *Addictive Behaviors, 28*(4), 803–809. [https://doi.org/10.1016/S0306-4603\(01\)00275-1](https://doi.org/10.1016/S0306-4603(01)00275-1)
- Yap, M. B. H., Cheong, T. W. K., Zaravinos-Tsakos, F., Lubman, D. I., & Jorm, A. F. (2017). Modifiable parenting factors associated with adolescent alcohol misuse: A systematic review and meta-analysis of longitudinal studies. *Addiction, 112*(7), 1142–1162. <https://doi.org/10.1111/add.13785>