HHS Public Access

Author manuscript

Drug Alcohol Depend. Author manuscript; available in PMC 2023 January 06.

Published in final edited form as:

Drug Alcohol Depend. 2022 August 01; 237: 109502. doi:10.1016/j.drugalcdep.2022.109502.

Relationship Perceptions and Conflict Behavior among Cannabis Users

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Abstract

Background.—Cannabis use is increasingly common, yet few studies have examined its associations with couple functioning. To address this gap, we used actor-partner interdependence modeling to examine the associations between cannabis use, relationship perceptions, and observed conflict behavior in a community-based sample of cannabis users and their partners.

Methods.—Cannabis users (N = 232; 96 males; 122 females; 14 undisclosed biological sex) and their partners completed self-reports of cannabis frequency and global relationship satisfaction and commitment. At a laboratory visit, couples engaged in a 10min conflict discussion and a 5min discussion of areas of agreement, and reported on their post-conflict perceptions. Each partner's parasympathetic activity was assessed during the conflict task, and trained raters coded conflict and recovery behavior.

Results.—More frequent actor cannabis use was associated with more negative engagement and avoidance behavior during conflict, less parasympathetic withdrawal during conflict, and less effective behavioral recovery immediately after conflict. More frequent cannabis use was also associated with greater satisfaction with conflict resolution following the conflict discussion, but was not associated with perceived overall relationship satisfaction or commitment. Cannabis effects were independent of alcohol use.

Conclusions.—Among cannabis users, there are discrepancies between perceived and objective measures of relationship functioning, such that cannabis users viewed their relationships as better functioning compared to independent raters' reports. These findings highlight the need for a nuanced understanding of the associations between cannabis and relationship functioning, which

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Contributors

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Jessica E. Salvatore: Funding Acquisition, Conceptualization, Methodology, Writing, Review & Editing

Both authors have approved of the submitted manuscript.

Author Disclosures

Conflict of Interest

No conflict declared.

appear to be distinct from alcohol, as well as an organizing theoretical framework to stimulate future research.

Keywords

Cannabis use; couple functioning; conflict behavior; relationship perceptions

1. Introduction

Romantic relationships are important contexts for understanding the antecedents and consequences of substance use and disorder (Kendler et al., 2018; Leonard and Homish, 2005; Rönkä et al., 2002). To date, most studies in this area have focused on alcohol (Fischer and Wiersma, 2012; Leonard and Rothbard, 1999). Yet, cannabis use is increasingly common among American adults (Hasin, 2018). In 2020, roughly 35% of American young adults and 16% of adults 26 and older reported past-year cannabis use (Substance Abuse and Mental Health Services Administration, 2021). Although knowledge about the psychosocial and health correlates of cannabis is still evolving (National Academies of Sciences Engineering and Medicine, 2017; Volkow et al., 2014), cannabis use is associated with a range of adverse outcomes including emergency room visits (Zhu and Wu, 2016), psychiatric and cognitive problems (Meier et al., 2012; Stinson et al., 2006), and lower quality of life (Fergusson and Boden, 2008). Only a few studies have examined the associations between cannabis use and couple functioning, which is a notable gap considering that involvement in a harmonious and supportive relationship is considered a hallmark of adult psychosocial functioning (Erikson, 1963; Reis et al., 2000).

The correlates and consequences of substance use in relationships reflect the dynamic interplay between partners' individual vulnerabilities and motivations for substance use, whether and how substance use is reinforced in the relationship, and the degree to which partners resemble one another in their patterns of use (Rodriguez and Derrick, 2017). Although the literature on cannabis use and relationship functioning is in its infancy, the handful of extant studies highlights the interplay between affect and cannabis use in romantic relationships (Testa et al., 2019), as well as the need to take a dyadic perspective to understand the impact of cannabis use on relationship processes (Cunradi et al., 2015; Smith et al., 2014; Testa et al., 2018). For example, individuals are more likely to use cannabis on days where positive affect is lower relative to one's own average, and cannabis use is associated with increases in positive affect and decreases in hostile/anxious affect (Testa et al., 2019). Yet, the use of cannabis to regulate one's own emotional experience can have paradoxical effects on relationships, including more negative interactions with a partner whose use is discrepant (Testa et al., 2018). The picture emerging from these studies underscores the need for careful characterization of the associations between cannabis use and indicators of couple functioning from a dyadic perspective. In addition, given that co-use of cannabis and alcohol is common (Yurasek et al., 2017), clarifying whether cannabis use has unique and specific associations with couple functioning beyond alcohol use remains an important unanswered question.

Our objective here was to use a dyadic perspective to examine the associations between cannabis use, relationship perceptions, and observed conflict behavior in a community-based sample of cannabis users and their partners drawn from a larger multimethod study on couple functioning (Haydon and Moss, 2021). It is widely recognized that multimethod approaches can provide unique insights into couple functioning (Gottman and Notarius, 2000; Reis, 1994). Such approaches overcome the limitations inherent to single method designs (Campbell and Fiske, 1959), and discrepancies across methods can lead to insights that can in turn inform clinical practice. An example would be if different patterns of association emerge for perceptions and behavior that could be leveraged in a therapeutic context to bring awareness to potentially harmful interpersonal dynamics (Rogge et al., 2013). Included in this report are participants' global self-reports of relationship satisfaction and commitment, their behavior and physiology during a laboratory-based conflict interaction task, and their post-conflict perceptions. This set of measures was selected to provide a picture of partners' broadband relationship perceptions alongside their behavior, physiology, and perceptions in the context of a dyadic stressor. Additionally, these measures capture key variation in couple functioning emphasized in major theoretical frameworks in relationships science (i.e., vulnerability-stress-adaption model (Karney and Bradbury, 1995), Rusbult's (1980) investment model, behavioral and affective process models (Gottman and Levenson, 1992), and spillover and buffering models (Overall and Simpson, 2015)).

Data were fit with actor-partner interdependence models (APIMs; Kenny et al., 2006), which simultaneously models actor effects (i.e., the effects of one's own cannabis use) as well as partner effects (i.e., the effects of a partner's cannabis use) while controlling for the correlation between partners in the same dyad. We asked three questions:

1. Are actor and partner cannabis use associated with self-reported perceptions of satisfaction and commitment?
2. Are actor and partner cannabis use associated with observed conflict behaviors (negative engagement, conflict avoidance), observed conflict recovery behavior (positive recovery), and parasympathetic withdrawal (decrease in respiratory sinus arrhythmia from rest to conflict, indicative of recruitment of autonomic resources in the face of emotional challenge)?
3. Are actor and partner cannabis use associated with self-reported post-conflict perceptions (satisfaction with conflict resolution, demand behavior, and withdrawal behavior)?

2. Material and Methods

2.1. Participants

Data came from an existing study of interpersonal stress and sleep in a community-based sample assessed between 2017–2019 (Haydon and Moss, 2021). The full sample included 416 individuals in 208 cohabiting couples, recruited via flyers and social media posts in western Massachusetts, U.S., where recreational cannabis use was legalized in 2016. Data included in this report represent participants who reported cannabis use (N = 232 individuals

from 145 couples) and their partners. The analytic sample included 96 males, 122 females, and 14 participants who did not report biological sex; 17% identified as transgender or non-binary. The racial composition of the sample was 76% white, 10% Latinx, 8% Black, 7% multiracial, 5% Native American, and 4% Asian; 9 participants did not report race. The mean age was 28.3 years (SD = 5.6); 53.7% earned under $50,000 in annual household income. Mean relationship length was 3.8 years (SD = 3.3) and 18% of couples were married.

2.2. Procedure

Participants completed an online survey regarding substance use, relationship satisfaction, and commitment. Next, at a laboratory visit, couples were videotaped discussing their biggest relationship problem for 10 minutes, during which participants' heart rate and respiration were assessed. Couples then discussed areas of agreement in their relationships for 5 minutes. Participants also completed a daily diary study of stress and sleep (not discussed here). Informed consent was obtained and participants received U.S. $100.

2.3. Measures

2.3.1. Cannabis Use.—Participants reported their typical cannabis use frequency (1 = never, 2 = less than monthly, 3 = monthly, 4 = weekly, 5 = daily or almost daily). The full sample included 180 participants who reported never using cannabis and 4 who did not report their usage. Among the 232 participants who reported cannabis use, 86 (37%) reported less than monthly use, 24 (10%) reported monthly use, 46 (20%) reported weekly use, and 76 (33%) reported daily or almost daily use. For analysis, we combined the monthly and weekly users into one group due to sparseness in both groups and to balance sample size across response options[1].

2.3.2. Alcohol Use.—Participants reported on the three AUDIT-C items (Bush et al., 1998) regarding their frequency and quantity of alcohol use and their frequency of consuming six or more drinks in one sitting in the past 30 days. Items were summed to create an alcohol use index.

2.3.3. Relationship Satisfaction and Commitment.—The Hendrick Relationship Assessment Scale (Hendrick, 1988) assessed relationship satisfaction with seven items rated on a 7-point scale (α = .84). The Perceived Relationship Quality Components Inventory (Fletcher et al., 2000) assessed relationship commitment with a subscale of 3 items rated on a 7-point scale (1 = not at all; 7 = extremely; α = .87).

2.3.4. Parasympathetic Withdrawal.—Sensors on participants' torsos assessed heart rate and respiration during a 4-min resting baseline and the 10-min conflict discussion. Heart rate was measured continuously at 1000 Hz. Respiratory sinus arrhythmia (RSA) for each epoch was calculated based on interbeat intervals with data acquisition systems from the James Long Company (Caroga Lake, NY). Raw scores were log-transformed.

[1]Our rationale for the combining these two categories is that monthly and weekly use both suggest regular use within a defined period of time (i.e., at least monthly), whereas there is likely to be greater unmeasured variability in the less than monthly group (e.g., once a year vs. every 6 weeks).

RSA withdrawal was calculated by subtracting mean conflict RSA from mean baseline RSA; higher scores reflect greater RSA withdrawal. Four participants' data were lost due to participant interference or equipment failure.

2.3.5. Conflict Behavior.—Four trained raters assessed participants' behavior during the conflict discussions. Negative engagement assessed the extent to which targets issued demands for change, criticism, or blame on a 5-point Likert-type scale from 1 (none) to 5 (very strong). Low scores were assigned to participants who never or rarely used these tactics; high scores were assigned when these tactics were used frequently and/or intensively. Interrater reliability, established on 20% of the sample, was .89. Trained raters also assessed each partner's conflict avoidance, indicated by deflecting, skirting or ignoring areas of disagreement, on a 5-point Likert-type scale from 1 (none) to 5 (very strong). Low scores were assigned when participants made no attempt to avoid conflict; high scores were assigned when participants made strong efforts to avoid conflict by refusing to discuss disagreements or disengaging from the interaction entirely. Interrater reliability was .95.

2.3.6. Positive Conflict Recovery.—A separate set of raters assessed participants' post-conflict recovery behavior (i.e., the extent to which partners are able to transition out of conflict, regardless of resolution, toward a discussion of agreements and positive aspects of their relationship; Haydon et al., 2017; Salvatore et al., 2011). Using a 5-point Likert-type scale from 1 (not at all) to 5 (very strong), raters assessed the extent to which each partner exhibited effective positive conflict recovery during the 5-min discussion of agreements immediately following the conflict discussion. Low scores were assigned when participants made no substantive contributions to the discussion of positive aspects of the relationship. High scores were assigned when participants nominated areas of agreement or positive aspects of the relationship or when they elaborated upon their partner's suggestions. Interrater reliability, established on 25% of cases, was .89.

2.3.7. Post-Conflict Perceptions.—Following the conflict discussion, participants reported their satisfaction with conflict resolution on a scale of 1 (not at all) to 7 (extremely). Each partner also reported how much they demanded change, criticized, or blamed their partner (actor demand behavior) and how much they withdrew from conflict during the discussion (actor withdrawal behavior) on a scale of 1 (not at all) to 7 (very much).

2.4. Analytic Strategy

We observed significant interdependence between partners' data (Table 1), and partners in 33% of couples were indistinguishable by sex or gender. Accordingly, we used APIMs for indistinguishable dyads (Kenny et al., 2006). Each model specified partners (level 1) as repeated within couples (level 2) and included level 1 fixed effects for actor and partner cannabis and alcohol use (standardized with *z*-transformation). Models specified compound symmetry covariance for repeated measures. Recent work highlights that benchmarks for small, medium, and large effect sizes vary across psychological subdisciplines and that effects tend to be smallest in non-experimental between-subjects designs (Gignac and Szodorai, 2016; Schäfer and Schwarz, 2019). Funder and Ozer (2019) argued that effects of $r = .10$ for behaviors that reoccur can have meaningful consequences, as small effects

accumulate over time. For these reasons, we focus our interpretation on effect sizes of $r \geq .10$.

3. Results

3.1. Descriptive Statistics and Correlations

Actor and partner cannabis use were correlated (Pearson's $r = .41$, $p < .001$). In 19 couples, both partners reported less than monthly use; in 16 couples, both partners reported monthly or weekly use; in 22 couples, both partners reported daily or almost daily use. In the other couples, at least one partner reported using less than monthly, monthly or weekly, or daily. Cannabis and alcohol use were negatively correlated ($r = -0.15$, $p < .01$). Descriptive statistics and correlations between all variables appear in Table 1.

3.2. Relationship Perceptions

Table 2 summarizes the results of the APIMs examining the associations between cannabis use, relationship satisfaction, and commitment. Relationship satisfaction was not associated with actor cannabis use (effect size $r = .02$), partner cannabis use ($r = .06$), actor alcohol use ($r = .07$), or partner alcohol use ($r = .01$). Relationship commitment was also not associated with actor cannabis use ($r = .02$), partner cannabis use ($r = -.07$), actor alcohol use ($r = -.06$), or partner alcohol use ($r = -.01$).

3.3. Conflict & Recovery Behavior

Table 2 summarizes results of the APIMs examining the associations between cannabis use and observed conflict and recovery behavior. Higher negative engagement was associated with higher actor cannabis use ($r = .13$) and lower partner cannabis use ($r = -.20$). Higher negative engagement was also associated with lower actor alcohol use ($r = -.18$), but partner alcohol use ($r = .01$) was not associated with actor negative engagement. Higher conflict avoidance was associated with higher actor cannabis use ($r = .20$) but was not associated with partner cannabis use ($r = .02$), actor alcohol use ($r = -.04$), or partner alcohol use ($r = .01$). Effective conflict recovery behavior was associated with lower actor cannabis use ($r = -.18$) but was not associated with partner cannabis use ($r = .07$), actor alcohol use ($r = .00$), or partner alcohol use ($r = .06$).

3.4. Parasympathetic Withdrawal

Table 2 summarizes the result of the APIM examining the association between cannabis use and parasympathetic withdrawal during conflict. Greater RSA withdrawal was associated with lower actor cannabis use ($r = -.13$), higher partner cannabis use ($r = .11$), higher actor alcohol use ($r = .16$), and lower partner alcohol use ($r = -.21$).

3.5. Post-Conflict Perceptions

Table 2 summarizes results of the APIMs examining the associations between cannabis use and post-conflict perceptions. Higher satisfaction with conflict resolution was associated with higher actor cannabis use ($r = .13$) and lower actor alcohol use ($r = -.12$). Satisfaction with conflict resolution was not associated with partner cannabis use ($r = -.07$) or partner

alcohol use (r = .03). Self-reported actor demand behavior was associated with higher actor alcohol use (r = .12) but was not associated with actor cannabis use (r = −.07), partner cannabis use (r = −.01), or partner alcohol use (r = −.06). Self-reported actor withdrawal behavior was not associated with actor cannabis use (r = −.01), partner cannabis use (r = −.07), actor alcohol use (r = .09), or partner alcohol use (r = −.05).

4. Discussion

We used multiple methodologies and a dyadic perspective to ask three questions about the associations between cannabis use and relationship functioning. Guided by Funder and Ozer (2019), we used an effect-size based approach for inferences with $r \geq .10$ as the cut-off in view of evidence that even small effects that accumulate over time can have meaningful consequences. First, we examined whether actor and partner cannabis use were associated with overall relationship satisfaction and commitment. We found no meaningful associations between either actor or partner cannabis use and these global self-report measures (c.f., other studies have found a negative association between cannabis use and relationship satisfaction, or that this link depends on whether partners are concordant on cannabis use; Crane et al., 2016; Fergusson and Boden, 2008).

Second, we examined whether actor and partner cannabis use were associated with objective measures from a series of couples interaction tasks: observed conflict behaviors (negative engagement, conflict avoidance), observed conflict recovery behavior (positive recovery), and parasympathetic withdrawal (decrease in respiratory sinus arrhythmia from rest to conflict). Across these objective indicators, more frequent cannabis use was associated with less effective behavior and parasympathetic response. Interestingly, more frequent cannabis use was associated with greater use of both negative engagement (i.e., demand, criticism, and blame directed at the partner) and conflict avoidance (i.e., unconstructive withdrawal from conflict). Although research on the demand/withdraw pattern typically treats demand and withdrawal as complementary role-based behaviors (Burrell et al., 2014), these tactics can fluctuate within-person across a single conflict interaction (Baucom et al., 2015; Cerda et al., 2016). In fact, evidence suggests that demand and withdraw behavior may both stem from poor self-regulation of emotional arousal (Baucom et al., 2015; Gottman & Levenson, 1992). This interpretation is further supported by our finding that more frequent cannabis use was associated with less parasympathetic withdrawal from baseline to conflict, suggesting less effective mobilization of autonomic resources to cope with the emotional demands of conflict.

We also found some evidence for partner effects. In several cases, actor and partner cannabis use had opposing effects on relationship outcomes. For example, although more frequent actor cannabis use was associated with more negative engagement and less parasympathetic withdrawal, more frequent partner cannabis use was associated with less actor negative engagement and more actor parasympathetic withdrawal. This may suggest that, controlling for actor cannabis use, partners of more frequent cannabis users were doing more of the emotional “heavy-lifting” during conflict, perhaps recruiting more physiological resources to deal with the challenges of conflict with more frequently-using partners who may themselves be struggling with physiological regulation. When these suggestive findings are

considered alongside the prior evidence that couple resemblance/discordance for cannabis use is associated with multiple indicators of couple functioning (Crane et al., 2016), they underscore the need for a dyadic perspective to understand the correlates and consequences of cannabis use in relationships.

More frequent cannabis use was also associated with less effective behavioral recovery in the moments after conflict. Thus, in addition to less effective engagement in conflict, more frequent cannabis use was associated with less effective use of the opportunity for reconnection and repair after conflict, which several studies indicate has negative longer-term consequences for couple functioning (Haydon et al., 2017; Parsons et al., 2020; Salvatore et al., 2011). This pattern of findings is interesting in view of the cannabis use motives literature (Simons et al., 1998), which documents a consistent association between coping motives (i.e., using cannabis to avoid or relieve tension or distressing feelings) and higher frequency of cannabis use (Bresin and Mekawi, 2019). Although cannabis use motives were not assessed in this study, on the basis of our findings we speculate that those who are higher on cannabis-to-cope motives and use cannabis to modulate negative emotions may not be able to flexibly shift to engage in other types of shared goals with a partner, potentially reflecting the broader neurocognitive consequences of cannabis use (Dellazizzo et al., 2022; Thames et al., 2014).

Third, we examined whether actor and partner cannabis use were associated with post-conflict perceptions. More frequent cannabis use was associated with greater satisfaction with conflict resolution but was not meaningfully associated with self-reported demand or withdrawal behaviors. Partner cannabis use was not meaningfully associated with post-conflict perceptions. Reconciling these findings with the handful of extant studies in this area is challenging owing to differences in the dimensions of conflict examined, as well as how cannabis use was measured. For example, others have linked cannabis use to greater self-reported relationship conflict frequency and self-reported intimate partner violence (Cerda et al., 2016; Flanagan et al., 2020). Likewise, others have documented associations between conflict and a drug use composite that includes cannabis; however, the unique and specific associations between conflict and cannabis (versus alcohol or other drugs) was not reported (Caughlin and Malis, 2004; Jarnecke et al., 2022). The mixed picture thus far highlights the need for a more systematic understanding of how cannabis relates to varying dimensions of conflict behavior.

4.1. Implications

The observed discrepancies between cannabis users' own perceptions of relationship functioning and objective measures underscores the need to go beyond simplistic conclusions about cannabis use being either "good" or "bad" for relationships. Based on the evidence presented here, we posit that cannabis use is not harmful for (and may in fact be "protective" of) relationship perceptions. Although positive relationship perceptions may sustain satisfaction over time (Murray et al., 1996), they may lead individuals to ignore or rationalize evidence that conflicts with their perceptions (Karney et al., 2001). Moreover, our findings indicate that cannabis use may undermine productive engagement in and recovery from conflict. Conflict is an inevitable part of any relationship, and relationships

grow through effective resolution of disagreements. Accordingly, chronic unconstructive approaches to disagreements may ultimately undermine relationship health (Overall and McNulty, 2017). Moreover, lack of awareness of these patterns may prevent frequent cannabis users from redirecting toward healthier conflict resolution tactics.

It is worth noting that cannabis effects reported here held after controlling for alcohol use. In our sample, more frequent cannabis use was associated with lower alcohol use, a departure from other samples in which alcohol and cannabis use are typically comorbid (Yurasek et al., 2017). Yet, others have shown that recreational cannabis legalization was associated with reductions in alcohol purchasing (Calvert and Erickson, 2021), and there is evidence that alcohol and cannabis both complement and substitute for one another (Subbaraman, 2016). At times the associations between alcohol use and relationship functioning ran counter to the direction of the effects we observed for cannabis (e.g., cannabis was associated with lower parasympathetic withdrawal, higher levels of negative engagement, and higher satisfaction with conflict resolution, while opposite effects were observed for alcohol). It is possible that this pattern reflects subtypes of cannabis and alcohol users (Davis et al., 2019). Thus, our results caution against the assumption that the interpersonal correlates and consequences of substance use are uniform across drug classes.

4.2. Limitations

Given the exploratory nature of the study, we made inferences based on effect sizes $r \geq .10$. However, we recognize the need to account for multiple comparisons. When we used the more stringent threshold of Benjamini and Hochberg (1995) corrected p values, the significance of effects reported in Table 2 remained largely unchanged with a few exceptions: the associations between actor alcohol use and parasympathetic withdrawal and negative engagement were no longer statistically significant. Although we believe participants were not under the influence of cannabis at the time of assessment, this assumption cannot be confirmed without urinalysis, which was not conducted. Relatedly, the assessment of cannabis use focused on frequency, but did not differentiate other dimensions (e.g., method of use, quantity, or concentration) (Cuttler and Spradlin, 2017), nor did we assess whether participants experienced clinically significant problems. Whether the associations between cannabis use and couple functioning change in the context of cannabis use disorder or other psychiatric comorbidities remains to be seen. Of note, 43% of the sample scored at or above the cutoff for risk of clinical depression on the CES-D (Radloff, 1977). The high number of people meeting the clinical cutoff prompted us to evaluate, in a series of supplementary analyses, whether depressive symptoms confounded the effects reported above. The pattern of effects was unchanged when CES-D scores were included as a covariate. Finally, to ensure the robustness of the results to the choice to combine the monthly and weekly cannabis use response options, we reran all analyses presented in Table 2 with groups defined as less than monthly/monthly, weekly, and daily or almost daily. The pattern of effects was identical to that reported here.

4.3. Conclusions

Among cannabis users, there were discrepancies between objective measures and users' own perceptions of relationship functioning. Independent observers (unaware of participants'

cannabis use) rated more frequent cannabis users as higher in negative engagement and conflict avoidance, and psychophysiological data indicated that more frequent cannabis users showed less parasympathetic flexibility in response to conflict. Yet, in their post-conflict self-reports, more frequent cannabis users were more satisfied with conflict resolution and did not perceive themselves as engaging in either demand or withdrawal behaviors. Moreover, cannabis use was not meaningfully associated with participants' global self-reports of relationship satisfaction or commitment. Divergence of self-reports from observed behavior and physiological measures suggests users may be unaware (or perhaps unbothered by) negative relationship dynamics during and after conflict. Replication in other samples will provide further tests and refinements of this hypothesis to develop a more nuanced picture of relationship dynamics between cannabis users and their partners.

Acknowledgements

This work was funded by a National Science Foundation grant (RUI 1650694) to Katherine C. Haydon. Additional support for Jessica E. Salvatore came from K01 AA024152 and R01 AA028064 from the National Institute on Alcohol Abuse and Alcoholism.

References

Baucom BR, Dickenson JA, Atkins DC, Baucom DH, Fischer MS, Weusthoff S, Hahlweg K, Zimmermann T, 2015. The interpersonal process model of demand/withdraw behavior. J. Fam. Psychol. 29(1), 80–90. [PubMed: 25495639]

Benjamini Y, Hochberg Y, 1995. Controlling the false discovery rate: a practical and powerful approach to multiple testing. J. R. Statist. Soc. B. 57(1), 289–300.

Bresin K, Mekawi Y, 2019. Do marijuana use motives matter? Meta-analytic associations with marijuana use frequency and problems. Addict. Behav. 99, 106102. [PubMed: 31473571]

Burrell NA, Kartch FF, Allen M, Hill CB, 2014. A meta-analysis of demand/withdraw interaction patterns, in: Burrell NA, Allen M, Gayle BM, Preiss RW, R.W. (Eds.), Managing Interpersonal Conflict Routledge, pp. 315–332.

Bush K, Kivlahan DR, McDonell MB, Fihn SD, Bradley KA, 1998. The AUDIT alcohol consumption questions (AUDIT-C): an effective brief screening test for problem drinking. Ambulatory Care Quality Improvement Project (ACQUIP). Alcohol Use Disorders Identification Test. Arch. Intern. Med. 158(16), 1789–1795. [PubMed: 9738608]

Calvert CM, Erickson D, 2021. Recreational cannabis legalization and alcohol purchasing: a difference-in-differences analysis. J. Cannabis Res. 3(1), 27. [PubMed: 34233755]

Campbell DT, Fiske DW, 1959. Convergent and discriminant validation by the multitrait-multimethod matrix. Psychol Bull 56, 81–105. [PubMed: 13634291]

Caughlin JP, Malis RS, 2004. Demand/withdraw communication between parents and adolescents: Connections with self-esteem and substance use. J. Soc. Pers. Relat. 21(1), 125–148.

Cerda M, Moffitt TE, Meier MH, Harrington H, Houts R, Ramrakha S, Hogan S, Poulton R, Caspi A, 2016. Persistent cannabis dependence and alcohol dependence represent risks for midlife economic and social problems: a longitudinal cohort study. Clin. Psychol. Sci. 4(6), 1028–1046. [PubMed: 28008372]

Crane CA, Testa M, Schlauch RC, Leonard KE, 2016. The couple that smokes together: Dyadic marijuana use and relationship functioning during conflict. Psychol. Addict. Behav. 30(6), 686–693. [PubMed: 27454369]

Cunradi CB, Todd M, Mair C, 2015. Discrepant patterns of heavy drinking, marijuana use, and smoking and intimate partner violence: results from the California Community Health Study of Couples. J. Drug Educ. 45(2), 73–95. [PubMed: 26464462]

Cuttler C, Spradlin A, 2017. Measuring cannabis consumption: Psychometric properties of the Daily Sessions, Frequency, Age of Onset, and Quantity of Cannabis Use Inventory (DFAQ-CU). PLoS One 12(5), e0178194. [PubMed: 28552942]

Davis CN, Slutske WS, Martin NG, Agrawal A, Lynskey MT, 2019. Identifying subtypes of cannabis users based on simultaneous polysubstance use. Drug Alcohol Depend. 205, 107696. [PubMed: 31726429]

Dellazizzo L, Potvin S, Giguère S, Dumais A, 2022. Evidence on the acute and residual neurocognitive effects of cannabis use in adolescents and adults: a systematic meta-review of meta-analyses. Addiction.

Erikson E, 1963. Childhood and society. Norton, New York.

Fergusson DM, Boden JM, 2008. Cannabis use and later life outcomes. Addiction 103(6), 969–976. [PubMed: 18482420]

Fischer JL, Wiersma JD, 2012. Romantic relationships and alcohol use. Curr. Drug Abuse Rev. 5(2), 98–116. [PubMed: 22455505]

Flanagan JC, Leone RM, Gilmore AK, McClure EA, Gray KM, 2020. Association of cannabis use with intimate partner violence among couples with substance misuse. Am. J. Addict. 29(4), 323–330. [PubMed: 32219903]

Fletcher GJO, Simpson JA, Thomas G, 2000. The measurement of perceived relationship quality components: A confirmatory factor analytic approach. Pers. Soc. Psychol. Bull. 26(3), 340–354.

Funder DC, Ozer DJ, 2019. Evaluating effect size in psychological research: sense and nonsense. Advances in Methods and Practices in Psychological Science 2(2), 156–168.

Gignac GE, Szodorai ET, 2016. Effect size guidelines for individual differences researchers. Pers Indiv Differ 102, 74–78.

Gottman JM, Levenson RW, 1992. Marital processes predictive of later dissolution: behavior, physiology, and health. J Pers Soc Psychol 63(2), 221–233. [PubMed: 1403613]

Gottman JM, Notarius CI, 2000. Decade review: Observing marital interaction. J Marriage Fam 62(4), 927–947.

Hasin DS, 2018. US epidemiology of cannabis use and associated problems. Neuropsychopharmacol. 43(1), 195–212.

Haydon KC, Jonestrask C, Guhn-Knight H, Salvatore JE, 2017. The dyadic construction of romantic conflict recovery sabotage. J. Soc. Pers. Relat. 34(6), 915–935. [PubMed: 29398761]

Haydon KC, Moss C, 2021. Attachment and sleep: A dyadic intensive longitudinal actigraphy study. J. Soc. Pers. Relat. 38(1), 148–157.

Hendrick SS, 1988. A generic measure of relationship satisfaction. J. Marriage Fam. 50(1), 93–98.

Jarnecke AM, Leone RM, Kirby C, Flanagan JC, 2022. Intimate partner violence and couple conflict behaviors: the moderating effect of drug use problem severity. J. Interpers. Violence 37(1–2), NP1170–NP1196. [PubMed: 32437311]

Karney BR, Bradbury T, 1995. The longitudinal course of marital quality and stability: a review of theory, methods, and research. Psychol Bull 118(1), 3–34. [PubMed: 7644604]

Karney BR, McNulty JK, Frye NE, 2001. A social-cognitive perspective on the maintenance and deterioration of relationship satisfaction, in: H. HJ, Wenzel A (Eds.), Close Romantic Relationships. Psychology Press, pp. 203–222.

Kendler KS, Larsson Lönn S, Salvatore JE, Sundquist J, Sundquist K, 2018. The origin of spousal resemblance for alcohol use disorder: causal inference utilizing longitudinal and within-person designs. JAMA Psychiatry 75(3), 280–286. [PubMed: 29417130]

Kenny DA, Kashy DA, Cook WL, 2006. Dyadic data analysis. Guilford Press, New York, NY, US.

Leonard KE, Homish GG, 2005. Changes in marijuana use over the transition to marriage. J. Drug Issues 35(2), 409–429. [PubMed: 17186062]

Leonard KE, Rothbard JC, 1999. Alcohol and the marriage effect. J. Stud. Alcohol 13, 139–146.

Meier MH, Caspi A, Ambler A, Harrington H, Houts R, Keefe RS, McDonald K, Ward A, Poulton R, Moffitt TE, 2012. Persistent cannabis users show neuropsychological decline from childhood to midlife. Proc. Natl. Acad. Sci. USA 109(40), E2657–2664. [PubMed: 22927402]

Murray SL, Holmes JG, Griffin DW, 1996. The self-fulfilling nature of positive illusions in romantic relationships: Love is not blind, but prescient. J. Pers. Soc. Psychol. 71, 1155–1180. [PubMed: 8979384]

National Academies of Sciences Engineering and Medicine, 2017. The health effects of cannabis and cannabinoids: the current state of evidence and recommendations for research. The National Academies Press, Washington, DC.

Overall NC, McNulty JK, 2017. What type of communication during conflict is beneficial for intimate relationships? Curr. Opin. Psychol. 13, 1–5. [PubMed: 28025652]

Overall NC, Simpson JA, 2015. Attachment and dyadic regulation processes. Curr Opin in Psychol 1, 661–666.

Parsons JA, Prager KJ, Wu S, Poucher JW, Hansen MP, Shirvani F, 2020. How to kiss and make-up (or not!): Postconflict behavior and affective recovery from conflict. J. Fam. Psychol. 34(1), 35–45. [PubMed: 31393139]

Radloff LS, 1977. The CES-D scale: A self-report depression scale for research in the general population. Appl. Psychol. Meas. 1(3), 385–401.

Reis HT, 1994. Domains of experience: Investigating relationhsip proecsses from three perspectives, in: Erber R, Gilmour R (Eds.), Theoretical frameworks for personal relationships. Erlbaum, Hillsdale, NJ, pp. 87–110.

Reis HT, Collins WA, Berscheid E, 2000. The relationship context of human behavior and development. Psychol. Bull. 126(6), 844–872. [PubMed: 11107879]

Rodriguez LM, Derrick J, 2017. Breakthroughs in understanding addiction and close relationships. Curr Opin Psychol 13, 115–119. [PubMed: 28813280]

Rogge RD, Cobb RJ, Lawrence E, Johnson MD, Bradbury TN, 2013. Is skills training necessary for the primary prevention of marital distress and dissolution? A 3-year experimental study of three interventions. J Consult Clin Psychol 81(6), 949–961. [PubMed: 24060193]

Rönkä A, Oravala S, Pulkkinen L, 2002. “I met this wife of mine and things got onto a better track”: turning points in risk development. J. Adolesc. 25(1), 47–63. [PubMed: 12009749]

Rusbult CE, 1980. Commitment and satisfaction in romantic associations: A test of the investment model. Journal of Experimental Social Psychology 16(2), 172–186.

Salvatore JE, Kuo SIC, Steele RD, Simpson JA, Collins WA, 2011. Recovering from conflict in romantic relationships: A developmental perspective. Psychol. Sci. 22(3), 376–383. [PubMed: 21245491]

Schäfer T, Schwarz MA, 2019. The meaningfulness of effect sizes in psychological research: Differences between sub-disciplines and the impact of potential biases. Front Psychol 10, 813. [PubMed: 31031679]

Simons J, Crorreia CJ, Carey KB, Borsari BE, 1998. Validating a five-factor marijuana motives measure: relations with use, problems, and alcohol motives. J. Couns. Psychol. 45(3), 265–273.

Smith PH, Homish GG, Collins RL, Giovino GA, White HR, Leonard KE, 2014. Couples’ marijuana use is inversely related to their intimate partner violence over the first 9 years of marriage. Psychol. Addict. Behav. 28(3), 734–742. [PubMed: 25134048]

Stinson FS, Ruan WJ, Pickering R, Grant BF, 2006. Cannabis use disorders in the USA: prevalence, correlates and co-morbidity. Psychol. Med. 36(10), 1447–1460. [PubMed: 16854249]

Subbaraman MS, 2016. Substitution and complementarity of alcohol and cannabis: a review of the literature. Subst. Use Misuse 51(11), 1399–1414. [PubMed: 27249324]

Substance Abuse and Mental Health Services Administration, 2021. Key substance use and mental health indicators in the United States: Results from the 2020 National Survey on Drug Use and Health. Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Rockville, MD.

Testa M, Wang W, Derrick JL, Brown WC, Collins RL, 2019. Does morning affect contribute to daily cannabis use? Addict. Behav. 95, 64–69. [PubMed: 30856545]

Testa M, Wang W, Derrick JL, Leonard KE, 2018. Marijuana use by intimate partners: Does discrepant use impair relationship functioning? Psychol. Addict. Behav. 32(4), 475–484. [PubMed: 29708362]

Thames AD, Arbid N, Sayegh P, 2014. Cannabis use and neurocognitive functioning in a non-clinical sample of users. Addict. Behav. 39(5), 994–999. [PubMed: 24556155]

Volkow ND, Baler RD, Compton WM, Weiss SR, 2014. Adverse health effects of marijuana use. N. Engl. J. Med. 370(23), 2219–2227. [PubMed: 24897085]

Yurasek AM, Aston ER, Metrik J, 2017. Co-use of alcohol and cannabis: a review. Curr. Addict. Rep. 4(2), 184–193. [PubMed: 32670740]

Zhu H, Wu LT, 2016. Trends and correlates of cannabis-involved emergency department visits: 2004 to 2011. J. Addict. Med. 10, 429–436. [PubMed: 27574753]

Table 1.

Bivariate Associations and Descriptive Statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Actor Cannabis Use	**.41*****												
2. Partner Cannabis Use	.41***	**.41*****											
3. Actor Alcohol Use	−.15*	−.21**	**.50*****										
4. Partner Alcohol Use	−.22**	−.09	.50***	**.50*****									
5. Satisfaction	.04	.05	.05	.03	**.53*****								
6. Commitment	.02	−.05	−.06	−.05	.46***	**.17*****							
7. Negative Engagement	.08	−.13*	−.14*	−.08	−.07	.05	**.32*****						
8. Conflict Avoidance	.23***	.10	−.07	−.08	−.06	−.14*	.15*	**.67*****					
9. Conflict Recovery	−.15*	.00	.06	.11†	.18**	.12†	−.24***	−.20**	**.65*****				
10. RSA Withdrawal	.08	−.05	−.04	.13†	.05	.15*	.16*	.09	.01	**.11**			
11. Resolution Satisfaction	.11†	−.00	−.12†	−.07	.23***	.13*	−.16***	.05	.08	.03	**.48*****		
12. Actor Demand	−.08	−.03	−.08	.03	−.19**	−.06	.36***	−.05	−.13*	−.04	−.23***	**.09**	
13. Actor Withdrawal	−.05	−.09	.09	.00	−.20**	−.03	.07	.05	−.12†	−.08	−.38***	.17*	**.15***
Mean	2.96	2.52	3.42	3.30	6.10	6.63	1.34	1.31	2.67	−.88	4.43	2.08	1.67
SD	.83	1.13	2.34	2.29	.77	.62	.74	.72	.97	.92	.94	1.21	1.18

Note. N = 232.

* $p < .10$

** $p < .01$

*** $p < .001$.

Bolded coefficients represent intraclass correlations between actor and partner variables.

Drug Alcohol Depend. Author manuscript; available in PMC 2023 January 06.

Table 2.

Effects of Actor and Partner Cannabis and Alcohol Use on Relationship Functioning

	Satisfaction					Commitment					RSA Withdrawal				
	b	*SE*	*p*	CI_{95}	*r*	*b*	*SE*	*p*	CI_{95}	*r*	*b*	*SE*	*p*	CI_{95}	*r*
Actor Cannabis	.02	.07	.80	−.12, .16	.02	.02	.06	.80	−.11, .14	.02	**−.18**	**.09**	**.05**	**−.37, .00**	**.13**
Partner Cannabis	.05	.06	.39	−.06, .16	.06	−.05	.05	.27	−.15, .04	.07	**.11**	**.07**	**.10**	**−.02, .25**	**.11**
Actor Alcohol	.05	.05	.29	−.05, .15	.07	−.04	.05	.38	−.13, .05	.06	**.15**	**.07**	**.03**	**.01, .28**	**.16**
Partner Alcohol	.01	.05	.85	−.09, .11	.01	−.01	.05	.85	−.10, .08	.01	**−.21**	**.07**	**.00**	**−.34, −.07**	**.21**
	Negative Engagement					Conflict Avoidance					Conflict Recovery				
	b	*SE*	*p*	CI_{95}	*r*	*b*	*SE*	*p*	CI_{95}	*r*	*b*	*SE*	*p*	CI_{95}	*r*
Actor Cannabis	**.15**	**.07**	**.05**	**.00, .29**	**.13**	**.20**	**.06**	**.00**	**.07, .32**	**.20**	**−.23**	**.08**	**.01**	**−.40, −.06**	**.18**
Partner Cannabis	**−.16**	**.05**	**.00**	**−.27, .06**	**.20**	.02	.05	.75	−.08, .12	.02	.06	.07	.33	−.07, .20	.07
Actor Alcohol	**−.13**	**.05**	**.02**	**−.23, −.02**	**.18**	−.02	.04	.58	−.11, .06	.04	.00	.06	.99	−.11, .12	.00
Partner Alcohol	.01	.05	.90	−.10, .11	.01	.01	.05	.86	−.08, .10	.01	.06	.06	.34	−.06, .17	.06
	Resolution Satisfaction					Actor Demand					Actor Withdraw				
	b	*SE*	*p*	CI_{95}	*r*	*b*	*SE*	*p*	CI_{95}	*r*	*b*	*SE*	*p*	CI_{95}	*r*
Actor Cannabis	**.18**	**.09**	**.05**	**.00, .35**	**.13**	−.14	.12	.27	−.38, .11	.07	−.02	.12	.87	−.26, .22	.01
Partner Cannabis	−.08	.07	.28	−.21, .06	.07	−.01	.09	.88	−.19, .17	.01	−.09	.09	.31	−.27, .09	.07
Actor Alcohol	**−.11**	**.06**	**.07**	**−.23, .01**	**.12**	**−.14**	**.09**	**.11**	**−.32, .03**	**.12**	.10	.09	.25	−.07, .28	.09
Partner Alcohol	−.02	.06	.71	−.10, .15	.03	−.08	.09	.40	−.10, .26	.06	−.07	.09	.46	−.24, .11	.05

Note. $N = 232$. CI_{95} = confidence intervals. Effect size $r = \sqrt{(\frac{t2}{t2 + df})}$. Bolded coefficients are effect size $r \geq .10$. Orange shading represents global relationship evaluations; no shading represents observed behavior and psychophysiology during conflict; blue shading represents post-conflict relationship perceptions.