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A Multi-Method Examination of Negative Behaviors during Couples Interactions and Problem

Drinking Trajectories

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Abstract

Models of alcohol use disorder (AUD) are increasingly conceptualizing social and relationship factors as being critical to the understanding of problem drinking. Close relationships involving conflict have been a particular research focus, and partners' expressions of negative emotion are theorized to impact drinking among those with AUD. While it has long been presumed that behaviors during couples interactions influence drinking—and this assumption has informed many modern treatments for AUD—this hypothesis has not been directly tested. We bring multiple methods to bear on this question, combining laboratory based behavioral-observation with a longitudinal design. Forty-eight individuals with AUD (probands), together with their partners, completed a laboratory-based conflict interaction. Their behavior was coded with the Rapid Marital Interaction Coding System. Longitudinal follow-ups of drinking behaviors were completed at 6 and 12 months. Results showed that, above and beyond the proband's own behaviors, partner negative behaviors moderated probands' drinking trajectories, with drinkers whose partners displayed higher levels of hostility at baseline reporting slower declines in frequency of a) drinking, b) heavy episodic drinking, and c) alcohol problems over time and higher levels of drinking, heavy episodic drinking, and alcohol problems at follow-up. Results emphasize the importance of considering close relationships in the study of AUD and further indicate the utility of combining multiple methods in alcohol research.

*Keywords*: alcohol use disorder, negative behaviors, longitudinal, relationship quality, couples

General Scientific Summary

This research is the first to explore behavior during couples' interaction as a predictor of longitudinal

drinking outcomes among individuals with alcohol use disorder (AUD).  Results indicated that,

independent of the individual with AUD's own behaviors, negative behavioral expressions by their

partners during couples interactions predicted increased drinking at 1-year follow-up

NEGATIVE PARTNER BEHAVIORS DRINKING

Research over the past several decades increasingly suggests that an understanding of problematic drinking requires a consideration of the drinker's close social relationships. The nature of our relationships with those around us—the quality of the social interactions we engage in on a daily basis—is among the more powerful and important known factors influencing our emotional states (Baumeister & Leary, 1995), and models of problem drinking now reflect the importance of these social elements of experience. Thus, while theories of alcohol use disorder (AUD) have historically focused almost exclusively on factors intrinsic to the drinker him/herself (e.g., MacAndrew, 1965), many models of disordered drinking are now expanding to consider social and relationship factors as contributors to problematic alcohol use (e.g., Epstein & McCrady, 1998; Fairbairn & Sayette, 2014; Leonard & Eiden, 2007). Reflecting these expanded models, intervention researchers are now increasingly creating roles for significant others in formal AUD treatment programs (e.g., Miller, Zweben, DiClimente, & Rychtarik, 1994), with many featuring a prominent focus on improving the quality of social interaction within these close relationships and on modifying the behaviors of not only the individual with AUD but, importantly, of the significant other as well (McCrady & Epstein, 2009; O'Farrell & Clements, 2012).

One important social reality for many problem drinkers are interpersonal conflicts (Leonard & Eiden, 2007). Problematic alcohol use can exert enormous strain on close social relationships, and both individuals with AUD and their significant others tend to display negative interaction patterns during their social encounters (Marshal, 2003). Significant others of those with AUD often experience high levels of anxiety and depression (Leonard & Eiden, 2007). Further, these individuals may sometimes seek, either consciously or not, to punish the drinking behaviors of individuals with AUD through their own negative behavioral expressions (Hooley, 2007). As a result, families and couples including heavy drinkers are characterized by high levels of conflict, and researchers have devoted a great deal of

attention to understanding conflict and negative emotional displays as they manifest within these couples (Leonard & Eiden, 2007; Marshal, 2003). Although expressions of criticism by significant others may sometimes be viewed by these individuals themselves as important tools for altering the drinker's behavior (Hooley, 2007), such interaction patterns have come to be viewed by researchers and clinicians as harmful (Epstein & McCrady, 1998). In line with this view, prominent behavioral couples interventions now include a pronounced focus on altering the nature of the behaviors displayed during couples interactions, incorporating units designed to decrease negative expressions during couples conflicts and to train significant others to avoid expressions of hostility and criticism (McCrady & Epstein, 2009; Powers, Vedel, & Emmelkamp, 2008).

To our knowledge, negative interaction patterns within close relationships have not previously been directly examined as a predictor of harmful drinking outcomes. Nonetheless, a large amount of indirect evidence has accumulated to suggest a relationship between these negative interactions and problem drinking. In the broader couples literature, models have emerged to suggest that the specific nature of behaviors displayed during couples interaction acts as a central mechanism underlying overall relationship functioning (e.g., Karney & Bradbury, 1997). Within the alcohol literature, environmental stressors, including social stressors, are among the most widely-researched precipitants of drinking behavior (e.g., Higgins & Marlatt, 1975). Further, research in social psychology suggests that indications of social dislike and criticism can give rise to self-regulatory failures (Baumeister, DeWall, Ciarocco, & Twenge, 2005). Social rejection may be perceived as particularly threatening when observed within the context of a close relationship (DeHart, Tennen, Armeli, Todd, & Affleck, 2008). In the literature examining alcohol use specifically among couples, research indicates that self-reports of poor relationship quality, low satisfaction, and verbal aggression within close relationships prospectively predict increased drinking (e.g., Whisman, Uebelacker, & Bruce, 2006), and individuals in recovery

from alcohol use disorder self-report spousal factors as a primary contributor to relapse (e.g., Maisto, McKay, & O'Farrell, 1995).

Of note, research by O'Farrell and colleagues (1998) as well as Fitcher and colleagues (1997) was the first to examine the link between negative interaction patterns and drinking using direct observations of significant other behavior. These researchers produced important initial evidence that behavioral displays of criticism and hostility of the significant others of individuals with AUD predicted relapse among these individuals at 1-year follow-up.  Importantly, however, these studies examined the behaviors of significant others while they interacted with an interviewer alone, and did not explore significant other behaviors displayed during interaction with the proband (individual with AUD) him/herself. Therefore, it remains unclear whether these individuals would have displayed these same behaviors in the company of the proband, and further whether the behavior of the proband him/herself might better explain effects of interest. Thus, while it is now widely believed that the quality of interaction with significant others can impact drinking outcomes, and, indeed, while therapies have been developed based partially on this premise, we do not yet have direct evidence to support such a link.

*The Current Study*: The present research is the first study, to our knowledge, to explore whether behaviors during interactions between individuals with AUD and their partners predict drinking trajectories. More specifically, this research uses a laboratory-based couples conflict paradigm and a well-validated system of behavioral coding (Heyman, 2004) to examine the effect of negative spouse behaviors, including hostility/criticism, in predicting drinkers' alcohol use outcomes at 1-year follow-up. We aimed to examine a diverse sample of individuals for this study and recruited drinkers not only within clinical settings but also from the community at large. Given results of prior studies (e.g., O'Farrell et al., 1998), we predicted that high levels of negative behaviors among partners would predict poorer outcomes among individuals with AUD, above and beyond any effects of the drinker's own

negative behavior.  Based on this prior research, we also predicted that displays of hostility among partners would largely drive these effects.

Methods

*Participants*

As described elsewhere (Cranford, Tennen, & Zucker, 2015), probands with alcohol use disorder and their spouses were recruited from a local substance abuse treatment center (*n*=20 couples) and from the local community (*n*=34 couples).  For the treatment center sample, 559 medical charts of current and incoming patients were screened, and *n*=73 patients met the following eligibility criteria: 1) DSM-IV clinical diagnosis of past 1-year alcohol abuse or dependence, 2) currently married, 3) 18 years of age and older, and 4) not currently a threat to self or others.  The most common reason for exclusion was "not currently married" (n=352). We approached patients before or after therapy sessions (note that these were not couples-focused interventions) and introduced the study.  Of the 73 patients who met eligibility criteria, 20 (27.4%) agreed to participate.  Among those who did not participate, 38% did not call back; 32% refused to participate (the most common reason was "too busy"); and 19% indicated that their spouse was unable or unwilling to participate. We obtained age, gender, and race data from the charts of those who refused to participate, and there were no significant differences between participants and non-participants.

For the community sample, the majority (88.2%) were recruited via newspaper and web-based ads whereas the remainder were recruited via advertisements in local bars. The Rapid Alcohol Problem Screen 4 (RAPS4; Cherpitel, 2002) was used to screen for past 1-year AUD.  Of the 307 potential participants who contacted our offices in response to recruitment efforts, *n*=66 screened positive for AUD and, of these eligible individuals, 52% ultimately agreed to participate. Among those who screened positive and initially expressed interest in participating, reasons for nonparticipation included:

unable to re-contact (*n*=14), spouse unwilling to participate (*n*=5), refused ⁄ no reason given or other reason given (*n*=10), and no transportation (*n*=3). Data from six couples (3 from the community sample and 3 from the clinical sample) were lost due to equipment problems associated with video recording, and thus a total of *N*=48 couples were included in the final sample for this study.

The final sample of 48 couples included 32 couples with a male proband/female partner and 16 couples with a female proband/male partner.  Mean (standard deviation) ages for probands and spouses were 43.8 (13.5) and 43.4 (14.3) years, respectively. Participants were 76.1% White, 17.5% Black, 2.1% Asian, and 4.2 % "other" racial group. The modal level of education was ''some college.'' The median amount of time couples had spent living together at baseline was 5.7 years (range: 6 months to 47 years).

*Procedures*

Couples who met inclusion criteria were invited into the laboratory. They first completed a background questionnaire including demographics and retrospective measures of drinking behavior, personality, and mood (e.g., Beck Depression Inventory, Beck, Steer, & Carbin, 1988; Antisocial Behavior Inventory, Zucker, Ellis, Fitzgerald, Bingham, & Sanford, 1996). Couples were then asked to select a problem that causes intense disagreement in their relationship, and to discuss it for 15 minutes (see Cranford et al., 2015 for more details).  Couple interactions were videotaped.

All participants were contacted at 6- and 12-month follow-up to complete a telephone interview in which they provided information about their drinking. Data from 1 proband could not be obtained at 6 month follow-up and data from 6 probands could not be obtained at 12-month follow-up.  For Heavy Episodic Drinking (HED) and drinking problems, data from 1 additional individual was missing at 6-months and 2 individuals at 12-months. Individuals with missing data at either 6 or 12 month follow up did not differ from those without missing data on any baseline measure of drinking severity or spouse behavioral expression (*p's* > .32).

*Measures*

*Behaviors:* Real-time couples' interactions were coded from videos using the Rapid Marital Interaction Coding System (RMICS; Heyman, 2004). This coding system is designed to measure couples' behavior during conflicts. The RMICS system includes five negative behavioral codes: hostility, psychological abuse, distress-maintaining attributions, dysphoric affect, and withdrawal. Videos were coded by trained observers under the supervision of Dr. Richard Heyman (Heyman, 2004) at the RMICS Coding Center. Consistent with patterns observed in previous studies, base rates of some negative behaviors (psychological abuse, withdrawal, and dysphoric affect) were too low in the present study to permit independent examination of these codes (Heyman, 2004). However, the codes "distress-maintaining attributions" and, of particular relevance to study hypotheses, "hostility" did manifest with sufficient frequency to permit separate analyses. Hostility was defined as a response that communicates displeasure, disapproval, or disagreement of the partner, and could be verbal (e.g., "I don't give a damn what you think") or nonverbal (e.g., contemptuous facial expression, eye rolling, exasperated sighs indicative of criticism) in nature (Heyman, 2004). RMICS also includes four positive behavioral codes—acceptance, relationship-enhancing attribution, self-disclosure, and humor—along with one neutral code—constructive problem discussion/solution. Behavior was coded at the level of the event (speech turn), or, when the speaker's turn lasted more than 30 seconds, in 30-second increments. Average kappa coefficients were acceptable: .71 for positive behaviors, .57 for neutral behaviors, .79 for negative behaviors (.65 for hostility and .92 for distress-maintaining attributions).

*Drinking Outcomes*: Past 1-month alcohol consumption at baseline and 6- and 12-month follow-ups was assessed with two items: 1) Drinking Days: number of days consumed one or more alcoholic beverages; and 2) HED: Frequency of HED (frequency of heavy drinking episodes), defined as consuming 5 or more drinks for men (4 for women) within a 2-hour period. Also at these three time

points, the frequency of alcohol-related problems (Drinking Problems) in the past 3 months was measured with the Short Index of Problems (SIP; Miller, Tonigan, & Longabaugh, 1995; Cronbach's alpha=.95).

### Data Analysis Plan

Multilevel modeling procedures were used to examine moderators of drinking trajectories among probands with AUD (Raudenbush & Bryk, 2002). Modeling was conducted at two levels of analysis: within-person (level-1) and between person (level-2), predicting three drinking outcomes: Drinking Days, HED, and Drinking Problems. Time was entered at level-1 and the resulting slopes (linear trajectories over time), in addition to intercepts, were treated as random at level-2. Spouse behaviors as well as probands' behaviors were entered at level-2 as moderators of these over-time trajectories in all analyses. To limit the number of tests run, we only examined individual RMICS codes where the overall category (positive or negative) was significant. Visual inspection of drinking outcome variables suggested that all three followed a Poisson distribution, and therefore analyses were conducted using multilevel generalized linear modeling procedures and an unrestricted level-1 covariance matrix (Raudenbush & Bryk, 2002). Where recruitment source (clinical vs. community) moderated trajectories, it was entered as a covariate in all models. See also supplemental materials for models that examine the effects of spouse and proband behaviors while controlling for a variety of other covariates, including spouse drinking behaviors that might also affect drinking trajectories.

### Results

***Sample Characteristics***: Descriptive statistics are presented in Table 1. On average, across clinical and community samples, probands with AUD reported drinking 10.5 out of the past 30 days, and reported an average of 3.2 heavy drinking episodes. Probands enrolled in treatment at baseline were drinking at relatively low levels (average of 2.9 drinking days, 2.0 heavy drinking episodes), whereas

those recruited from the community were drinking more heavily (14.6 drinking days, 3.9 heavy drinking episodes). Probands reported moderate problems associated with their drinking in both clinical and community samples (see Miller et al., 1995 for clinical norms). Clinical interviews were not conducted with spouses to determine AUD status, but information was collected about spouses' drinking patterns and drinking problems. Spouses reported drinking about half as many days as probands (5.9 days/30), reported HED less than a third as frequently (1 day/30), and experienced minimal to no drinking problems. Out of the sample of 48 spouses, 3 (6.3%) qualified as "heavy drinkers"—engaging in more than 5 heavy drinking episodes over the past 30 days—at baseline and 4 (8.3%) reported having moderate problems with drinking (Miller et al., 1995).  Spouses in the clinical sample tended to display more negative behaviors than those in the community sample, although this effect did not quite reach significance, $F=3.89$, $df=47$, $p=0.055$.

*Probands' Drinking Trajectories*: On average, across all individuals in the sample, drinking and drinking problems tended to decline across the one year period of observation [Drinking Days: $B=-0.63$, $t=-3.84$, $p<.001$; HED: $B=-.97$, $t=-4.78$, $p<.001$; Drinking Problems: $B=-1.45$, $t=-6.06$, $p<.001$]. Declines in drinking were observed across both clinical and community samples, with declines in drinking days and HED being equivalent across these two samples, but declines in drinking problems being significantly larger in the treatment sample, $B=-2.00$, $t=-3.13$, $p=.002$.

*Spouse Negative Behaviors*: Consistent with hypotheses, spouse negative behaviors displayed during the couples interaction at baseline emerged as a moderator of probands' drinking trajectories. More specifically, trajectories of drinking problems, drinking days, and HED among probands were significantly moderated by spouse negative behaviors [Drinking Problems: $B=0.08$, $t=2.77$, $p=.007$; Drinking Days: $B=0.04$, $t=2.80$, $p=.006$; HED: $B=0.05$, $t=2.59$, $p=.01$] (see Table 2). Whereas at baseline there was no significant relationship between spouse negative behaviors and drinking problems,

drinking days, or HED, *p's*>.86, at 1-year follow-up, probands whose spouses had shown higher levels

of negative behaviors were having significantly more drinking problems, *B*=0.15, *t*=3.19, *p*=.002, were

engaging in more HED, *B*=0.09, *t*=2.21, *p*=.033, and were tending to report more drinking days, *B*=0.08,

*t*=1.72, *p*=.09. Alcoholics' own negative behaviors did not moderate their own drinking trajectories

although, in models also controlling for spouse negative behaviors, a trend towards significance

emerged with respect to drinking days, *B*=-0.05, *t*=-1.96, *p*=.053. There was no evidence that these

effects differed across clinical and community samples, *p's*>.38.  Further, no effects emerged with

respect to spouse neutral, *p*'s>.51, or spouse positive behaviors, *p's* > .08, when these were examined in

place of spouse negative behaviors as moderators of probands' drinking trajectories.

Since omnibus tests of negative behavior produced support for spouse negative behaviors as a

moderator of probands' drinking trajectories, we proceeded to examine individual RMICS codes to

explore where effects emerged as strongest.  In tests of individual RMICS codes, spouse hostility

emerged as a significant moderator of probands' drinking trajectories across all three drinking outcomes:

Drinking days, *B*=0.05, *t*=3.38, *p*=.001; HED; *B*=0.05, *t*=2.88, *p*=.005; Drinking problems, *B*=0.07,

*t*=2.83, *p*=.006. Whereas at baseline there was no significant relationship between spouse hostility and

any of these three drinking outcomes, all *p's*>.46, at 1 year follow-up, probands whose spouses had

shown higher levels of hostility at baseline were having significantly more drinking problems, *B*=0.16,

*t*=3.31, *p*=.002, engaging in more HED, *B*=0.12, *t*=2.84, *p*=.007, and reporting higher numbers of

drinking days, *B*=0.09, *t*=2.03, *p*=.048, than those whose spouses had shown less hostility.  In contrast,

spouse distress-maintaining attributions did not moderate probands' drinking trajectories across any of

the three drinking outcomes, all *p*'s > .11. Taken together, results indicate that, independent of probands'

own negative behaviors, high levels of negative behaviors among spouses resulted in slower declines in

negative drinking outcomes over time and tended to predict negative drinking outcomes at 1-year

follow-up, an effect that appeared to be driven by expressions of hostility among spouses.

## Discussion

Combining behavioral observation methods and a prospective study design, the current study

was the first to explore the power of negative behavioral displays during couples' interactions as a

predictor of drinking trajectories among individuals with AUD. Consistent with prior studies examining

significant other behaviors (Fichter et al., 1997; O'Farrell et al., 1998), in which spouses/family have

been interviewed independent of probands, we found that high levels of negative behavioral displays

among spouses during couples interaction predicted slower declines and poorer drinking outcomes

among individuals with AUD at 1 year follow-up. Of note, effects of spouse negative behaviors emerged

as particularly pronounced when the specific behavior of hostility was examined. Probands whose

spouses had expressed high levels of hostility at baseline showed slower declines in HED, drinking

problems, and drinking days over time, and indicated more heavy drinking episodes, more drinking

problems, and were tending to display more drinking days at 1-year follow-up compared with those

whose spouses had displayed lower levels of hostility at baseline. Thus, this study provides the first

evidence for behavior during couples' interaction as a longitudinal predictor of drinking outcomes,

pointing to a potentially important role for negative behaviors in predicting the course of drinking.

Of interest, effects of spouse negative behaviors and hostility emerged even after accounting for

the behaviors of the individual with AUD him/herself. Unlike many prior studies examining families of

individuals with AUD (O'Farrell et al., 1998), the sample for the current study consisted of a mix of

individuals recruited from clinical and community settings, indicating that the effects of significant other

behaviors are not limited to those seeking treatment. When considered in light of prior experimental

research demonstrating that expressions of rejection and criticism in social relationships can cause self-

regulatory failures (Higgins & Marlatt, 1975), including alcohol use, these findings might suggest that hostile expressions in close relationships can actually exacerbate maladaptive drinking patterns.

Of note, however, the findings presented in this paper do not alone suggest a causal link between partner hostility and drinking. Individuals who live with a problem drinker are in a unique position to observe the drinker at close range and collect information about his/her behavior (Miller et al., 1994). Thus, another explanation for the findings presented here is that significant others may become aware early on of maladaptive psychological or behavioral processes within the proband, and partner hostility could be simply an early indicator of, rather than a contributor to, problems to come. Regardless of whether a causal pathway is assumed, however, these findings provide support for models of AUD that look beyond the individual drinker him/herself, examining the drinker as he/she exists within the context of a network of social relationships (Epstein & McCrady, 1998; McAweeney, Zucker, Fitzgerald, Puttler, & Wong, 2005).

Limitations of the current research should be noted. First, the current study engaged a small and eclectic sample of participants. The sample size did not allow sufficient power to examine moderators of the effects of negative behaviors on drinking trajectories, such as the gender of the proband. Findings should be replicated in larger samples of participants. Second, consistent with many prior studies examining couples processes as predictors of drinking (O'Farrell et al., 1998; Whisman et al., 2006), we examined alcohol use during a 1 year follow-up period. This period of time was sufficient to show variation in drinking patterns. Nonetheless, it could be useful to follow couples for longer periods of time.

To summarize, the current study combined data from a laboratory session and longitudinal follow-ups to take a novel view of the role of close relationship processes in the progression of AUD. Results appear to confirm an important role for partner behavior during couple interactions in the course

of problem drinking. Findings highlight the importance of considering significant others and social

interaction processes in the study of problem drinking, and further provide key evidence to support

fundamental assumptions underlying popular modern treatments for AUD.

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Table 1. Descriptive Statistics for Probands with AUD and their Spouses at Baseline

| | Proband (N=48) M (SD) | Spouse (N=48) M (SD) | Correlations within Couples (*r*) |
|---|---|---|---|
| Negative Behaviors | 4.65 (7.23) | 5.52 (6.91) | .32* |
|   Distress-Maintaining Attributions | 1.15 (1.62) | 1.54 (1.79) | .39* |
|   Hostility | 3.27 (6.15) | 3.60 (6.30) | .31* |
| Positive Behaviors | 11.90 (7.06) | 12.29 (8.27) | .74* |
| Marital Satisfaction | 3.26 (.93) | 3.17 (.84) | .44* |
| Antisocial Behaviors | 18.40 (13.72) | 10.90 (8.36) | .45* |
| Depression | 12.65 (10.35) | 9.27 (8.69) | .25 |
| Number Drinking Days Past Month | 10.50 (10.14) | 6.33 (8.98) | .12 |
| Heavy Episodic Drinking Past Month | 3.23 (5.01) | 0.98 (2.35) | .08 |
| Drinking Problems (past month) | 12.48 (11.27) | 3.04 (6.57) | .22 |

Negative Behaviors=Frequency of negative behaviors during 15-minute laboratory couples interaction (see methods); Marital Satisfaction=Response to "how satisfied are you with your relationship" (0=not at all, 4=extremely); Antisocial Behaviors were assessed using the Antisocial Behavior Inventory; Depression was assessed using the Beck Depression Inventory.

*r*=Pearson's *r*

\*  *p*<.05

Table 2. Results of Primary Analyses Exploring Negative Behaviors as Moderators of Probands' Drinking Trajectories

### Drinking Problems Trajectories

| | Total Negative Behaviors | | | Subdivided by Negative Behavior Type | | | | | |
| | | | | Distress-Maintaining Attributions | | | Hostility | | |
| | B | t ratio | p value | B | t ratio | p value | B | t ratio | p value |
|---|---|---|---|---|---|---|---|---|---|
| ProbBehav | 0.02 | 0.40 | 0.689 | 0.47 | 1.78 | 0.08 | 0.03 | 0.39 | 0.702 |
| Time | -1.88 | -5.50 | <0.001 | -1.96 | -5.44 | <0.001 | -1.76 | -5.74 | <0.001 |
| ProbBehav*Time | -0.01 | -0.39 | 0.701 | 0.14 | 1.10 | 0.274 | -0.01 | -0.27 | 0.790 |
| SpBehav | 0.15 | 3.19 | 0.002 | 0.29 | 1.31 | 0.197 | 0.16 | 3.31 | 0.002 |
| **SpBehav*Time** | 0.08 | 2.77 | 0.007 | 0.19 | 1.63 | 0.107 | 0.07 | 2.83 | 0.006 |
| RecrtSrce[ç] | -0.68 | -2.12 | 0.040 | -0.42 | -1.23 | 0.226 | -0.76 | -2.40 | 0.021 |

### Drinking Days Trajectories

| | Total Negative Behaviors | | | Distress-Maintaining Attributions | | | Hostility | | |
| | B | t ratio | p value | B | t ratio | p value | B | t ratio | p value |
|---|---|---|---|---|---|---|---|---|---|
| ProbBehav | -0.09 | -1.72 | 0.093 | 0.24 | 1.47 | 0.150 | -0.12 | -2.18 | 0.035 |
| Time | -0.67 | -3.10 | 0.003 | -0.70 | -3.02 | 0.003 | -0.61 | -3.16 | 0.002 |
| ProbBehav*Time | -0.05 | -1.96 | 0.053 | 0.18 | 2.19 | 0.031 | -0.07 | -2.87 | 0.005 |
| SpBehav | 0.08 | 1.72 | 0.093 | -0.01 | -0.04 | 0.965 | 0.09 | 2.03 | 0.048 |
| **SpBehav*Time** | 0.04 | 2.80 | 0.006 | -0.11 | -1.07 | 0.288 | 0.05 | 3.38 | 0.001 |

### HED Trajectories

| | Total Negative Behaviors | | | Distress-Maintaining Attributions | | | Hostility | | |
| | B | t ratio | p value | B | t ratio | p value | B | t ratio | p value |
|---|---|---|---|---|---|---|---|---|---|
| ProbBehav | -0.12 | -2.05 | 0.047 | -0.07 | -0.25 | 0.801 | -0.16 | -2.40 | 0.021 |

NEGATIVE PARTNER BEHAVIORS DRINKING

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time | -1.19 | -4.05 | <0.001 | -1.04 | -3.43 | <0.001 | -1.13 | -4.32 | <0.001 |
| ProbBehav*Time | -0.04 | -1.40 | 0.167 | 0.04 | 0.29 | 0.774 | -0.06 | -2.03 | 0.046 |
| SpBehav | 0.09 | 2.21 | 0.033 | 0.12 | 0.42 | 0.678 | 0.12 | 2.84 | 0.007 |
| **SpBehav*Time** | 0.05 | 2.59 | 0.011 | 0.01 | 0.00 | 0.997 | 0.05 | 2.88 | 0.005 |

N=48 couples; Time is centered at 12-month follow-up. SpBehav=behaviors displayed by spouse—either hostility, distress-maintaining attributions, or total negative behavior (see column headings for exact behaviors entered in each model); ProbBehav=Corresponding behaviors displayed by proband with AUD.

ᶜRecrtSrce=the recruitment source of participants, either clinical or community. Recruitment source is only entered into models predicting drinking problems, since it did not affect trajectories of the other two drinking outcomes (see methods section).