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We-Language and Sustained Reductions in Drinking in Couple-Based Treatment for Alcohol Use Disorders

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Abstract

Couple-based treatments for alcohol use disorders (AUDs) produce higher rates of abstinence than individual-based treatments and posit that active involvement of both identified patients (IPs) and significant others (SOs) is partly responsible for these improvements. Separate research on couples' communication has suggested that pronoun usage can indicate a communal approach to coping with health-related problems. The present study tested whether communal coping, indicated by use of more first-person plural pronouns ("we" language), fewer second-person pronouns ("you" language), and fewer first-person singular pronouns ("I" language), predicted improvements in abstinence in couple-based AUD treatment. Pronoun use was measured in first- and mid-treatment sessions for 188 heterosexual couples in four clinical trials of alcohol behavioral couple therapy (ABCT). Percentages of days abstinent were assessed during treatment and over a six-month follow-up period. Greater IP and SO "we" language during both sessions was correlated with greater improvement in abstinent days during treatment. Greater SO "we" language during first- and mid-treatment sessions was correlated with greater improvement in abstinence at follow-up. Greater use of IP and SO "you" and "I" language had mixed correlations with abstinence, typically being unrelated to or predicting less improvement in abstinence. When all pronoun variables were entered into regression models, only greater IP "we" langue and lower IP "you" language predicted improvements in abstinence during treatment, and only SO "we" language predicted improvements during follow-up. Most pronoun categories had little or no association with baseline relationship distress. Results suggest that communal coping predicts better abstinence outcomes in couple-based AUD treatment.

Introduction

Alcohol use disorders (AUDs) affect approximately 7.5% of the population (Hasin, Stinson, Ogburn, & Grant, 2007) and are associated with an array of social consequences (e.g., arrests, poor relationship quality), health problems (e.g., liver disease, accidental injury), and economic costs (e.g., lost wages, legal costs). Previous research has shown that social

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environmental factors are associated with the prevalence of AUDs and treatment outcomes. For example, greater drinking and encouragement of drinking from one's social network is associated with greater alcohol consumption in both treatment-seeking and non-treatment-seeking populations (Beattie, 2001; Groh, Jason, Davis, Ferrari, & Olson, 2007; Longabaugh, Wirtz, Zywiak, & O'Malley, 2010; Manuel, McCrady, Epstein, Cook, & Tonigan, 2007). Several factors related to social support also are associated with better outcomes for identified patients (IPs) in AUD treatment. For example, negative events in relationships with significant others (SOs) are cited as major reasons for IP relapse (Maisto, O'Farrell, Connors, & McKay, 1988), and IPs in AUD treatment who have SOs that provide greater assurance and support and offer fewer negative behaviors, such as withdrawing from the drinker or avoiding conversations about drinking, drink at lower intensities during treatment (McCrady, Hayaki, Epstein, & Hirsch, 2002).

Given the degree to which drinking outcomes are affected by social support, especially from SOs, several psychosocial treatments for AUDs that incorporate willing SOs into the treatment process have been developed and shown to be equally or more efficacious in reducing alcohol consumption than IP-only therapies (McCrady, Epstein, Cook, Jensen, & Hildebrandt, 2009; McCrady, Epstein, & Hirsch, 1999; Miller, Meyers, & Tonigan, 1999; see Powers, Vedel, & Emmelkamp, 2008 for meta-analysis). Drawing on cognitive-behavioral models, these treatments aim to reduce alcohol consumption by enhancing relationship satisfaction, teaching coping skills to IPs, and eliciting active support for abstinence from SOs. In this manner, it is thought that IPs encounter fewer antecedents to drinking or relapse (e.g., through reduced relationship conflict) and that IPs and SOs both can utilize more effective strategies for IPs to avoid drinking. Previous research has found that women with AUDs are particularly likely to benefit from couple-based alcohol treatment over individual-based treatment if they have poorer baseline relationship satisfaction or comorbid psychopathology (McCrady et al., 2009). However, there has been little research on other factors that predict positive outcomes in couple-based alcohol treatment.

In an effort to link specific behaviors that occur during treatment sessions with post-treatment outcomes, research in many treatment areas has focused on coding clients' within-session language. In AUD treatment research, such studies have typically coded verbal behaviors that are thought to represent constructs such as motivation to change (e.g. "change talk") or resistance to the therapist or the treatment (e.g., "sustain talk") and found that greater change talk and less sustain talk predict better abstinence outcomes (e.g., Aharonovich, Amrhein, Bisaga, Nunes, & Hasin, 2008; Amrhein, Miller, Yahne, Palmer, & Fulcher, 2003; Magill et al., 2014; Moyers, Martin, Houck, Christopher, & Tonigan, 2009). The methods in these studies typically involve coding client and therapist speech such that each statement, phrase, or idea is coded into one of several predefined language categories by trained coders, and the frequencies of these language categories are tested for association with post-treatment outcomes.

Text analysis offers an alternative approach to measuring the verbal behavior that occurs during treatment sessions. By measuring the frequencies of specific words that occur during conversations, text analysis can help researchers ascertain meaningful semantic information

from verbal behavior from a variety of contexts where language is used. For example, text analysis has been used to study a variety of psychological constructs including social relationships, emotionality, thinking styles, and personality traits from text samples including internet blogs, student essays, political speeches, interpersonal transactions, and more recently, psychotherapy sessions (see Tausczik & Pennebaker, 2010 for a review).

Of particular interest in the context of couple interactions is the frequencies with which partners use certain pronouns that are thought to represent cohesion and a collaborative approach to the problem that is being discussed. For example, greater use of first-person plural pronouns ("we" language, e.g., "we", "us", "our") is thought to indicate a greater sense of togetherness and communal coping toward problems that are discussed during couple interactions (Rohrbaugh, Shoham, Skoyen, Jensen, & Mehl, 2012; Simmons, Gordon, & Chambless, 2005; Tausczik & Pennebaker, 2010). This hypothesis has received empirical support in previous research; for example, greater use of "we" language has been associated with greater marital satisfaction in couples coping with breast cancer (Robbins, Mehl, Smith, & Weihs, 2013) and with healthy, non-distressed couples (Simmons et al., 2005; Williams-Baucom, Atkins, Sevier, Eldridge, & Christensen, 2010), although this association has not always been replicated (e.g., Sillars, Shellen, McIntosh, & Pomegranate, 1997; Slatcher, Vazire, & Pennebaker, 2008). Greater use of "we" language has also been associated with reduced physiological arousal and fewer negative behaviors during couple interactions (Seider, Hirschberger, Nelson, & Levenson, 2009).

Greater use of "we" words also has been associated with better health outcomes. For example, Rohrbaugh et al. (2012) assessed the frequency of "we" language during a laboratory-based couple interaction task among 20 dyads in which one or both partners smoked tobacco products and was diagnosed with or considered to be at high risk for heart or lung disease. After participants received a couple-based smoking-cessation intervention, SO "we" language from a pre-treatment interaction task and residualized changes in "we" language assessed during mid-treatment and final sessions of the intervention predicted a greater likelihood of abstinence from smoking twelve months after the IP's initial quit date. In another sample of 57 couples in which one partner had heart failure, greater SO "we" language during a home-based interaction task predicted more positive change in heart failure symptoms, such as fatigue, difficulty breathing, and chest pain six months later (Rohrbaugh, Mehl, Shoham, Reilly, & Ewy, 2008).

In contrast to first-person plural pronouns, greater use of second-person pronouns ("you" language, e.g., "you", "your") is thought to indicate less social cohesion and a greater sense of separateness and is associated with lower marital satisfaction (Robbins et al., 2013; Seider et al., 2009; Sillars et al., 1997; Slatcher et al., 2008; Williams-Baucom et al., 2010). In one study of 98 relatives of IPs seeking treatment for obsessive-compulsive disorder or panic disorder with agoraphobia, greater use of "you" words was associated with poorer quality of relationship to IPs as well as greater levels of criticism and overly-involved emotional reactions to IPs' psychopathology (Simmons, Chambless, & Gordon, 2008).

First-person singular pronouns ("I" language, e.g., "I", "me", "mine") are hypothesized to represent greater self-focus and have had mixed associations with relationship satisfaction

and health behavior change. For example, greater "I" language has been found to predict higher marital satisfaction among distressed couples but lower marital satisfaction among non-distressed couples (Sillars et al., 1997; Williams-Baucom et al., 2010). Among IPs with heart failure, greater SO "I" language during a home interview predicted greater improvement in IP general health status but not heart failure symptoms six months later, while IP "I" language was unrelated to change in general health or heart failure symptoms (Rohrbaugh et al., 2008).

In summary, the associations of pronoun use with relationship and health outcomes have varied across studies and populations. Greater "we" and "I" language have had mixed associations with relationship satisfaction, although greater "we" language has consistently predicted better health outcomes in patients with lung- and heart-health conditions. Moreover, few studies have examined the associations of pronoun use during psychotherapy sessions and health behavior outcomes, and these studies have not been replicated in other populations, including those with AUDs.

The aim of the present study was to assess the associations of IP and SO pronoun use during couple-based alcohol treatment sessions with changes in drinking during and after treatment. Consistent with the results of Rohrbaugh et al. (2012), we hypothesized that greater "we" language, particularly from SOs, during the first session and during a mid-treatment session would be associated with less relationship distress and would predict better drinking outcomes at later time points. Conversely, we also hypothesized that greater "you" language would be associated with higher relationship distress and would predict poorer drinking outcomes at later time points. We hypothesized that these relationships would be present for both first- and mid-treatment sessions given that previous studies have found associations between pronoun use and health outcomes during pre-treatment and mid-treatment time periods and because we hypothesized that pronoun use could be an indicator of relatively stable, underlying dyadic traits such as togetherness and communal coping. Because previous studies have had mixed findings on the significance of "I" language, associations between this language category, drinking outcomes, and relationship distress also were tested but no *a priori* hypotheses were made. Within an exploratory framework, we also examined moderating effects of IP gender, and, following Rohrbaugh et al. (2012), tested whether *changes* in pronoun use predicted changes in drinking.

Method

Participants

Participants were heterosexual dyads from four randomized clinical trials of alcohol behavioral couple therapy (ABCT) (PACT study: McCrady et al., 1986; Men's study: McCrady et al., 1999; Women's I study: McCrady et al., 2009; Women's II study: Epstein, 2009). Two-hundred eighteen dyads were included in the ABCT conditions of these studies, of which 188 had at least a first-treatment session ($n = 169$) or mid-treatment session ($n = 115$) that could be transcribed for use in the current study. Three studies (PACT, Women's I, and Women's II) included other conditions in which some participants received a non-couple based treatment, but these participants were not considered for the present analysis.

Across all four studies, IPs met Diagnostic and Statistical Manual (DSM) III or DSM-IV (American Psychiatric Association, 1980, 1994) criteria for alcohol abuse or alcohol dependence and consumed alcohol within the 30–60 days prior to initial contact with the treatment study. Neither individual in the couple met criteria for current drug dependence with physiological dependence, current psychotic disorder, or significant cognitive impairment. SOs with AUDs were screened out in the PACT and Men's studies. All of the couples were in committed relationships and both partners had to be willing to come to treatment.

Eighty-six IPs (45.7%) were female; most IPs were White (*n* = 172; 91.5%). The mean (*SD*) age was 43.5 (10.3) for IPs and 44.1 (11.4) for SOs. The majority of the dyads were married (*n* = 160, 85.1%), with the remainder cohabitating (*n* = 14, 7.4%), in a committed relationship but not living together (*n* = 7, 3.7%), separated (*n* = 4, 2.7%), or had unknown marital status (*n* = 2, 1.1%). Participants reported being in their romantic relationships on average for 13.3 years (*SD* = 11.1). Additional information on participant characteristics and procedures is available in the original publications of the respective studies.

Treatment

All participants completed up to 12–20 sessions of ABCT with treatment goals focused on abstinence from alcohol and improved relationship functioning. The treatment in all studies had three major aims: (1) improve the IP's ability to maintain abstinence through cognitive-behavioral skill training, (2) improve the SO's ability to assist with and reinforce IP abstinence through SO skill training, and (3) attenuate relationship distress and improve relationship satisfaction and communication through behavioral couple therapy (McCrady & Epstein, 2009).

Audio recordings from the first-treatment session and a mid-treatment session (session 8 in the PACT, Men's, and Women's II studies, and session 9 in the Women's I study) were selected for analysis in the present study because of the similarity in topics that were addressed across studies in these sessions. In the first treatment session, all treatment manuals specified that therapists should introduce the rationale for treating AUDs within a couple therapy framework, encourage SOs to be actively involved in treatment, teach both partners to make daily recordings of relationship satisfaction and IP drinking, and assign homework. In the mid-treatment session, all treatment manuals specified that therapists should address the couple's relationship via reciprocity enhancement (i.e., each partner engaging in behaviors outside of the treatment session that are desirable to the other partner) and teach skills related to assertiveness (i.e., clear and appropriate expression of rights and feelings) and/or refusing drinks in social situations. In all sessions, therapists were instructed to work within a couple therapy framework that encouraged both partners to be actively involved in the treatment process.

Measures

Pronoun usage—Cassette tape recordings from first- and mid-treatment sessions were digitized and transcribed by trained transcriptionists. Transcriptionists were naïve with regard to the study hypotheses and were instructed to transcribe the sessions word-for-word

as accurately as possible. Transcriptions were then reviewed by one of seven graduate student research assistants who listened to the corresponding audio tape and corrected noticeable transcription errors. Pronoun counts were obtained from transcripts using an R script (R Development Core Team, 2012) that identified frequencies of pre-specified text strings. Frequencies of pronoun words were identified using previously-developed pronoun lists (Pennebaker, Francis, & Booth, 2007) to classify words as first-person singular ("I" language, including I, I'm, I'll, I'd, I've, me, my, myself, and mine), second person singular ("you" language, including you, you're, you'll, you'd, you've, your, yourself, yourselves, and yours) and first-person plural ("we" language, including we, we're, we'll, we'd, we've, us, let's, our, ours, ourselves). Pronoun words from each category were identified and matched to the corresponding speaker in the transcript (IP or SO). Pronoun counts within each category were summed and divided by the total word count for each speaker, providing an index that represented the proportion of each speaker's total language that fit into each pronoun category.

Alcohol consumption—Alcohol consumption was operationalized using the percentage of days abstinent (PDA) from alcohol during baseline (pre-treatment), within-treatment, and follow-up (post-treatment) periods. Pre-treatment PDA was assessed via timeline follow-back interviews (Sobell & Sobell, 1992) that assessed alcohol consumption over the 90 days before the last drinking day prior to a pre-treatment baseline interview.

Within-treatment PDA was assessed through daily self-monitoring cards on which IPs recorded daily drinking, urges to drink, and rating of daily relationship satisfaction (on a 1–7 Likert-type scale). These cards were collected at the beginning of each treatment session for all studies. Analyses for the present study used daily drinking data for computing within-treatment drinking. Missing observations were supplemented with data from timeline follow-back interviews (Women's I and II studies) conducted at the end of the treatment period. Within-treatment PDA was computed separately for the blocks of time that occurred after the 1st treatment session and through the 7th treatment session (referred to here as treatment weeks 1–7), which always occurred before the mid-treatment sessions, and for the four-week block of time that occurred after the 9th session (referred to here as treatment weeks 9–12), which always occurred after the mid-treatment session. Among the 188 participants with at least one codeable treatment session, 181 provided data for within-treatment PDA in treatment weeks 1–7 and 139 provided data for within-treatment PDA in treatment weeks 9–12.

Follow-up PDA was assessed for the six-month period starting 180 days and ending 360 days after the first treatment session. Follow-up PDA assessments were anchored to this point because the length of treatment varied between studies (i.e., 12–20 weeks) and between participants (e.g., due to premature treatment dropout or variability in the length of time to complete all sessions). Therefore, anchoring the follow-up period to this common time frame retained an identical follow-up period for all participants. Follow-up PDA was available for 158 participants. PDA measures across the baseline, within-treatment, and follow-up time periods were all correlated at $p < .05$ with Pearson r values ranging from 0.17 (baseline and treatment-weeks 9–12) to 0.69 (treatment-weeks 1–7 and treatment weeks 9–12).

Relationship distress—Relationship distress was measured using the Areas of Change Questionnaire (ACQ; Margolin, Talovic, & Weinstein, 1983), which assesses relationship complaints, perceived complaints of one's partner, and the perceptual accuracy between the actual and perceived complaints. Participants rated the degree to which they wanted (or perceived their partner as wanting) changes in specific behaviors (e.g., "I want my spouse to start interesting conversations with me" and "I want my partner to argue with me") using a seven-point Likert scale ranging from "much less" to "much more." The present study utilized the IP and SO Total Want scores on the ACQ, which represent the overall level of relationship distress as rated by each partner. IP scores were available from all studies, whereas SO scores were only collected in the PACT, Men's and Women's I studies. The ACQ was administered at baseline in all of the original clinical trials but was not consistently administered at other follow-up points. Internal reliability of the ACQ was high, with Cronbach's alpha = 0.91 for IP and SO Total Want scores.

Analytic Plan

Bivariate correlations were utilized to assess the associations of first- and mid-treatment-session pronoun usage with changes in PDA and with baseline relationship distress. Changes in abstinence from alcohol relative to baseline were computed for the within-treatment and follow-up periods by subtracting baseline PDA from within-treatment and follow-up PDA, respectively. Positive values for these change scores indicated increases in abstinence during treatment or at follow-up compared to baseline, while negative change scores indicated decreases in abstinence during treatment or follow-up compared to baseline. On average, participants had much higher PDA during treatment and at follow-up compared to baseline (mean PDA change score during treatment weeks 1–7 compared to baseline = 40.30, SD = 32.55; mean PDA change score during treatment weeks 9–12 compared to baseline = 53.78, SD =34.73; mean PDA change score during follow-up compared to baseline = 41.53, SD = 35.25). Therefore, a positive correlation between a pronoun category and PDA change scores would indicate that greater use of a pronoun category was associated with a higher PDA change score (i.e., greater improvement), while a negative correlation would indicate that greater use of a pronoun category was associated with a lower, but often positive, PDA change score (i.e., less improvement, but still an overall reduction in PDA). Additional analyses used multiple regression to test for potential moderating effects of gender, associations between changes in PDA when all language variables were entered simultaneously, and associations between changes in pronoun use and changes in PDA. All statistical tests and descriptive statistics were estimated with full information maximum likelihood to reduce bias in the presence of missing data (Hallgren & Witkiewitz, 2013; Hedden et al., 2009).

Results

Descriptive Statistics

Descriptive statistics for the relative frequency of each language category are presented by session in Table 1. In both sessions, "we," "I", and "you" language accounted for a combined total of approximately 11–13% of IP and SO language. "I" and "you" language occurred more frequently than "we" language for each speaker in both sessions, all Wald

tests of equality ($df = 1$) > 196.1, all $p < .001$. In both sessions IPs produced more total words than SOs, both Wald ($df = 1$) > 69.2, both $p < .001$.

Descriptive statistics for alcohol consumption variables and relationship distress also are presented Table 1. The mean percentage of days abstinent at baseline was relatively low with IPs reporting abstinence on 33.94% of days. On average, participants had significantly improved abstinence rates relative to baseline at treatment weeks 1–7, Wald test ($df = 1$) = 186.6, treatment weeks 9–12, Wald test ($df = 1$) = 344.6, and at the follow-up period, Wald test ($df = 1$) = 170.9, all $p < .001$.

Correlations among IP and SO pronoun categories are presented in Table 2. Individuals with higher rates of pronoun usage from a particular language category in the first session typically had higher rates of the same language category at the mid-treatment session. For example, first-session IP and SO "we" language were positively correlated with mid-treatment IP and SO "we" language, respectively ($r = 0.35$ and 0.28, $p < 0.01$). Similar associations were found between first-session and mid-treatment language for IP and SO "I" language ($r = 0.47$ and 0.30, respectively, $p < .01$) and IP and SO "you" language ($r = 0.52$ and 0.26, $p < 0.05$). Higher rates of pronoun usage in one language category often, but not always, were significantly correlated with lower rates of pronoun usage from a different language category in the same session. For example, first-session IP and SO "we" language were negatively correlated with first-session IP and SO "I" language, respectively ($r = -.36$ and $-.26$, $p < 0.01$), but had mixed associations with first-session IP and SO "you" language ($r = -0.02$, ns, and $r = -0.15$, $p < .05$).

Associations between Language, Relationship Distress, and Alcohol Consumption

First session pronoun use—Correlations between first-session pronoun use, baseline relationship distress, and PDA change scores are presented in Table 3. Note for PDA change score variables, positive correlation coefficients in Table 3 indicate greater increases (i.e., greater improvement) in PDA, while negative coefficients indicate lower increases (i.e., less improvement, but often still improvement relative to baseline) in PDA. IP relationship distress was not significantly associated to any first-session pronouns, but higher SO relationship distress was modestly associated with more SO "you" language and less IP "we" language. Higher rates of first-session IP "we" language predicted greater improvements in PDA in treatment weeks 1–7 and treatment weeks 9–12, but were not significantly associated with changes in PDA at follow-up. Higher rates of first-session SO "we" language predicted greater improvements in PDA in treatment weeks 1–7 but not in treatment weeks 9–12, and also predicted greater improvements in PDA at follow-up.

Higher rates of first-session IP and SO "you" language predicted less improvement in PDA in treatment weeks 1–7 and 9–12, while IP "you" language but not SO "you" language predicted less improvement in PDA at follow-up. None of the first-session "I" language categories were significantly associated with changes in PDA.

Bivariate associations between language categories and PDA change scores are presented visually in Figure 1. Each plot in Figure 1 shows the associations of first-session language categories (separate lines, values represented in standardized z-score units on x-axes) with

changes in PDA (presented in raw units on *y*-axes) during treatment weeks 1–7 (top plots), treatment weeks 9–12 (middle plots), and the follow-up period (bottom plots) for IPs (left plots) and SOs (right plots).

Mid-treatment session pronoun use—Associations between mid-treatment session pronoun use, baseline relationship distress, and changes in PDA are presented in Table 4. As with Table 3, positive correlation coefficients for the PDA variables in Table 4 indicate greater increases (i.e., greater improvement) in PDA at follow-up relative to baseline. No pronoun categories were significantly related to baseline IP relationship distress, although greater IP "we" language was modestly associated with lower SO relationship distress. Higher rates of mid-treatment IP "we" language predicted greater improvements in PDA during treatment weeks 9–12, but were not significantly associated with greater improvements in PDA at follow-up. Greater mid-treatment SO "we" language predicted greater improvements in PDA in treatment weeks 9–12 and continued to predict improved PDA at follow-up.

Rates of IP and SO "you" language were not significantly related to changes in PDA over subsequent time periods. Mid-treatment IP and SO "I" language were associated with smaller improvements in PDA in treatment weeks 9–12 but were not significantly related to changes in PDA at follow-up. Figure 2 provides a visual representation of these associations between mid-treatment session language and PDA change scores during treatment weeks 9–12 and the follow-up period.

Gender as moderator—Moderation analyses were conducted to test for differences in the associations between pronoun use and PDA change scores for male vs. female IPs. Moderation was tested by entering gender, pronoun use, and a gender × pronoun use interaction into a series of regression models for each language category and testing the significance of the gender × pronoun category interaction. None of the language categories that were observed to be correlated with changes in PDA were significantly moderated by IP (or SO) gender (all $p > 0.15$).

Regression models—Regression models were used to test which language variables predicted changes in PDA while accounting for the shared variance between the multiple language categories and outcome variables. Variance inflation factors (VIFs) due to multicollinearity were small for each predictor variable (maximum VIF = 1.67), indicating that multicollinearity was not problematic for interpreting the regression results (O'Brien, 2007).

Results from regression models predicting changes in PDA from the IP and SO language categories are presented in Table 5 with unstandardized regression coefficients. These results indicate that, when controlling for other language variables, only first-session IP "we" language and first-session IP "you" language significantly predicted changes in PDA during treatment weeks 1–7 and 9–12. In addition, only first-session SO "we" language significantly predicted changes in PDA at the follow-up period. All other language variables from the first- and mid-treatment sessions were not significantly related to changes in PDA, including several language variables that were significant predictors in bivariate correlation

analyses. This suggests that, when controlling for the shared variance among pronoun variables, only IP "we" and "you" language remained as a significant predictors of changes in PDA during treatment and only SO "we" language remained as a significant predictor at follow-up.

Although IP and SO relationship distress did not correlate significantly with changes in PDA during any treatment period, all $|r| <= 0.15$, all $p > .05$, additional regression models were analyzed including baseline IP and SO relationship distress as covariates to determine which language variables predicted changes in PDA beyond baseline relationship distress. In these models, only first-session IP "we" language remained as a significant predictor of PDA change scores in treatment weeks 1–7 (Est. = 18.19, SE = 6.61, $p = 0.006$) and treatment weeks 9–12 (Est. = 17.75, SE = 7.64, $p = 0.02$). First-session IP "you" language no longer significantly predicted changes in PDA after controlling for baseline relationship distress, although the magnitudes of these effects were only slightly smaller than the magnitudes obtained before controlling for relationship distress (i.e., compared to Table 5), suggesting that accounting for relationship distress yielded only small changes in the relationships between IP "you" language and changes in PDA. Specifically, regression coefficients for first-session IP "you" language predicting changes in PDA were −5.56 (SE = 3.35, $p = 0.10$) for PDA in treatment weeks 1–7 and −7.64 (SE = 4.10, $p = 0.06$) for treatment weeks 9–12 after controlling for relationship distress. First-session SO "we" language no longer significantly predicted changes in PDA in the follow-up, and the magnitude of this effect was substantially reduced (Est. = 2.71, $SE = 5.13$, $p = 0.60$) compared to the magnitude before controlling for baseline relationship distress.

Changes in language predicting changes in alcohol consumption—Correlation and regression analyses predicting changes in PDA were repeated using change scores of each IP and SO pronoun category from the first-session to the mid-treatment session. All correlations and regression coefficients predicting changes in PDA from changes in pronoun use were non-significant (all $|r| < 0.16$, all $p > 0.10$). In other words, although the overall degree of pronoun use was associated with changes in drinking, the changes in language that occurred from first-session to mid-treatment during ABCT were not significantly related to changes in drinking.

Power Analysis

Several associations between language variables, relationship distress, and changes in PDA were non-significant, and a power analysis was conducted using GPower (Erdfelder, Faul, & Buchner, 1996) to determine the effect size required to achieve a nominal power level of 0.80 given an alpha level of 0.05 (two-tailed).

Results indicated that the present study was powered to detect correlations of $|r|$ 0.21 for correlations between first-session language and changes in PDA at follow-up at a 0.80 power level. Likewise, the present study was powered to detect correlations of $|r|$ 0.24 for correlations between mid-treatment session language and changes in PDA at follow-up at a 0.80 power level. However, because power analysis assumed listwise deletion in the presence of missing data but the present study used full information maximum likelihood,

the present study was powered to detect somewhat smaller effect sizes than the estimates obtained above (Hallgren & Witkiewitz, 2013). Together, these results suggest that the present study was equipped to detect relatively small effect sizes and that non-significant findings are unlikely due to inadequate statistical power.

Discussion

The present study found that language used during couple-based alcohol use disorder treatment sessions predicted changes in alcohol use during and after the course of treatment. Specifically, within the correlation models, more IP and SO "we" language predicted greater increases in abstinent days during subsequent weeks of treatment, and greater SO "we" language further predicted more abstinent days, relative to baseline, over the six-month follow-up period. In contrast, greater IP and SO "you" language in first-treatment sessions and mid-treatment predicted lower increases in abstinent days (i.e., predicted more drinking days) during subsequent periods of treatment and greater IP "you" language in mid-treatment sessions predicted lower increases in abstinent days during the follow-up period, relative to baseline. Greater IP and SO "I" language during mid-treatment sessions, but not first-treatment sessions, predicted lower increases in abstinent days during subsequent periods of treatment. As expected, fewer relationships were significant when all language variables were entered simultaneously into a regression model; however even after controlling for all other language variables, greater IP "we" language and less IP "you" language in first-treatment sessions predicted more improvement in PDA during both within-treatment periods, and greater SO "we" language in first-treatment sessions predicted improvement in PDA during the follow-up period. When further controlling for baseline relationship satisfaction, only first-session IP "we" language emerged as a significant predictor of changes in drinking during treatment. The tendency for both IPs and SOs to use a particular language category was consistent across time, for example, with partners who used more "we" language during the first session also using more "we" language during the mid-treatment session. For both sessions the frequencies of each language category were unrelated to baseline IP relationship distress, and had modest correlations or no correlation with SO relationship distress.

The association between "we" language and positive health outcomes is consistent with findings from previous research in different health domains such as smoking and heart failure (Rohrbaugh et al., 2008, 2012). The finding in correlation models that greater "we" language provided by SOs, but not IPs, predicted better drinking outcomes during follow-ups that occurred six to twelve months later is also in line with previous findings that "we" language from SOs, but not IPs, predicted heart failure symptom outcomes over a subsequent six-month period (Rohrbaugh et al., 2012). In contrast, the finding that only IP "we" language predicted changes during treatment after controlling for all other language categories and baseline relationship distress suggests that IP "we" language may be a more important predictor of changes in drinking during treatment, predicting changes beyond the other variables in the present study.

Further analyses showed that the associations between "we" language and reductions in alcohol consumption were not moderated by gender. Although some previous research

suggests that gender may moderate the associations of pronoun use with marital satisfaction (Seider et al., 2009) and hostility (Simmons et al., 2008), other research has found no moderating effects of gender on pronoun use and health outcomes in the context of heart failure (Rohrbaugh et al., 2008). It is possible that the previously-observed moderating effect of gender on pronoun use and relationship distress reflects differences with which men and women express language during relational conflicts (e.g., Seider et al., 2009), while the lack of gender differences in pronoun use and health outcomes reflects a more common linguistic style among men and women for expressing communal coping when faced with health problems.

Rohrbaugh and colleagues (2008, 2012) theorize that "we" language within couple interactions focused on health problems indicates a stronger sense of togetherness and communal coping with regard to health problems, whereas "you" language indicates a stronger sense of separateness and less communal coping. In couple and family-systems models of health behavior change, togetherness and communal coping are thought to facilitate improved likelihood of increasing and maintaining positive health behaviors. For example, the ABCT model (McCrady & Epstein, 2009), which the treatments in the present study were based on, emphasizes that IP alcohol problems often are best conceptualized as issues shared by both partners in a relationship, and that behavior change can be maximized when alcohol problems are addressed collaboratively and both partners assist with the behavior change goals. The tendency for "we" language to predict more positive drinking outcomes and the mixed associations of "you" and "I" language with more negative drinking outcomes during treatment in the present study is consistent with this notion that a collaborative approach to treatment allows for greater improvement in health behaviors.

It is important to note that dominant models of couple therapy and family systems do not assert that the use of "we" language in dyadic interactions is directly responsible for causing better health outcomes, but instead, greater usage of these terms is indicative of a dyad's sense of togetherness and orientation toward communal coping (e.g., Rohrbaugh et al., 2008). In other words, greater use of "we" language in dyadic interactions is not necessarily hypothesized to be a mechanism of change in treatment or a useful behavior to directly target in treatment sessions, but instead is thought to be indicative of a collaborative approach. This collaborative approach may be pre-existing or subject to change during treatment, and in either case, may help facilitate behavior change. In the present study, changes in pronoun use failed to predict changes in PDA, providing more support for pronoun use as a pre-existing trait and not a mechanism of change in ABCT that helped facilitate improvements in abstinence. However, other work has found that changes in we-language during treatment predicted subsequent abstinence from smoking (Rohrbaugh et al., 2012), and additional research is warranted to understand more precisely what construct is represented by we-language, to test the limits in the malleability of pronoun use, and to better understand whether *changes* in pronoun use can be directly targeted by treatment providers to elicit communal coping and health behavior change. Further, the present study found no correlation between any of the language categories and baseline IP relationship distress and only a few modestly-sized correlations with baseline SO relationship distress, suggesting that the constructs represented by "we" language during ABCT sessions (e.g.,

togetherness and communal coping in relation to drinking problems) are likely to be a different construct than general relationship distress and satisfaction.

As noted by others (e.g., Rentscher, Rohrbaugh, Shoham, & Mehl, 2013), the constructs that underlie pronoun use are likely context-dependent. For example, in the context of generally positive discussions of health problems, pronoun use may reflect a communal approach to coping with a health problem, whereas in the contexts of an argument, pronoun use may reflect other constructs such as the couples' sense of togetherness or demand-withdrawal patterns (Rentscher et al., 2013). In ABCT sessions, communal coping could be reflected in expressions of a joint goal for successful treatment from both partners rather than as an individual goal for the IP to address by him- or herself. For example, couples may discuss alcohol use, cravings, and their consequences as affecting both partners and their relationship. Likewise, communal coping may be expressed as steps taken to improve the dyadic relationship, such as both partners increasing their engagement in positive, non-drinking activities together.

If communal coping and togetherness facilitate better treatment outcomes, it may be possible to improve abstinence outcomes by assessing and targeting these constructs in couple-based alcohol treatments. This was not an explicit goal in the ABCT sessions that were delivered in the present study, but future research may more directly test this hypothesis. For example, it may be possible for treatment providers to assess for evidence of communal coping and togetherness, in part by attending to the use of "we," "I," and "you" language from IPs and SOs, which in turn could provide prognostic information about drinking outcomes and assist with case formulation. Based on the amount of communal coping expressed during treatment sessions, providers could focus on improving communal coping strategies when those strategies are lacking and encouraging continued or enhanced use of these strategies when they are present. Although it was beyond the scope of the present study to test whether treatment providers are able to assess and improve communal coping and togetherness during couple-based alcohol treatment, future research may provide additional information on effective strategies for doing this and the subsequent effects on drinking outcomes.

The present study had several limitations. First, the associations between pronoun use and drinking outcomes, although time-lagged, were correlational in nature and were not manipulated experimentally. It is therefore possible that the observed relationships could be due to one or more third variables that were not assessed. In short, firm causal conclusions about the relationship between "we" language and drinking outcomes should not be drawn at this point.

Second, the use of pronoun counts necessarily decontextualized the semantic meaning of the conversations that took place during treatment sessions. Although this criticism applies to all other studies that use a word-count approach to text analysis (Tausczik & Pennebaker, 2010), it limits the ability to fully understand the underlying messages that were contained within the "we", "I", or "you" language that was spoken. For example, it would be possible for statements using any of these pronoun categories to communicate supportive, oppositional, neutral, or withdrawing messages. In other words, it is not possible to directly

confirm that the use of greater "we" language is indicative of greater communal coping or togetherness using word-count approaches alone.

Finally, there are sampling limitations in the present study that limit the generalizability of the results. For example, the sample was predominantly White, pronoun use was only analyzed from the first session and a mid-treatment session of the treatment, and couples with drug dependence, psychotic disorders, or significant cognitive impairment were excluded.

Each of these limitations suggests several possible opportunities for future research. For example, future studies could use an experimental design to manipulate some aspect of treatment in an attempt to influence togetherness and communal coping, and changes in these constructs could be tested more directly as causal agents in producing better drinking outcomes. Future research also could identify additional ways to measure togetherness and communal coping, such as through self-report measures or behavioral coding instruments, to better understand measurement issues related to these constructs. Future research also could test the generalizability of the results in the present study, for example, by utilizing samples that are more ethnically diverse or seeking couple-based treatment for the use of other drugs besides alcohol.

The present study also had several strengths. The sample size used in the present study was considerably larger than most previous studies of pronoun use and health behavior change. Recordings were transcribed by professional transcribers and each manuscript was checked and corrected by a trained graduate student for possible errors. The present study examined pronoun use and health behavior change in alcohol treatment sessions, which is a previously unexplored area. The present study also measured outcomes up to twelve-months after the first session of treatment.

The results of the present study support the hypothesis that in-session pronoun use may provide information about a couple's sense of togetherness and communal approach to coping. Greater togetherness and communal coping may in turn predict better drinking outcomes in couple-based alcohol treatments, and future research may more explicitly test the causal relationships among these constructs.

Acknowledgments

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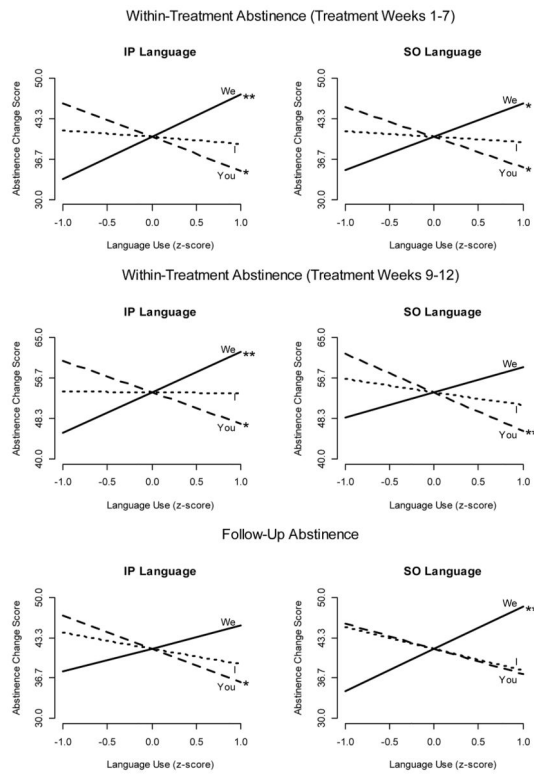
Figure 1.
Abstinence change scores predicted by correlations with first-session language variables.

Within-Treatment Abstinence (Treatment Weeks 9-12)

IP Language   **SO Language**
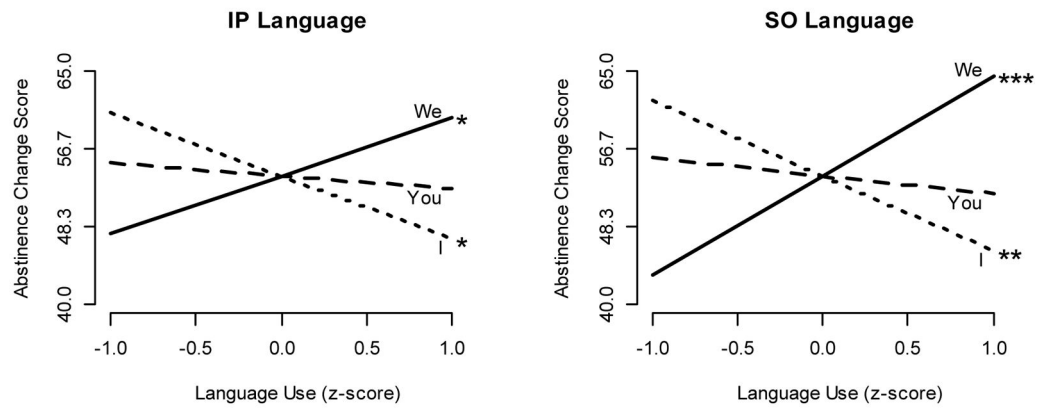
Follow-Up Abstinence

IP Language   **SO Language**
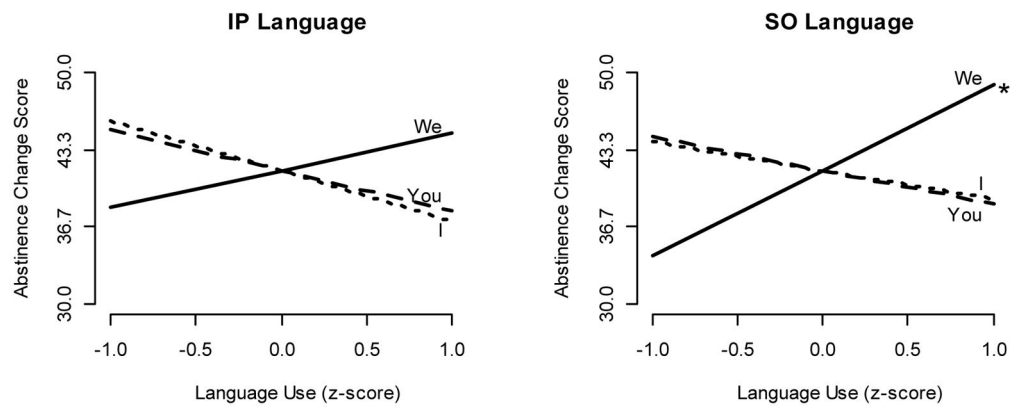
Figure 2.
Abstinence change scores predicted by correlations with mid-treatment language variables.

Table 1

Means (Standard Deviations) of Language and Drinking Variables

	Language Variables	
	First Session	**Mid-Treatment**
IP Percent "we"	0.98(0.47)	1.26(0.70)
SO Percent "we"	1.45(0.69)	1.46(0.73)
IP Percent "you"	2.56(0.90)	2.89(0.92)
SO Percent "you"	3.18(1.25)	3.55(1.41)
IP Percent "I"	9.13(1.51)	8.54(1.49)
SO Percent "I"	6.95(1.67)	6.88(1.90)
IP Word count	3281.43(1610.86)	3952.78(1796.23)
SO Word count	1981.91(1233.90)	2261.23(1264.29)
	Alcohol Consumption and Relationship Variables	
Pre-Treatment PDA	33.94(29.90)	
Treatments weeks 1–7 PDA	73.86(29.69)	
Treatment weeks 9–12 PDA	84.08(24.23)	
Follow-up PDA	74.68(32.50)	
Baseline IP Relationship Distress	20.75(14.75)	
Baseline SO Relationship Distress	27.68(15.32)	

Note: IP = identified patient, SO = significant other, PDA = percentage of days abstinent.

Table 2

Correlations Between Pronoun Use by Speaker and Session

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. IP "we" (first session)											
2. SO "we" (first session)	**.30**										
3. IP "we" (mid-tx session)	**.35**	−.02									
4. SO "we" (mid-tx session)	**.32**	**.28**	**.22**								
5. IP "I" (first session)	**−.36**	−.14	−.08	.02							
6. SO "I" (first session)	−.12	**−.26**	**.20**	−.03	**.20**						
7. IP "I" (mid-tx session)	**−.23**	−.09	**−.47**	**−.22**	**.47**	.00					
8. SO "I" (mid-tx session)	−.16	.02	**−.29**	**−.38**	−.04	**.30**	**.22**				
9. IP "you" (first session)	−.02	−.05	**−.17**	−.14	−.10	**.20**	.16	**.19**			
10. SO "you" (first session)	**−.21**	**−.15**	−.07	.02	.14	.00	.12	.03	**.32**		
11. IP "you" (mid-tx session)	−.10	.03	**−.22**	−.04	.04	−.02	.03	.06	**.52**	.17	
12. SO "you" (mid-tx session)	−.03	−.13	**.33**	−.13	.00	−.14	−.03	**−.41**	.11	**.26**	.07

Note: Correlation coefficients in bold font are significant at $p < .05$.

Table 3

Correlations Between First-Session Language, Relationship Distress, and Increases in PDA

	IP Baseline Relationship Distress	SO Baseline Relationship Distress	Increase in PDA from Pre-Treatment to Treatment Weeks 1–7	Increase in PDA from Pre-Treatment to Treatment Weeks 9–12	Increase in PDA from Pre-Treatment to Follow-Up
IP "we"	.030	−.178[*]	.222[**]	.247[**]	.112
SO "we"	−.060	−.097	.172[*]	.151	.198[**]
IP "you"	.068	.096	−.172[*]	−.189[*]	−.156[*]
SO "you"	.052	.219[*]	−.160[*]	−.235[**]	−.123
IP "I"	−.053	.052	−.038	.000	−.076
SO "I"	.150	.180	−.033	−.084	−.103

Note: PDA = percentage of days abstinent, IP = identified patient, SO = significant other.

[*]
$p < .05$,

[**]
$p < .01$.

Table 4

Correlations Between Mid-Treatment-Session Language, Relationship Satisfaction, and Increases in PDA

	IP Baseline Relationship Distress	SO Baseline Relationship Distress	Increase in PDA from Pre-Treatment to Treatment Weeks 9–12	Increase in PDA from Pre-Treatment to Follow-Up
IP "we"	−.036	−.306[*]	.183[*]	.084
SO "we"	−.111	−.162	.309[***]	.199[*]
IP "you"	.132	.067	−.046	−.098
SO "you"	.021	−.097	−.053	−.078
IP "I"	−.019	.128	−.199[*]	−.125
SO "I"	.117	.253	−.238[**]	−.066

Note: PDA = percentage of days abstinent, IP = identified patient, SO = significant other.

[*] $p < .05$,

[**] $p < .01$,

[***] $p < .001$.

Table 5

Regression Model Coefficients for Language Categories Predicting Increases in PDA

	PDA Change Scores (Treatment Weeks 1–7)			PDA Change Scores (Treatment Weeks 9–12)			PDA Change Scores (Follow-Up)			
First-Session Language	**Est.**	**SE**	**t**	**Est.**	**SE**	**t**	**Est.**	**SE**	**t**	**VIF**
IP "we"	**12.92**	**5.81**	**2.23***	**15.23**	**6.51**	**2.34***	2.21	6.69	0.33	1.26
SO "we"	5.50	3.79	1.45	3.49	4.35	0.80	**8.56**	**4.29**	**2.00***	1.18
IP "you"	**−6.02**	**3.03**	**−1.99***	**−8.48**	**3.53**	**−2.41***	−5.68	3.50	−1.62	1.21
SO "you"	−1.26	2.18	−0.58	−1.20	2.61	−0.46	−0.37	2.71	−0.14	1.21
IP "I"	0.35	1.80	0.20	0.34	2.03	0.17	−1.48	2.19	−0.68	1.23
SO "I"	0.23	1.63	0.14	0.78	1.92	0.41	−0.56	1.88	−0.30	1.18
Mid-Treatment Language										
IP "we"				−1.34	3.24	−0.41	0.51	5.80	0.09	1.67
SO "we"				3.81	2.80	1.36	8.74	5.22	1.68	1.39
IP "you"				−0.39	2.01	−0.19	−4.08	3.80	−1.07	1.10
SO "you"				0.38	1.59	0.24	−1.70	2.95	−0.58	1.59
IP "I"				0.47	1.47	0.32	−1.73	2.63	−0.66	1.39
SO "I"				0.84	1.17	0.72	0.06	2.18	0.03	1.61

Note. Significant regression coefficients are presented in bold. VIF = variance inflation factor.

* $p < .05$.