

Contents lists available at [ScienceDirect](#)

Journal of Adolescence

journal homepage: www.elsevier.com/locate/jado

Motivational Interviewing to prevent dropout from an education and employment program for young adults: A randomized controlled trial



Caitlin S. Sayegh ^{a,*}, Stanley J. Huey Jr. ^{a,b}, Elizabeth Barnett ^c, Donna Spruijt-Metz ^c

^a Department of Psychology, University of Southern California, USA

^b Department of American Studies and Ethnicity, University of Southern California, USA

^c Department of Preventive Medicine, University of Southern California, USA

ARTICLE INFO

Article history:

Received 27 December 2016

Received in revised form 7 April 2017

Accepted 8 April 2017

Available online 27 April 2017

Keywords:

Motivational Interviewing

Change talk

Preference for consistency

Retention

ABSTRACT

This study tested the efficacy of Motivational Interviewing for improving retention at a “second chance” program in the United States for unemployed young adults who had not graduated high school (ages 18–24; 60% male). We investigated how Motivational Interviewing effects might be mediated by change talk (i.e., arguments for change) and moderated by preference for consistency (PFC). Participants ($N = 100$) were randomly assigned to (1) Motivational Interviewing designed to elicit change talk, (2) placebo counseling designed not to elicit change talk, or (3) no additional treatment. Motivational Interviewing sessions increased change talk, but did not increase program retention or diploma earning. PFC was a significant moderator of Motivational Interviewing’s impact on program retention; Motivational Interviewing was most effective at increasing 8 week retention for high PFC participants, and least effective for low PFC participants. These results suggest that Motivational Interviewing could be a useful tool for improving retention in education and employment programs, but clinicians should be attentive to how participant characteristics might enhance or diminish Motivational Interviewing effects.

© 2017 The Foundation for Professionals in Services for Adolescents. Published by Elsevier Ltd. All rights reserved.

High school dropout puts young adults at risk for unemployment (Sum, Khatiwada, McLaughlin, & Palma, 2011), criminal involvement (Bernburg & Krohn, 2003), and substance use (Fothergill et al., 2008). “Second chance” programs, which provide education and employment opportunities, may be able to address skill gaps, increase employability, and reduce antisocial behavior and substance use (Bloom, 2010; Edelman, Holzer, & Offner, 2006). The Los Angeles Conservation Corps (LACC), one such “second chance” program, is a community-based education and employment organization modeled on President Franklin Delano Roosevelt’s Civilian Conservation Corps. Between 1933 and 1942, the Civilian Conservation Corps provided 2.5 million unemployed young men with work completing outdoor projects intended to benefit the country (e.g., constructing hiking trails, planting trees, building dams) (Hendrickson, 2003). Today’s Conservation Corps programs, including

* Corresponding author. Department of Psychology, University of Southern California, 3620 McClintock Ave./SGM 501, Los Angeles, CA, 90089, USA.
E-mail address: caitlin.smith.sayegh@gmail.com (C.S. Sayegh).

LACC, often emphasize education and community service in addition to paid work experience. In a randomized trial, corps members were less likely to be unemployed or arrested compared to non-corps members (Jastrab, Masker, Blomquist, & Orr, 1996).

However, second change programs like LACC often have relatively low retention rates (Jastrab et al., 1996). A large number of Civilian Conservation Corps members “deserted” the corps (Hendrickson, 2003); only about 75% of participants are retained in education and employment programs over the first three months (Cave, Bos, Doolittle, & Toussaint, 1993; Schochet, Burghardt, & McConnell, 2008); and only about two-thirds of participants complete these programs (Jastrab et al., 1996; Millenky, Bloom, MillerRavett, & Broadus, 2011). Unfortunately, there is no published research on increasing retention in educational and employment programs for young adults.

Motivational Interviewing is an intervention designed to impact targeted behaviors by eliciting and strengthening intrinsic motivation (Miller & Rollnick, 2012). A meta-analysis showed that Motivational Interviewing had positive effects on client engagement in other interventions (Lundahl, Kunz, Brownell, Tollefson, & Burke, 2010). Motivational Interviewing has never been studied as a program retention strategy in the context of “second chance” programs, but its successful implementation in other domains suggests it may help retain participants in a Conservation Corps program.

Change talk (CT), or client verbalizations about change, has been identified as a potential mechanism underlying Motivational Interviewing effects (Miller & Rose, 2009). The link between Motivational Interviewing adherence and CT is well supported by research (e.g., Gaume, Bertholet, Faouzi, Gmel, & Daepfen, 2010), as is the link between CT and positive outcomes (e.g., Baer et al., 2008). The Motivational Interviewing literature has not yet conclusively answered the question of whether CT is a change mechanism. Three within-group studies have shown CT to mediate the relationship between Motivational Interviewing adherence and client change (Barnett et al., 2013; Moyers, Martin, Houck, Christopher, & Tonigan, 2009; Pirlott, Kisbu-Sakarya, DeFrancesco, Elliot, & MacKinnon, 2012), although a fourth study did not (Vader, Walters, Prabhu, Houck, & Field, 2010). These studies were limited by the lack of experimental manipulation of CT. Only one study has simultaneously brought CT under experimental control and tested whether it mediated Motivational Interviewing's effects. Morgenstern et al. (2012) randomly assigned participants to Motivational Interviewing, relational counseling, or a self-change condition. They found that Motivational Interviewing produced more CT than the other conditions, and CT mediated the effects of Motivational Interviewing on drinking outcomes, but only during the first week of treatment. More studies bringing CT under experimental control are needed to understand CT's potential role as an Motivational Interviewing mechanism of change.

Cognitive Dissonance Theory offers an explanation for how CT might function as a change mechanism. Traditional dissonance studies suggest that participants change their attitudes to be consistent with a position they have advocated (e.g., Festinger & Carlsmith, 1959). CT is essentially advocacy for a certain course of action, and therefore, may promote subsequent behaviors consistent with that advocacy (Draycott & Dabbs, 1998). Eliciting CT during Motivational Interviewing may induce dissonance by highlighting the discrepancy between an advocated position and inconsistent behaviors (e.g., a statement in favor of punctuality vs. actual frequent tardiness). Individuals may then be motivated to reduce dissonance through behavior change (e.g., arriving on time in the future).

However, not all individuals are strongly motivated to behave consistently with what they have advocated (Guadagno & Cialdini, 2010). For these individuals, Motivational Interviewing might have little impact on their later behaviors. Preference for consistency (PFC), defined as the motivation to be and appear consistent, can moderate dissonance effects (Cialdini, Trost, & Newsom, 1995). For example, in a study of adults with high levels of prejudice, individuals with greater PFC reported less prejudice after advocating a non-prejudicial attitude, compared to low-PFC individuals who performed the same advocacy (Heitland & Bohner, 2010). This could mean that interventions like Motivational Interviewing, which aim to elicit clients' arguments in favor of change, could be especially effective for individuals who care a great deal about consistency, but might be less helpful for those who do not value consistency very highly.

1. Current study

The primary goal of this study was to examine whether Motivational Interviewing would improve program retention for young adults in a “second chance” program. Additional aims included mediation and moderation tests to help explain how and for whom Motivational Interviewing works. Specifically, we tested CT as a mediator and PFC as a moderator of Motivational Interviewing effects. Therefore, a randomized controlled trial of Motivational Interviewing was undertaken at the Los Angeles Conservation Corps program (LACC), designed with a focus on understanding the role of CT and PFC.

2. Method

2.1. Participants and setting

At LACC, corps members participate in a variety of activities, with a focus on earning credits toward a high school diploma and developing job skills on paid work crews. Program recruits begin by participating in an 8-week orientation phase which includes educational activities and work training. After successfully completing the orientation, they are promoted to corps member status, at which time they can begin earning a paycheck. Corps members are asked to commit to participating for at least 22 weeks (including the 8 weeks of orientation). After 22 weeks, some corps members continue in the program, while

others transition to external educational or employment opportunities. Program participants were all between 18 and 24 years old, and indicated they were unemployed and had not graduated from high school.

All 160 individuals who enrolled in LACC between July 2012 and April 2013 were invited to participate in this study. One-hundred recruits agreed to participate, and were randomly assigned to one of three conditions: 1) Motivational Interviewing ($n = 34$), 2) placebo counseling ($n = 38$), or 3) no treatment ($n = 28$) (Fig. 1). Ninety-four percent of Motivational Interviewing participants and 89% of placebo counseling participants attended their assigned counseling session. Researchers were not given permission to inspect any demographic or program data for individuals who declined to participate, so it was not possible to compare the characteristics of those who did or did not consent.

2.2. Design

The University of Southern California Institutional Review Board approved all study procedures. A certificate of confidentiality was obtained to protect participants who reported illegal activity. Recruitment and consent took place in a classroom at the beginning of six consecutive LACC orientation periods. When participants consented to study procedures, they gave signed permission to researchers to access their LACC records. After completing the pre-treatment questionnaires, participants were randomly assigned to a condition using a random number generator. Those participants who were assigned to Motivational Interviewing or placebo counseling met with a study interventionist within the first two weeks of LACC. Sessions were audio-recorded. At 8 weeks and 22 weeks, participants were contacted by phone, mail, or email to fill out follow-up self-report questionnaires.

2.3. Conditions

2.3.1. Motivational Interviewing condition

The Motivational Interviewing condition consisted of one 30-minute session during which the Values Card Sort (Miller, C'de Baca, Matthews, & Wilbourne, 2001) was administered using Motivational Interviewing counseling style. The Values Card Sort is an exercise designed to facilitate a discussion of values in relation to target behaviors, elicit CT, and enhance perceived discrepancy between stated values and inconsistent behavior. The interventionists asked open-ended questions exploring what each participant's top three values meant to the participants, how well the participants saw themselves as living out these values, how these values were relevant to LACC, and how committed they were to each value. The interventionists used Motivational Interviewing-adherent techniques to elicit CT and focused the session on how participants' values were relevant to succeeding at LACC.

2.3.2. Placebo counseling condition

The placebo counseling condition was structurally similar to Motivational Interviewing, but differed in several key ways. Interventionists asked participants to explore how their three least important values might be important to *other people*. In the placebo counseling condition, the interventionists used Motivational Interviewing-style, but did not direct the session toward CT. Instead, they directed the session toward elaborations on why other people might find the bottom three values important. This condition was developed based on the idea that an intervention consisting of Motivational Interviewing style and technique, without an emphasis on intrinsic motivation or change talk, would be relatively inert. Counseling aimed at eliciting client talk about unimportant values and other people's perspectives was the logical opposite of an Motivational Interviewing session, with the focus on one's own values and perspective. Furthermore, the placebo counseling condition was

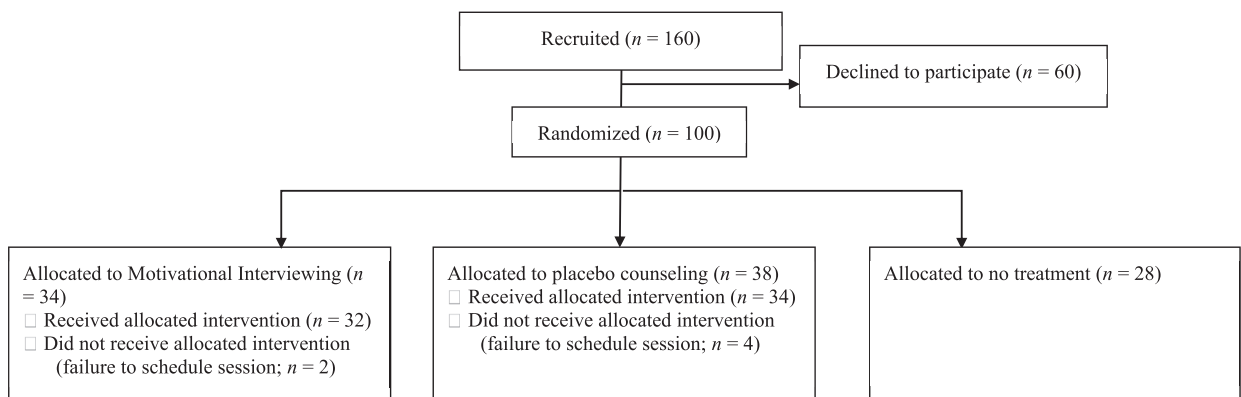


Fig. 1. Consolidated Standards of Reporting Trials (CONSORT) flow diagram. Participants who were lost to follow-up for self-report data did not respond to repeated phone, mail, or email contacts from study personnel. No participants who were successfully contacted declined to provide self-report data.

designed to have face validity and feel like a counseling session for both interventionists and participants. Additionally, this placebo counseling condition was similar to the control condition used by Cohen and colleagues in their research on psychosocial values affirmation interventions (Cohen, Garcia, Apfel, & Master, 2006).

2.3.3. No treatment condition

In the no treatment condition, participants engaged in LACC as usual. The only difference from usual activities was that participants were administered questionnaires.

2.4. Training and fidelity

Interventionists were six undergraduate students.¹ The interventionists received 12 h of instruction in using Motivational Interviewing technique and Motivational Interviewing style from a Motivational Interviewing Network of Trainers (MINT) trainer, followed by four hours of training in how to use Motivational Interviewing skills and style to elicit CT and four hours of training in how to use Motivational Interviewing skills and style to elicit perspective-taking. Placebo counseling was presented as a viable alternative to Motivational Interviewing. During training and supervision, the Motivational Interviewing condition was always referred to as the “Change Talk Intervention” and the placebo counseling condition was referred to as the “Perspective Taking Intervention.” Interventionists were not informed of study hypotheses. All interventionists conducted both Motivational Interviewing and placebo counseling sessions throughout the trial. Interventionists were asked at the end of the study if they thought one condition would be more effective at improving program success than the other. Three indicated they thought Motivational Interviewing would be most effective, two indicated they thought placebo counseling would be most effective, and one indicated she thought the conditions would be equally effective.

Training for both interventions involved reviewing treatment protocols, listening to recorded model sessions, and receiving live supervision of role-played sessions. Interventionists' practice sessions were coded using the MITI Code 3.1.1 (Moyers, Martin, Manuel, Miller, & Ernst, 2010). The MITI produces behavioral counts and global scores of therapist behavior. The behavioral counts measure the proportions of open-ended questions, complex reflections, and Motivational Interviewing-adherent behaviors (e.g., asking permission, affirming the client, emphasizing client control), as well as the ratio of reflections to questions. A global spirit rating was calculated as a composite score consisting of three global scores: evocation (eliciting the client's own ideas), collaboration (maintaining equitable power between therapists and clients), and autonomy/support (emphasizing the client's independence). To apply the MITI to a counseling session, a target behavior must be selected. For the Motivational Interviewing condition, this was “succeeding in LACC program” and for the placebo counseling condition, this was “taking other people's perspective.” The MITI could be applied to both Motivational Interviewing and placebo counseling conditions, because both interventions consisted of questions, reflections, and other therapeutic interactions that could be coded by raters. Interventionists were trained until they achieved beginning proficiency levels on these measures in both conditions. Every two-to-four weeks, coded transcripts were returned to interventionists as feedback to improve fidelity (Miller, Yahne, Moyers, Martinez, & Pirritano, 2004).

2.5. Measures

Several variables, including age, ethnicity, gender, and years of education, were collected through self-report. In addition, the following measures were administered via paper-and-pencil self-report packets.

2.5.1. Child welfare system history

Participants were asked to indicate whether they had ever been involved in the foster system. Specifically, the self-report questionnaire battery included the question, “Have you stayed one night or more nights in a foster care or group home setting in your whole life?”

2.5.2. Arrest history

Participants were administered the single question, “Have you ever been arrested?” This item was used to categorize participants who had or who had not experienced arrest.

2.5.3. Relationship status

Participants were asked to indicate which of the following responses best described their relationship status: 1) married, 2) living with domestic partner, 3) never married, 4) separated, 5) divorced, or 6) widowed. For the purposes of this study, participants were categorized as either 1) married or living with a domestic partner, or 2) not married or living with a domestic partner.

¹ In a meta-analysis, the degree held by the interventionist did not moderate treatment efficacy; undergraduates, and those with BAs, MAs, PhDs, or MDs, were equally effective at delivering Motivational Interviewing (Lundahl et al., 2010).

2.5.4. Parenthood status

Participants were administered the single item, “Do you have any children?” Based on their response, they were categorized as parents or not parents.

2.5.5. Substance use

Substance use was measured using items from the Youth Risk Behavior Survey (CDC, 2011), a questionnaire with demonstrated test-retest reliability (Zullig, Pun, Patton, & Ubbes, 2006). The Youth Risk Behavior Survey provided a way to measure rates of binge drinking, tobacco use, marijuana use, and other illegal drug use (e.g., heroin, cocaine) in the sample. Examples of items included, “During the past 30 days, on how many days did you smoke cigarettes?” or “During the past 30 days, how many times have you used methamphetamines (also called speed, crystal, crank, or ice)?” The number of participants to report any binge drinking, tobacco use, marijuana use, or other illegal drug use was used in analyses, rather than data about frequency of use, due to the skewed nature of frequency data.

2.5.6. Antisocial behavior

Antisocial behavior was measured using the Self-Report Delinquency Scale (Elliott, Huizinga, & Morse, 1986), a measure with acceptable test-retest reliability (Thornberry & Krohn, 2000). Examples of items included, “How many times in the past month have you thrown objects (such as rocks or bottles) at cars or people?” or “How many times in the past month have you stolen (or tried to steal) things worth between \$5 and \$50?” We used the variety scoring method, which sums the number of different antisocial acts an individual reports, as this has been shown to be more reliable and less skewed than other scoring methods (Bendixen, Endresen, & Olweus, 2003). Using this variety method, individuals' scores could range from 0–40.

2.5.7. Motivation

Program motivation was measured using Miller and Johnson's (2008) Motivational Screening Measure, a short three-item measure using simple language. This measure requires participants to rate how important a target is for them, how able they feel they are to reach this target, and how committed they are to reaching this target, on a scale from 0–10. We defined the target as “succeeding at the Conservation Corps.” This resulted in items such as, “It is important to me to succeed at the Conservation Corps,” and “I could succeed at the Conservation Corps.” The three responses were averaged, resulting in scores that could range from 0–10. The Motivational Screening Measure was re-administered at 8 weeks and 22 weeks.

2.5.8. Change talk

CT was coded from session recordings by three undergraduate research assistants, using the Client Behavior Counts section of the MISC 2.1 (Miller, Moyers, Ernst, & Amrhein, 2008). Coders were trained until they achieved reliability with master-coded transcripts. Client CT related to “succeeding at LACC” was identified and summed to create a CT frequency (CTF) score. ICCs for summary scores were fair to excellent in this study (mean ICC = 0.76, ranging from 0.40–.99) (Cicchetti, 1994).

2.5.9. Preference for consistency

We measured PFC with the Preference for Consistency Scale–Brief (PFC-B; Cialdini et al., 1995). High scores on this scale predict stronger responses to dissonance induction (e.g., Bator & Cialdini, 2006). The reliability ($\alpha = 0.84$) and validity of the PFC-B have been established with undergraduates (Cialdini et al., 1995), and the PFC-B has been administered to young adults without high school diplomas (Brown, Asher, & Cialdini, 2005). The PFC-B had high internal consistency ($\alpha = 0.80$) in our sample.

2.5.10. Outcomes

Two primary program outcomes were extracted from LACC's electronic archives. *Program retention* was measured as a dichotomous variable—participants were categorized as either “still enrolled in LACC” or “no longer enrolled in LACC” through orientation (8 weeks) and through the first performance evaluation (22 weeks). Whenever a participant is expelled from LACC or leaves voluntarily, a program staff member records a “separation” in the electronic archives. If a separation was labeled “positive” in the archives (e.g., new employment, enrolling in another school), we coded the participant as “retained” for our analyses, as positive separations were consistent with program goals. Another program outcome was *high school diploma earning*. After 22 weeks, data was extracted from the LACC records to categorize participants as either having earned or not earned a high school diploma in the program.

2.6. Analysis

Descriptive statistics were calculated to characterize the sample in terms of age, ethnicity, gender, and other factors. Baseline characteristics were compared across conditions using χ^2 tests for categorical variables, one-way analysis of variance (ANOVA) tests for continuous variables with normal distributions, and Kruskal–Wallis one-way ANOVA tests for continuous variables with non-normal distributions. The main effects of Motivational Interviewing on retention and high school diploma earning were examined using binary logistic regression. Motivational Interviewing participants were contrasted with placebo counseling participants and a combined group of placebo counseling and no treatment participants. For hypotheses regarding CT, only data from participants assigned to the Motivational Interviewing and placebo counseling conditions who received

their allocated counseling were used ($n = 66$). The effect of Motivational Interviewing on CTF was assessed using linear regression, and the effects of CTF on outcomes were assessed using binary logistic regression. If significant baseline differences between conditions were identified, we included these variables as covariates.

Using stepwise regression, we examined CTF as a mediator and PFC as a moderator of Motivational Interviewing effects. If there was a significant main effect of Motivational Interviewing on retention or high school diploma earning, we added CTF as a second predictor and inspected whether this changed the significance of the main effect. Regardless of whether there was a main effect of Motivational Interviewing on retention or diploma earning, we added PFC and the interaction between PFC and Motivational Interviewing as additional predictors. The stepwise χ^2 statistic was examined for significance. We included any characteristics with significant baseline differences between conditions in these regression models.

Additionally, the potential effect of Motivational Interviewing on self-reported motivation was evaluated by conducting independent-samples t-tests contrasting Motivational Interviewing versus placebo counseling, and Motivational Interviewing versus placebo counseling and no treatment combined at 8 weeks and 22 weeks. Analyses were conducted using all available data, using an alpha level of $p < 0.05$. In order to examine the effect of missing data on results, we re-ran all analyses on five separate ($m = 5$) multiply imputed datasets (Schlomer, Bauman, & Card, 2010), using variables collected at pre-treatment to impute missing data. The multiple imputation was conducted via the SAS Version 13.1 procedure, PROC MI. We reported any conflicts between results from the analyses conducted on the complete dataset versus the imputed datasets.

3. Results

On average, participants were 20 years old and had completed the 10th grade. Sixty percent of the sample was male, about two-thirds were Latino, and one-third was African American (Table 1). The only participant characteristic showing significant baseline differences across conditions was gender, $\chi^2(2, 100) = 7.01, p = 0.03$. Neither PFC-B nor CTF was significantly skewed or non-normal. Sessions lasted 28.65 min on average ($SD = 8.05$), with no significant difference in session duration between conditions.

3.1. Intervention fidelity

In order to equalize the conditions as much as possible, a primary goal was to deliver both Motivational Interviewing and placebo counseling sessions proficiently according to the MITI. There were some significant differences in fidelity between conditions. Motivational Interviewing had higher fidelity on two measures (i.e., reflection to question ratio, $t(64) = 2.93, p = 0.01$; proportion of Motivational Interviewing adherence, $t(64) = 2.04, p < 0.05$) and placebo counseling had higher fidelity on one measure (i.e., proportion of complex reflections, $t(64) = 2.64, p = 0.01$). However, results showed that interventionists were proficient on all five MITI measures when conducting Motivational Interviewing, and on four when conducting placebo counseling.

Table 1
Baseline Characteristics.

Characteristic	Total ($N = 100$)		Motivational Interviewing ($n = 34$)		Placebo Counseling ($n = 38$)		No Treatment ($n = 28$)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender (male)*	60	60.0	14	41.2	27	71.1	18	64.3
Ethnicity								
Latino	58	61.7	19	55.9	21	55.3	18	64.3
African American	29	30.9	9	26.5	12	31.6	8	28.6
Other	5	5.3	3	8.8	2	5.2	0	0.0
Married/Living with Partner	15	18.3	5	20.6	5	13.2	3	10.7
Parent	27	27.6	8	23.5	7	18.4	12	42.9
History of Child Welfare System Involvement	17	17.5	4	11.8	7	18.4	6	21.4
History of Arrest	39	42.9	13	38.2	15	39.5	11	39.3
Binge Drinking	28	29.2	8	35.0	11	30.6	9	32.1
Tobacco Use	28	28.9	11	33.3	10	27.8	7	25.0
Marijuana Use	29	29.6	9	27.3	10	27.0	10	35.7
Illegal Drug Use	8	8.2	4	12.1	2	5.4	2	7.1
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age, years	19.91	1.56	19.97	1.29	19.95	1.77	19.79	1.60
Education, years	10.07	3.94	9.87	3.52	10.32	4.10	9.96	4.38
Antisocial Behavior	2.96	5.26	3.00	4.72	3.03	5.86	2.82	5.22
Program Motivation	9.46	1.18	9.57	0.60	9.20	1.84	9.64	0.48
Preference for Consistency	5.69	1.49	5.42	1.65	5.80	1.41	5.90	1.39

* $p < 0.05$, significant difference by condition at baseline.

Note. Percentages were always calculated from the number of participants endorsing a behavior divided by the number of participants who gave reports on that behavior, not the total number of participants.

3.2. Intervention effects

Twenty-five percent of recruits did not complete the 8-week orientation, and an additional 11% did not continue through the 22-week performance evaluation. That is, 36% of participants did not complete the full 22 weeks. Twenty-eight percent of recruits earned a high school diploma within 22 weeks. Overall, there were no significant effects of Motivational Interviewing on retention or diploma earning compared with placebo counseling, or placebo counseling and no treatment combined (see Table 2).

Motivational Interviewing significantly increased CTF compared with placebo counseling, $\beta = 0.86$, $t(64) = 12.48$, $p < 0.001$, adjusted for gender. Together, Motivational Interviewing and gender explained a significant proportion of variance in CTF scores, $R^2 = 0.72$, $F(2, 63) = 79.04$, $p < 0.001$. The mean level of CTF was 29.41 ($SD = 11.79$) in Motivational Interviewing, and 3.15 ($SD = 3.24$) in placebo counseling. The significant difference in CTF indicated that the conditions were in fact, distinct. However, CTF had no significant effect on retention or diploma earning. Specifically, CTF was not related to retention at 8 weeks, $OR = 0.99$, 95% CI [0.95–1.02], $p = 0.40$, retention at 22 weeks, $OR = 1.00$, 95% CI [0.96–1.03], $p = 0.75$, or diploma earning at 22 weeks, $OR = 1.01$, 95% CI [0.97–1.04], $p = 0.78$. Therefore, mediation analyses were not warranted.

3.3. Moderation analyses

Adding the condition \times PFC-B interaction term to the stepwise binary regression model predicting 8-week retention significantly improved model fit, $\chi^2(1, 90) = 4.21$, $p = 0.04$. The interaction term was marginally significantly related to retention at 8 weeks ($p = 0.05$; Table 3). Participants who received Motivational Interviewing and reported higher PFC were most likely to complete the 8-week orientation than other participants, whereas Motivational Interviewing participants who reported lower PFC were *least likely* to complete the 8-week orientation (Fig. 2). No moderator effects were found for 22-week retention or for diploma earning.

3.4. Self-reported motivation

There was no difference in self-reported motivation between Motivational Interviewing versus placebo counseling at 8-weeks, $t(31) = 0.87$, $p = 0.39$, or 22 weeks, $t(45) = 0.92$, $p = 0.36$. There was also no difference in motivation between Motivational Interviewing versus placebo counseling or no treatment at 8-weeks, $t(44) = 1.57$, $p = 0.12$, or 22 weeks, $t(64) = 0.40$, $p = 0.69$. Furthermore, CTF was not a significant predictor of self-reported motivation at 8 weeks, $\beta = -0.03$, $p = 0.32$, or 22 weeks, $\beta = 0.03$, $p = 0.35$.

3.5. Missing data

There was no missing data for retention or diploma earning outcomes. CTF was missing for the six participants who did not attend their allocated counseling session. Ten participants failed to complete the PFC-B or Motivational Screening Measure at the pre-treatment assessment. The Motivational Screening Measure was not completed by 54 participants at 8 weeks, nor by 34 participants at 22 weeks. None of the results differed when analyses were re-run using imputed data. All significant results remained significant, and all nonsignificant results remained nonsignificant.

4. Discussion

This trial was the first to apply Motivational Interviewing in the context of a “second chance” program for young adults. We found that Motivational Interviewing did not improve program retention or diploma earning. There are various reasons why Motivational Interviewing may not have been effective. First, whereas ambivalence about initiating treatment is common among substance users, the typical targets of Motivational Interviewing (e.g., Oser, McKellar, Moos, & Moos, 2010), LACC participants reported high motivation at pretreatment. This suggests that Motivational Interviewing may not have impacted overall retention because there was little room for improvement in motivation. Indeed, there were no significant effects of Motivational Interviewing on self-reported motivation, which could indicate that participants were already at the “ceiling” on

Table 2
Effects of Motivational Interviewing on Retention and Diploma Earning.

	Motivational Interviewing (<i>n</i> = 34)		Placebo Counseling (<i>n</i> = 38)		No Treatment (<i>n</i> = 28)		Motivational Interviewing vs. Placebo Counseling			Motivational Interviewing vs. Placebo Counseling or No Treatment		
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>OR</i>	95% CI	<i>p</i>	<i>OR</i>	95% CI	<i>p</i>
8 Week Retention	26	76.5	29	76.3	20	71.4	1.33	0.42–4.25	0.63	0.99	0.37–2.67	0.98
22 Week Retention	23	67.6	25	65.8	16	57.1	1.15	0.41–3.25	0.79	0.90	0.37–2.24	0.83
22 Week Diploma	10	29.4	11	28.9	7	25.0	1.17	0.40–3.43	0.77	1.04	0.40–2.68	0.94

Note. Regression analyses were conducted controlling for gender, because the distribution of males in each condition differed significantly at baseline.

Table 3
Moderation Results.

Models	Predictor	β	SE β	Wald's χ^2	df	OR (95% CI)	p
Predicting 8-Week Retention							
Step 1: $R^2 = 0.01$	MI vs. CC/NT	0.02	0.52	0.00	1	1.02 (0.37–2.80)	0.97
Step 2: $R^2 = 0.01$	MI vs. CC/NT	-0.04	0.53	0.01	1	0.96 (0.34–2.69)	0.96
	PFC	0.11	0.17	0.42	1	1.11 (0.80–1.55)	0.52
Step 3: $R^2 = 0.06$	MI vs. CC/NT [†]	-3.81	2.05	3.45	1	0.02 (0.00–1.23)	0.06
	PFC	-0.18	0.23	0.64	1	0.83 (0.53–1.30)	0.42
	MI x PFC [†]	0.72	0.37	3.76	1	2.05 (0.99–4.22)	0.05
Predicting 22-Week Retention							
Step 1: $R^2 = 0.02$	MI vs. CC/NT	-0.12	0.47	0.07	1	0.88 (0.35–2.22)	0.80
Step 2: $R^2 = 0.03$	MI vs. CC/NT	-0.19	0.48	0.16	1	0.83 (0.32–2.12)	0.69
	PFC	0.11	0.15	0.51	1	1.12 (0.83–1.51)	0.48
Step 3: $R^2 = 0.05$	MI vs. CC/NT	-2.18	1.84	1.40	1	0.11 (0.00–4.15)	0.24
	PFC	-0.06	0.20	0.09	1	0.94 (0.64–1.39)	0.76
	MI x PFC	0.43	0.33	1.77	1	1.54 (0.82–2.92)	0.18
Predicting Diploma Earning							
Step 1: $R^2 = 0.03$	MI vs. CC/NT	-0.04	0.50	0.01	1	0.96 (0.36–2.53)	0.93
Step 2: $R^2 = 0.03$	MI vs. CC/NT	-0.10	0.51	0.04	1	0.90 (0.34–2.43)	0.84
	PFC	0.12	0.17	0.45	1	1.12 (0.80–1.57)	0.50
Step 3: $R^2 = 0.03$	MI vs. CC/NT	-0.19	2.01	0.01	1	0.83 (0.02–42.38)	0.93
	PFC	0.09	0.23	0.17	1	1.10 (0.71–1.71)	0.68
	MI x PFC	0.05	0.34	0.02	1	1.05 (0.54–2.04)	0.88

[†] $p < 0.10$.

Note. All analyses were conducted controlling for gender, because the distribution of males in each condition differed significantly at baseline. Ten participants did not fill out the PFC-B measure at pre-treatment, and were missing from these moderation analyses. Explained variance is estimated with Cox and Snell R^2 .

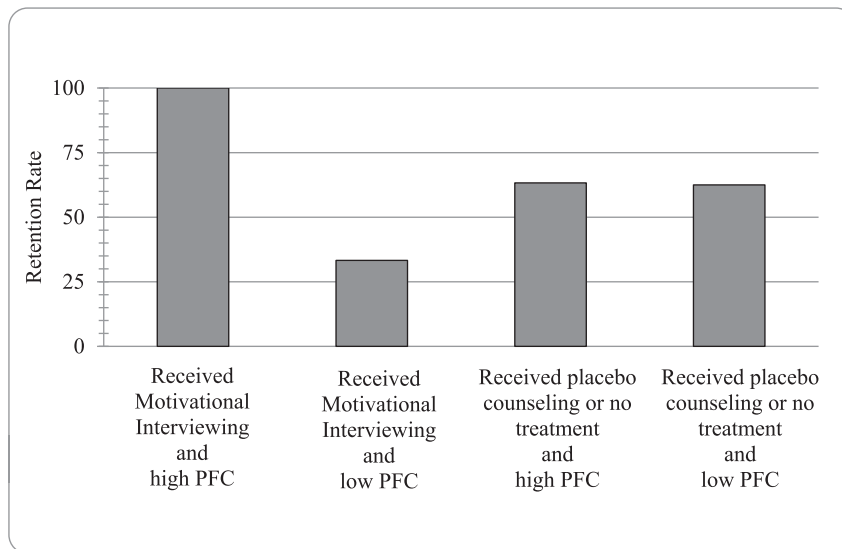


Fig. 2. Effect of Motivational Interviewing on retention moderated by PFC. The 8-week program retention rate for participants assigned to Motivational Interviewing versus control conditions and who reported PFC scores one standard deviation above versus below average.

this construct. Furthermore, participants in this study faced significant barriers to success, such as caring for children or younger siblings, coping with medical or psychiatric disorders, and transportation challenges. Given that some investigators have argued that Motivational Interviewing may not be sufficient in helping individuals overcome socio-economic or other stressors (e.g., Befort et al., 2008), interventions such as problem-solving training may outperform motivational approaches.

Although Motivational Interviewing did not have a significant effect on program retention or diploma earning, it did facilitate CT. However, because CT was not predictive of retention or diploma earning, it was not a significant mediator in this Motivational Interviewing trial. Our study was only the second to examine CT as a Motivational Interviewing mediator using an experimental design, whereas most prior studies examined variation in CT *within* the Motivational Interviewing condition. Since a within-group design does not allow researchers to determine whether Motivational Interviewing causally elicits CT, it is important to consider evidence from experimental studies in conjunction with this existing research. The apparent

discrepancy between our results and Morgenstern and colleagues' (2012) finding suggests that more experimental research is needed to understand the role of CT in Motivational Interviewing.

4.1. PFC as treatment moderator

Our finding that Motivational Interviewing was more effective at improving program retention for participants who value consistency adds to the budding literature examining how individual characteristics moderate Motivational Interviewing treatment efficacy. Identifying significant moderators like PFC can provide evidence for decision making about who to target with which counseling approach (Macias et al., 2008). Previous meta-analyses have identified specific demographic characteristics that moderate Motivational Interviewing efficacy, such as age and ethnicity (e.g., Lundahl et al., 2010). However, few studies have tested whether Motivational Interviewing is differentially effective for individuals based on psychological characteristics. One notable exception is a study conducted by Carey, Henson, Carey, and Maisto (2007), which found that individuals with stronger self-regulation skills benefitted more from a brief motivational intervention to reduce heavy drinking. Although self-regulation and PFC are not directly related, both variables influence how individuals approach translating motivation into action. Therapists can use this information to determine which program participants might be the most responsive to Motivational Interviewing in light of their individual characteristics.

Beyond informing practical decisions about who to target with motivational interventions, identifying moderators can also help clarify our broader theoretical understanding of how Motivational Interviewing works (Dunn, Deroo, & Rivara, 2001). We conceptualized Motivational Interviewing within the Cognitive Dissonance framework. Overall, we expected that Motivational Interviewing would elicit CT and prompt participants to behave consistently with their stated motivation in order to reduce dissonance. However, we hypothesized that these effects would hold only for those most susceptible to dissonance induction. PFC is a useful concept for explaining why Motivational Interviewing may have promoted retention through dissonance induction for some program participants, but not for others. Individuals who are low in PFC do not necessarily view themselves as inconsistent. Rather, they place a value on spontaneity and unpredictability (Guadagno & Cialdini, 2010). Some studies have shown that individuals with low PFC may not only be immune to dissonance induction, but may in fact show a reverse dissonance effect (e.g., Bator & Cialdini, 2006). As such, participants who rated themselves low on PFC may have reacted to the Motivational Interviewing intervention negatively, and may have viewed the counseling as heavy-handed or constraining. Therefore, the results of this trial provide some support for a cognitive dissonance interpretation of Motivational Interviewing effects.

4.2. Limitations

A few limitations warrant caution in interpreting these results. First, due to the busy orientation schedule at LACC, and limited space and personnel, it was only possible to deliver a one-session, 30-minute Motivational Interviewing intervention. It is possible that a longer or multiple-session intervention may have been more powerful at increasing retention. Furthermore, there may have been differences between corps members who consented to participate in the study versus those who did not. Possibly, corps members who did not consent to the study were more ambivalent about LACC and would have responded to Motivational Interviewing. In addition, since PFC only explained a small amount of variance in 8-week retention, it is important not to overstate its importance as a moderator. Nonetheless, this study contributes to the Motivational Interviewing literature by focusing on how individual characteristics moderate motivational interventions. Also, the lack of effect of Motivational Interviewing on self-reported motivation may be due to the high level of missing data on this variable at 8 and 22 weeks. Finally, there were some unintended differences in clinician behaviors between Motivational Interviewing and placebo counseling conditions. There was no systemic assessment of how participants or interventionists perceived the interventions and we did not establish that placebo counseling was totally inactive. There may have been effects of that condition that were not measured in this study. However, we were mostly able to keep conditions similar in terms of style yet different in terms of eliciting CT, which allowed for a rigorous test of CT as a mechanism of change.

4.3. Conclusion

Our failure to find overall intervention effects for this version of Motivational Interviewing (i.e., using the Values Card Sort) and with this population (i.e., unemployed young adults without diplomas) suggests that implementing Motivational Interviewing to address wide-ranging, novel target behaviors should be continued with ongoing scrutiny. Motivational Interviewing has proven effective in several arenas, and there are likely many beneficial uses for Motivational Interviewing that will be identified in the future. Researchers should continue to assess how helpful Motivational Interviewing can be in each new context. Although Motivational Interviewing did not improve program retention in this trial, it is possible that other adjunctive interventions might improve the success of participants in programs like LACC. Whether those interventions include problem-solving training, more intensive Motivational Interviewing, or other strategies, investigators should continue to investigate how clinicians can support young adults in making the most of these "second chance" programs. Furthermore, researchers should test relevant mediator and moderator variables in order to expand our knowledge of how and for whom motivational interventions work. This study contributes to the broader Motivational Interviewing literature by

highlighting how a theoretically-relevant individual characteristic, PFC, may moderate treatment efficacy. Therapists can use this information to guide decisions about when to employ Motivational Interviewing versus other treatment approaches.

Acknowledgements

This work was supported by the Fahs-Beck Fund for Research and Experimentation at the New York Community Trust, and the Society for the Psychological Study of Social Issues.

References

- Baer, J. S., Beadnell, B., Garrett, S. B., Hartzler, B., Wells, E. A., & Peterson, P. L. (2008). Adolescent change language within a brief motivational intervention and substance use outcomes. *Psychology of Addictive Behaviors*, 22, 570–575. <http://dx.doi.org/10.1037/a0013022>.
- Barnett, E., Moyers, T. B., Sussman, S., Smith, C., Rohrbach, L. A., Sun, P., et al. (2013). From counselor skill to decreased marijuana use: Does CT matter? *Journal of Substance Abuse Treatment*. <http://dx.doi.org/10.1016/j.jsat.2013.11.004>. Advance online publication.
- Bator, R. J., & Cialdini, R. B. (2006). The nature of consistency motivation: Consistency, inconsistency, and anticonsistency in a dissonance paradigm. *Social Influence*, 1(3), 208–233. <http://dx.doi.org/10.1080/15534510600823638>.
- Befort, C. A., Nollen, N., Ellerbeck, E. F., Sullivan, D. K., Thomas, J. L., & Ahluwalia, J. S. (2008). Motivational interviewing fails to improve outcomes of a behavioral weight loss program for obese African American women: A pilot randomized trial. *Journal of Behavioral Medicine*, 31(5), 367–377. <http://dx.doi.org/10.1007/s10865-008-9161-8>.
- Bendixen, M., Endresen, I. M., & Olweus, D. (2003). Variety and frequency scales of antisocial involvement: Which one is better? *Legal and Criminological Psychology*, 8(2), 135–150. <http://dx.doi.org/10.1348/135532503322362924>.
- Bernburg, J. G., & Krohn, M. D. (2003). Labeling, life chances, and adult crime: The direct and indirect effects of official intervention in adolescence on crime in early adulthood. *Criminology*, 41, 1287–1317. <http://dx.doi.org/10.1111/j.1745-9125.2003.tb01020.x>.
- Bloom, D. (2010). Programs and policies to assist high school dropouts in the transition to adulthood. *The Future of Children*, 20, 89–108. <http://dx.doi.org/10.1353/foc.0.0039>.
- Brown, S. L., Asher, T., & Cialdini, R. B. (2005). Evidence of a positive relationship between age and preference for consistency. *Journal of Research in Personality*, 39, 517–533. <http://dx.doi.org/10.1016/j.jrp.2004.07.001>.
- Carey, K. B., Henson, J. M., Carey, M. P., & Maisto, S. A. (2007). Which heavy drinking college students benefit from a brief motivational intervention? *Journal of Consulting and Clinical Psychology*, 75(4), 663. <http://dx.doi.org/10.1037/0022-006X.75.4.663>.
- Cave, G., Bos, H., Doolittle, F., & Toussaint, C. (1993). *JOBSTART: Final report on a program for school dropouts*. New York: Manpower Demonstration Research Corporation.
- CDC. (2011). *State and local youth risk behavior survey*. Retrieved from http://www.cdc.gov/healthyyouth/yrbs/pdf/questionnaire/2011_hs_questionnaire.pdf.
- Cialdini, R. B., Trost, M. R., & Newsom, J. T. (1995). Preference for consistency: The development of a valid measure and the discovery of surprising behavioral implications. *Journal of Personality and Social Psychology*, 69, 318–328. <http://dx.doi.org/10.1037/0022-3514.69.2.318>.
- Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment*, 6(4), 284. <http://dx.doi.org/10.1037/1040-3590.6.4.284>.
- Cohen, G. L., Garcia, J., Apfel, N., & Master, A. (2006). Reducing the racial achievement gap: A social-psychological intervention. *Science*, 313(5791), 1307–1310. <http://dx.doi.org/10.1126/science.1128317>.
- Draycott, S., & Dabbs, A. (1998). Cognitive dissonance 2: A theoretical grounding of motivational interviewing. *British Journal of Clinical Psychology*, 37, 355–364. <http://dx.doi.org/10.1111/j.2044-8260.1998.tb01391.x>.
- Dunn, C., Deroo, L., & Rivara, F. P. (2001). The use of brief interventions adapted from motivational interviewing across behavioral domains: A systematic review. *Addiction*, 96(12), 1725–1742. <http://dx.doi.org/10.1080/09652140120089481>.
- Edelman, P. B., Holzer, H. J., & Offner, P. (2006). *Reconnecting disadvantaged young men*. Washington, DC: The Urban Institute Press.
- Elliott, D. S., Huizinga, D., & Morse, B. (1986). Self-reported violent offending: A descriptive analysis of juvenile violent offenders and their offending careers. *Journal of Interpersonal Violence*, 1, 472–514. <http://dx.doi.org/10.1177/088626086001004006>.
- Festinger, L., & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *The Journal of Abnormal and Social Psychology*, 58, 203–210. <http://dx.doi.org/10.1037/h0041593>.
- Fothergill, K. E., Ensminger, M. E., Green, K. M., Crum, R. M., Robertson, J., & Juon, H. (2008). The impact of early school behavior and educational achievement on adult drug use disorders: A prospective study. *Drug and Alcohol Dependence*, 92, 191–199. <http://dx.doi.org/10.1016/j.drugalcdep.2007.08.001>.
- Gaume, J., Bertholet, N., Fouzi, M., Gmel, G., & Daepfen, J. (2010). Counselor motivational interviewing skills and young adult CT articulation during brief motivational interventions. *Journal of Substance Abuse Treatment*, 39, 272–281. <http://dx.doi.org/10.1016/j.jsat.2010.06.010>.
- Guadagno, R. E., & Cialdini, R. B. (2010). Preference for consistency and social influence: A review of current research findings. *Social Influence*, 5(3), 152–163. <http://dx.doi.org/10.1080/15534510903332378>.
- Heitland, K., & Bohner, G. (2010). Reducing prejudice via cognitive dissonance: Individual differences in preference for consistency moderate the effects of counter-attitudinal advocacy. *Social Influence*, 5, 164–181. <http://dx.doi.org/10.1080/15534510903332261>.
- Hendrickson, K. E., Jr. (2003). Replenishing the soil and the soul of Texas: The civilian conservation corps in the lone star state as an example of state-federal work relief during the great depression. *The Historian*, 65, 801–817. <http://dx.doi.org/10.1111/1540-6563.00038>.
- Jastrab, J., Masker, J., Blomquist, J., & Orr, L. (1996). *Evaluation of national and community services programs: Impacts of service: Final report on the evaluation of American conservation and youth service corps*. Cambridge, MA: Abt Associates.
- Lundahl, B. W., Kunz, C., Brownell, C., Tollefson, D., & Burke, B. L. (2010). A meta-analysis of motivational interviewing: Twenty-five years of empirical studies. *Research on Social Work Practice*, 20, 137–160. <http://dx.doi.org/10.1177/1049731509347850>.
- Macias, C., Jones, D. R., Hargreaves, W. A., Wang, Q., Rodican, C. F., Barreira, P. J., et al. (2008). When programs benefit some people more than others: Tests of differential service effectiveness. *Administration and Policy in Mental Health and Mental Health Services Research*, 35(4), 283–294. <http://dx.doi.org/10.1007/s10488-008-0174-y>.
- Millenky, M., Bloom, D., Muller-Ravett, S., & Broadus, J. (2011). *Three-year results of the National Guard Youth ChalleNge evaluation*. New York: Manpower Demonstration Research Corporation.
- Miller, W. R., C' de Baca, J., Matthews, D. B., & Wilbourne, P. L. (2001). *Personal values card sort*. Retrieved from <http://casaa.unm.edu/inst/Personal%20Values%20Card%20Sort.pdf>.
- Miller, W. R., & Johnson, W. R. (2008). A natural language screening measure for motivation to change. *Addictive Behaviors*, 33(9), 1177–1182. <http://dx.doi.org/10.1016/j.addbeh.2008.04.018>.
- Miller, W. R., Moyers, T. B., Ernst, D., & Amrhein, P. (2008). *Manual for the motivational interviewing skill code*. University of New Mexico: Center on Alcoholism, Substance Abuse and Addictions. Retrieved from <http://casaa.unm.edu/download/misc.pdf>.
- Miller, W. R., & Rollnick, S. (2012). *Motivational interviewing: Helping people change* (3rd ed.). New York: Guilford Press.
- Miller, W. R., & Rose, G. S. (2009). Toward a theory of motivational interviewing. *American Psychologist*, 64, 527–537. <http://dx.doi.org/10.1037/a0016830>.

- Miller, W. R., Yahne, C. E., Moyers, T. B., Martinez, J., & Pirritano, M. (2004). A randomized trial of methods to help clinicians learn motivational interviewing. *Journal of Consulting and Clinical Psychology, 72*(6), 1050–1062. <http://dx.doi.org/10.1037/0022-006X.72.6.1050>.
- Morgenstern, J., Kuerbis, A., Amrhein, P., Hail, L., Lynch, K., & McKay, J. R. (2012). Motivational interviewing: A pilot test of active ingredients and mechanisms of change. *Psychology of Addictive Behaviors, 26*(4), 859–869. <http://dx.doi.org/10.1037/a0029674>.
- Moyers, T. B., Martin, T., Houck, J. M., Christopher, P. J., & Tonigan, J. S. (2009). From in-session behaviors to drinking outcomes: A causal chain for motivational interviewing. *Journal of Consulting and Clinical Psychology, 77*, 1113–1124. <http://dx.doi.org/10.1037/a0017189>.
- Moyers, T. B., Martin, T., Manuel, J. K., Miller, W. R., & Ernst, D. (2010). *Revised global scales: Motivational interviewing treatment integrity 3.1.1*. University of New Mexico: Center on Alcoholism, Substance Abuse and Addictions.
- Oser, M. L., McKellar, J., Moos, B. S., & Moos, R. H. (2010). Changes in ambivalence mediate the relation between entering treatment and change in alcohol use and problems. *Addictive Behaviors, 35*(4), 367–369. <http://dx.doi.org/10.1016/j.addbeh.2009.10.024>.
- Pirlott, A. G., Kisbu-Sakarya, Y., DeFrancesco, C. A., Elliot, D. L., & MacKinnon, D. P. (2012). Mechanisms of motivational interviewing in health promotion: A bayesian mediation analysis. *The International Journal of Behavioral Nutrition and Physical Activity, 9*. <http://dx.doi.org/10.1186/1479-5868-9-69>.
- Schlomer, G. L., Bauman, S., & Card, N. A. (2010). Best practices for missing data management in counseling psychology. *Journal of Counseling Psychology, 57*(1), 1–10. <http://dx.doi.org/10.1037/a0018082>.
- Schochet, P. Z., Burghardt, J., & McConnell, S. (2008). Does job corps work? Impact findings from the National job corps study. *The American Economic Review, 98*(5), 1864–1886. <http://dx.doi.org/10.1257/aer.98.5.1864>.
- Sum, A., Khatiwada, I., McLaughlin, J., & Palma, S. (2011). No country for young men: Deteriorating labor market prospects for low-skilled men in the United States. *Annals of the American Academy of Political and Social Science, 635*, 24–55. <http://dx.doi.org/10.1177/0002716210393694>.
- Thornberry, T. P., & Krohn, M. D. (2000). The self-report method for measuring delinquency and crime. In U.S. National Institute of Justice (Ed.), *Measurement and analysis of crime and justice: Criminal justice series* (Vol. 4, pp. 33–83). Washington, DC: National Institute of Justice.
- Vader, A. M., Walters, S. T., Prabhu, G. C., Houck, J. M., & Field, C. A. (2010). The language of motivational interviewing and feedback: Counselor language, client language, and client drinking outcomes. *Psychology of Addictive Behaviors, 24*, 190–197. <http://dx.doi.org/10.1037/a0018749>.
- Zullig, K. J., Pun, S., Patton, J. M., & Ubbes, V. A. (2006). Reliability of the 2005 middle school youth risk behavior survey. *Journal of Adolescent Health, 39*, 856–860. <http://dx.doi.org/10.1016/j.jadohealth.2006.07.008>.