

AVOID FALLING FOR A JERK(ETTE): EFFECTIVENESS OF THE PREMARITAL INTERPERSONAL CHOICES AND KNOWLEDGE PROGRAM AMONG EMERGING ADULTS

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Premarital education may help emerging adults form healthy relationships, but evaluation research is needed, particularly with community samples. We studied emerging adults in the Premarital Interpersonal Choices and Knowledge (PICK) program, using a pre- to post- and a posttest-then-retrospective-pretest design to examine change in perceived relationship skills, partner selection, relational patterns, and relationship behaviors and attitudes. Mixed models analyses showed that scores for the treatment group ($n = 682$) increased from pre to post on all four outcomes. Changes in scores for the nonequivalent comparison group ($n = 462$) were nonsignificant. In addition, significant differences between pre- and retrospective prescores demonstrated evidence for response shift bias. The results suggest that the PICK program helps participants increase their knowledge regarding the components of healthy relationship formation.

Key words: posttest-then-retrospective-pretest, response-shift bias.

Although emerging adults in the United States marry less often and later than previously (Sassler, 2010), marriage is still an important priority for many (Wilcox, 2010). The extended time before marriage (and for some, between marriages) has come with an increase in various types of intimate relationships including which increasingly includes casual sex (Giordano, Manning, Longmore, & Flanigan, 2012), sliding into cohabitation (Stanley, Rhoades, & Fincham, 2011), serial cohabitation, and reconciliations and sex with exes (Halpern-Meehin, Manning, Giordano, & Longmore, 2013). Relationship cycling and fast relationship pacing have been associated with lower levels of marriage stability and commitment (Busby, Carroll, & Willoughby, 2010; Vennum & Johnson, 2014; Willoughby, Carroll, & Busby, 2014) and, therefore, might not be conducive to marital aspirations (Whitehead & Popenoe, 2000).

Given these trends, premarital interventions such as the *Premarital Interpersonal Choices and Knowledge* (PICK) have been developed for individuals in the mate selection phase. Such programs, often targeted to emerging adults, are becoming a common way to help young adults to increase their odds at achieving healthy relationships. However, there is little related evaluation

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research. The purpose of this study was to examine the effectiveness of the PICK program among emerging adults. PICK is only one of a few relationship education programs specifically designed for individuals who are seeking an intimate relationship or deciding whether to deepen a current relationship (Hawkins, Carroll, Doherty, & Willoughby, 2004). The curriculum is designed to help individuals make healthy, deliberate relationship choices. With prevention theory as a foundation for this study (Coie et al., 1993), we used a pre- to post- and a posttest-then-retrospective-pretest design with two groups of emerging adults: a treatment group drawn from the community and a nonequivalent control group drawn from the university.

LITERATURE REVIEW

Prevention Theory

The principles of prevention theory are at the heart of premarital intervention. Coie et al. (1993) outlined the essence of prevention science as an interplay between (a) risk factors—variables with high probability of onset that increase the occurrence, duration, and intensity of dysfunction, and (b) protective factors—variables that increase resistance to risk factors and dysfunction (Coie et al., 1993). Prevention theorists suggest that risk factors should be addressed early when they can be most influenced and have not yet developed into predictors of dysfunction. Additionally, individuals more likely to develop dysfunction should also be identified promptly and given skills to buffer the processes that contribute to eventual dysfunction. Coie et al. (1993) pointed out that those most at risk are often the most difficult to reach and therefore often do not receive tools or resources.

Premarital Relationship Education in Emerging Adulthood

With the rationale of reaching individuals early before dysfunction develops, family life educators are now targeting emerging adults in the mate selection phase—even before committed, intimate relationships occur (Cottle, Thompson, Burr, & Hubler, 2014). Fincham, Stanley, and Rhoades (2011) argued that emerging adulthood is an ideal time for couple relationship education (CRE) because (a) individuals often have not yet married, but often form committed, sexual relationships, (b) dating violence continues to be a widespread problem that may be addressed at least somewhat by CRE, (c) there are many negative consequences to risky sexual behaviors that CRE may address, and (d) healthy dating relationships have been associated with fewer mental health issues (see also Braithwaite, Delevi, & Fincham, 2010).

Emerging adulthood occurs approximately during the ages of 18 and 29 (Arnett, 2014), and is characterized by (a) self-exploration, (b) instability, (c) self-focus, (d) feeling in-between, and (e) increased possibilities (Arnett, 2014). As Hamilton and Hamilton (2006) noted, emerging adulthood has many paths—some work full time, or attend a trade school or junior college while others attend universities. In a study of emerging adults who participated in individually based CRE at the university, Braithwaite, Lambert, Fincham, and Pasley (2010) noted the limited reach of that venue. They concluded that “future research is needed to examine the impact of this kind of intervention on individuals who do not pursue higher education” (p. 745). Currently only one published study (Antle et al., 2013) has evaluated this kind of intervention with a community sample. By offering programs outside the university, there is a potential to reach the unique group of emerging adults who may not have the resources to attend a university.

Because there is relatively little educational programming for individuals in the mate selection phase, there is little evaluation research on such programs, particularly with community samples. Markman and Rhoades (2012) reviewed CRE programs from 2002 to 2010, and of the 32 studies in the review, only two featured programs targeting individuals in the mate selection stage: *Within My Reach* (WMR; Pearson, Stanley, & Kline, 2005) and PICK (Antle et al., 2013; Van Epp, Futris, Van Epp, & Campbell, 2008). To the authors' knowledge, there are currently only seven published quantitative studies evaluating CRE in the mate selection phase: five in the university setting (Braithwaite, Lambert, et al., 2010; Cottle et al., 2014; Fincham et al., 2011; Olmstead et al., 2011), one to individuals from low socioeconomic backgrounds in the community (Antle et al., 2013), and one to military personnel (Van Epp et al., 2008).

In this study, we used emerging adults from the university as a nonequivalent comparison group, along with a treatment group of emerging adults from the community. This study design

increases control by allowing comparison of risk factors and outcomes of the two groups (Montero & Leon, 2007). In the literature, certain demographic variables have been associated with a higher likelihood of divorce including being poor, having higher order marriages (i.e., married and divorced multiple times), being less educated, and having children from prior relationships (Amato, 2010). To the extent that university attendance constitutes privilege, and thus potential for lower levels of risk, it may be that the emerging adults in the treatment group experience more risk, which may more strongly warrant intervention (Coie et al., 1993). We reasoned that comparing the baseline scores of the treatment group of emerging adults with those from the university might help reveal potential differences in perceived skills and attitudes, thereby shedding light on the potential risk levels of those in attendance. For example, one group might have less knowledge than the other which may justify further intervention or a higher dosage of the program. Knowing general profiles among emerging adults with regard to divorce rates, presence of children, education levels, income levels, and cultural backgrounds might also help future facilitators more succinctly focus their content to those in attendance. Such findings might also help in the formation of future editions of this and other programs.

Reach and Effectiveness of PICK

To date, over 500,000 individuals have attended a PICK course, and certified instructors reside in all 50 states (J. Van Epp, personal communication, January 13, 2015). Additionally, the PICK curriculum has been around for several years—the instructor’s manual is on its fifth edition (Van Epp, 2010). Yet, there have been only two published quantitative studies and a handful of preliminary unpublished evaluations of PICK. The initial findings from these evaluations are promising. Van Epp et al. (2008) provided PICK to military personnel and found significant increases in retrospective pre- to postscores in relationship confidence and knowledge. Brower et al. (2012) applied the content of PICK to adolescents and, using a retrospective pre- to postdesign, found significant increases in knowledge about healthy relationships. In addition to these two studies, three separate unpublished reports showed that pre- to postscores in knowledge and attitudes increased for attendees (Marriage Works Ohio, n.d.; Michigan Healthy Marriage Coalition, n.d.; Schumm & Theodore, 2014). Although these reports provide initial evidence for the effectiveness of PICK, more rigorous evaluative research on PICK is needed.

PICK Program Content

The main aim of PICK is to teach participants research-based information to help them increase their chances of long-term relationship success. There are two overarching goals featured in the PICK program, including (a) recognizing characteristics of a potential partner and (b) appropriately pacing a relationship (see Van Epp et al., 2008 for a review). The program’s first goal is to educate individuals on areas that contribute to marital stability and quality. These areas include family dynamics and childhood experiences, attitudes and actions of the conscience, compatibility potential, examples of other relationships, and skills for relationships (F.A.C.E.S.). The second goal of PICK is to provide individuals with knowledge concerning pacing in the dating process, and to help them effectively balance increased levels of closeness to be proportionate with factors such as knowledge, trust, and commitment. Because the only two published evaluations of PICK involved military personnel and adolescents, the program still needs to be evaluated in other contexts including emerging adulthood.

In the current study, we compared emerging adult attendees with nonparticipants from the university. The purpose was to (a) test the effectiveness of PICK in a treatment group of emerging adults by determining differences between pre (and retrospective pre)- and postmean scores on four outcome variables including *perceived relationship skills, partner selection, relational patterns, and relationship behaviors and attitudes*; and (b) examine differences in mean scores for the treatment group of emerging adults versus the university sample on the four outcome measures. This design is comparable to a nonequivalent group design in which groups are formed under circumstances that permit no control (or limited control) of assignment of individuals. In addition, the between-subjects comparisons allowed us to examine outcomes relative to two groups with potentially differing risk levels, thus allowing us to test the outcomes according the principles of prevention theory.

METHOD

Procedures

Participants were recruited from eight predominantly urban/suburban communities across a western state through newspapers advertisements, Internet advertisements, word of mouth, collaboration with local extension faculty, distribution of flyers, announcements in university classes, and commercials in local movie theaters. These participants attended 180 courses that took place from October 2, 2012 to August 6, 2014. Any individual over the age of 18 was eligible; registration was via Internet but walk-ins were allowed. All participants completed a two-page pretest survey prior to the first lesson and a similar posttest survey at the conclusion of the last session of the course. All courses were 6 hr in length with identical content. Multiple formats of PICK were offered, ranging from 1-day 6-hr sessions to six 1-hr sessions spread out over 6 weeks. In terms of format, 2.1% attended a onetime workshop; 16% attended two, 3-hr sessions over 2 weeks; 42% attended three, 2-hr sessions over 3 weeks; and 8% attended four, 1.5-hr sessions over 4 weeks or six, 1-hr sessions over 6 weeks (32% missing data on this item). A meal from a local restaurant was provided at each group meeting as an incentive for individuals to participate. Each of the nine facilitators completed the Instructor Certification Packets and passed the online test to become certified PICK instructors. Additionally, the nine instructors participated in a full-day training conference that oriented them to the curriculum and to project procedures. To further ensure treatment fidelity, site visits were performed periodically by the initiative's project director who observed classes and gave feedback.

A nonequivalent comparison group of university students was recruited at a western university during the spring semester of 2013. A project coordinator distributed surveys to students in eight classes (five family science courses and three business courses). Students used the first 10–15 min of class to complete the two-page pretest survey. This project coordinator returned to the same eight classes 2 weeks later and students again took the first 10–15 min of class time to complete the two-page posttest survey. Survey completion was voluntary; extra credit was not offered to the students.

Participants

For this study, emerging adults were selected from the full sample of PICK participants, which consisted of 2,760 individuals. Because the program was designed primarily for single individuals, and because the outcome measures focus on aspects such as partner selection, we dropped participants who were engaged or married ($n = 312$). Additionally, we chose to limit our sample to emerging adults ages 18–25 in order to make the treatment group and university group equivalent in terms of developmental stage. This resulted in a sample of 682 emerging adults from the community in the treatment group and 462 emerging adults from the university in the comparison group. Those in dating relationships were included in the analyses due to the program's focus on recognizing characteristics of a potential partner that shape long-term relationship outcomes, and on appropriately pacing a relationship. These aims are germane to developing relationships.

Treatment group. The mean age of the treatment group ($n = 682$) was 21.5 ($SD = 2.24$). The participants were 73.5% women and 26.3% men. Regarding race and ethnicity, 84.7% were White, 6.8% were Hispanic/Latino, 3.4% indicated Other, 1.3% were Native American, 0.6% were Asian American, and 0.9% were African American. In this sample, 72.4% were single, 27.5% were dating, and 0.1% were widowed. Regarding education, 6.3% had attended some high school, 19.1% were high school graduates or had a GED, 52.5% had attended some college, 17.8% had obtained a college or technical degree, and 2.4% had obtained a graduate degree. There were 7.8% that had at least one child and 3.0% had experienced a divorce. The median income of the treatment group was \$10,000.

Nonequivalent comparison (university) group. Data were collected from a university group that originally included 725 college students recruited from various undergraduate classes from a local university. We eliminated from this sample individuals older than 25 ($n = 263$). This resulted in a sample of 462 individuals including 69.7% women and 29.9% men. The mean age of the group was 21.35 ($SD = 3.98$). Regarding race and ethnicity, 91.6% of the sample was White, 3% Latino,

1.9% other, 1.7% Asian American, 0.6% Native American, and 0.4% African American. Regarding relationship status, 67.7% were single, and 32% were dating. Only 0.4% had at least one child and 1.1% had experienced a divorce. Median household income was \$7,000.

Measures

Two measures focused on perceived personal knowledge about relationship skills and partner selection. These measures were generated to reflect the content of the course. Two additional measures, used in a previous evaluation of PICK (see Van Epp et al., 2008), focused on perceived knowledge about a potential partner including relational patterns and relationship behaviors and attitudes. Because of the emphasis PICK places on forming relationships, traditional premarital outcome measures such as communication skills, problem solving, empathy, and marriage quality do not suffice because such measures assume an extant intimate relationship. Instead, due to the program's focus on mate selection, appropriate variables include factors such as knowledge, attitudes, and perceptions. Fincham et al. (2011) stated that one of the main difficulties in evaluating WMR was identifying appropriate measures. They thus began to develop measures to meet the needs of WMR (see Vennum & Fincham, 2011), which were not yet published at the inception of the current initiative. We developed items that measured knowledge, attitudes, and perceptions of those attending the course. The first two scales measure an individual's perceived knowledge about (a) relationship skills and (b) partner selection. The last two scales (Van Epp et al., 2008) measure perceived importance of knowledge about a potential partner's (c) relationship patterns, and his or her (d) relationship behaviors and attitudes.

Although most of the items reflect prior research, some of the items on these measures reflect unique content featured in PICK. To increase clarity about the measures, we provide their full descriptive titles here. To decrease wordiness throughout the study, however, the four outcome measures are simply referred to as *relationship skills*, *partner selection*, *relational patterns*, and *relationship behaviors and attitudes*.

Perceived knowledge about relationship skills. To measure perceived relationship skills, participants rated three statements on a 5-point Likert scale ranging from 1 *disagree* to 5 *strongly agree*. These statements included "I understand what it takes to have a healthy relationship," "I know how to communicate well with a partner," and "I have good conflict management skills." Mean scores were calculated. Cronbach's alphas (including both samples) were .70 for pretest, .70 for retrospective pre, and .70 for posttest.

Perceived knowledge about partner selection. Participants rated partner selection using four statements: "I know how to choose the right partner for me," "I know the important things to learn about a potential partner," "I know how to pace a relationship in a safe way," and "I can spot warning signs in relationships." These statements were placed on 5-point Likert scales ranging from 1 *disagree* to 5 *strongly agree*. Mean scores were calculated. Cronbach's alphas were .82 for pretest and .79 for posttest.

Perceived importance of knowledge about a potential partner's relationship patterns. Participants were given the stem "How important is it to you to know the following about someone prior to becoming seriously committed?" (see Van Epp et al., 2008). The variable of relational patterns was measured using four items: "what he/she learned from his or her family when growing up," "what he/she has been like in past relationships," "how well he/she gets along with his or her parents," and "what his or her friendships are like." Attendees rated these four items ranging from 1 *unimportant* to 5 *crucially important*. Mean scores were calculated. Cronbach's alphas were .73 for pretest, .77 for retrospective pre, and .78 for posttest.

Perceived importance of knowledge about a potential partner's relationship behavior and attitudes. Relationship behaviors and attitudes were measured using three statements on 5-point Likert scales ranging from 1 *unimportant* to 5 *crucially important* (Van Epp et al., 2008). Participants were given the stem "How important is it to you to know the following about someone prior to becoming seriously committed?" and asked to rate a list of statements ranging from 1 *unimportant* to 5 *crucially important*. These statements included "how he/she fights when angry," "how he/she reacts when my feelings are hurt," and "what he/she believes about right and wrong." Mean scores were calculated. Cronbach's alphas were .62 for pretest, .66 for retrospective pre, and .68 for posttest.

Plan of Analysis

Mixed models testing. To test differences between the various means at the various times in the treatment group emerging adults, we used a linear mixed models analysis for longitudinal data (see Everitt, 2010). Within a linear model, there are fixed effects and error (Winter, 2013). Not only does the mixed models analysis account for fixed effects, it also accounts for randomness introduced by individual differences—“essentially giving structure to the error” (Winter, 2013, p. 3). The mixed models analysis has several advantages over other options, especially repeated-measures ANOVA, such as cases not needing to be dropped because of missing data. Linear mixed models also accounts for different spacing in repeated measurements (Seltman, 2014). We also used mixed models to compare the pretest and posttest scores of the treatment group with the scores from the university sample on all four outcome measures.

Chi-square comparisons. We used chi-square tests to explore the differences between the treatment group and the university sample, and compared them on the following variables: gender, race/ethnicity (White, Latino, and Other), income (0–\$20,000, \$20,001–\$35,000, and \$35,000 or higher), education level (high school degree or less, some college, college degree, and graduate degree), previous divorce (yes/no), and presence of children (yes/no).

Response shift bias. As a class participant’s understanding changes from pre- to postintervention, it is hypothesized that the way they interpret questions on presurveys differs on postsurveys. Because individuals do not know the course content beforehand, they will likely produce biased scores in the pretest due to a lack of understanding about the questions themselves. This is known as response shift bias (Howard, 1982). Response shift bias has been tested by comparing pretest means with retrospective pretest means to determine whether the differences are statistically significant (Drennan & Hyde, 2008). Significant differences between the two means are presumed to indicate altered understanding about the construct being measured and to indicate that response shift bias has occurred. To test this phenomenon, we used mixed models design to compare pretest means with retrospective pretest means. Three of the four measures in this study featured posttest-then-retrospective-pretest evaluations (Marshall, Higginbotham, Harris, & Lee, 2007) in the postsurvey, including relationship skills, partner selection, and relationship behaviors and attitudes (partner selection was not tested retrospectively due to space limitations on the survey). Participants were asked on the posttest survey to “mark the boxes that reflect your opinion *before* and *after* attending this course” for perceived relationship skills, and “how important was it to you before the course *and* how important *is it now* to know the following about someone *prior to* becoming seriously committed” for mate selection and behaviors and attitudes.

RESULTS

Reliability Testing

Because the outcome measures were psychometrically untested, we conducted principal components factor analyses to determine the reliability of the measures before testing the difference scores in the mixed models analyses. Eigenvalues for the items ranged from 1.7 to 2.7 and explained 55.5–60% of the variability. As previously shown, Cronbach’s alpha levels for three of the four outcome variables were .70 and higher. The alpha levels for the fourth outcome variable (relationship behaviors and attitudes) had alphas that ranged from .62 to .68. Although not robust, these coefficients are considered to be acceptable in emerging areas of research (Cho & Kim, 2015; Lance, Butts, & Michels, 2006).

Differences in Means for the Treatment Group

Using a mixed models analysis, we tested for changes in the treatment group over time for the four variables, including perceived knowledge of (a) relationship skills, and (b) partner selection, as well as perceived importance of knowledge about a potential partner’s past (c) relational patterns, and (d) relationship behaviors and attitudes. In mixed models, one must specify a reference point. The posttest was used as the reference point; the *t*-test scores reflect differences compared to the posttest means. These results are reported in Tables 1–4, including results regarding gender differences.

| Table 1 <i>Mixed Models Results for Relationship Skills</i> | | | | | |
|--|--|----------|---------------|-------------------------|----------|
| Parameter | Mean scores (<i>SD, n</i>) | Estimate | Std. error | <i>t</i> - Statistic | <i>p</i> |
| Intercept | | 4.25 | .027 | 157.49 | .001 |
| Pre | 3.53 (0.62, 176) <i>3.41* (0.68, 494)</i> | -0.84 | .029 | -28.62 | .001 |
| Retro-pre | 3.35 (0.71, 114) <i>3.18* (0.72, 334)</i> | -1.06 | .031 | -33.76 | .001 |
| Post | 4.34 (0.57, 111) <i>4.27 (0.51, 338)</i> | — | — | — | — |
| Gender (M) (F reference) | | 0.099 | .046 | 2.15 | .032 |

Note. Women's means are italicized and differ from those of men where **p* < .05.

| Table 2 <i>Mixed Models Results for Partner Selection</i> | | | | | |
|--|---|----------|------------|---------------------|----------|
| Parameter | Mean scores (<i>SD, n</i>) | Estimate | Std. error | <i>t</i> -Statistic | <i>p</i> |
| Intercept | | 4.11 | .028 | 144.67 | .001 |
| Pre | 3.28 (0.76, 173) <i>3.16 (0.80, 495)</i> | -0.95 | .034 | -27.83 | .001 |
| Post | 4.10 (0.60, 112) <i>4.16 (0.54, 339)</i> | — | — | — | — |
| Gender (M) (F reference) | | 0.01 | .051 | 0.21 | .837 |

Note. Women's means are italicized.

Relationship skills. Means for perceived relationship skills differed significantly across each time point (see Table 1). The mean was highest at the posttest. The posttest mean ($M = 4.28$, $SD = 0.53$) was significantly higher than the retrospective pretest ($M = 3.23$, $SD = 0.72$, $t = -33.76$, $p < .001$) and the pretest ($M = 3.44$, $SD = 0.66$, $t = -28.62$, $p < .001$). Means differed by gender ($t = 2.15$, $p < .05$) indicating that men scored higher overall than women on perceived relationship skills. Mean scores (SD, n) for men were *pretest*: 3.53 (0.62, 176); *retrospective-pre*: 3.35 (0.71, 114); and *posttest*: 4.34 (0.57, 111). Means (SD, n) for women were *pretest*: 3.41 (0.68, 494); *retrospective-pre*: 3.18 (0.72, 334); and *posttest*: 4.27 (0.52, 338).

Partner selection. Mean scores for perceived personal knowledge about partner selection differed significantly across each time point, again with highest scores found at the posttest (see Table 2). The mean score at the posttest ($M = 4.20$, $SD = 0.55$) differed significantly compared to the pretest mean ($M = 3.20$, $SD = 0.79$, $t = -27.83$, $p < .001$). Due to space considerations on the survey, no retrospective pretest data were collected for this measure. Gender differences were not significant ($t = 0.21$, $p = .837$). Mean scores (SD, n) for men were *pretest*: 3.28 (0.76, 173) and *posttest*: 4.10 (0.60, 112). Mean scores (SD, n) for women were *pretest*: 3.16 (0.80, 495) and *posttest*: 4.16 (0.54, 339).

| Table 3 <i>Mixed Models Results for Relational Patterns</i> | | | | | |
|--|--|----------|---------------|-------------------------|----------|
| Parameter | Mean scores (<i>SD, n</i>) | Estimate | Std. error | <i>t</i> - Statistic | <i>p</i> |
| Intercept | | 4.60 | .026 | 178.2 | .001 |
| Pre | 3.61 (0.70, 175) <i>4.13* (0.59, 497)</i> | −0.51 | .026 | −19.14 | .001 |
| Retro-pre | 3.44 (0.85, 110) <i>3.78* (0.77, 331)</i> | −0.81 | .035 | −23.32 | .001 |
| Post | 4.31 (0.59, 108) <i>4.57* (0.48, 337)</i> | — | — | — | — |
| Gender (M) (F reference) | | −0.38 | .044 | −8.67 | .001 |

Note. Women's means are italicized and differ from those of men where **p* < .05.

| Table 4 <i>Mixed Models Results for Relationship Behaviors and Attitudes</i> | | | | | |
|---|--|----------|---------------|-------------------------|----------|
| Parameter | Mean scores (<i>SD, n</i>) | Estimate | Std. error | <i>t</i> - Statistic | <i>p</i> |
| Intercept | | 4.73 | .022 | 211.65 | .001 |
| Pre | 3.98 (0.62, 174) <i>4.43* (0.52, 497)</i> | −0.33 | .022 | −14.87 | .001 |
| Retro-pre | 3.83 (0.77, 110) <i>4.19* (0.66, 332)</i> | −0.55 | .029 | −19.25 | .001 |
| Post | 4.47 (0.55, 108) <i>4.72* (0.40, 337)</i> | — | — | — | — |
| Gender (M) (F reference) | | −0.35 | .040 | −8.77 | .001 |

Note. Women's means are italicized and differ from those of men where **p* < .05.

Relational patterns. For both men and women, means for relational patterns at posttest ($M = 4.51$, $SD = 0.52$) were significantly higher than means at pretest ($M = 4.00$, $SD = 0.66$, $t = -19.14$, $p < .001$; see Table 3) and retrospective pretest ($M = 3.70$, $SD = 0.80$, $t = -23.32$, $p < .001$). The test for gender differences was also significant ($t = -8.67$, $p < .001$) showing that women, at all points, rated themselves significantly higher on knowledge of relational patterns. Mean scores (SD, n) for men were *pretest*: 3.61 (0.69, 175); *retrospective-pre*: 3.44 (0.85, 110); and *posttest*: 4.31 (0.59, 108). Mean scores (SD, n) for women were *pretest*: 4.31 (0.59, 497); *retrospective-pre*: 3.78 (0.77, 331); and *posttest*: 4.57 (0.48, 337).

Relationship behaviors and attitudes. Mean differences on relationship behaviors and attitudes were significantly higher at posttest ($M = 4.66$, $SD = 0.45$) compared to the pretest ($M = 4.31$, $SD = 0.58$, $t = -14.87$, $p < .001$) and retrospective pretest ($t = -19.25$, $p < .001$; see Table 4). Means varied significantly by gender ($t = -8.77$, $p < .001$). On average, women scored higher than men regarding the importance of knowing about their partner's dynamics before becoming committed. Mean scores (SD, n) for men were *pretest*: 3.98 (0.62, 174); *retrospective-pre*:

3.83 (0.77, 110); and *posttest*: 4.47 (0.55, 108). Mean scores (*SD*, *n*) for women were *pretest*: 4.43 (0.52, 497); *retrospective-pre*: 4.19 (0.66, 332); and *posttest*: 4.72 (0.40, 337).

Response Shift Bias

To test for possible response shift bias, the pretest means were compared with the retrospective pretest means on the measures of relationship skills, relational patterns, and relationship behaviors and attitudes. All three tests yielded significant differences. For relationship skills, the pretest mean ($M = 3.44$, $SD = 0.66$) was significantly higher than the retrospective pretest mean ($M = 3.23$, $SD = 0.72$) ($t = 7.51$, $p < .001$). Regarding relational patterns, the pretest mean ($M = 4.0$, $SD = 0.66$) was likewise significantly higher than the retrospective pretest mean ($M = 3.70$, $SD = 0.80$) ($t = 6.79$, $p < .001$). For relationship behaviors and attitudes, the pretest mean ($M = 4.31$, $SD = 0.58$) was also significantly higher than the retrospective pretest mean ($M = 4.10$, $SD = 0.71$) ($t = 7.97$, $p < .001$). Thus, the pretest mean was significantly higher than the retrospective pretest mean on all three comparisons, indicating the presence of response shift bias.

Treatment Group Versus Nonequivalent Group

As stated previously, we hypothesized that emerging adults from the community on the whole would likely be different from those from the university. To understand differences between groups, we used chi-squared tests to examine differences between emerging adults (ages 18–25) in single or dating relationships in the treatment group and emerging adults attending university courses for the following variables: gender, race/ethnicity (White, Latino, and Other), income (0–\$20,000, \$20,001–\$35,000, and \$35,000 or higher), education level (high school degree or less, some college, college degree, and graduate degree), previous divorce (yes/no), and presence of children (yes/no). Compared to the university emerging adults, the treatment emerging adults differed in ethnicity ($\chi^2 = 12.46$, $p < .01$) with the treatment group having more Latinos and more individuals from Other ethnic groups. They also differed in income levels ($\chi^2 = 29.69$, $p < .001$) with those from the treatment group making more money on average than the university group. In the treatment group, education levels ($\chi^2 = 136.41$, $p < .001$) were more diverse than the university group with more individuals having only high school degrees, fewer individuals with some college, but more already having college degrees. Emerging adults in the treatment group were more likely to have experienced a divorce ($\chi^2 = 7.04$, $p < .01$) and were more likely to have children ($\chi^2 = 35.41$, $p < .001$).

Group Comparisons

Using mixed models, we compared differences in the means of outcome variables between the single emerging adults from the university and those from the treatment group. The same four outcome variables were used including perceived knowledge of relationship skills, partner selection, a potential partner's relational patterns, and a potential partner's relationship behaviors and attitudes.

Relationship skills. At pretest, the mean for relationship skills was higher for the university emerging adults ($M = 3.79$, $SD = 0.57$) than for the treatment group ($M = 3.44$, $SD = 0.65$) ($t = 9.47$, $p < .001$); see Table 5. The nonequivalent (university) group by treatment by time variable differed significantly for relationship skills ($t = 18.88$, $p < .001$). This test compares the treatment group and comparison group scores from pretest to posttest and showed significant improvement in the treatment group, and not for the comparison group. Results indicated that emerging adults in the treatment group improved from pre- to posttreatment (3.44, $SD = 0.65$ at pretreatment vs. 4.28, $SD = 0.55$ at posttreatment) when compared with those from the university (3.79, $SD = 0.57$ vs. 3.85, $SD = 0.52$). Results did not differ by gender.

Partner selection. At pretest, the mean score for partner selection was again significantly higher for the emerging adults in the university group ($M = 3.58$, $SD = 0.71$) compared with the mean for those in the treatment group ($M = 3.19$, $SD = 0.79$) ($t = 8.67$, $p < .001$); see Table 6. At posttest, the mean score for partner selection was significantly higher for the treatment group compared with the posttest score for the university group. The nonequivalent by treatment by time variable differed significantly for partner selection ($t = 17.31$, $p < .001$), indicating that those in

| Table 5 <i>Mixed Models Results for Relationship Skills With Nonequivalent Group</i> | | | | |
|---|----------|------------|---------------------|----------|
| Parameter | Estimate | Std. error | <i>t</i> -Statistic | <i>p</i> |
| Intercept | 4.26 | .025 | 169.05 | .001 |
| Nonequivalent × treatment | −0.41 | .038 | −11.28 | .001 |
| Pre to post | −0.83 | .026 | −32.11 | .001 |
| Nonequivalent × treatment × time | 0.76 | .040 | 18.88 | .001 |
| Gender | 0.06 | .035 | 1.75 | .08 |

| Table 6 <i>Mixed Models Results for Partner Selection With Nonequivalent Group</i> | | | | |
|---|----------|------------|---------------------|----------|
| Parameter | Estimate | Std. error | <i>t</i> -Statistic | <i>p</i> |
| Intercept | 4.15 | .029 | 145.42 | .001 |
| Nonequivalent × treatment | −0.44 | .042 | −10.47 | .001 |
| Pre to post | −0.95 | .031 | −30.16 | .001 |
| Nonequivalent × treatment × time | 0.82 | .048 | 17.31 | .001 |
| Gender | −0.012 | .04 | −0.312 | .755 |

the treatment group improved in scores from pre- to posttreatment (3.19, *SD* = 0.78 at pretreatment vs. 4.15, *SD* = 0.57 at posttreatment) when compared with the university group (3.58, *SD* = 0.73 vs. 3.71, *SD* = 0.63). Once again, mean scores did not differ significantly by gender.

Relational patterns. At pretest, the mean score for relational patterns did not differ significantly for the university group (*M* = 4.03, *SD* = 0.57) compared with the treatment group (*M* = 4.00, *SD* = 0.67); see Table 7. The nonequivalent by treatment by time variable differed significantly, suggesting that the treatment group improved more over time compared with the university students (*t* = 12.90, *p* < .001). The mean for emerging adults in the treatment group went from 4.00, *SD* = 0.57 at pretreatment to 4.51, *SD* = 0.48 at posttreatment, while the mean for emerging adults from the university went from 4.03, *SD* = 0.57 at pretreatment to a mean of 4.04, *SD* = 0.55 at posttreatment. The scores for men in both the university group and the treatment group on average were significantly lower than scores for women on knowledge about potential partner's relational patterns (*t* = −10.21, *p* < .001).

Relationship behaviors and attitudes. For this variable, the treatment group mean (*M* = 4.31, *SD* = 0.58) was higher at pretest compared with the university students (*M* = 4.25, *SD* = 0.58; *t* = −1.97, *p* < .05); see Table 8. The nonequivalent by treatment by time variable differed

| Table 7 <i>Mixed Models Results for Relational Patterns With Nonequivalent Group</i> | | | | |
|---|----------|------------|---------------------|----------|
| Parameter | Estimate | Std. error | <i>t</i> -Statistic | <i>p</i> |
| Intercept | 4.0 | .026 | 178.19 | .001 |
| Nonequivalent × treatment | −0.46 | .038 | −12.14 | .001 |
| Pre to post | −0.51 | .025 | −20.32 | .001 |
| Nonequivalent × treatment × time | 0.50 | .039 | 12.90 | .001 |
| Gender | −0.35 | .040 | −10.21 | .001 |

Table 8

Mixed Models Results for Relationship Behaviors and Attitudes With Nonequivalent Group

| Parameter | Estimate | Std. error | <i>t</i> -Statistic | <i>p</i> |
|----------------------------------|----------|------------|---------------------|----------|
| Intercept | 4.73 | .023 | 205.60 | .001 |
| Nonequivalent × treatment | −0.30 | .033 | −8.99 | .001 |
| Pre to post | −0.33 | .022 | −15.06 | .001 |
| Nonequivalent × treatment × time | 0.25 | .034 | 7.31 | .001 |
| Gender | −0.34 | .032 | −10.83 | .001 |

significantly, suggesting again that the treatment group improved more over time from pretest to posttest (4.31, $SD = 0.64$ pretest, vs. 4.66, $SD = 0.54$ posttest), compared to the university group (4.25, $SD = 0.57$ pretest, vs. 4.32, $SD = 0.58$ posttest) ($t = 7.31, p < .001$). Women's mean scores were higher, on average, than men ($t = -10.83, p < .001$) in both the university and treatment groups.

DISCUSSION

The current study is one of the first evaluations to examine the effectiveness of PICK with a community sample. The results provide evidence that PICK helps individuals gain knowledge about forming healthy relationships. Attendees demonstrated significant pretest to posttest gains in all four outcomes: perceived knowledge about relationship skills and partner selection, and perceived knowledge about a potential partner's relational patterns and relationship behaviors and attitudes. Using prevention theory as a guide, we compared means of emerging adults in the treatment group to means in a university nonequivalent comparison group. Our purpose was to compare both preintervention and postintervention scores among the treatment group (which was relatively more diverse) with a university control group. As expected, the pre- to postgains on the four outcomes made by the emerging adults in the treatment group were significantly higher than the pre- to postmeans of the comparison group emerging adults from the university who did not receive treatment. These results thus give further support for the effectiveness of PICK, particularly among community participants. The current results are consistent with research on PICK that has documented gains from pre- to posttests in areas of compromise, trust, knowledge, and understanding (Marriage Works Ohio, n.d.; Michigan Healthy Marriage Coalition, n.d.; Schumm & Theodore, 2014; Van Epp et al., 2008).

By targeting emerging adults in the community with PICK, we tried to reach individuals early and to serve those who might be relatively more at risk (Coie et al., 1993). Regarding risk factors that contribute to divorce (Amato, 2010), the differences in demographics between emerging adults from the community and university emerging adults suggest that the treatment group was at higher risk for relationship dysfunction in potentially important ways. Overall, the treatment group emerging adults had significantly less education than the university group (e.g., 26% of the treatment group had a high school education or less compared to 6.5% of the university group), higher rates of divorce (3.1% compared with 1.1%), and higher likelihood of having children (7.8% compared with 0.4%). But there were also potential protective factors among some in the community sample: Nearly 20% had obtained a college degree, and mean income levels were higher for this group (\$7,000 for university students vs. \$10,000 for the treatment group). Beyond risk and protective factors, we can only conclude that those in the treatment group were somewhat more diverse than those in the university group.

The preintervention scores for each group may also be viewed as potential markers for risk. However, comparing the means on the four outcomes for the two groups produced mixed results. For example, the university group had relatively higher scores on relationship skills and partner selection—possibly suggesting higher risk for those in the treatment group regarding their own

skills and choosing a partner. Conversely, those in the treatment group scored relatively higher on perceived knowledge about a potential partner's relationship behaviors and attitudes. Taken together, the pretreatment means suggest that the university group was more confident in their initial personal relational knowledge, but that the community (treatment) group was at least somewhat more confident in their initial knowledge about partner selection.

These analyses yielded differences by gender (further tests of demographic predictors are provided in K. B. Bradford, J. W. Stewart, B. J. Higginbotham, & R. Pfister. (2016), submitted). In the treatment group, men scored higher than women on perceived relationship skills (e.g., healthy communication and conflict management) which may be counter to cultural scripts. There were no gender differences regarding knowledge of partner selection. Scholars have emphasized that there are far more gender overlaps than gender differences in communication and that dichotomous views are typically inaccurate; the lack of gender difference regarding partner selection may support such a nuanced view (Dindia & Canary, 2006). Conversely, women scored higher than men on two outcome measures: relational patterns and relationship behaviors and attitudes. This finding suggests that women in the study were more likely to carefully examine their potential partners' relationships and personality characteristics. This finding is in agreement with past research that suggests women, more than men, tend to be relatively more particular about the characteristics of a potential partner (Schwarz & Hassebrauck, 2012) and have been found to value generosity, intellect, sociability, reliability, kindness, and humor in a potential partner whereas men tend to place more emphasis on physical attractiveness, creativity, and being a domestic partner.

Response Shift Bias

The results of this study give evidence of response shift bias in the pretest–posttest design. On the three scales in which we used retrospective pretreatment measures (relationship skills, relational patterns, and relationship behaviors and attitudes), mean scores between pretest and retrospective pretest differed significantly. We found that participants tended to rate their knowledge higher before the intervention, but lower on the retrospective post, perceiving (presumably) they actually knew less than they thought they did before they started. These findings provide clear evidence for response shift bias, which has implications for pretest–posttest designs. Without measuring the shift in pretreatment measure, pre- and posttest differences (and thus program impact) may be underestimated. These results may even suggest that clinicians should consider retrospective assessments beyond intake, given the evidence here that treatment may alter perceptions of intended intervention outcomes. Despite differences in the content and goals of CRE assessments versus clinical assessments, therapy clients may possibly rate themselves lower retrospectively than at initial intake.

Some studies have shown that employing retrospective pretest designs are more accurate than pre- to postdesigns because they more closely reflect behavioral indices (Howard, 1982; Pratt, McGuigan, & Katzev, 2000). Others have also demonstrated that participants' perceptions of the construct being measured shifts from pre- to posttest because of exposure to program content (Drennan & Hyde, 2008). Although the retrospective pretest design might not replace traditional pretest–posttest design, the current findings demonstrate empirical differences in each method and suggest that a retrospective design may be useful in measuring the impact of relationship education. Conversely, Hill and Betz (2005) argued and also showed that other biases besides response shift bias were at work in their research. They showed that retrospective pretests were susceptible to such biases as faulty recall, emotionality, and cognitive distortion (i.e., individuals naturally want to feel they invested their time wisely in a program). Because of these biases, Hill and Betz (2005) recommend using retrospective pretests on measures of attendee's subjective experience, but also using pre- to postdesigns on outcome measures such as skills and knowledge. More research on retrospective pre- to postdesigns is needed to further examine the pros and cons.

Strengths and Limitations

Strengths of the current study include sample sizes with ample statistical power. A mixed models approach was used to appropriately account for random effects in subjects and time. In addition, the inclusion of a nonequivalent group of university emerging adults provided a way to test

prevention theory through demographic comparisons and mixed models comparisons, thus allowing us to examine program outcomes with more confidence. Despite these strengths, there are also limitations to the current study. One limitation is that the current measures lack thorough psychometric testing. We established one form of reliability through principal components analyses and internal consistency using Cronbach's alpha tests which produced acceptable internal consistency scores. However, the range of alpha levels for relationship behaviors and attitudes was somewhat low, ranging from .62 to .68. One possible reason is that the measure has only three items. Another reason may be due to the properties of the item "What he/she believes about right and wrong." The factor loadings for this item were relatively low, suggesting that further investigation and development is warranted. Still, such coefficients are considered as acceptable in emerging research (Lance et al., 2006). In fact, some scholars argue that a high alpha indicates an overly narrow measure and is thus antithetical to validity (see Cho & Kim, 2015). Another limitation is that other forms of reliability including test-retest and parallel forms are not established for these measures, nor is validity (e.g., predictive, concurrent, convergent, or divergent validity). Moreover, the nature of the program is preventative and the measures are attitudinal, gauging perceived knowledge about variables such as relationship skills and partner selection that presumably have not yet occurred. That is, we did not determine how the tested knowledge and attitudes transforms into behavior.

Future Research

Because PICK has been relatively less evaluated compared to other premarital programs such as PREP and PREPARE/Enrich, there are many opportunities for future research. As other evaluations targeting individuals in the mate selection phase have noted (Antle et al., 2013; Braithwaite, Delevi, et al., 2010; Braithwaite, Lambert, et al., 2010; Van Epp et al., 2008), participants should be followed to see how the program affects their behavior longitudinally—namely their choice of partners, and correlations of ratings of relationship knowledge with actual relationship behaviors. Because the current measures were self-report, future researchers might employ behavioral coding longitudinally as relationships progress (Antle et al., 2013; Van Epp et al., 2008), thereby eliminating issues such as social desirability bias, helping to further establish the effectiveness of the program. Change mechanisms and predictor variables might also be examined in order to examine such issues as how, and for whom this type of CRE works. Because the current sample was somewhat diverse in terms of age, life course stage, income, and education level, it would be advantageous to understand for whom PICK works. Because the program continues to expand in reach, future evaluations should also seek to establish the effectiveness of PICK with various target groups including high school students, incarcerated individuals, and individuals with low socioeconomic backgrounds. Finally, future research might also examine the cost effectiveness of the PICK program.

Implications

Based on the current findings, it appears that PICK helps those searching for relationships (Markman & Rhoades, 2012), including emerging adults who had already experienced divorce. In addition, the formative data showed that 96% of attendees would recommend the course to others and 97% thought the program was a good experience suggesting that regardless of life course stage (having children, having experienced a divorce, and experiencing emerging adulthood or mid to later adulthood), individuals were highly satisfied with the program. Thus, the summative and formative data both point to PICK as being a promising prerelationship program. Because of the number of attendees who had children, those who host future PICK courses might consider eliminating potential barriers by providing child care to attendees who are parents.

Clinical Implications

Beyond the promising results of this study, a general knowledge of evidence-based programs that are available to the community and the content of these programs might help clinicians as they intervene with individuals. PICK is particularly helpful with individuals who are seeking relationships and with those who are between relationships and want a healthier relationship in the future. Such programs might help to augment and complement the therapeutic process by providing

educational opportunities to individuals that need them (see Antle et al., 2013). Additionally, as Antle et al. (2013) pointed out, CRE usually does not have a family systems perspective and “to bridge the gap between these two fields, marriage and family therapists must be able to think and work systemically with clients in traditional social work settings where a systems approach does not usually exist” (p. 355). Some have encouraged clinicians to take a more preventative stance by providing premarital counseling (Murray, 2005; Shurts, 2008; Stahmann, 2000). As more family therapists participate in preventative care, an exchange of ideas between educators and therapists becomes imperative. Furthermore, given that emerging adults may not seek therapy for emerging intimate relationships (but could still benefit from relationship knowledge), clinicians might work together in tandem with community organizations and family life educators to provide emerging adults with such information.

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