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Computer-based prevention of intimate partner violence in marriage

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ABSTRACT

Objective: Intimate partner violence (IPV) is a common, costly societal problem. Interventions designed to reduce IPV recidivism have had limited success but primary prevention efforts are likely to be more effective in reducing the occurrence of IPV. The purpose of this study was to examine the impact of a computer-based preventive intervention (ePREP) on IPV in a sample of married, community couples.
Method: We employed a randomized clinical trial design comparing ePREP to an active placebo control group. Using a community sample of 52 married couples (21% Black, 3% Asian, 65% White, 7% Latino, 4% Mixed/biracial) who had been married, on average, 4.3 years, we examined the impact ePREP on IPV as measured by self and partner reports of the Revised Conflict Tactics Scale. We assessed couples at baseline, six-weeks post-baseline, and one-year post-baseline. We used the Actor Partner Interdependence Model with treatment effects to analyze the obtained dyadic data.
Results: We found that ePREP reduced physical and psychological aggression among married couples (on average across informants, a 90% reduction in expected counts of physical aggression, and a 0.18 standard deviation reduction in psychological aggression) and that these gains were maintained at a 1-year follow-up assessment.
Conclusions: Interventions that can be delivered widely and at a low-cost will increase the likelihood of reaching those who will benefit most from receiving them. Implications for implementing flexible interventions and changing our approach to treatment delivery are discussed.

Approximately 36% of women and 29% of men in the United States have experienced physical forms of IPV (Black et al., 2011). Psychological aggression (e.g., verbal threats, belittling, etc.) by an intimate partner is even more common: 48% of women and 49% of men report experiencing it. Interventions designed to reduce IPV recidivism have had limited success (Babcock, Green, & Robie, 2004); primary prevention efforts are likely to be more effective in reducing IPV than waiting for it to occur and then trying to stop its recurrence. Further, interventions that can be delivered widely and at low-cost will increase the likelihood of reaching those who will benefit most from receiving them. The purpose of this randomized clinical trial (RCT) is to examine the impact of a flexible, computer-based, preventive intervention (ePREP) that has as one of its goals to reduce IPV. Using a community sample of married couples we examined the impact of ePREP on IPV with the goal of implementing it in a portfolio of prevention efforts as well as in efforts to extend the benefits of treatment given its ability to be broadly administered in a way that more costly, existing interventions cannot.

Review of relevant research

IPV is a costly societal problem

Although IPV is strongly associated with marital distress (Lawrence & Bradbury, 2001), much IPV occurs in the context of ordinary, nondistressed marriages. Estimates from population-based survey data—not treatment seeking samples—indicate that between 20% and 30% of couples have experienced physical forms of IPV (Black et al., 2011; Coker et al., 2002). Population based survey data inquiring about current marriages show that 15.2% of women and 20.3% of men report the occurrence of IPV (Afifi et al., 2009). These data indicate that husbands and wives perpetrate IPV at similar rates; despite this, some evidence suggests that women are more likely to be injured as a consequence of IPV, but the research is not unanimous on this issue (Archer, 2000; Capaldi & Owen, 2001). The vast majority of IPV that occurs in marriage has been termed *situational couple violence* and consists primarily of pushing, slapping, etc.; this is in contrast to the more severe

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intimate terrorism which is much more harmful and typically accompanied with attempts to exert control over the partner (Johnson, 1995).

IPV within the context of marriage is associated with a number of poor outcomes. In addition to immediate physical and emotional suffering, IPV is associated with poorer physical and mental health. Women exposed to IPV have a 50%–70% increase in gynecological, central nervous system, and stress-related problems such as appetite loss, abdominal pain, and digestive problems (Campbell et al., 2002). But the effects of IPV are not limited to women. The occurrence of IPV is associated with poor health, depressive symptoms, substance use, developing a chronic disease, chronic mental illness and injury in both sexes (Coker et al., 2002). Another population-based study that used structured clinical interviews to determine diagnoses found that the experience of IPV was associated with a higher incidence of multiple psychiatric disorders in men and women (Afifi et al., 2009).

Psychological forms of IPV (e.g. intimidation, verbal abuse, etc.) are also associated with poor outcomes. In a sample of women surveyed in routine primary care settings, Coker, Smith, Bethea, and King (2000) showed that psychological IPV was uniquely associated with a host of stress related conditions such as chronic pain, stomach ulcers, frequent indigestion, diarrhea, and constipation as well as work-preventing disability, arthritis, and sexually transmitted infections. These data further showed that psychological IPV was *as* strongly associated with adverse health outcomes as physical IPV. Again, this effect is not unique to women—another population based study that included both men and women found that poor outcomes were *more* strongly associated with psychological IPV than with physical IPV (Coker et al., 2002).

IPV also affects children who witness it. Children who are exposed to IPV exhibit more aggression, delinquency, depression, anxiety, posttraumatic stress symptoms, sleep disturbance, and academic and cognitive problems (Margolin & Gordis, 2000). Regarding longer term outcomes, a large cohort study that controlled for a host of relevant family-of-origin and socioeconomic factors (including other forms of domestic violence) found that witnessing parental IPV as a child uniquely predicted higher incidences of depression, alcohol dependence, perpetration of IPV and perpetration of violence against children as an adult (Roustit et al., 2009). This study and others (Ehrensaft et al., 2003; Newcomb & Locke, 2001; Tschann et al., 2009) provide converging evidence that IPV tends to be transmitted intergenerationally, so the effects of IPV are not limited to the initial generation but tend to repeat in subsequent generations.

Existing interventions for IPV

The majority of interventions that attempt to reduce IPV have focused on preventing recidivism—that is, trying to prevent the recurrence of IPV after it has already occurred. A meta-analysis of treatments targeting males who perpetrate IPV (Babcock et al., 2004) showed that these interventions have a limited effect on recidivism compared to simply going through the process of being arrested and processed through the legal system—those who received an intervention were 5% less likely to offend again when compared to those who did not receive an intervention. Further, these interventions are almost exclusively delivered in groups to male perpetrators who have been referred after being arrested for perpetrating physical IPV. Given that IPV has physical and psychological effects on both males and females and the impact of psychological IPV can be as harmful as or worse than physical IPV, more broadly applicable interventions are needed. Moreover, IPV is a dyadic process and it can be argued that targeting only one partner is less likely to be as effective than targeting both partners (Moffitt, Robins, & Caspi, 2001). Indeed, in his review of couple based treatments for IPV, O'Leary (2008) provides evidence that couple interventions for IPV are at least as effective as individual interventions and that the couple format does not cause increased risk for harm relative to treatments that focus on one partner only.

Primary preventive interventions targeting relationship violence (as opposed to the tertiary interventions described in the previous paragraph) have focused almost exclusively on dating violence among adolescents, delivered in a group format in schools. A meta-analysis reviewing research on these interventions found positive changes in violence-related attitudes and knowledge about issues surrounding dating violence, but there was little evidence of changes in violent behavior (Wekerle & Wolfe, 1999). One school-based intervention study with a 2.5 year follow-up has since shown behavioral effects: 9.8% of students in control schools reported physical dating violence compared to 7.4% of students in schools that received the intervention, a 2.4% difference (Wolfe et al., 2009). But a major limitation of the research on these interventions is that they have relied exclusively on self-report, and socially desirable responding is a major threat to validity when asking for reports of IPV. Also, it is unclear—given the lack of longer-term follow-up—whether these effects translate into marriage and other long-term partnerships.

Research has frequently called for IPV preventive interventions for couples (e.g., (Holtzworth-Munroe et al., 1995; Wathen & MacMillan, 2003), but few have emerged. One program presented pilot data, but follow-up data has yet to be published (Holtzworth-Munroe et al., 1995). The only other study that speaks to this issue examined the PREP intervention (Markman, Stanley, & Blumberg, 2010). Although it was not designed explicitly to address IPV, Markman and colleagues found that PREP produced decreases in IPV, but the effect of the intervention waned by the 5-year follow-up (Markman, Renick, Floyd, Stanley, & Clements, 1993). These findings support the idea that interventions that teach conflict management, communication skills training and the generally seek to improve relationship skills (see Holtzworth-Munroe, 2000) may be optimal for targeting IPV.

ePREP

The ePREP intervention was designed with the goal of maximizing flexibility in order to broaden the reach of prevention efforts and extend the benefits of relationship education. Initially derived from the Prevention and Relationship Enhancement program (PREP, Markman et al., 2010) and designed as a general premarital intervention, ePREP has been shown to reliably decrease IPV in a series of RCTs. In an initial RCT examining students in college dating relationships (Braithwaite & Fincham, 2007), ePREP participants experienced improvements in, among other things, IPV relative to an active placebo condition at an eight-week follow-up. This effect for IPV was replicated and extended to a 10-month follow-up in a second study (Braithwaite & Fincham, 2009); this study further showed that the positive effect of ePREP on IPV was not significantly attenuated if partners ended their relationship and began another one. Although these two studies on ePREP were promising, both were conducted with only one partner in the dyad. In a subsequent RCT, Braithwaite and Fincham (2011) delivered ePREP to dating couples; when ePREP was delivered to couples the effects of the intervention were more immediate and robust than when the intervention was delivered to individuals. Each of these studies on ePREP has been done with premarital dating/cohabiting relationships. It remains to be seen whether ePREP can effectively prevent IPV in the context of established marriages.

The present study seeks to extend previous research on the impact of ePREP on IPV by examining its effect in a sample of married couples from the community. Although the vast majority

of research on premarital couples interventions focuses on newlywed samples, we were interested in examining the impact of ePREP on more established marriages. The preceding paragraphs demonstrated that IPV is common among community couples, so it is important to know whether a flexible intervention such as ePREP can have an impact where the problem exists. Once IPV has occurred, as it has for roughly one third of community couples, it is more likely to occur in the future (O'Leary et al., 1989) and is a better predictor of divorce among married couples than general marital distress and/or negative communication (Rogge & Bradbury, 1999). Consequently preventing IPV where it occurs has the potential to stop future IPV and disrupt harmful processes that lead to divorce. This study tested the hypothesis that community couples in established marriage who receive ePREP would engage in less physical-aggression and psychological aggression than those who received an active placebo control.

Method

Participants and procedure

In the spring of 2009, 104 participants (52 married couples) were recruited from the Tallahassee, Florida area via posted advertisements, online advertisements, and local newspaper advertisements. These advertisements indicated that we were searching for "married couples to take part in a research study", but did not specify the nature of the study. When participants called to request more information, we explained that the study was designed to help us "understand the course of marriage," and research assistants then explained the procedures involved, which included "tak[ing] part in a computer based presentation that educates you about relationships" and "complet[ing] weekly homework assignments." To be included couples needed to be legally married, be fluent in English, be willing to visit our lab on two separate occasions, and be willing to access weekly emails at home or where ever they chose to access the Internet. We do not have data on the number of couples who only inquired about the study over the phone; however, of those who were formally assessed for eligibility, no couples were excluded as a result of these criteria. One couple was randomized to condition but never completed any assessments or the intervention.

In addition to a number of other relational processes and individual variables, we collected data on IPV as a primary outcome of this RCT; institutional review board approval was obtained prior to any data collection. Table 2 shows participant characteristics at baseline. Of note, our sample included a large proportion of participants with a lower-income: between 73% and 80% of the sample earned less than the median national income. On average couples had been married for 4.3 years, 59% of couples had one or more children, and 20% of families had stepchildren.

Before coming to the lab, couples were randomly assigned to condition using a computer generated randomization list; participants were blind to condition, but the experimenter was not. After giving informed consent, participants independently completed a battery of questionnaires and then, together, viewed the interactive presentation associated with their assigned intervention; most couples completed the presentation in approximately 1 h. After this, participants were given a paper copy of the information covered in their presentation so they could review it as needed. Then, the research assistant explained to the couples that they would be completing weekly homework assignments each week for the next six weeks, each of which would take approximately 1 h. H/she then gave the first week's homework assignment and informed the participants that they would be contacted by e-mail each week for the next six weeks. These e-mails directed each individual participant to an online survey that assessed their compliance with the previous week's homework and provided a link to online resources, including streaming video that refreshed their knowledge of the skill associated with that week's assigned

Table 1
Outline of ePREP and active placebo control presentations.

ePREP condition	Active placebo condition
1. Background on risk factors for relationship problems: communication danger signs. a. "Time Out" technique 2. Description of how communication filters can impair constructive communication. 3. Description of how normal patterns of communicating fail to address deeper issues and why addressing these deeper issues is a key element of having a healthy relationship. a. XYZ Communication technique 4. Communication skills training a. Speaker-Listener technique 5. Problem solving training a. Problem solving technique 6. Enhancing fun and friendship a. "Fun deck" technique 7. Final section reviewing techniques and setting up plan to complete weekly homework assignments (including a weekly date).	1. Background about how mental health and relationships are associated. 2. Description of depression and its association with relationship functioning. 3. Conditions associated with depression and their association with relationship functioning. 4. Available forms of treatment for depression and associated conditions. 5. Description of anxiety and its association with relationship functioning. 6. Physiological reactions in anxiety and associated conditions. 7. Information about the importance of healthy relationships, common problems in relationships and the consequences of relationship distress. 8. Available forms of treatment for anxiety and relationship distress.

Table 2
Baseline characteristics of participants.

	Mean years	SD
How old are you?	32.36	10.01
How long have you been married?	4.29	4.46
How much education have you completed?	%	
Less than HS	1.9%	
HS diploma or equivalent	8.7%	
Some college	34.6%	
Bachelor's degree	31.8%	
Grad or prof, completed	23.1%	
How many times have you been married?	%	
1	77.0%	
2	21.0%	
3	2.0%	
Do you have children?	%	
No	41.4%	
Yes	58.7%	
Do you have step-children?	%	
No	79.8%	
Yes	20.2%	
What is your current income?	%	Cum. %
None	6.7%	6.7%
5k	3.9%	10.6%
5k–15k	15.4%	26.0%
15k–25k	15.4%	41.4%
25k–30k	13.5%	54.8%
30k–40k	18.3%	73.1%
40k–50k	7.7%	80.8%
50k–75k	9.6%	90.4%
75k–100k	5.8%	96.2%
over 100k	3.9%	100.0%
What is your race or ethnicity?	%	
Black	21.4%	
Asian	2.9%	
White	65.1%	
Latino	6.8%	
Mixed/biracial	3.9%	

homework (which had to be completed as a couple). These videos were some (but not all) of the same videos viewed in the presentation; no new skills or techniques were presented in them. The prompts in the email asked them to apply the techniques to problems they may have faced in the previous week or specific issues they have struggled with, in order to help them apply these skills to their specific relationship. In addition, these weekly emails (to participants in both conditions) included the following prompt: "To get the maximum benefit from your participation in this study, you need to actively apply the information taught to you in the presentation." After six weeks, couples returned to the lab to complete a post-treatment assessment. A flowchart illustrating these procedures and retention data can be seen in Fig. 1. All participants completed the presentation phase of the intervention (the initial lab session) and retention rates were 96% at post-treatment (with commensurate rates of compliance with weekly homework assignments) and 92% at the one-year follow-up; there were no differences between treatment groups in retention rates. Participants were paid $70 for full participation.

Interventions

The computer-presentation portions of both interventions were self-paced and included both text and video. Both ePREP and the active placebo intervention contained approximately the same amount of content and took participants approximately 1 h to complete. Participants in the ePREP condition received training in empirically based methods for improving romantic relationships; these have been described elsewhere (Braithwaite & Fincham, 2009, 2011). Participants in the control condition viewed a presentation that taught inert information that was designed to seem like part of an intervention (see Table 1 for an overview of the content of both computer presentations). As in the ePREP condition, participants in this active-control condition completed weekly homework assignments that were designed to seem like part of a relationship focused preventive intervention but, in reality, contained no "active ingredients" (e.g., "Please discuss celebrity relationships that you think are particularly healthy..."). At the end of the sixth week, participants in both conditions were invited back to

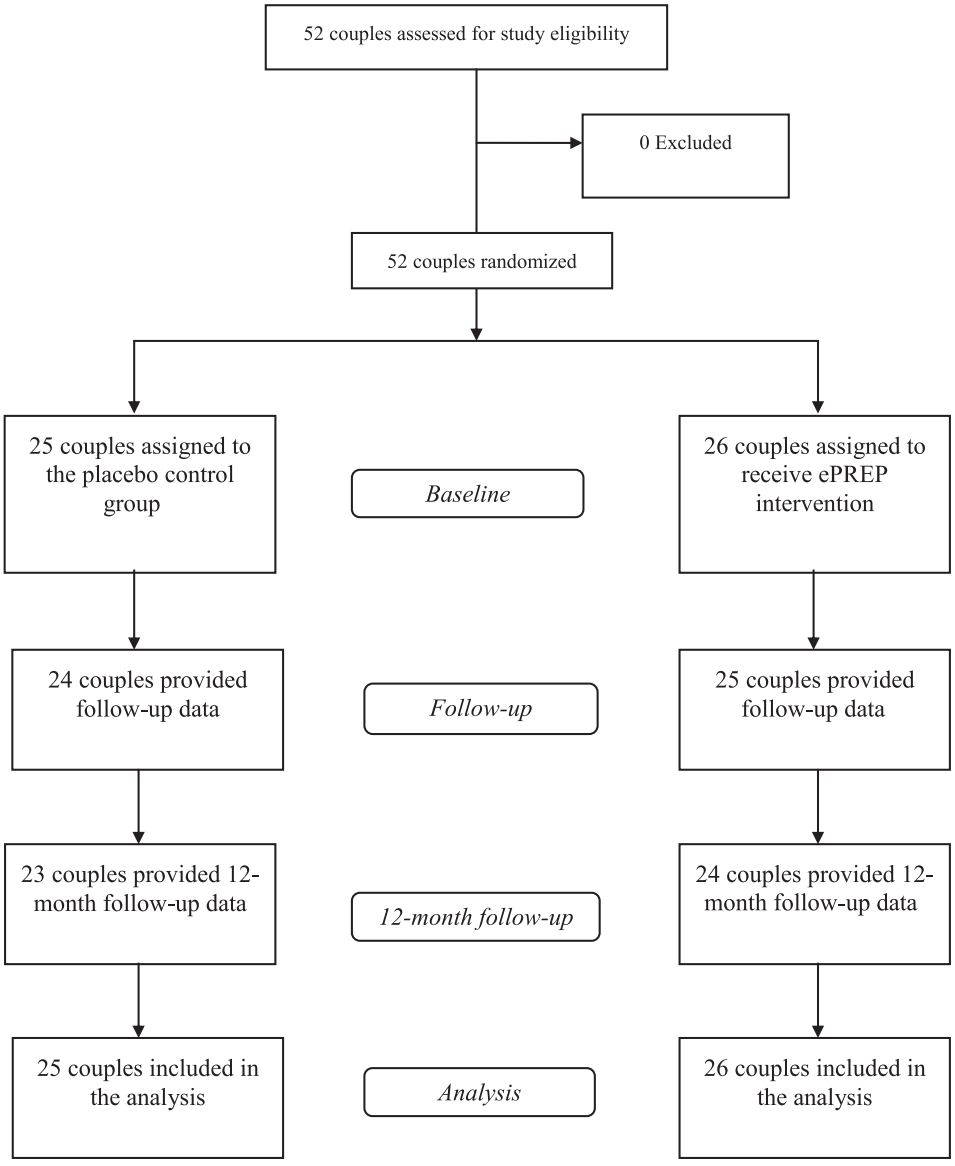

Fig. 1. Flowchart of randomized clinical trial design.

the lab to complete a post-treatment assessment. One-year post-treatment, participants in both conditions completed an online survey.

Assessment

Participants completed the Revised Conflict Tactics Scale (CTS-2) at baseline and each of the follow-up assessments. The CTS-2 assesses the methods couple use to resolve conflict. The psychological aggression and physical-aggression scales were used to assess how frequently these tactics were employed in the previous 6 weeks (responses ranged from "This has never happened" to "More than 20 times in the past 6 weeks"). The CTS-2 provides self and partner-reported accounts of IPV and has demonstrated good construct validity and internal consistency ranges from 0.79 to 0.95 across scales (Straus, Hamby, Boney-McCoy, & Sugarman, 1996). We used the CTS-2 total score as our outcome (coded as directed in Straus et al., 1996), which includes items for both minor and severe forms of IPV. Examples of minor items are "I pushed or shoved my partner" (physical aggression); "I shouted or yelled at my partner" (psychological aggression). Examples of severe items are "I slammed my partner against a wall" (physical aggression); "I destroyed something belonging to my partner" (psychological aggression).

Analytic strategy

We used the Actor-Partner Interdependence Model (APIM) with treatment effects to examine the impact of ePREP on IPV relative to an active placebo intervention. There are a number of advantages to using the APIM when analyzing couples data. Perhaps the most important is that the APIM accounts for the non-independence of couples data. One of the fundamental assumptions of virtually all parametric statistical tests is independence of observations. By their very nature, couples' data are not independent (meaning they are inevitably correlated). As an illustration, it is unlikely that one partner is entirely satisfied with the relationship while the other is in abject misery. Violating the independence assumption presents a major threat to the validity of a given study and can lead to substantially increased risk of Type I or Type II error depending on the sign of the within-couple correlation. Another key advantage of the APIM is that it allows for an examination of important interpersonal processes that exist within romantic relationships (unlike simple composite scores) by generating actor and partner effects. Rather than analyzing men's and women's data separately, the APIM allows us to assess of the impact of, for example, a wife's aggression on her husband's aggression (a partner effect) while accounting for the stability of the husband's aggression over time (the actor effect). By examining the effect of treatment while accounting for these important interpersonal effects, the APIM allows us to model the effect of treatment in a way that more closely approximates the reality of the multiple contextual influences that exist in romantic relationships rather than trying to foist artificial independence on dynamic, interdependent processes.

We observed couples at baseline (Time 1), six-weeks post-baseline (Time 2) and one-year post-baseline (Time 3). Because of the time lag between Time 2 and Time 3, we hypothesized that an APIM with a mutual influence component at Time 3 was the most appropriate dyadic model for examining outcomes (Kenny, 1996). As can be seen in Fig. 2, a mutual influence component models a feedback loop within couple at a given time point (a husband's aggression at Time 3 causes his wife to be more aggressive at Time 3 and vice versa). This is in contrast to a partner effect (seen between Time 1 and Time 2) that models, for example, how earlier aggression predicts later partner aggression. However, *Mplus* does not allow reciprocal interactions with count data, so we used standard partner effects for our count, physical-aggression outcomes.

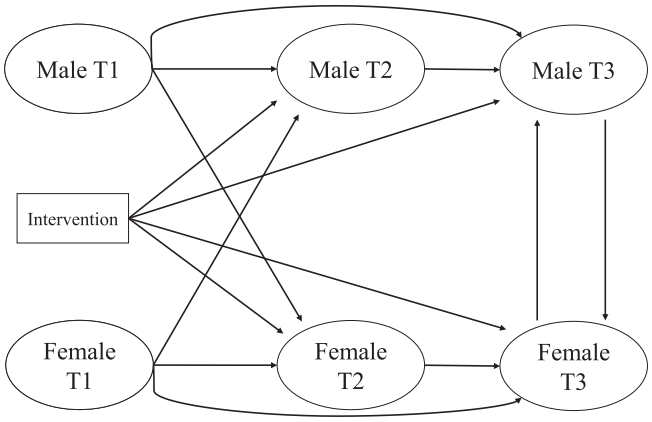

Fig. 2. The actor partner interdependence model with treatment effects and mutual influence components at T3.

To take full advantage of our dyadic data, we fit separate models for self and partner reports. Data for all the variables were empirically distinguishable by gender. Each of the models we examined are known to be identified and provided an adequate fit to the data (model fit indices available from first author upon request). For our count data we provide the expected reduction in counts of the behavior in question (e.g., self-reported physical assault) to aid in the interpretation of unstandardized coefficients, which are not readily interpretable. Because we used an intent-to-treat approach, all participants were included in the analyses regardless of whether or not they completed the six weeks of the intervention and/or follow-up assessments.

Results

Preliminary data screening

Missingness at both follow-ups was unrelated to any of the examined variables with the exception of psychological aggression: missingness at post-treatment (but not the one year follow-up) was associated with more psychological aggression at baseline. Full information maximum likelihood (FIML) estimation was used to accommodate missing data. We detected one case in the physical-aggression data that appeared to be randomly responding (responses fluctuating from 0 to 10 standard deviations above the mean in an implausible pattern); this outlier was excluded from the analysis. Untransformed means and standard deviations for both groups can be seen in Table 3.

Although we analyzed the frequency of IPV, rather than prevalence, it is helpful to know how much IPV occurred in this sample: 18% of couples at baseline, 8% at post-treatment, and 20% at the 1-year follow-up (24% of couples the control group and 16% in the ePREP condition) self-reported the occurrence of any physical aggression (1 = one or more act of physical aggression occurred, 0 = no physical aggression occurred); regarding partner-reported physical aggression, 20% of couples at baseline, 13% at post-treatment and 21% at the 1-year follow-up (30% of couples in the control group and 11% in the ePREP condition) reported the occurrence of any partner-perpetrated physical aggression. The majority of observed IPV was "minor" according to CTS-2 categorization, but some couples reported severe IPV: 2% of couples at baseline, 0% at post-treatment, and 2.5% at the 1-year follow-up (5% of couples in the control group and 0% in the ePREP condition) self-reported the occurrence of any severe physical aggression. A similarly small proportion reported partner-perpetrated physical aggression: 8% of couples at baseline, 6% at post-treatment and

Table 3
Descriptive statistics.

Sex	Variable	Time 1				Time 2				Time 3			
		ePREP		Placebo		ePREP		Placebo		ePREP		Placebo	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
M	Phys agg-self	0.23	0.71	0.16	0.47	0.08	0.41	0.00	0.00	0.05	0.23	0.26	0.75
	Phys agg-partner	0.00	0.00	0.20	0.82	0.17	0.64	0.26	1.05	0.92	2.75	0.60	1.82
	Psych agg-self	5.48	9.38	1.84	2.73	1.44	1.85	1.00	2.04	1.35	2.28	1.43	2.59
	Psych agg-partner	5.78	9.58	2.36	4.81	4.16	11.87	1.48	2.87	5.88	14.28	1.60	2.54
F	Phys agg -self	0.04	0.20	0.40	1.12	0.13	0.45	0.25	1.03	0.92	2.87	0.24	0.62
	Phys agg -partner	0.85	3.53	1.12	4.06	0.13	0.61	0.25	0.85	0.37	1.61	0.57	2.09
	Psych agg-self	6.63	10.57	3.44	5.80	4.72	12.94	1.42	1.93	6.00	15.75	1.57	1.72
	Psych agg-partner	8.44	11.59	3.48	7.73	2.88	6.02	2.21	5.79	3.70	10.84	2.61	7.47

Note. "*-Self*" indicates self-report, "*-Partner*" indicates partner-report.

10.25% at the 1-year follow-up (10% of couples in the control condition and 10.5% in the ePREP condition).

Did ePREP reduce physical aggression?

Self-reported physical aggression

The best fitting count model for our self-reported physical-aggression data was a zero-inflated Poisson model. Because of a lack of variability among men at Time 2 (a mean and standard deviation of 0), we had to set the influence of the male Time 2 variable in the model to zero. As can be seen in Table 4, participants in the ePREP condition reported significant decreases in self-reported physical aggression at post-treatment and at the one-year follow-up. Specifically, receiving ePREP was associated with less female-perpetrated physical aggression at post-treatment ($B = -2.67$, $p < .01$), and less male-perpetrated physical aggression ($B = -4.41$, $p < .05$) and less female-perpetrated physical aggression ($B = -1.26$, $p = .058$) at the 1-year follow-up. These values correspond with a 71% reduction in expected counts for female-perpetrated physical aggression and a 99% reduction in expected counts of male perpetrated physical aggression at the 1-year follow-up.

Partner-reported physical aggression

The best fitting count model for our partner-reported physical aggression data was a Poisson model. Because of a lack of variability among female reports of male-perpetrated aggression at Time 1, we had to set the influence of this variable in the model to zero. As can be seen in Table 4, receiving ePREP was associated with an increase in female-perpetrated physical aggression at post-treatment ($B = 1.08$, $p < .01$), but significant decreases in female-perpetrated physical aggression ($B = -3.62$, $p < .01$) at the one-year follow-up—a 97% reduction in expected counts of physical aggression.

Did ePREP reduce psychological aggression?

Given the nature of the distributions of data for psychological aggression, we modeled these outcomes as continuous, but appropriate transformations were applied to bring their distributions within acceptable limits prior to conducting analyses. Modification indices suggested that including both partner effects and mutual influence components would significantly improve model fit, so we included partner paths from Time 2 to Time 3; analyses run with and without these paths did not change the pattern of results.

As can be seen in Table 4, receiving ePREP was associated with a significant reduction in self-reported male-perpetrated psychological-aggression at the one year follow-up ($\beta = -0.18$, $p < .05$) and partner-reported female-perpetrated psychological aggression at the one-year follow-up ($\beta = -0.19$, $p < .01$). Specifically, those who received ePREP experienced 0.18 standard deviations less male-perpetrated psychological aggression (according to self-reports) and 0.19 standard deviations less female-perpetrated psychological aggression (according to partner-reports).

Discussion

Despite repeated calls for interventions that prevent IPV, few have emerged. The present study examined the impact of a flexible, computer-based preventive intervention on the perpetration of IPV in a community sample of couples. Our data show that, relative to an active placebo control condition, ePREP reduced physical aggression and psychological aggression as much as 1-year post-treatment. That we obtained effects relative to an active placebo control is not trivial in this area of research. Bradbury recently used an active placebo control in his study of a general relationship education intervention and found that it produced intervention effects that were indistinguishable from the intervention (Bradbury, 2011). This is encouraging for those who wish to make interventions both flexible and accessible, but it also suggests that there is a high hurdle for interventions to clear in terms of demonstrating incremental utility.

Perhaps the reason active controls have generated effects has to do not only with expectancy effects but also with an increase in general self-regulation. Finkel and colleagues have suggested that reductions in IPV may be driven by general self-regulation

Table 4
Summary of data from the APIM models.

Label	Parameter	Physical-aggression partner report	Physical-aggression self report	Psych aggression partner report	Psych aggression self report
Post-treatment effects	Tx → M_2	0.23	Excluded from analysis	−0.04	−0.02
	Tx → F_2	1.08**	−2.67**	−0.09	−0.03
1 Year treatment effects	Tx → M_3	−2.01	−4.41**	0.15	−0.18*
	Tx → F_3	−3.62**	−1.26*	−0.19**	0.15

**$p < .01$, *$p = .058$.
Note. Physical aggression was modeled as a count data, all other values are standardized regression coefficients (betas).

processes (Finkel, DeWall, Slotter, Oaten, & Foshee, 2009). However, in both ePREP and active control conditions, participants were prompted each week to try to get the most benefit from their intervention by making their best efforts at improving their relationship—this seems likely to increase general self-regulation targeted at improving the relationship. Yet ePREP demonstrated superior outcomes despite this, suggesting that newly acquired relationship skills had an effect beyond general self-regulation.

The results of this study provide convergent support for the notion that improving relationship skills can reduce IPV perpetration. Research focusing on male perpetrated physical-aggression suggests that there are different types of violent men, but one common factor of each of these subtypes is deficient relationship skills (Holtzworth-Munroe, 2000). Although ePREP is not designed specifically to treat IPV, it teaches relationship skills that appear to reduce IPV perpetration among both men and women. Moreover, it teaches many of the same skills employed in couples intervention designed to reduce IPV recidivism such as using "Time-Out" to disrupt negative escalation (Heyman & Schlee, 2003). Additionally, one of the outlying studies in the Babcock, et al. (2004) meta-analysis that generated strong treatment effects was a relationship enhancement intervention that taught, among other things, communication skills training, including how to manage conflict. Finally, the only published couple studies that show reliable effects for preventing the occurrence of IPV involved the PREP program which is very similar in content to ePREP (Holtzworth-Munroe et al., 1995; Markman et al., 1993).

However, communication skills are not the only active ingredient that is potentially at work in explaining these outcomes. Couples who received ePREP were taught to manage negative escalation using the "Time-Out" skill. They were taught to use a model for effective problem solving. They were asked to engage in weekly "couple meetings" where they could talk about important issues in a context separated from potentially conflict-triggering events. They were asked to rekindle fun and friendship by dating weekly and trying novel activities in their dates. Any one or a combination of these components could have had an effect on reducing IPV. Future research should focus on analyzing components of interventions like ePREP to determine which active ingredients drive outcomes.

It is remarkable that these effects were observed despite the relatively short time individuals were engaged in the intervention. Meta analytic research suggests that relationship education interventions with less than nine "contact hours" may produce weak results (Hawkins, Stanley, Blanchard, & Albright, 2012). Yet couples in our study spent, on average, a little over an hour viewing the ePREP presentation and approximately 1 h per week on weekly homework assignments—taken together, this sums to just over 6-h of assigned "work", none of which was done with anyone other than the partner. Other interventions, such as motivational interviewing, have been shown to generate significant improvements in outcomes with as few as one session (McCambridge & Strang, 2004). But the notion that hours of delivery are the best way to measure intervention dosage is an assumption worth questioning. The psychotherapy outcome literature finds limited support for the intuitive dose-effect model; instead, research shows that rates of change are not constant across hours of delivery, with shorter durations of treatment related to quicker improvements—indeed, no differences in rates of clinically significant change emerge between those who only received eight sessions versus those who received eighty (Baldwin, Berkeljon, Atkins, Olsen, & Nielsen, 2009).

Related to the idea of clients taking a "good enough" approach to psychological interventions, another potentially important difference between ePREP and other relationship education interventions discussed earlier is that all those intervention were delivered in groups whereas ePREP is delivered directly to a couple. This may be important because a disconnect between the learning of communication skills and their successful implementation may weaken the effect of preventive interventions (Bradbury & Lavner, 2012; Snyder & Schneider, 2002); perhaps the unique method of delivery for ePREP allows for immediate implementation to the specific problems couples face. Couples working on communication skills alone, not in a group, may be more likely to discuss real, difficult issues that they may avoid discussing in a group for fear of revealing too much to those around them. Perhaps this fosters better implementation to the couples "real life" than group delivered interventions. Further, the self-paced format of this method of delivery may allow for more efficient use of time than group delivery. In groups, it is inevitable that some will grasp concepts or skills more quickly than others. Perhaps the self-paced nature of ePREP maximizes use of time spent on the intervention, allowing couples to get maximum benefit in a minimum amount of time. Future research could examine whether these differences between computer-based delivery and group delivery explain the difference in time investment required of these interventions in order to generate robust treatment effects.

The present study is limited in the following ways. First, our sample was not a homogeneous group of people (i.e. some participants were in their first marriage, others were in their second; some had children or stepchildren, others did not, etc.). Having such a heterogeneous sample does not allow us to firmly say whether the observed effects would replicate for groups who are traditionally targeted for relationship education such as those who just had their first child. In addition, sample heterogeneity increases statistical error given the many contextual factors that are at play (stepchildren, previous marriage, etc.), making our statistical tests relatively less powerful. Second, the observed percentage change in expected counts for the aggression models likely overestimate the positive effect of ePREP given our sample size and that physical aggression was a rare occurrence; we attempted to mitigate this limitation by using appropriate analyses for modeling rare events. Moreover, these findings fit with previous research on ePREP that showed robust effects for physical aggression (Braithwaite & Fincham, 2009; 2011). Future research with larger samples is needed to provide converging evidence regarding the effect size of ePREP on physical aggression. Third, women in the ePREP condition slightly increased their perpetration of physical aggression at post-treatment before ultimately reducing it at the 1-year follow up. This is consistent with the "incubation effect" we have observed for other variables in previous studies with ePREP (see Braithwaite & Fincham, 2009; 2011) and likely represents the fact that the intervention asks couples to communicate about difficult issues, which may have led to an initial increase in females aggression—although female-perpetrated physical aggression precipitously dropped at the 1-year follow up, this initial increase is still of concern. The incubation effect may also be seen in the fact that reductions in psychological aggression were absent post-treatment, but present at the one year follow-up. Finally, although the present study suggests that ePREP would be an excellent intervention for primary prevention, the present study is not a pure primary prevention study as a proportion of couples reported IPV at baseline. But because IPV is endemic to marital and premarital relationships (O'Leary, 2008), we may have to think more flexibly about where interventions like ePREP fit in a prevention framework—primary prevention, in this context, may have the goals of keeping low rates as low over time or attempting to lower existing rates (that "start" above zero, even for newlywed/cohabiting populations).

These limitations are tempered by a number of strengths. First, this is one of only a handful of studies to examine a couple-based

intervention for preventing IPV, the only study to examine an IPV intervention using dyadic data analytic techniques and, to our knowledge, the first IPV treatment study to examine outcomes other than self-reported IPV (we used both self and partner-reports). Second, the heterogeneity of the sample is both a limitation (as noted above) and a strength. Although premarital interventions are probably most beneficial when delivered early in the developmental course of the relationship, previous research seems to have firmly established that these interventions work in those populations; an important question that has been left unanswered is whether these interventions can be effective when delivered later in the developmental course of marriage to couples that experience a variety of life circumstances including having relatively smaller incomes, children, step-children, and living in a period of marriage when the "honeymoon is over" (Aron, Norman, Aron, & Lewandowski, 2009). Doing this allows for a glimpse into whether interventions typically thought of as premarital can have an impact once the glow of the newlywed years has faded and declines in marital functioning are typically underway. Finally, critics have noted that over the past 20 years psychological science has focused on efficacy at the expense of effectiveness and practical application in developing interventions (Chorpita et al., 2011). Administering ePREP to a community sample approximates the way that interventions like ePREP will be delivered. Thus this study moves in the direction of effectiveness and potential dissemination rather than strict efficacy.

Extending the reach of prevention

What are the implications of these findings for future research and practice? One implication concerns our prevention efforts; specifically, interventions like ePREP make tiered approaches to intervention and treatment much more feasible. Prevention efforts are typically thought of as being universal (primary prevention), targeted (secondary prevention) or intensive (tertiary prevention) (Atkins & Frazier, 2011). ePREP is ideally suited as a universal preventive intervention given its flexibility, cost-effectiveness, and cross-domain impact—in addition to reducing IPV it has been shown to improve multiple domains of relationship functioning and mental health (Braithwaite & Fincham, 2007, 2009, 2011). Computer-based interventions could be delivered as early as high-school to see whether they can have a similar impact to school based prevention efforts (Wolfe et al., 2009), but with increased flexibility. Universal prevention is an important goal for IPV because, despite its common occurrence and insidious effects, many couples do not perceive IPV as problematic (Ehrensaft & Vivian, 1996).

ePREP could also be profitably used as a targeted intervention for those who are at elevated risk for IPV or marital distress. For example, we might target those who are at higher risk for marital distress and dissolution such as those whose parents have divorced (Amato & Rogers, 1997) or who have married at a young age (Heaton, 2002). For IPV in particular we might target those who have a history of child abuse (Afifi et al., 2009; Renner & Slack, 2006), those who are experiencing a great deal of life stress (Langer, Lawrence, & Barry, 2008), or those who have previously experienced situational couple violence (O'Leary et al., 1989) as the risk for IPV may be greater for these individuals.

Finally, for couples that are experiencing more serious forms of IPV, we would recommend standard therapist-delivered treatments such as the Physical Aggression Couples Treatment (Heyman & Schlee, 2003). For intimate terrorism, we would defer to existing treatments for batterers, acknowledging that they are limited in effectiveness but hopeful that our tiered preventive efforts may reduce the need for these downstream interventions as well as the overall occurrence of IPV and its sequelae.

Reaching those who are leary of psychological services

Another important implication concerns reaching those who do not typically receive these interventions. Kazdin and Blase (2011a) have noted that no one model of intervention is likely to reach all who need treatment, so having a portfolio of interventions gives us the best chance of reaching the underserved. We believe that ePREP represents an additional portfolio option with the potential to not only cast a wider net (i.e., through new media such as social networks), but also to reach people who are disinclined to receive psychological services. Many people prefer non-traditional means of delivery of interventions such as ePREP and state that their least preferred intervention methods are home visits, therapists, and groups (Metzler, Sanders, Rusby, & Crowley, 2012). When recruiting for the present study, we would often speak to an interested wife who explained to us that her husband was reluctant to participate. When we explained the nature of the study, and that the intervention was a computer-based intervention program completed by the couple without a therapist, husbands, almost invariably, became willing to participate.

Dosing psychological treatment

A final implication of this work concerns our model for the delivery of psychological services. Just as important as providing a portfolio of preventive interventions—the *how* of dissemination—we believe it is also critically important *when* we deliver interventions. Based on the information in our voluminous treatment outcome literature, the implicit answer to when we deliver treatment is once, when individuals are already in deep distress. Our delivery model is almost always one dose of treatment that occurs in a 6–8 week span with the hope that this will create change that lasts indefinitely.

But is it realistic to expect that one big dose of treatment will lead to a "happily ever after"? Actually, the evidence suggest just the opposite: *Most* outcome effects for the *majority* of couples are non-existent a few years after couples therapy (Jacobson & Addis, 1993) and premarital education (Markman et al., 1993). This truth extends beyond the scope of couples interventions to the broader outcome literature in psychology (e.g., Kennedy, Abbott, & Paykel, 1999). This limitation does not mean that psychotherapy should be abandoned, nor does it mean that we should carry on under the false premise that our current approach is effective at reducing the burden of psychological dysfunction (Kazdin & Blase, 2011b); rather, we should adapt by learning to dose treatment in a way that maximizes the chance of lasting improvement. We are not without potential models of this approach: dentists, pediatricians and primary care physicians primarily perform regularly scheduled "well" check-ups aimed at preventing problems or the recurrence of future problems following treatment; others have explicitly developed psychosocial interventions within this paradigm for delivery in mind (Cordova et al., 2005). By changing our model for the delivery of psychological services from our current model of wait-to-fail, then seek one large dose of treatment to an approach that focuses on prevention, surveillance, and appropriate dosing of treatment over the long-term, we have a much better chance of reducing suffering from psychological dysfunction and helping those who do suffer to realize lasting improvement.

Interventions like ePREP make this "smart-dosing" approach much more feasible because ePREP can easily be prescribed as a booster session for couples who are, for example, beginning to lapse into unhealthy patterns of communication. Used in concert with surveillance procedures such as RELATE (Halford et al., 2010) that seek to provide couples with regular check-ups on their marital health, interventions like ePREP can easily be delivered

before too much deterioration occurs. Further, as we move to more personalized approaches for relationship education, it would be possible to prescribe just a module of ePREP that specifically targets the particular needs of a couple. In fact, interventions like ePREP could easily be prescribed by primary care physicians when they routinely check for signs of IPV (Campbell et al., 2002). It is possible that delivery of services like ePREP in a venue people are already comfortable with (primary care) could reduce stigma and allow for timely intervention before situational couple violence has the chance to escalate. A similar approach could occur in religious organizations to reach those who may not have a primary care physician or who may not typically receive psychological services, but may elect to do so when delivered via their place of worship (Laurenceau, Stanley, Olmos-Gallo, Baucom, & Markman, 2004).

Conclusion

It is time for a sea change in psychology in which psychotherapy is not the go-to treatment, but rather a "downstream" intervention that is used only after prevention efforts have failed. Ideally, psychotherapy would be used like a goalkeeper in a soccer match—the last line of defense that is used only after the offense (universal prevention efforts) has failed to keep the ball on the other side of the field and the defense (targeted prevention efforts) has been unable to stop the attack of the opposition. Rather than perseverating in traditional models for the delivery of psychological services, we need to broaden our thinking to include interventions that can be deployed in a way that narrows the gap between the need for intervention and our ability to provide it. We also need to think more expansively about what it means for a treatment to "work"; instead of making our goal short-term symptom reduction, we need to target the more difficult goal of lasting wellness. To achieve these ends, we believe that a portfolio of non-traditional, but elegant interventions delivered and dosed in a timely fashion will do far more to reduce the burden of psychological dysfunction than a large dose of psychotherapy once in a lifetime.

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