Holding on to what might have been may loosen (or tighten) the ties that bind us: A counterfactual potency analysis of previous dating alternatives

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HIGHLIGHTS

- Data from undergraduate samples and adult community samples were studied.
- Regret of forgone alternatives correlated positively with counterfactual potency.
- Current relationship commitment correlated negatively with counterfactual potency.
- Regret of forgone alternatives mediated the counterfactual potency/commitment link.
- Among highly invested partners, counterfactual potency increased commitment.

ARTICLE INFO

ABSTRACT

Existing research shows that people who have good *current* alternatives to their romantic partner are less committed to the relationship. The present research indicates that relationship commitment also depends on perceptions of high quality *forgone* alternatives. The current research investigates the role of *counterfactual potency* (i.e., perceived likelihood of a mentally simulated alternative to reality) concerning potential dating partners from the past. Data from three studies revealed that as the perceived potency of a past romantic alternative increased, regret associated with forgone dating alternatives increased and commitment to the current partner decreased. Regret associated with forgone alternatives mediated the relationship between counterfactual potency and commitment. However, the link between counterfactual potency and commitment was further moderated by investment size; among the highly invested, as the perceived potency of a past romantic alternative increased, commitment to the current partner increased. Results are discussed in light of the investment model of relationship commitment.

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Introduction

To the extent that one's relationship quality is good or bad, it seems quite reasonable that one would be more or less committed to remaining in that relationship. Early in the study of relationship commitment, however, researchers had the important insight that when people are forming commitment intentions, they do not simply evaluate their present relationship reality, but they also mentally simulate possible alternative realities (Kelley, 1979; Kelley & Thibaut, 1978; Rusbult, 1980, 1983; Thibaut & Kelley, 1959). If a person believes he/she could have a better relationship with someone other than the current partner, the person experiences lower commitment to that partner (Le & Agnew, 2003).

The mental simulation of alternatives to reality is known as counterfactual thinking (Roese & Olson, 1995). Research on decision making has found that when people simulate an *upward counterfactual* (i.e., mental simulation of an alternative more favorable than reality), they tend to be less satisfied with their decision (Markman, Gavanski, Sherman, & McMullen, 1993; Roese, 1994). Interestingly, when relationship researchers refer to imagining alternative relationship partners, they typically focus only on the simulation of current or future alternative realities. In fact, close inspection of the items used to measure quality of one's alternatives (Rusbult, Martz, & Agnew, 1998) implies an exclusive current or future temporal perspective (e.g., "My alternatives are…" and "…I would find another…"). Counterfactual researchers, on the other hand, frequently study the effects of "mentally undoing" a past decision. Counterfactual researchers have shown that such simulations are highly influential in evaluations and decisions, despite the fact that they are simulations of *forgone* alternatives to the present reality, that is, realities that could never come to pass (Kahneman & Miller, 1986; Kahneman & Tversky, 1982; Roese, 1997).

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Counterfactuals about forgone past dating alternatives have yet to be studied in romantic relationships. Consider a scenario in which an individual experiences counterfactual thoughts in a relational context. For example, Joe is currently in a relationship of three years with Naomi. Although their relationship is fairly comfortable and easygoing, it is not as exciting as it was when they first began dating. Joe's commitment to Naomi is likely to be influenced by his beliefs about the kinds of relationship partners he could attract if he left Naomi and started searching for a new partner. An interesting, and as yet unasked, question is whether Joe's level of commitment to Naomi is also likely to be influenced by the extent to which Joe believes he had favorable alternatives to Naomi when they began dating. Perhaps Joe had also considered pursuing Lauren. Is Joe's current commitment to Naomi influenced by his counterfactual belief about the favorableness of a forgone reality in which he chose Lauren over Naomi?

Clearly, information about current alternatives is relevant to decisions to continue/discontinue a relationship. Forgone alternatives, however, are expired opportunities, and they indicate nothing about what one's situation would be like if the current relationship were to end. Nevertheless, we hypothesized that beliefs about forgone alternatives will impact current commitment because of their role in creating personal feelings of regret (e.g., Landman, 1987; Miller & Taylor, 1995; Petrocelli, Percy, Sherman, & Tormala, 2011). Because much of counterfactual thinking appears to be spontaneous (Markman, Gavanski, Sherman & McMullen, 1993; McEleney & Byrne, 2006; Petrocelli & Sherman, 2010), we propose that regret stemming from counterfactual thinking can undermine relationship commitment.

Counterfactual potency

We expect upward counterfactuals about forgone alternatives to influence commitment (independent of beliefs about current alternatives). However, not all counterfactuals have equal potency. If Joe believes that Lauryn was unlikely to accept his advances years ago he is unlikely to feel regret about choosing Naomi. If Joe believes that Lauryn would have dated him, but that they would have been unhappy, he is also unlikely to regret choosing Naomi. Petrocelli, Percy, Sherman and Tormala (2011) found that counterfactual thoughts are most predictive of affective reactions to the extent that they are potent—that is, having a high likelihood associated with both the antecedent (would Joe have asked Lauryn on a date?; would Lauryn have said yes?) and the consequence (would the relationship have been satisfying?). Petrocelli, Percy, Sherman & Tormala (2011) defined *counterfactual potency* (CP) as the product of the likelihood associated with the antecedent ("*if likelihood*" or IL) and the likelihood associated with the consequence ("*then likelihood*" or TL). In a series of studies, Petrocelli, Percy, Sherman & Tormala (2011) showed that the magnitude of regret was greatest when both the IL and TL were high.

Hypotheses

Investment model research appears to assume that the quality of alternatives, as it relates to commitment, involves only those that are/could be available in the future (see Rusbult, Martz & Agnew, 1998). The present research questions this widespread assumption. We propose that one's views of alternatives near or present during the time one decided to *begin* the current relationship should serve as particularly important standards of comparison for a number of reasons. The availability and desirability of current alternatives are likely to decrease as people invest more and age. Forgone alternatives of the past, however, may retain their potency over long periods of time, as they represent an imagined alternative reality that never need to be tested against current reality-constraints. In this way, forgone alternatives of the more distant past may serve as habitual standards of comparison for judging one's current relationship. Consistent with CP theory, we hypothesized that the perceived potency of forgone romantic alternatives is especially

critical to commitment because of its connection to regret. That is, when one perceives that a forgone alternative was actually quite possible and would have led to greater happiness (i.e., high CP-forgone alternative) one should experience greater regret for forgoing the past alternative. Thus, CP for a forgone alternative would have an indirect effect on commitment through regret.

Although these predictions flow naturally from research on counterfactual reasoning, different predictions might be suggested by other social psychological theories. Self-perception theory (Bem, 1967, 1972; Fazio, 1987) suggests that individuals who perceive they have forgone a very potent alternative to their current partner would infer that this must mean they are highly committed to their current partner. This inferential process would lead higher CP-forgone alternative to be associated with greater, rather than lesser, commitment.

In the present studies, we investigated whether higher CP for a forgone alternative would be negatively associated with commitment, similar to the established effect for higher quality current alternatives, or whether it would be positively associated with commitment, as self-perception theory might suggest (Bem, 1967, 1972). We also explored a third possibility: that the effect of high CP on commitment would depend on the extent to which a person has invested valuable and irretrievable resources in the current relationship. Cognitive dissonance theory (Festinger, 1957) suggests that thinking about a very potent forgone alternative would create strong feelings of dissonance, which could either be resolved by reducing commitment to the current partner, or by increasing commitment to the current partner. Thus, higher CP forgone-alternative might be associated with reduced commitment for people who have not invested much in their current relationships, but with greater commitment for people who have invested a great deal.

Study 1 explored the relationship between CP forgone-alternative and commitment in an undergraduate student sample. In Study 2 we conducted a replication of Study 1 using both an undergraduate student sample as well a broader community sample. In Study 3, we extended the findings by conducting an experimental manipulation of the potency of a CP-forgone alternative, again with both undergraduate sample and community samples.

Study 1

Method

Participants and design

Eighty-eight undergraduate students ($M_{age} = 18.40$, $SD = .93$ years, 60 females) involved in a romantic relationship ($M_{duration} = 39.49$ months, $SD = 29.75$) were recruited from psychology courses in exchange for partial course credit. A correlational design was employed.

Procedure

Participants were asked to complete a computerized self-administered interpersonal relationship questionnaire.

Current relationship partner. Participants were first asked to answer questions with regard to their relationship partner. They typed only their partner's first name or initial to permit the personalization of subsequent questions. Participants were then queried regarding their partner's age, sex, and the duration of the relationship in months.

Alternative relationship partner. Next, participants were asked to think about a forgone alternative using the following instructions:

> Now we would like you to think about some other people that you know that you might have considered dating other than [current partner]. Please think about people that you might have realistically dated. Please list one of the individuals you thought about when we asked you to think about some other people that you might have considered dating other than [current partner].

These instructions placed no restrictions on the type of forgone alternative a person could generate (it could be a person that the participant did or did not ever ask out or ever date, and from the distant or recent past). We designed the instructions to cast a broad net, in order to pick up a potent forgone alternative if such a person existed for the participant.

Participants provided this person's first name or initial to permit the personalization of subsequent questions. Readily accessible, forgone dating alternatives appeared to have been easily brought to mind by our participants.

Counterfactual potency-forgone alternative. To measure the counterfactual potency of the forgone alternative (CP-forgone alternative), participants were first introduced to the idea of a counterfactual thought about a forgone alternative. It was explained that sometimes, when people think about the person they are dating, they might think "If only I had dated Person B, then I might be better off…"

Participants were then asked to consider the following counterfactual: "If only I had decided to date [forgone-alternative], then I might be better off." and presented with the IL and TL questions. Considering only the first part of the counterfactual (IL), participants were asked "What do you perceive was the likelihood that you would have dated [forgone-alternative]?" Next, participants were instructed to consider only the second part of the thought (TL), and asked "Given that you had decided to date [forgone-alternative], what do you perceive is the likelihood that you would be better off?" using an 11-point scale with *not at all likely* (0) and *extremely likely* (10) as the anchor labels. Consistent with (Petrocelli, Percy, Sherman & Tormala, 2011), CP-forgone alternative was calculated by multiplying the IL and TL estimates.

Regret-forgone alternative. Participants responded to the item "To what extent do you regret not choosing an alternative relationship?" using a *not at all* (0) and *completely* (8) response scale.

Investment model variables. Participants completed Rusbult, Martz & Agnew's (1998) measure of satisfaction, quality of alternatives, and commitment. Subscales for satisfaction (e.g., "I feel satisfied with our relationship"), quality of alternatives (e.g., "The people other than my partner with whom I might become involved are very appealing"), and investment size (e.g., "I have put a great deal into our relationship that I would lose if the relationship were to end") each contained 5 items that were rated on a nine-point response scale with *don't agree at all* (0) and *agree completely* (8) as the anchor labels (Rusbult, Martz & Agnew, 1998). Cronbach's alphas for the scale items were strong: satisfaction level (.93), quality of alternatives (.82), and investment size (.82).

Commitment. Finally, participants completed Rusbult et al's (1998) 7-item measure of commitment (e.g., "I want our relationship to last for a very long time" and "I am committed to maintaining my relationship with my partner") using the same response scale as the previous items (Cronbach's α = .90).

Results and discussion

We began our analyses by first examining the correlations between all study variables (see Table 1). Consistent with our hypotheses, CP-Forgone Alternative was negatively correlated with current Commitment. Also consistent with our hypothesis, CP-Forgone Alternative was significantly positively correlated with Regret-Forgone Alternative.

To test our hypothesis that there is a negative indirect path between CP-Forgone Alternative and Commitment mediated through Regret-Forgone Alternative, we used a bootstrap procedure to construct bias-corrected confidence intervals based on 5000 random samples with replacement from the full sample (see Preacher & Hayes, 2004, 2008). The size of the indirect effect was −.03 (SE = .01), and the 95% confidence interval excluded zero, 95% CI [−.05, −.02], Z = −4.19, p < .001, indicating a significant negative indirect path.

Next, we tested a structural equation model using Amos 19.0 (Arbuckle, 2010). In this analysis, we used Investment Model variables and CP-Forgone Alternative as predictors of Regret-Forgone Alternative and Commitment (see Fig. 1). This model had good fit, $\chi^2(df = 1) = .05$, $p = .83$, RMSEA = .00, CFI = 1.00, and provided further support for the study hypotheses. As expected, CP-Forgone Alternative appeared to indirectly contribute to the prediction of relationship Commitment through its association with Regret-Forgone Alternative (above and beyond the investment model predictors).

Finally, to test the possibility that the relationship between CP-Forgone Alternative and Commitment was moderated by variables that are indicative of relationship maturity (i.e., age, relationship length and investment size), we employed hierarchical multiple regression procedures recommended by Cohen & Cohen (1983). In these analyses, CP-Forgone Alternative and each potential moderating variable were centered. In each hierarchical multiple regression analysis, we controlled for Satisfaction and Quality of Alternatives in the first step, entered CP-Forgone Alternative and the potential moderator (e.g., Investment Size) in the second step, and the interaction term was entered in the final step. Neither age, relationship length, nor investment size qualified the main effect of CP-Forgone Alternative in this study (all ps > .33).

Our hypotheses concerning one's current level of commitment were supported in that the perceived likelihood of a relatively distant alternative actually occurring and its estimated effect on well-being (CP), and the regret associated with forgoing that alternative, played important roles in explaining current commitment. Our data suggest that an important influence on one's comparison level (Kelley & Thibaut, 1978; Thibaut & Kelley, 1959) may be the likelihood of actually being in a close relationship with a relatively distant alternative, even more so than the quality of one's current alternatives.

We suspect that our failure to detect moderation may have been due to the fact that our sample was comprised of undergraduates, who have a restricted range for age, relationship length, and investment size. Thus, we tested our hypothesis regarding moderation in Study 2 using both an undergraduate sample as well as a community sample of adults.

Table 1
Intercorrelations and descriptive statistics of study variables (Study 1).

Variable	1	2	3	4	5	6	M	SD
1. CP-forgone alternative	–						16.22	20.19
2. Satisfaction	−.55**	–					6.29	1.55
3. Investment	−.19	.24*	–				5.13	1.68
4. Quality of alternatives	.39**	−.28**	−.33**	–			4.03	1.75
5. Regret-forgone alternative	.57**	−.61**	−.33**	.40**	–		2.23	1.89
6. Commitment	−.45**	.60**	.62**	−.42**	−.64**	–	5.66	1.60
7. Duration of current relationship	.00	−.07	.12	−.11	−.04	−.03	39.49	29.75

Note. CP = counterfactual potency.
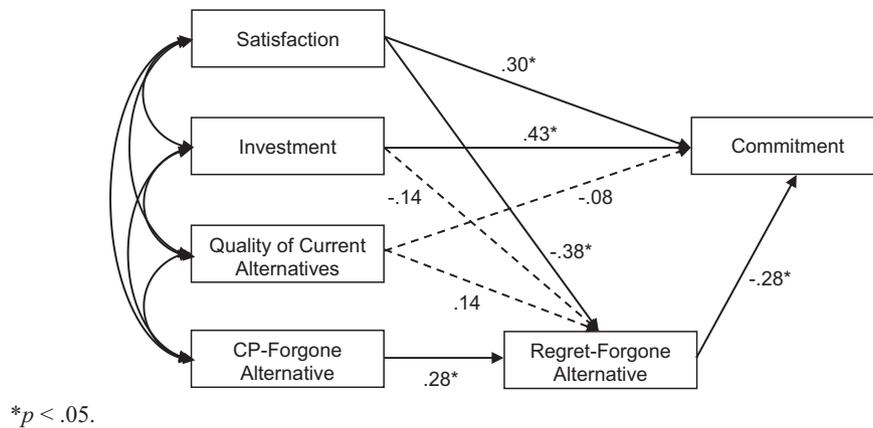* p < .05.
** p < .01.

Undergraduate Sample *n* = 88:

p < .05.

Fig. 1. Results of structural equation model (Study 1). Undergraduate sample *n* = 88: *p* < .05.

Study 2

In Study 2, we made important changes to the design to establish the generalizability of the effects found in Study 1. First, in order to determine the degree to which our findings from Study 1 would extend to a broader population, and in order to allow a better test of the moderation hypotheses, we recruited both an undergraduate student sample and a community sample and divided some of our analyses with respect to the sample.

Second, because people are likely to construe their more distant past in abstract (global) rather than concrete (specific) ways (see Kyung, Menon, & Trope, 2010), we reasoned that some people may construe their forgone alternatives in a relatively broad way (especially among the community sample where forgone alternatives may be from decades earlier). Some people may not have a single, specific, potent forgone alternative, but they may nevertheless have a highly potent abstract counterfactual, of the form "I could have dated someone from my past that I passed up, and if I had I would have been better off." Research shows when people are asked to judge the probability of something, such as an event or a cause, they often fail to "unpack" or divide the judged target into its constituent parts (Fischhoff, Slovic, & Lichtenstein, 1978; Johnson, Hershey, Meszaros, & Kunreuther, 1993). Although people often alter their judged probabilities when they are encouraged to unpack a focal hypothesis, they do not appear to unpack the focal hypothesis spontaneously (Tversky & Koehler, 1994). Thus, in this study we measured CP-forgone alternatives globally across all forgone alternatives that came to mind for the participant, in order to determine whether the abstractness of the CP statements would impact the results.

Finally, because Study 1 participants completed the CP- and regret-forgone alternatives item questions before the investment model questionnaires, it is possible that the procedure artificially raised the salience of CP- and regret-forgone alternatives when participants were answering questions about their commitment to their current partner. Thus, in Study 2 we counterbalanced the order of these measurements.

Method

Participants and design

Ninety-seven undergraduate students (M_{age} = 18.91 years, SD = .95, 51 females), and 104 MTurk participants (M_{age} = 35.05 years, SD = 10.87, 70 females) involved in a romantic relationship ($M_{undergraduate}$ = 31.48 months, SD = 30.54, M_{MTurk} = 89.19 months, SD = 91.80) were recruited for participation. Among the MTurk participants, 40% reported that they were married to their romantic partner. Undergraduates earned partial course credit, whereas MTurk participants earned $0.25 for completing the survey. A single factor design

was employed such that participants were presented with the CP- and Regret-Forgone Alternatives items either before or after the investment model items.

Procedure

The procedures of Study 2 were similar to those of Study 1. After answering a few background questions (e.g. age, relationship length), participants completed a "current relationship" survey and a "forgone alternatives" survey. The order of these surveys was counter-balanced across participants. The current relationship survey included the Rusbult measures of relationship satisfaction, quality of alternatives, investment size, and commitment described in Study 1. Cronbach's alphas were .97, .83, .92, and .92 for satisfaction level, investment size, quality of alternatives, and commitment, respectively.

For the forgone-alternatives survey, participants were given the same instructions as those in Study 1, to "think about some other people that you know that you might be otherwise dating today other than (current partner)." Unlike Study 1, participants were permitted to list more than one forgone alternative (maximum of three). Once participants had thought of a few specific forgone alternatives, they were asked the counterfactual potency questions: "Given all of the people that came to mind when we asked you to think about some other people that you know who you might be otherwise dating today, what do you perceive is the likelihood that you might be in a dating relationship with one of those other people now?" (IL) and "Assuming that you were actually in a dating relationship with one of the other people who you know that you might be otherwise dating today, what do you perceive is the likelihood that you would be better off?" (TL) using an 11-point response scale with *not at all likely* (0) and *extremely likely* (10) as the anchor labels. Again, consistent with (Petrocelli, Percy, Sherman & Tormala, 2011), the overall CP-Forgone Alternatives variable was calculated by multiplying the overall versions of the IL and TL estimates. Regret was assessed using the item, "To what extent do you regret not choosing an alternative relationship?" using a *not at all* (0) and *completely* (8) response scale.

Results

We began our analyses by first thoroughly examining whether or not the order of the current relationship survey and the forgone-alternatives survey affected our results. Using several one-way analysis of variance tests, we found that order of measurement had no statistically significant effects on, Commitment, CP-Forgone Alternatives, Regret-Forgone Alternatives, or any of the investment model predictors of Commitment (all *F*-values < 2.17, *ns*). Using hierarchical multiple regression, we found that order of measurement had no effect on

Commitment even when controlling for the investment model predictors, $\beta = -.05$, $t(196) = -1.18$, $p = .24$. Furthermore, order of measurement did not significantly interact with any of the other predictors of Commitment, (all t-values < 1.20, ns). Because the levels of the predictors of Commitment were not affected by order of measurement, and because the relationships between the predictors and Commitment were not affected by order, we did not include order in any of our subsequent analyses.

Next, we explored the ways in which our two samples may have differed. Analyses with each of our measures revealed that the community sample of adults differed from the undergraduate sample in six important ways: a) they were significantly older, $t(199) = 13.67$, $p < .001$; b) they reported dating their current partner for a greater number of months, $t(199) = 5.89$, $p < .001$; c) they reported significantly greater relationship Investment Size ($M = 5.78$, $SD = 1.88$ vs. $M = 5.14$, $SD = 1.57$), $t(199) = 2.57$, $p < .02$; d) they reported significantly less Quality of Current Alternatives ($M = 3.03$, $SD = 2.39$ vs. $M = 4.06$, $SD = 1.84$), $t(199) = 2.57$, $p < .02$; e) they reported significantly greater Regret-Forgone Alternatives ($M = 2.85$, $SD = 2.42$ vs. $M = 2.09$, $SD = 1.56$), $t(199) = 2.60$, $p < .02$; and f) they reported significantly more Commitment to their current partners ($M = 7.31$, $SD = 1.85$ vs. $M = 6.65$, $SD = 1.77$), $t(199) = 2.63$, $p < .01$.

Next, we examined the correlations between all study variables (see Table 2). The majority of the correlations were consistent between the samples as well as with our Study 1 results. However, because of the differences between the samples outlined above, we began our analyses separately for each sample, and then subsequently explored variables that might explain the differences in the patterns observed for the two samples.

As in Study 1, we began with our undergraduate sample and tested our hypothesis that there was a negative indirect path between CP-Forgone Alternatives and Commitment mediated through Regret-Forgone Alternatives. The size of the indirect effect was $-.02$ ($SE < .01$), and the 95% confidence interval excluded zero, 95% CI [$-.04$, $-.01$], $Z = -3.69$, $p < .001$, indicating a significant negative indirect path. We then tested a structural equation model using Amos 19.0 (Arbuckle, 2010), shown in Fig. 2A. In this analysis, we used Investment Model variables and CP-Forgone Alternatives as predictors of Regret-Forgone Alternatives and Commitment. This model had good fit, $\chi^2(df = 1) = .63$, $p = .43$, RMSEA $= .00$, CFI $= 1.00$, and provided a close replication of the pattern found in Study 1.

We next turned to our community sample and again tested our hypothesis that there was a negative indirect path between CP-Forgone Alternatives and Commitment mediated through Regret-Forgone Alternatives. The size of the indirect effect was $-.03$ ($SE < .01$), and the 95% confidence interval excluded zero, 95% CI [$-.05$, $-.02$], $Z = -5.44$, $p < .001$, indicating a significant negative indirect path. We then tested a structural equation model using Amos 19.0 (Arbuckle, 2010),

displayed in Fig. 2B. This model had good fit, $\chi^2(df = 1) = .32$, $p = .57$, RMSEA $= .00$, CFI $= 1.00$, and also provided a close replication of the pattern found in Study 1.

We then combined the samples in order to investigate whether variables associated with the maturity of the relationship might moderate the association between CP-Forgone Alternatives and Commitment, specifically focusing on Age, Current Relationship Length, and Investment Size. To test each possibility, we again employed hierarchical multiple regression procedures similar to those employed in Study 1. CP-Forgone Alternatives and each potential moderating variable were first centered. In each analysis, we controlled for sample, Satisfaction and Quality of Alternatives in the first step, entered CP-Forgone Alternatives and the potential moderator (e.g., Investment Size) in the second step, and the interaction term was entered in the final step. Similar to the findings of Study 1, neither Age nor Current Relationship Length qualified the main effect of CP-Forgone Alternatives ($ps > .25$). However, Investment Size, $\beta = .12$, $t(194) = 2.95$, $p < .01$, emerged as a significant moderator of the effect of CP-Forgone Alternatives, $\beta = -.04$, $t(195) = -.86$, $p = .39$.

To interpret the interaction, simple slope analyses were conducted according to the procedures recommended by Aiken & West (1991). Thus, simple slopes were plotted and examined at one standard deviation above and below the means of CP-Forgone Alternatives and Investment Size (see Fig. 3). These analyses showed that when Investment Size was low, Commitment significantly decreased as CP-Forgone Alternatives increased, $\beta = -.20$, $t(194) = -3.26$, $p < .01$. Interestingly, the pattern was very different for participants who reported relatively high Investment Size; when Investment Size was high, Commitment significantly increased as CP-Forgone Alternatives increased, $\beta = .20$, $t(194) = 3.16$, $p < .01$. From another angle, Investment Size was strongly positively associated with Commitment among participants who reported relatively high CP-Forgone Alternatives, $\beta = .51$, $t(194) = 7.61$, $p < .001$, but only weakly associated with Commitment among participants who reported relatively low CP-Forgone Alternatives, $\beta = .10$, $t(194) = 1.60$, $p = .11$.

Study 3

Both Study 1 and Study 2 explored memory-based simulations of alternative relationships in the sense that likelihood estimates of forgone alternatives were entirely retrospective. Given the correlational nature of the data, the direction of causality cannot be established. Thus, Study 3 incorporated an experiment, designed to manipulate how people recall a forgone relationship in ways that would experimentally influence CP associated with that forgone alternative and, consequently, regret and commitment. Such an investigation provides more support for our claim of causality between the constructs examined.

Table 2
Intercorrelations and descriptive statistics of study variables (Study 2).

Variable	1	2	3	4	5	6	7	8	M	SD
1. CP-forgone alternatives	–	$-.23^*$	$-.03$	$.58^{**}$	$.54^{**}$	$-.33^{**}$	$.00$	–	19.71	24.99
2. Satisfaction	$-.30^{**}$	–	$.58^{**}$	$-.41^{**}$	$-.64^{**}$	$.81^{**}$	$-.31^{**}$	–	6.14	2.13
3. Investment	$-.09$	$.35^*$	–	$-.22^*$	$-.38^{**}$	$.65^{**}$	$-.03$	–	5.78	1.88
4. Quality of alternatives	$.37^{**}$	$-.33^{**}$	$-.22^*$	–	$.57^{**}$	$-.54^{**}$	$.11$	–	3.03	2.39
5. Regret-forgone alternatives	$.42^{**}$	$-.63^{**}$	$-.20^*$	$.30^{**}$	–	$-.73^{**}$	$.09$	–	2.85	2.42
6. Commitment	$-.40^{**}$	$.66^{**}$	$.41^{**}$	$-.56^{**}$	$-.64^{**}$	–	$-.10$	–	7.32	1.85
7. Duration of current relationship	$.05$	$.14$	$.36^{**}$	$-.04$	$.02$	$.18$	–	–	89.19	91.80
8. Alternatives dated	$.04$	$-.01$	$-.14$	$.14$	$.00$	$-.08$	$-.11$	–	–	–
M	15.32	6.49	5.14	4.06	2.09	6.65	31.48	.52		
SD	19.00	1.38	1.57	1.84	1.56	1.77	30.54	.71		

Note. The community sample of adults and student sample intercorrelations and descriptive statistics are displayed above and below the diagonal, respectively. CP = counterfactual potency. Alternatives dated are the sum of alternatives that participants had actually dated at one time or another.
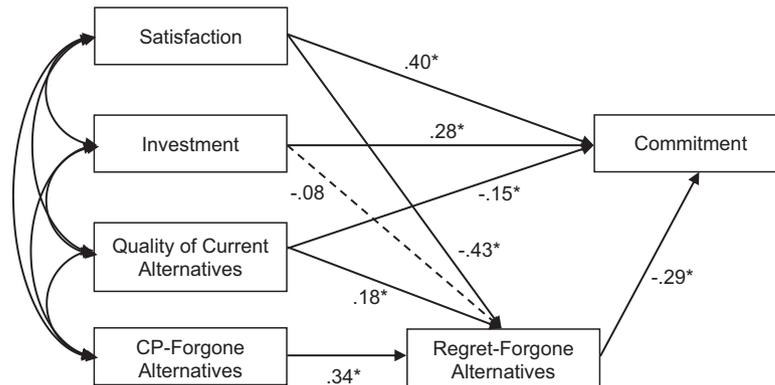 * $p < .05$.
 ** $p < .01$.

Undergraduate Sample $n = 97$:
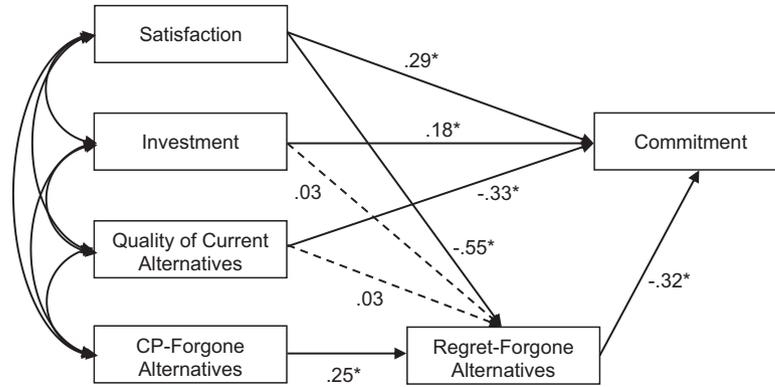
Community Sample of Adults $n = 104$:

*p < .05.

Fig. 2. Results of structural equation models (Study 2). Undergraduate sample $n = 97$: Community sample of adults $n = 104$: *p < .05.

We again collected data from an undergraduate student sample as well as a community sample of adults. To raise (lower) CP-forgone alternative, participants generated reasons for why it was likely (unlikely) that they might actually be in a relationship with a forgone alternative today if it wasn't for their current partner as well as reasons for why being in a relationship with the forgone alternative would have been satisfying (not so satisfying). We then examined the degree to which this manipulation shaped CP and regret associated with forgone alternatives as well as current relationship commitment.

Fig. 3. Predicted regression means of commitment by CP-forgone alternatives and investment size (Study 2).

In this study, we returned to the measurement of CP for one specific forgone alternative, as it was more consistent with the study design (and as the specificity of measurement did not appear to affect the study results across Study 1 and Study 2). We also included additional questions about the specific forgone alternative, such as the length of time since the opportunity to date the alternative, whether the participated had ever dated the alternative, and if so, how long they had dated. Finally, rather than counterbalancing the placement of CP-Forgone Alternative items before or after Regret-Forgone Alternative, we counterbalanced the order in which the regret and the investment model items were measured.
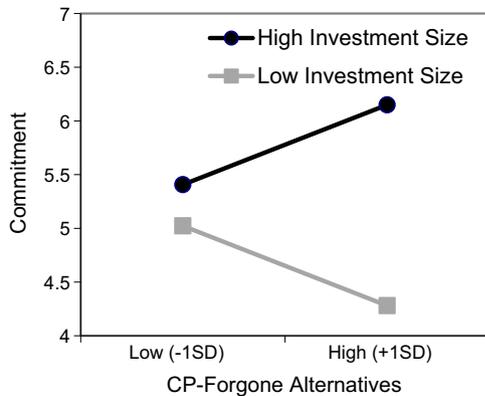
Method

Participants and design

A total of 274 individuals participated in Study 3. However, 18 participants were excluded from all analyses due to either incomplete data or failure to follow directions, and two participants were excluded due to reporting a Commitment score well below three standard deviations from the mean. The final sample consisted of 254 individuals: 100 undergraduate students ($M_{age} = 19.16$ years, $SD = 1.09$, 46 females), and 154 MTurk participants ($M_{age} = 35.24$ years, $SD = 11.06$, 107 females) involved in a romantic relationship ($M_{undergraduate} = 36.05$ months, $SD = 37.11$, $M_{MTurk} = 106.78$ months, $SD = 111.74$). Among the MTurk participants, 63% reported that they were married to their romantic partner. Undergraduates earned partial course credit, whereas MTurk participants earned $0.25 for completing the survey. A

single factor design was employed such that participants were assigned to one of two CP conditions.

Procedure

In the current study, participants were given the same instructions for generating forgone alternatives as in Studies 1 and 2 with one change: instead of the word "dating" the instructions used the phrase "in a romantic relationship with." Participants were asked to select one specific alternative that had come to mind and to list the person's initials, as in Study 1. The initials were piped in to subsequent questions about the forgone alternative. Participants also indicated how long ago was the time they had the opportunity to date the person, whether they had ever dated the person, and if so, how long they had dated them.

Counterfactual potency manipulation. Participants were then randomly assigned to one of two conditions. Participants assigned to the *high* [low] CP condition were asked to think of two reasons *why there is some possibility* [why it is not very likely] they could actually be in a relationship with the person they listed today, if it wasn't for their current partner. They were also asked to think of two reasons why being in a romantic relationship with the person they listed today might *be satisfying* [not be so satisfying]. Participants were then asked to briefly list their reasons in a single box provided. Consistent with research on availability heuristic tasks (e.g., Schwarz et al., 1991), we expected the reason-listing task to be relatively easy and to bolster the likelihood that participants would assume the position we led them to consider.

Measurement of CP-forgone alternative. Participants rated the same CP-forgone alternative CP statements as in Study 1: "What do you perceive is the likelihood that you might be in a romantic relationship with [forgone alternative] now?" and "Assuming that you were actually in a romantic relationship with [forgone alternative] now, what do you perceive is the likelihood that you would be better off?" using 11-point response scales with *not at all likely* (0) and *extremely likely* (10) as the anchor labels.

Other variables. Finally, participants completed the same Rusbult, Martz & Agnew (1998) measures of satisfaction, quality of alternatives, investment size, and commitment as in Studies 1 and 2, and the same regret forgone-alternative measure as in Study 1. The order of the Rusbult measures and the regret measure was counterbalanced. Cronbach's alphas for the investment model measures were .94, .86, .90, and .92 for satisfaction level, investment size, quality of alternatives, and commitment, respectively.

Results

Manipulation check

Because the content of the CP manipulation dealt with simulations concerning a particular individual, we tested the effect of the CP manipulation on the CP-Forgone Alternative variable. As expected, participants assigned to the high CP condition reported greater CP-Forgone Alternative ($M = 20.62$, $SD = 22.77$) than did the low CP condition ($M = 12.65$, $SD = 20.23$), $t(252) = 8.68$, $p < .01$. Furthermore, the manipulation appeared to operate the same way in both samples, as Sample (undergraduate vs. community sample) did not significantly moderate the effect of the manipulation on CP-Forgone Alternative, $F(3, 250) = 2.06$, $p = .15$.

Characteristics of the samples

As in Study 2, we explored the ways in which our two samples differed and found differences in every variable measured except the CP measures and Regret-Forgone Alternative. Analyses revealed that the community sample of adults differed from the undergraduate sample in nine ways: a) they were significantly older, $t(252) = 14.48$,

$p < .001$; b) they reported dating their current partner for a greater number of months, $t(252) = 6.11$, $p < .001$; c) they reported a greater distance in time (months) from whence they might have begun dating the alternative partner listed, $t(252) = 7.85$, $p < .001$; d) a greater percentage reported actually dating the alternative partner listed, $t(252) = 3.12$, $p < .01$; e) they reported a greater duration of time (months) that they actually dated the alternative partner listed, $t(252) = 3.77$, $p < .001$; f) they reported significantly less relationship Satisfaction with their current partner, $t(252) = 2.72$, $p < .02$; g) they reported significantly greater relationship Investment Size, $t(252) = 2.39$, $p < .02$; h) they reported significantly less Quality of Current Alternatives, $t(252) = 5.06$, $p < .001$; and i) they reported being significantly more Committed to their current partners, $t(252) = 6.36$, $p < .001$ (see Table 3).

Next, we examined the correlations between all study variables in each of the two samples. The majority of the correlations were consistent between the samples as well as with our Study 1 and Study 2 results.

Due to the consistency across samples in the pattern of correlations and in the size of the effect of the CP manipulation, all of our subsequent analyses were calculated using the entire sample.

Regret-Forgone Alternative

We examined the effect of the CP manipulation on Regret-Forgone Alternative. A marginal effect of the CP manipulation emerged such that the high CP condition reported more Regret-Forgone Alternative ($M = 2.81$, $SD = 2.22$) than did the low CP condition ($M = 2.34$, $SD = 1.97$), $t(252) = 1.77$, $p = .07$. We tested whether the manipulation had an indirect effect on Regret through the rated CP-Forgone Alternative. Using the same bootstrap procedure as that used in Study 1 and Study 2, we found the size of this indirect effect to be .39 ($SE = .14$), and the 95% confidence interval excluded zero, 95% CI [.13, .71], $Z = 2.79$, $p < .01$, indicating a significant positive indirect path.

Current relationship commitment

We next examined the effect of our CP manipulation on Commitment. A marginal effect of the CP manipulation emerged, $t(252) = 1.90$, $p = .06$; as expected, the high CP condition reported less Commitment ($M = 6.62$, $SD = 1.90$) than did the low CP condition ($M = 7.05$, $SD = 1.68$). We tested whether the manipulation had an indirect effect on Commitment through the rated CP-Forgone Alternative. The size of the indirect effect was $-.22$ ($SE = .08$), and the 95% confidence interval excluded zero, 95% CI [$-.39$, $-.07$], $Z = -2.56$, $p < .02$, indicating a significant negative indirect path. Next, as a corollary to our analysis of Regret-Forgone Alternative in Study 1 and Study 2, we tested regret as a mediator of the link between the rated CP-Forgone Alternative and Commitment. As expected, the size of the indirect effect was $-.20$ ($SE < .12$), and the 95% confidence interval excluded zero, 95% CI [$-.45$, $-.02$], $Z = -1.97$, $p < .05$, indicating a significant negative indirect path.

Investment size as a moderator

Finally, we were interested in whether or not we would find evidence for a CP Condition × Investment Size interaction, similar to that found in Study 2. Using the same hierarchical regression approach of the previous studies, we found evidence of a significant CP Condition × Investment Size interaction, $\beta = .07$, $t(247) = 1.98$, $p < .05$, which qualified the main effect of CP condition, $\beta = -.04$, $t(248) = -.98$, $p = .32$. The interaction pattern was similar to that of our Study 2 findings (see Fig. 4). When Investment Size was low, significantly greater Commitment was reported by the low CP condition than the high CP condition, $\beta = -.11$, $t(247) = -2.11$, $p < .05$. Again, the pattern was very different for participants who reported relatively high Investment Size; among these individuals, Commitment did not significantly differ between the high and low CP conditions, $\beta = .04$, $t(247) = .67$, *ns*. From another angle, Investment Size was strongly positively associated with Commitment

Table 3
Intercorrelations and descriptive statistics of study variables (Study 3).

Variable	1	2	3	4	5	6	7	8	9	10	*M*	*SD*
1. CP-forgone alternative	–	−.37**	−.18*	.51**	.53**	−.36**	−.12	−.16	−.04	.02	16.26	22.36
2. Satisfaction	−.17	–	.48**	−.46**	−.70**	.66**	.16*	.09	.08	.06	5.13	1.37
3. Investment	−.08	.65**	–	−.33**	−.37**	.74**	.36**	.24**	−.01	−.13	5.18	1.08
4. Quality of alternatives	.38**	−.14	−.11	–	.54**	−.48**	−.20*	−.19*	.00	.00	3.16	1.39
5. Regret-forgone alternative	.48**	−.40**	−.30**	.31**	–	−.61**	−.10	−.10	−.03	.02	2.71	2.29
6. Commitment	−.36**	.67**	.57**	−.46**	−.41**	–	.28**	.22**	.10	.01	7.38	1.59
7. Duration of current relationship	.03	−.23*	−.06	.11	.16	−.13	–	.74**	.03	−.03	106.78	111.74
8. Time from alternative	.09	.08	.26**	.05	.10	.02	.24*	–	.10	.07	121.09	120.91
9. Dated alternative	−.04	−.02	.10	.01	−.03	.04	−.13	.11	–	.44**	.64	.48
10. Duration of alternative relationship	.13	.08	.15	.17	.10	−.12	−.03	.12	.41**	–	21.81	37.68
M	17.13	5.54	4.85	4.02	2.37	6.01	36.05	25.45	.44	6.56		
SD	21.16	.83	1.05	1.21	1.78	1.80	37.12	17.59	.50	18.11		

Note. The community sample of adults and student sample intercorrelations and descriptive statistics are displayed above and below the diagonal, respectively.

 * $p < .05$.
 ** $p < .01$.

among the high CP condition participants, $\beta = .49$, $t(247) = 8.82$, $p < .001$, but more weakly associated with Commitment for the low CP condition participants, $\beta = .35$, $t(247) = 6.21$, $p < .001$.

Additional information about forgone alternatives

In our examination of additional forgone alterative variables (i.e., distance in time that the participant had the opportunity to date the forgone alternative, whether or not they had actually dated the alternative, and the duration of the alternative dating relationship) we found no evidence that any of these variables had significant main effects on Regret or Commitment when controlling for investment model variables (all $ps > .14$) and no evidence that they moderated the effect of the CP manipulation on Regret or Commitment. Furthermore, statistically controlling for these variables did not alter any of the findings reported above.

General discussion

Our approach to the link between alternatives and commitment adds three distinct aspects neglected by previous investigations: a) clear consideration of past alternatives; b) the perceived likelihoods of those alternatives; and c) the regret associated with possible, but forgone, alternatives. This approach proved to be useful to predicting relationship commitment within the context of Rusbult's (1980, 1983) investment model.

Although the quality of one's current alternatives is important to commitment, our data suggest that past love interests can be readily

Fig. 4. Predicted regression means of commitment by CP-forgone alternative condition and investment size (Study 3).

brought to mind and used as standards of comparison for one's current relationship. To the extent that past alternatives are viewed as having been possible and likely to have led to happiness, people appear to experience more regret. This pattern was observed correlationally in Studies 1 and 2, and experimentally in Study 3, in both university student samples and adult community samples. The link between the CP associated with forgone alternatives and commitment did not appear to be influenced by either previously dating the alternative nor the duration of that relationship nor the time elapsed since the opportunity was forgone.

Thus, for individuals in relationships, the quality of a recent interest and/or admirer may pose less of a threat to one's current relationship commitment than a previous possibility from the distant past. We suspect that forgone alternatives from the distant past often serve as a habitual reference point. Not only do people have more "practice" at employing such reference points than more recent ones, but distant reference points also have more time to be distorted by cognitive biases and illusions. Furthermore, forgone alternatives seem more likely to be perceived as viable opportunities and final than current alternatives, and thus, they may be more strongly linked to regret (Roese & Summerville, 2005).

Our data from Study 2 and Study 3 also show that the relationship between counterfactual potency of forgone alternatives and relationship commitment depends in part on investment size. Although our expectation that commitment would be negatively associated with counterfactual potency was supported, the relationship between the counterfactual potency of forgone alternatives and commitment revealed a very different relationship among participants who considered their investment size to be relatively great. That is, the more that high investment size romantic partners perceived "yesteryear's relational might have beens" to be actual possibilities and likely to lead to the same or greater happiness, the more current relationship commitment they reported. The same moderation effects were not found for age, current relationship length, or time elapsed since the past forgone opportunity. This suggests that the perception of one's relationship investment size is more crucial to his/her commitment than are tangible aspects of current or alternative relationships.

Given that highly potent forgone alternatives predicted greater regret, one possibility is that the regret associated with highly potent, forgone alternatives creates a state of dissonance that can be resolved in two opposite ways, one of which is more practical in low investment relationships and the other of which is more practical in high investment relationships. A strategy that might be quite practical in low investment relationships may be to reduce the level of commitment (e.g., "I forwent a chance to date Robert Redford; why should I settle for Henry Fonda now?"). A different strategy that might be more practical in high investment relationships may be to view the regret associated with a potent
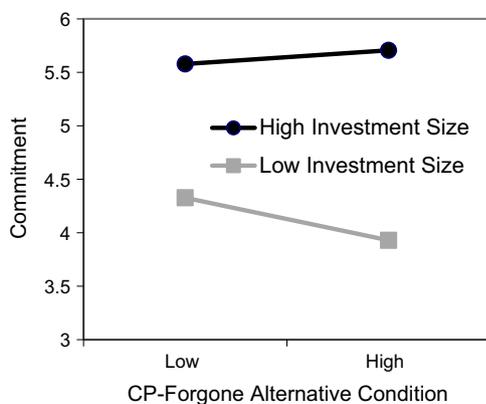
forgone alternative as "evidence" of high relationship commitment (e.g., "I forwent a chance to date Audrey Hepburn and stayed with Katharine Hepburn all these years—I must be a very committed partner."). In fact, self-perception theory (Bem, 1967, 1972; Fazio, 1987) holds that people often infer their attitudes and judgments from the recall of relevant behavioral and contextual information. One can see how this increased-commitment strategy might be especially appealing for highly invested partners. The highly invested relationship partner had not only sunk more time and resources in his/her current relationship than the less invested, they also forwent what he/she perceived to be relatively higher probabilities of happiness with the forgone partner, and he/she experienced higher levels of regret; it is also conceivable that he/she perceived fewer dating years left. We suspect that such relational inferences are similar to other demonstrations of commitment inferences based on investments in clearly undesirable relationships (e.g., abusive relationships) despite the presence of more desirable alternatives (see Rusbult & Martz, 1995).

Interestingly, given that order of presentation of the major sections of the questionnaire did not moderate our results, the CP of forgone alternatives does not appear to need to be made salient for the association between CP forgone alternatives and commitment to emerge. Rather, it appears that any effect that one's perceived CP of forgone alternatives has on his or her commitment level is spontaneous.

One potentially fruitful, future direction of the current research is to extend it to the various trajectories of interpersonal desirability that emerge during the course of one's life. Developments and changes that occur over the course of one's life may make alternatives easier or more difficult to imagine. Anything that would make alternatives easier or more difficult to imagine should affect regrets for those forgone alternatives. Take for instance Joe, who was insecure with low self-esteem during his former years. Although he may have never asked Lauryn for a date during those years, it may be much easier for him to imagine doing so now that he is secure with high self-esteem. On the other hand, Jake, at the top of his class and the Adonis of the bunch, may have been quite likely to ask Lauryn for a date. However, now that Jake is "down on his luck", he may find it more difficult to imagine dating Lauryn. Such changes in ease/difficulty of imagining alternative realities seem likely to emerge to the extent that people assimilate their current self-concept into their views of previous selves—essentially using the current self as a benchmark for viewing their past (Ross, 1989).

Forgoing an alternative partner might lead one to generate devastating counterfactuals. In many such cases, one may never know how hypothesized outcomes might have actually turned out, and coming to terms with the subjectivity of counterfactual thinking would seem to make such counterfactuals less potent. This notion also warrants empirical investigation.

Finally, our findings suggest that reducing either the if-likelihood (e.g., "Lauryn and I would have been a great match, but she would have never even given me the time of day.") or the then-likelihood associated with forgone alternatives (e.g., "Well, I could have gone out with Jake when he asked me, but he probably would have driven me crazy.") should reduce the regret associated with those alternatives and thereby increase current relationship commitment among low investment size couples. As individuals grow older and relationships extend over time, it seems reasonable to expect their regret minimizations to serve to enhance commitment. Research in this vein may provide support for the notion of a "psychological immune system" (e.g., Gilbert & Ebert, 2002; Taylor, 1991) that works to reduce negative affect and feelings of relationship dissatisfaction over time.

Conclusion

Our findings suggest that broadening the analysis of one's alternatives to the distant past is useful to predicting commitment. More specifically, commitment prediction appears to be improved by accounting for the perceived likelihoods of those alternatives actually being realities, as well as the emotional consequences linked to them (e.g., regret associated with forgone alternatives).

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