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The Bittersweet Taste of Sacrifice: Consequences for Ambivalence and Mixed Reactions

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People in close relationships often need to sacrifice their own preferences and goals for the partner or the relationship. But what are the consequences of such sacrifices for relationship partners? In this work we provide a systematic investigation of the consequences of sacrifice in romantic relationships, both for the person who gives up their goals as well as for the recipient of these benefits. In 5 studies combining experience sampling and experimental methods, we examined whether performing and receiving sacrifices is linked to the experience of ambivalence, that is, mixed feelings toward a partner. In the last 3 studies, we also examined the specific positive and negative reactions associated with sacrifice. Results revealed that performing and receiving sacrifices are both linked to ambivalence toward a romantic partner. Recipients of sacrifices experienced higher negative mood, guilt, and feelings of indebtedness, but these were accompanied by higher positive mood, gratitude, and feeling appreciated by the partner. Sacrificers mostly experienced negative reactions, such as higher negative mood, frustration, and feelings of exploitation, but they also reported some positive reactions, such as feeling happy from benefitting their partner, proud of themselves for being a good partner, and had increased expectations that their partner would reciprocate the sacrifice in the future. In sum, this work provides the first comprehensive study of the emotional reactions that are triggered by sacrifice and shows that sacrifice is a double-edged sword with both positive and negative consequences. Implications for sacrifice and ambivalence are discussed.

Keywords: sacrifice, ambivalence, emotions, close relationships, prosocial behavior

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It's a Saturday evening and Luke and Kelly are discussing their plans for the evening. Luke's best friends invited the two of them to go out to a karaoke. Luke is excited about the idea, but Kelly does not like singing in public, feels tired, and would rather spend a quiet evening at home with Luke, curled up on the couch watching a movie. They both try to persuade the other to engage in their preferred activity. Eventually, Kelly decides to give up her preference and to join Luke and his friends for karaoke. How might Kelly feel about her own sacrifice? Would she feel happy from having benefitted Luke or would she feel frustrated for not being able to pursue her individual preference? And how might Luke feel about Kelly's decision? Would he feel good about being able to pursue his interests and be grateful to Kelly? Or would he feel bad for Kelly and guilty for having pushed her into something that was not her first preference?

Kelly's decision to go to karaoke night with Luke can be conceptualized as a sacrifice—she gave up her own interest and preference to prioritize Luke's preference. What are the consequences of sacrifice? Which reactions are likely to arise after people perform or receive a sacrifice? Previous research has investigated the link between sacrifice and relationship satisfaction and has found mixed results in this regard. Some studies have found that people report higher relational well-being after having made a sacrifice (e.g., Ruppel & Curran, 2012; Van Lange, Ag-

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new, Harinck, & Steemers, 1997; Wieselquist, Rusbult, Foster, & Agnew, 1999), while other studies have shown negative effects (e.g., Totenhagen & Curran, 2011; Whitton, Stanley, & Markman, 2007; Young & Curran, 2016). Furthermore, preliminary findings from a recent meta-analysis found no associations between acts of sacrifice and relational well-being, for both the individual who performed the sacrifices and for the recipient of such sacrifices (Righetti, Sakaluk, Faure, & Impett, 2019).

The inconsistency of previous findings and the lack of associations with relationship well-being could either mean that sacrifice does not alter the way people feel toward their relationship or that it is beneficial for some people and detrimental for others. We posit a third possibility—that sacrifice is simultaneously good *and* bad for most people. Specifically, we argue that acts of sacrifice produce both positive *and* negative outcomes, and that people experience mixed feelings (i.e., ambivalence) toward their partner after the occurrence of these behaviors. Thus, the present work has two aims. First, we tested whether sacrifices increase feelings of ambivalence toward one's partner for both the person who enacts the sacrifice and for the recipient of this behavior. Second, we sought to provide the first comprehensive study of the specific positive and negative reactions that people experience when performing and receiving sacrifices.

If sacrifice is indeed related to ambivalence toward partners, this would allow for an integration of previously mixed findings. Moreover, the link between sacrifice and ambivalence would constitute a significant theoretical extension of research on sacrifice by revealing the nuances and complexities of the consequences of sacrifice for individual and couple well-being. Finally, research on general attitudinal ambivalence has detailed many consequences of experiencing evaluative conflict that, when applied to the context of romantic relationship, will also have important implications for the way partners treat each other.

Sacrifice and Personal and Relationship Well-Being

Couples often face interdependence dilemmas, that is situations in which their personal preferences diverge. According to interdependence theory (Kelley & Thibaut, 1978), in these situations people have immediate self-focused preferences that are independent and different from the ones of their partner. For example, Kelly's immediate preference, if she did not consider Luke's preference, would be to stay home and watch a movie. However, a number of other broader considerations (e.g., thinking about what Luke wants or thinking about what is the best for the relationship) may change her initial preference such that she decides to forego her initial preference for the sake of her partner or relationship; that is, she may decide to sacrifice. Sacrifice is a form of prosocial behavior because it involves benefitting the partner while subordinating one's own personal preference/goal (Impett & Gordon, 2008; Killen & Turiel, 1998; Righetti & Impett, 2017). Sacrifices can be classified as active and/or passive in nature. First, *active sacrifices* involve deviating from an individual's own preference by doing something else for the sake of the partner or relationship. For example, an individual might attend a partner's work event that they do not have any interest in attending. Second, *passive sacrifices* involve deviating from an individual's own preference by giving up something for the sake of the partner or relationship, for example investing less in one's career because it interferes with the good functioning of the relationship. However, many sacrifices involve both components and require the individual to give something while pursuing a different activity or preference. For instance, Kelly forewent her movie-watching preference (passive) in order to go to karaoke with Luke (active).

Behaving in a prosocial manner in relationships is generally positively associated with relationship satisfaction. For example, providing support, being responsive, helping partners in achieving goals, cheering for the partner's successes are all processes that foster relationship well-being (Bodenmann, Pihet, & Kayser, 2006; Le, Impett, Lemay, Muise, & Tskhay, 2018; Overall, Fletcher, & Simpson, 2010; Reis & Gable, 2015; Rusbult, Finkel, & Kumashiro, 2009). However, sacrifice is a special type of prosocial behavior because it entails providing a benefit to the partner at the costs of one's own immediate personal goals/preferences (e.g., Impett & Gordon, 2008). Thus, sacrifices can only occur in situations of divergence of interests, when partners' preferences initially differed (e.g., Van Lange, Rusbult, et al., 1997). If people's immediate preference in a situation is to help and support their partner, and this does not require them to give up any personal goal, this is not a sacrifice. Sacrifices occur when people would initially like to do something but they decide instead to subordinate their personal goals/preferences because of the partner or the relationship. Is this form of costly prosocial behavior positively or negatively related to relationship quality?

Research on whether sacrifice is positively or negatively associated with relationship satisfaction is mixed. Initially, sacrifice was thought to lead to positive relationship well-being because it would create a "climate" of trust and cooperation between partners (Van Lange, Rusbult, et al., 1997). Consistent with this idea, willingness to sacrifice has been positively associated with relationship well-being in several studies (e.g., Van Lange, Rusbult, et al., 1997; Wieselquist et al., 1999; Zhang & Li, 2015), and a recent meta-analysis confirmed this link (Righetti et al., 2019). However, being willing to sacrifice (i.e., having the intention to sacrifice), is a very different experience than actually performing one and incurring the costs of that sacrifice. Research examining the link between actual performed sacrifices and personal and relationship well-being has not yielded consistent results. Some studies found that sacrifice was positively associated with well-being (e.g., Chen & Li, 2007; Lan et al., 2017; Ruppel & Curran, 2012), whereas others documented that sacrifice was negatively related to well-being (e.g., Totenhagen & Curran, 2011; Whitton et al., 2007; Young & Curran, 2016). Others still found no association between the two (e.g., Impett, Gable, & Peplau, 2005; Righetti, Gere, Hofmann, Visserman, & Van Lange, 2016; Totenhagen, Curran, Serido, & Butler, 2013), a finding that is consistent with preliminary results from a recent meta-analysis of the link between actual performed sacrifice and relationship well-being (Righetti et al., 2019).

A crucial issue with most of these past studies, however, is that they assessed well-being in a unidimensional fashion. For example, relationship satisfaction has been typically assessed along one continuum ranging from *not at all satisfied* to *extremely satisfied*. However, what happens when someone experiences mixed reactions (both positive and negative) after a sacrifice? Research on ambivalence has shown that positive and negative thoughts and feelings can indeed arise at the same time (Cacioppo & Berntson, 1994; Larsen & McGraw, 2011; Schneider & Schwarz, 2017). However, in a typical measure of relationship satisfaction, an

individual who is simultaneously experiencing both positive and negative reactions might report no change in affect after a sacrifice because reporting only higher or lower satisfaction would be an inaccurate representation of their feelings. In other words, for a person who feels more positive, but also more negative, reporting feeling more satisfied would not be accurate. But reporting feeling less satisfied would not be accurate either. This renders impossible for researchers using the typical well-being scales to distinguish the absence of a change in affect from an experience of mixed feelings (i.e., ambivalence; Schneider, Veenstra, van Harreveld, Schwarz, & Koole, 2016; Thompson, Zanna, & Griffin, 1995; van Harreveld, Nohlen, & Schneider, 2015). Thus, we argue that sacrifice may not be as inconsequential as previous work seems to suggest (Righetti et al., 2019), but that researchers have not yet explored the possibility that sacrifice is simultaneously conducive to positive and negative reactions and that people may experience ambivalence after performing and receiving such behavior.

The Positive and Negative Facets of Sacrifice

If it is true that sacrifice elicits both positive and negative reactions, then it becomes important to understand what these specific reactions are. While several reactions have been theoretically proposed (Righetti & Impett, 2017), systematic empirical studies have yet to address this question. In this work, we aim to provide the first comprehensive empirical investigation of such reactions both for the person who enacts the sacrifice, as well as for the recipient.

The enactor of sacrifice. On the enactor's side, there are clear advantages of performing a sacrifice. For instance, because encountering situations of divergence of interests with one's partner is an aversive state (Righetti et al., 2016), by sacrificing, an individual can avoid burdensome discussions and solve the situation in a way that partners can still pursue activities together (Kelley & Thibaut, 1978). Furthermore, given that people feel good about behaving in a moral and altruistic way (e.g., Hofmann, Wisneski, Brandt, & Skitka, 2014), enactors may feel proud of themselves for behaving in a prosocial and caring way toward their partner. Additionally, given that sacrifices are often reciprocated (Van Lange, Rusbult, et al., 1997; Wieselquist et al., 1999), people may experience some positive affect from the anticipation that the partner will reciprocate the benefits in the future. Finally, given that romantic relationships are characterized by high communal orientation (Clark & Mills, 2011), people often feel good about making their partner happy through performing these acts (Kogan et al., 2010). Thus, as Righetti and Impett (2017) propose, performing a sacrifice should lead to feelings of pride, positive expectations of future reciprocation, the relief of stress, and positive feelings from observing one's partner achieve their own preferred outcomes.

On the other hand, there are also several reasons why sacrifice may induce enactors to experience negative affect. First, merely encountering situations of divergence of interests with one's partner triggers negative affect (Righetti et al., 2016). Second, by sacrificing, people cannot fulfill their personal goals or preferences, and when people cannot achieve their goals, they are likely to experience negative affect and frustration (e.g., Brunstein, 1993; Carver & Scheier, 1990; Emmons, 1986). Furthermore, according to transactive goal dynamics theory (Fitzsimons, Finkel, & vanDellen, 2015), when a romantic partner is the source of goal obstruction, people may experience negative affect and resentment. Previous research has indeed shown that people tend to feel less close, satisfied, and less motivated to approach a partner whom they feel is undermining, rather than supporting, their own goals (Brunstein, Dangelmayer, & Schultheiss, 1996; Drigotas, Rusbult, Wieselquist, & Whitton, 1999; Fitzsimons & Shah, 2008). Finally, by sacrificing, people place themselves in a vulnerable position. Visserman, Righetti, Impett, Keltner, and Van Lange (2018) showed that partners do not detect 50% of the daily sacrifices that an individual performs. Thus, at least half of the time (if not even more), people who perform a sacrifice are not recognized and appreciated for their behavior, which might increase feelings of exploitation and dissatisfaction with the relationship. Thus, performing a sacrifice should also lead to feelings of frustration, resentment, and exploitation (Righetti & Impett, 2017).

In sum, there are clear reasons to suspect that after performing a sacrifice, people may simultaneously have positive and negative reactions (Righetti & Impett, 2017). Additional evidence in support of the idea that sacrifice may be an ambivalent experience comes from research on sacrifice guided by an approach-avoidance theoretical perspective. Several studies have shown that people tend to be simultaneously motivated by desires to pursue or approach positive outcomes (e.g., make a partner happy, enhance relationship intimacy) and to avoid negative outcomes (e.g., avoid upsetting a partner, avert conflict) when they make a sacrifice (Impett et al., 2005; Impett, Gere, Kogan, Gordon, & Keltner, 2014). Yet while these two types of motives tend to be positively correlated, they are associated with distinct relationship and affective outcomes. More specifically, approach motives are typically associated with greater positive affect and relationship satisfaction, whereas avoidance motives are associated with higher negative affect and lower relationship satisfaction (Impett et al., 2005, 2014; Impett, Javam, Le, Asyabi-Eshghi, & Kogan, 2013). This means that because people tend to be simultaneously motivated to pursue approach and avoidance motives when making a sacrifice, they may experience mixed emotions and feelings toward their partner.

The recipient of sacrifice. Turning to the recipient of sacrifice, at first glance, the recipient has a lot to gain: They can pursue their own preferences or goals and, in many cases, they can do so while spending time with their partner. When people perceive that their partner has sacrificed for them, they also realize that their partner is willing to incur costs for the relationship, and such investments signal that the partner is committed to the relationship (Joel, Gordon, Impett, MacDonald, & Keltner, 2013), and can be trusted (Wieselquist et al., 1999). Knowing that the partner is willing to give up their own self-interest for the relationship can make recipients feel loved and cared for (e.g., Reis, Clark, & Holmes, 2004). Research has consistently shown that receiving sacrifices increases feelings of gratitude toward the partner, even if the sacrifice did not actually occur and was instead misperceived (Visserman et al., 2018). Thus, it has been theoretically proposed (Righetti & Impett, 2017) that receiving sacrifice should enhance positive feelings for being able to fulfill one's preferences and feelings of gratitude and appreciation toward one's partner.

However, there may also be a dark side of perceiving the partner to have sacrificed for the relationship (Righetti & Impett, 2017). For example, recipients may be aware that their partner had to give up their personal goals/preferences for them and, given the high

level of care (Clark & Jordan, 2002; Mills, Clark, Ford, & Johnson, 2004) and merged identity (Aron, Aron, Tudor, & Nelson, 1991) that characterize romantic relationships, recipients may feel sorry for their partner or guilty that their partner had to give up their own personal preferences. Furthermore, given that some level of reciprocity is expected in relationships (Van Lange, Rusbult, et al., 1997), recipients may feel indebted toward their partner and obliged to reciprocate. They may experience negative affect from being aware that the next time there is a divergence of interests, they might have to be the one to sacrifice. Finally, sometimes recipients simply do not want their partner to sacrifice, but prefer a solution in which they and their partner would pursue their own goals separately from each other. Thus, receiving a sacrifice should also lead to some negative affect, guilt, and to feelings of indebtedness (Righetti & Impett, 2017).

In sum, sacrifice may be a double-edged sword that has simultaneous beneficial and detrimental outcomes for both the enactor and the recipient (Righetti & Impett, 2017). However, this argument that has never been empirically tested, which is the goal of this work.

Sacrifice and Ambivalence

Ambivalence occurs when one's reactions to an attitude object are mixed, in that both positive and negative evaluations occur simultaneously (Conner & Armitage, 2008; Schneider & Schwarz, 2017; Thompson et al., 1995; van Harreveld, Nohlen, & Schneider, 2015). Ambivalence can be experienced toward any attitude object (e.g., political and societal issues, products, goals), including the way we feel toward other people (Lüscher & Pillemer, 1998). Fincham and Linfield (1997) were the first to propose that ambivalence can be experienced toward a romantic partner by showing that people can experience high positive and negative marital quality at the same time. In fact, rather than being a rare psychological state, ambivalence is often experienced toward close others (e.g., Zayas & Shoda, 2015), and is more likely to be experienced toward significant others than toward others with whom people do not feel very close (e.g., Fingerman, Hay, & Birditt, 2004). Experiencing ambivalence toward close others has important consequences for individual well-being as studies have shown that a high level of ambivalence toward one's partner is associated with higher blood pressure (Birmingham, Uchino, Smith, Light, & Butner, 2015), coronary artery calcification (Uchino, Smith, & Berg, 2014), and inflammation (Uchino et al., 2013). Furthermore, ambivalence in parent and adult children relationships is also linked to high psychological distress (e.g., Fingerman, Pitzer, Lefkowitz, Birditt, & Mroczek, 2008). Given that sacrifice may involve different reactions that are both positive and negative, we argue that this behavior is likely to increase feelings of ambivalence toward the partner, who is the reason why the sacrifice is occurring. Thus, for example, if after performing a sacrifice people would feel simultaneously happy for having benefitted their partner and frustrated because of their partner's obstruction of their personal goals, they will likely hold mixed feelings toward their partner.

While previous research has shown that ambivalence has important consequences for individual well-being, much less is known about the interpersonal consequences of experiencing ambivalence. Studies have shown that when people are aware that they are consciously experiencing ambivalence (i.e., when they report having mixed feelings toward an attitude object, also called subjective ambivalence; Newby-Clark, McGregor, & Zanna, 2002; Priester & Petty, 1996), they are motivated to reduce it, and they try to adopt strategies (e.g., increasing information processing) to form an univalent (positive or negative) evaluation (e.g., Maio, Bell, & Esses, 1996). However, because negative reactions generally carry more psychological weight than positive reactions (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001), negative evaluations may exert a greater influence on information processes when both positive and negative evaluations are experienced simultaneously. If this is the case, ambivalence may be a precursor of relationship instability and dissolution. Thus, when people experience frequent sacrifices the ambivalence associated with it may translate over time into negative thoughts that may lead to break-up.

Research Overview

Previous research has mostly focused on relationship satisfaction (e.g., Righetti et al., 2016; Ruppel & Curran, 2012; Totenhagen & Curran, 2011) or gratitude (Visserman et al., 2019, 2018) when examining the consequences of sacrifice. However, sacrifice is likely to elicit many other positive and negative reactions (Righetti & Impett, 2017), which have not yet been the source of empirical investigation. The present research aims to provide a comprehensive analysis of the consequences of sacrifice. Specifically, we hypothesized that both enacting and receiving a sacrifice would cause people to experience subjective ambivalence (i.e., feeling conflicted and mixed toward their partner; Newby-Clark et al., 2002; Priester & Petty, 1996). Furthermore, we sought to provide the first comprehensive understanding of which specific positive and negative reactions are elicited when enacting or receiving sacrifice. Considering the person who enacts the sacrifice, we hypothesized that performing a sacrifice would increase both positive and negative feelings toward one's partner, both positive and negative mood, and would induce people to feel proud, but also resentful and possibly exploited. We also hypothesized that after performing a sacrifice, people would expect their partner to reciprocate the sacrifice. Considering the recipient of sacrifice, we hypothesized that perceiving a sacrifice from one's partner would increase both positive and negative feelings toward one's partner, more positive and negative mood, and would induce people to feel grateful and appreciated, but also indebted to their partner and guilty. Furthermore, we predict that recipients would feel that they ought to be the one to sacrifice at the next divergence of interests.

We conducted five studies to test these ideas. Studies 1 and 2 gathered data from couples and assessed associations between sacrifice and positive and negative feelings toward one's partner (Studies 1 and 2) and actual subjective ambivalence (Study 2).[1] We did so with the use of general questionnaires (Study 2) and with a daily diary procedure (Studies 1 and 2). Study 2 also sought to investigate the longitudinal consequences of feelings of subjective ambivalence toward one's partner. Specifically, we assessed whether the ambivalence related to sacrifice influences relationship stability over time. In the remaining three studies (Studies 3, 4, and 5), we conducted experiments in which we manipulated

[1] In the first two studies we also tested a model in which self-sacrifice and perceived partner sacrifice were simultaneous predictors of reactions and ambivalence. The results of these additional analyses can be found in the online supplemental material.

sacrifice and assessed subjective ambivalence, as well as specific positive and negative reactions to sacrifice. Finally, to ensure that the effects of ambivalence were unaffected by possible changes in relationship satisfaction (e.g., to rule out the possibility that people might report higher ambivalence because their relationship satisfaction decreases after enacting or perceiving a sacrifice) we replicated relevant analyses controlling for relationship satisfaction.[2]

Ethical approval for the studies was obtained from the Scientific and Ethical Review Board of the university where the studies were conducted. Data and syntax for all studies are available on the OSF website (https://osf.io/7bxjs/?view_only=7e4516385cdf4d05a817b6a314b8302d). Data for Studies 1 and 2 are password protected because of the sensitivity of the data (data from couples with possible identifiable information). Data can be made available upon request to the first author and for review purposes only.

Study 1

In our first study we gathered data on daily experiences of romantic couples. Specifically, we conducted a 15-day diary study in which we assessed whether participants or their partners made a sacrifice and the extent to which they experienced positive and negative reactions toward their partner.

Method

Participants. We gathered data from 33 Dutch-speaking heterosexual couples ($N = 66$) living in the Netherlands. Participants were recruited via advertisements on social media (e.g., Facebook), Internet forums, a professional recruiting agency, and around a university campus. This study was designed to assess how hormonal fluctuations during the ovulatory cycle influence relationship dynamics (Righetti et al., 2020), but also contained variables relevant to the present research questions; these are the variables we report here. Because of the nature of the study, couples could participate in the study only if (a) the woman was not taking any hormonal contraceptive and was younger than 40-years-old, (b) the woman was not pregnant or breastfeeding, (c) the woman was having a regular menstrual cycle, (d) partners had been together for longer than 4 months, (e) they were cohabiting or spending at least 5 nights together a week, and (f) they were not consciously attempting to conceive. Participants' mean age was 26.30 years ($SD = 3.97$), and 33.3% were university students. On average, couples reported being involved for 46.27 months ($SD = 26.56$ months). Two couples withdrew from the study after the intake session; thus, the main analyses are conducted on the remaining 31 couples. Although this sample size is modest given all the criteria that couples had to meet, this was compensated with extensive sampling on 15 consecutive days for both members of the couple; hence, empirical associations were based on 930 total days of data. Participants were paid up to 50 Euros (100 Euros per couple) for participating in the study.

Measures and procedure. Participants replied to a number of questions about themselves and their relationship every evening (as close to bed time as possible) for 15 days. Participants were instructed to fill in the diary questions separately and not to discuss the replies with each other. Each day, participants separately reported how positive (one item; "Today, I felt positive feelings toward my partner") and how negative (1 item; "Today, I felt negative feelings toward my partner") they felt toward their partner. Finally, participants reported whether they made a sacrifice on that day (one item; "Today, I sacrificed something when my interests diverged from those of my partner"; 0 = *no,* 1 = *yes*) and whether their partner made a sacrifice for them (one item; "Today, my partner sacrificed something when my interests diverged from his/hers"; 0 = *no,* 1 = *yes*). All items were rated on a 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*).

Results

Because of the nonindependence of the data (multiple measurements within participants, and the nesting of participants within couples) we performed multilevel analyses. We used a two-level cross-model in which participants and daily measurements within participants (i.e., time) were treated as crossed and nested within the dyad (Kenny, Kashy, & Cook, 2006). Intercepts terms were treated as random, and slopes as fixed effects. Because gender did not reliably moderate the effects, dyads were treated as indistinguishable (Kenny et al., 2006). Results revealed that participants reported less positive feelings and more negative feelings toward their partner on days when they sacrificed compared with days when they did not sacrifice ($b = -.67$, $SE = .10$, 95% CI [−.86, −.48], $p < .001$ and $b = .87$, $SE = .14$, 95% CI [.58, 1.15], $p < .001$, respectively). Furthermore, participants also reported less positive feelings and more negative feelings on days when they received a sacrifice from their partner as compared with days when they did not ($b = -.28$, $SE = .11$, 95% CI [−.49, −.07], $p = .008$ and $b = .51$, $SE = .16$, 95% CI [.20, .82], $p < .001$, respectively). Thus, contrary to our expectations, this first study showed that both performing and receiving a sacrifice were associated with lower positive feelings and higher negative feelings toward one's partner.

Study 2

The previous study assessed positive and negative reactions toward one's partner on days of sacrifice in a sample of 30 couples. In Study 2 we sought to investigate whether people reported having more mixed feelings (i.e., subjective ambivalence) after a sacrifice in a larger sample ($N = 260$).[3] Additionally, we assessed whether people experience more negative and positive feelings toward their partner after a sacrifice. In this study we had data on sacrifice, subjective ambivalence, and positive and negative feel-

[2] In all the studies we report results for all the variables that were included in the study that address the specific research questions pursued in this article. Other variables that were assessed but were out of the scope of the present research questions (i.e., variables that did not measure sacrifice, ambivalence, and reactions to sacrifice) are not considered in the present investigation.

[3] In research on ambivalence, positive and negative ratings are often combined to retrieve an index of what researchers call objective ambivalence. This index tracks the strength and similarity of positive and negative reactions, and higher scores are usually interpreted as higher objective ambivalence (Kaplan, 1972; Thompson et al., 1995). However, with attitude objects where positive feelings generally are higher than negative, the index is strongly related to the amount of negativity reported. Analyses using this index therefore are unable to precisely test our hypotheses that both positive and negative emotions will increase as a result of sacrifice.

ings in multiple portions of the study, so we examined the associations between these variables at an intake session, during an 8-day diary, and at a 1-year longitudinal follow-up. Furthermore, given that the experience of feeling conflicted and ambivalent has been linked to tension and discomfort, and to a desire to solve it by leading to one side of an evaluation (Newby-Clark et al., 2002; van Harreveld et al., 2015), we investigated whether there are detrimental long-term consequences of sacrifice and subjective ambivalence for the relationship. Specifically, at the 1-year follow-up, we assessed thoughts of breaking up and actual break up as indexes of relationship stability. We then tested whether the average ambivalence experienced in the diary would mediate the association between the frequency of the sacrifices made over the course of the diary and thoughts of breaking up (and actual break up).

Method

Participants. We gathered data from 130 couples ($N = 260$) recruited via advertisements on social media (e.g., Facebook), various Internet forums, and face-to-face recruitment. The sample size was specified prior to data collection based on typical relationship studies and combined with a diary design to provide adequate statistical power. Except for one lesbian couple, all couples were heterosexual. Data from two couples and one individual were excluded from analyses because they did not properly follow the instructions at intake. All participants lived in the Netherlands and were required to speak Dutch. To be eligible to participate in the study, couples had to be together for longer than 4 months and have no children.[4] Partners were paid a maximum of 80 Euros each for their participation. As an additional incentive, participants could receive a bonus of 200 Euros via a lottery ticket. Participants' age ranged from 18 to 43 years ($M = 23.33$, $SD = 3.65$). Over half of the participants (63.6%) were students, 34% were working full time, and 2.4% were both working and studying. Couples' romantic involvement ranged from four months to 17 years ($M = 34.13$, $SD = 29.01$ months) and 34.8% of the couples were living together, of which a minority (2.4%) was married.

Measures and procedure. Couples came to the laboratory for an intake session, at which point partners were separated to complete a number of questionnaires in Dutch. First participants reported on their relationship satisfaction (Rusbult, Martz, & Agnew, 1998; four items; e.g., "I feel satisfied with our relationship"; $\alpha = .82$). After that, participants reported on their positive (one item; "How positive do you feel toward your partner?") and negative feelings toward their partner (one item; "How negative do you feel toward your partner?"). To gauge the direct experience of ambivalence, we also measured subjective ambivalence (Priester & Petty, 1996; one item; "Towards my partner I have: 1 = *completely one-sided reactions [only positive or negative reactions]* to 7 = *completely mixed reactions [positive and negative reactions together"]*). Finally, they reported on the frequency of their own sacrifices in the past three months (1 item; "In the past 3 months, how often have you sacrificed for your partner?"; 1 = *never* to 7 = *extremely often*) and the frequency of their partner's sacrifices (one item; "In the past t3 months, how often has your partner sacrificed for you?"; 1 = *never* to 7 = *extremely often*).

After completing the questionnaires, participants received instructions for completing the diary study. Specifically, participants were carefully instructed by the experimenter on how to recognize daily sacrifices in their relationship. Sacrifices were explained as forgoing your own preference by doing something that you find unpleasant and that you would not like to do (active sacrifice; e.g., going on a boring outing with your partner's friends), or by giving up something that you find pleasant or would like to do (passive sacrifice; e.g., not going out with your best friend), or a combination of the above (e.g., giving up spending time with your friends to go on a boring outing with your partner's friends; see Van Lange, Rusbult, et al., 1997). Participants also received a booklet with definitions and examples of sacrifice, as well as instructions for completing the diary. For example, participants were instructed to fill in the diary questions separately and not to discuss their replies with each other.

In the diary portion of the study, each day participants first reported on their relationship satisfaction (one item; "I feel satisfied with our relationship"). Participants also reported on their current positive (one item; "Right now, I feel positive feelings toward my partner") and negative feelings toward their partner (one item; "Right now, I feel negative feelings toward my partner"). They also reported their subjective ambivalence (Priester & Petty, 1996; one item; "Today, to which extent do you experience mixed reactions toward your partner [experience positive and negative reactions together]?" 0 = *completely one-sided reactions [only positive or negative reactions]* to 10 = *completely mixed reactions [positive and negative reactions together]*). Finally, they reported on whether or not they sacrificed each day for eight consecutive days (one item; "Have you sacrificed today for your partner/relationship?"; 0 = *no;* 1 = *yes*) and whether their partner sacrificed (one item; "Has your partner sacrificed today for you or your relationship?"; 0 = *no;* 1 = *yes*).

Finally, 1 year later, couples were contacted again to complete a follow-up survey. Of the initial 255 individuals, 233 responded to the follow-up and 191 reported that they were still together with their partner. If participants were still together, they reported on their relationship satisfaction, their positive and negative feelings toward their partner, and the frequency of their own and partner's sacrifices in the previous 3 months in the same manner as at the intake session. Ambivalence was not assessed in the follow-up. Additionally, we assessed whether they had thoughts about breaking up (adapted from the Marital Instability Index; Booth, Johnson, & Edwards, 1983; Impett et al., 2010; three items; e.g., "Have you ever seriously suggested the idea of breaking up?"; $\alpha = .86$).

Results

Analysis strategy. Because of the nonindependence of the data, analyses were performed with multilevel models as in Study 1 (Kenny et al., 2006). We used the Monte Carlo method to assess mediation (MCMAM), using unstandardized estimates. This simulation method shows 95% confidence intervals for the indirect effects using 20,000 simulations (Selig & Preacher, 2008). To ensure that sacrifice was associated with subjective ambivalence above and beyond general feelings of relationship satisfaction, we conducted additional analyses controlling for relationship satisfaction.

[4] Only couples without children were recruited to ensure that sacrifices occurred for the partner and not for the children.

Subjective ambivalence. In the diary, results revealed that on days when participants reported a sacrifice, they also experienced greater ambivalence toward their partner ($b = .26$, $SE = .07$, 95% CI [.13, .39], $p < .001$) than on days with no sacrifice. Results held when controlling for daily level of relationship satisfaction ($b = .26$, $SE = .07$, 95% CI [.12, .39], $p < .001$). As for a partner's sacrifice, participants reported marginally more ambivalence on days they received a sacrifice as compared with days without a partner's sacrifice ($b = .11$, $SE = .07$, 95% CI [−.02, .25], $p = .097$). Results held when controlling for daily relationship satisfaction ($b = .13$, $SE = .07$, 95% CI [.00, .26], $p = .050$). At the intake session, results revealed that the frequency of the participants' own sacrifices or their partner's sacrifices in the previous 3 months were not related to ambivalence ($p = .255$ and $p = .570$, respectively) and results were also not significant when controlling for relationship satisfaction.

Given that in the diary performed sacrifices were linked to higher ambivalence, we also assessed whether the number of sacrifices participants performed in the diary study influenced thoughts of breaking up and actual break up at follow-up and whether the ambivalence experienced during the diary phase mediated this effect. We calculated the number of sacrifices performed during the diary by summing the daily sacrifices and dividing this by the number of days participants completed the daily surveys. We also calculated the mean ambivalence experienced during the diary. Given that actual breakup is a categorical dependent variable, we used the generalized estimating equations (GEE) approach for indistinguishable dyads to analyze the data (Loeys, Cook, De Smet, Wietzker, & Buysse, 2014). Results revealed that average ambivalence experienced during the diary was positively related to thoughts of breaking up ($b = .12$, $SE = .05$, 95% CI [.02, 22], $p = .022$) and to actual break up 1 year later ($b = .014$, $SE = .003$, 95% CI [.007, 0.021], $p < .001$), controlling for number of sacrifices performed during the diary. Mediation analyses revealed that the ambivalence experienced during the diary phase mediated the link between performing sacrifices and thoughts of breaking up (indirect effect = 95% CI [.0002, .2448], see Figure 1) and actual break up (indirect effect = 95% CI [.0001, .0248]).

Positive and negative reactions. In the diary, results revealed that positive feelings were not associated with participants' sacrifice or their perception of their partners' sacrifice (both $p > .316$). However, participants reported more negative feelings for their partner on days when they sacrificed ($b = .17$, $SE = .06$, 95% CI [−.28, −.06], $p = .002$). Perceived partners' sacrifice was not associated with negative feelings ($p > .136$). At the intake and follow-up sessions, participants reported less positive and more negative feelings toward their partner the more they reported to have sacrificed in the past 3 months ($b = -.07$, $SE = .03$, 95% CI [−.12, −.02], $p = .010$ and $b = .11$, $SE = .03$, 95% CI [.05, .18], $p < .001$, respectively). Positive and negative feelings were unrelated to receiving sacrifices (both ps $> .171$).

Discussion

Consistent with the hypotheses, performing sacrifices was related to experiencing higher subjective ambivalence in the daily diary. Results held when controlling for relationship satisfaction. Furthermore, results indicated that the ambivalence experienced in the diary mediated the effects of the frequency of sacrifices in the diary portion and thoughts of breaking up and actual break up 1 year later. Examining the positive and negative reactions separately, replicating Study 1, results revealed that participants' sacrifices were associated with less positive and more negative feelings toward their partner. The hypothesis that receiving sacrifice would relate to subjective ambivalence was also partially supported in this study, although some of the associations trended in the expected direction but did not reach conventional levels of significance. However, positive and negative feelings toward one's partner were not associated with receiving sacrifices.

Study 3

The first two studies had high ecological validity by examining relationship experiences as they unfold in daily life. Those studies showed that performing sacrifices is likely to elicit negative reactions, whereas the data were less consistent for receiving sacrifices. Study 2 also provided preliminary evidence that sacrifice is linked to the experience of ambivalence. Study 3 sought to replicate these findings and to gain experimental control by manipulating sacrifice and assessing the consequences for subjective ambivalence and general positive and negative feelings toward one's partner. Furthermore, in this study we expanded our investigation by including several types of positive and negative reactions which were theoretically assumed to be influenced by sacri-

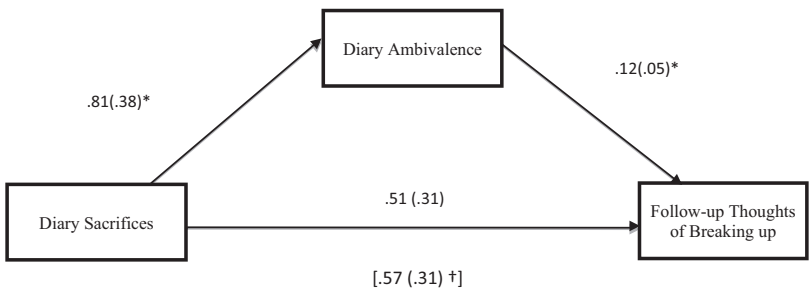

Figure 1. Ambivalence as a mediator of sacrifice and thoughts of breaking up. All reported values are unstandardized estimates (b values), with their standard errors reported between brackets. The total effect is reported between brackets [ ]. † $p < .10$. * $p < .05$.

fice (e.g., gratitude, pride, resentment, guilt; Righetti & Impett, 2017).[5]

Method

Participants. We gathered data from 338 participants (173 men and 165 women) from the online platform Amazon Mechanical Turk. Participants' mean age was 36.1 years (SD = 10.3), ranging from 18- to 74-years-old. On average, participants reported being in their current romantic relationship for 8 years (SD = 8.9 years), ranging from 2 months to 51 years. More than half of the participants (57.1%) were married, and most of the participants lived together with their partner (83.1%). The vast majority of the participants were involved in a heterosexual relationship (95.6%), and few in a homosexual relationship (4.4.%) Originally, 349 participants completed the study, but 11 participants revealed to us that they did not respond to the study seriously and indicated that we should discard their data. Participants received $1.50 for participation.

Measures and procedure. Participants were randomly assigned to one of three conditions in a between-participants design (self-sacrifice, partner-sacrifice, and control condition). In each condition, participants were asked to imagine themselves in three different scenarios and to report how they would feel in each scenario on a 7-point scale (1 = s*trongly disagree* to 7 = *strongly agree*). These scenarios regarded the participants making sacrifices (self-sacrifice condition), their partner making sacrifices (partner-sacrifice condition), or situations with no sacrifices (control condition). For example, in one of the three scenarios of the self-sacrifice condition participants read "*You and your partner are making plans for this Saturday night. You really want to go out with your best friends, as they are all available that night. You haven't seen them for a long time and were looking forward to finally catching up with them again. However, your partner has a different preference for this Saturday night. Your partner would really like to go to the movies with you and watch a new movie that (s)he has been looking forward to seeing, and that has a special premier this Saturday night. After some consideration, you decide not to go out with your friends and instead to give in to your partner's wishes to go to the movies together.*" In the partner-sacrifice condition they read "*You and your partner are making plans for this Saturday night. You would really like to go to the movies with your partner and watch a new movie that you have been looking forward to seeing, and that has a special premier this Saturday night. However, your partner has a different preference for this Saturday night. S/he really wants to go out with his/her best friends, as they are all available that night. (S)he hasn't seen them for a long time and was looking forward to finally catching up with them again. After some consideration, your partner decides not to go out with his/her friends and instead to give in to your wishes to go to the movies together.*" In the control condition they read "*You and your partner are making plans for this Saturday night. You are thinking to go to the movies with your partner and watch a new movie that has good reviews online, and that has a special premier this Saturday night. However, you know that there are only few tickets available. You go online and try to do your best to get those tickets as soon as possible.*" (see Appendix A for description of all three scenarios per condition). After each scenario, participants reported on a 7-point Likert scale (0 = *not at all* to 6 = *extremely*) their negative (three items; "distressed," "upset," and "bad"; α = .91) and positive mood (three items; "happy," "good," and "relieved"; α = .91). They also reported on some specific emotional reactions, such as whether they would feel "guilty," "proud," "grateful," "exploited," "appreciated," "in debt," "resentful." Finally, they also reported on having "mixed feelings" as a measure of subjective ambivalence. Further, we asked about the likelihood that the participant would make a self-sacrifice the next time they encounter a divergence of interest with their partner (three items; e.g., "I will be the one to sacrifice my preferences," α = .91). Finally, participants answered several demographic questions, and were given an honesty check in which we asked them whether they replied honestly to the questions in the study or whether we should discard their data because they provided some random responses. We also reassured them that they would be paid for the study regardless of their answer to this question. At the very end they were paid and debriefed.

Results

Analysis strategy. For each condition, each emotional reaction was averaged across the three scenarios (αs ranged from .62 to .85). To test the hypotheses that self-sacrifice would trigger ambivalence and an enhancement in both positive and negative emotional reactions as compared with control, we computed a dummy variable to assess this contrast (0 = *self-sacrifice*, 1 = *control*). To test the hypotheses that partner-sacrifice would trigger ambivalence and an enhancement in both positive and negative reactions as compared with control, we computed a dummy variable to assess this contrast (0 = *partner-sacrifice*, 1 = *control*). Comparisons among all the three conditions (including comparisons between self-sacrifice and partner-sacrifice) are reported in Table 1. Analysis of variance (ANOVA) was used to test the differences between conditions. Means and standard deviations of all the dependent variables can be found in Table 1.

Subjective ambivalence. Participants reported more ambivalence in the self-sacrifice condition than in the control condition, $F(1, 225) = 22.69$, $p < .001$, $d = .64$. Similarly, participants reported more ambivalence in the partner-sacrifice condition than in the control condition, $F(1, 222) = 18.25$, $p < .001$, $d = .57$.

Positive and negative reactions. Regarding the comparison between the self-sacrifice and control conditions, participants reported greater negative mood *and* lower positive mood in the self-sacrifice condition than in the control condition, $F(1, 225) = 16.50$, $p < .001$, $d = .54$, and $F(1, 225) = 13.81$, $p < .001$, $d = .50$, respectively. Participants also felt more guilty, exploited, and resentful in the self-sacrifice condition than in the control condition, $F(1, 225) = 18.66$, $p < .001$, $d = .58$, $F(1, 225) = 22.05$, $p < .001$, $d = .63$, and $F(1, 225) = 15.70$, $p < .001$, $d = .53$, respectively. Finally, participants felt less proud and grateful in the self-sacrifice condition than in the control condition, $F(1, 225) = 5.89$, $p = .016$, $d = .32$, and $F(1, 225) = 9.01$, $p = .003$, $d = .40$, respectively. Participants did not differ in feelings of indebtedness or appreciation between the two conditions, $p = .268$ and $p = .137$, respectively.

Regarding the comparison between the partner-sacrifice and control condition, participants reported greater negative mood, felt

[5] In this study we did not assess relationship satisfaction.

Table 1
Means and Standard Deviations for All the Dependent Variables for Self-Sacrifice, Control, and Partner-Sacrifice Condition in Study 3

	Self-sacrifice		Control		Partner-sacrifice	
Variables	*M*	*SD*	*M*	*SD*	*M*	*SD*
Ambivalence	3.77[a]	1.51	2.79[b]	1.59	3.71[a]	1.64
Negative feelings	2.91[a]	1.21	2.27[b]	1.11	3.06[a]	1.08
Positive feelings	3.94[a]	1.16	4.45[b]	1.17	4.59[b]	1.14
Negative mood	3.07[a]	1.36	2.38[b]	1.18	3.14[a]	1.34
Positive mood	4.05[a]	1.21	4.64[b]	1.19	4.50[b]	1.23
Guilty	2.74[a]	1.26	2.06[b]	1.11	3.90[c]	1.63
Proud	3.86[a]	1.21	4.26[b]	1.31	3.75[a]	1.48
Grateful	3.59[a]	1.39	4.14[b]	1.42	5.18[c]	1.35
Exploited	2.99[a]	1.44	2.16[b]	1.19	2.18[b]	1.33
Appreciated	4.06[a]	1.43	4.34[a]	1.47	5.09[b]	1.33
In debt	2.39[a]	1.31	2.20[a]	1.33	3.82[b]	1.62
Resentful	3.07[a]	1.46	2.32[b]	1.41	2.13[b]	1.24
Future sacrifice	4.34[a]	1.59	4.70[b]	1.24	5.14[c]	1.31

Note. Means within one row (i.e., self-sacrifice, control, and partner-sacrifice) with different superscripts are significantly different.

more guilt, and felt more in debt in the partner-sacrifice condition than in the control condition, $F(1, 222) = 19.76$, $p < .001$, $d = .60$, $F(1, 222) = 98.27$, $p < .001$, $d = 1.33$, and $F(1, 222) = 67.11$, $p < .001$, $d = 1.10$, $d = .54$, respectively. They also felt less proud in the partner-sacrifice condition than in the control condition, $F(1, 222) = 7.45$, $p = .007$, $d = .36$. However, they felt more grateful and more appreciated in the partner-sacrifice condition than in the control condition, $F(1, 222) = 31.12$, $p < .001$, $d = .75$, $F(1, 222) = 15.86$, $p < .001$, $d = .54$, respectively. Participants did not differ in feelings of positive mood, exploitation, or resentment between the two conditions, $p = .384$, $p = .943$, and $p = .294$, respectively.

Future sacrifice. Participants reported they would be less likely to sacrifice at the next divergence of interest in the self-sacrifice condition than in the control condition, $F(1, 225) = 3.68$, $p = .056$, $d = .26$. In contrast, participants reported that they would be more likely to sacrifice in the future in the partner-sacrifice condition than in the control condition, $F(1, 222) = 6.73$, $p = .010$, $d = .35$.

Discussion

Participants reported greater subjective ambivalence when thinking about a self-sacrifice and a partner-sacrifice as compared with control. Furthermore, participants reported an enhancement of some specific positive *and* negative reactions in the partner-sacrifice condition as compared with control. Specifically, when participants thought about receiving a sacrifice, they reported greater gratitude and appreciation but also more guilt and indebtedness. Furthermore, they reported that they would be more likely to reciprocate and be the one to sacrifice at the next divergence of interests in their relationship. However, although participants in the self-sacrifice condition reported greater ambivalence than those in the control condition, we could not detect the specific positive reactions associated with performing a sacrifice. In fact, participants reported worse general mood, greater feelings of exploitation, resentment, guilt, and lower feelings of gratitude and pride in the self-sacrifice condition than in the control condition. Although we did not hypothesize that people would experience enhanced guilt after performing a sacrifice, it may be possible that participants felt guilty for giving up the pursuit of their own personal goals. The only potential positive aspect of performing a sacrifice that was detected in this study is that participants reported that, at the next divergence of interest, they would be less likely to sacrifice while their partner would be more likely to do so, signaling an expectation of reciprocation.

Study 4

Study 3 showed that when people imagined either making or receiving a sacrifice from their partner, they reported greater subjective ambivalence. Furthermore, Study 3 identified some specific positive and negative emotional reactions that are enhanced when receiving a sacrifice (e.g., gratitude and guilt). However, while this study identified some negative reactions related to performing a sacrifice, it failed to show potential positive ones. One possibility for this may be that participants were asked to imagine making a sacrifice, but were not specifically asked to anticipate the partner's reaction. It may be possible that when people perform a sacrifice (and it is recognized by the partner), they may experience positive affect from observing the partner's reaction (e.g., seeing their partner happy, seeing that their partner expresses gratitude). Thus, to overcome this limitation and increase realism, we sought to replicate the previous study by asking participants to recall a real sacrifice episode that occurred in the past in their relationship. We then assessed subjective ambivalence, and the specific positive and negative emotional reactions as in Study 3.

Method

Participants. We gathered data from 399 participants (282 female, 116 male), who were on average 37.5 years old ($SD = 11.6$). Participants were recruited from the online platform Prolific. In terms of nationality, 79.7% were United Kingdom citizens, and 20.3% were U.S. citizens. Of those, 53.4% were married and 88.5% lived together. Our sample consisted of 95.7% heterosexual and 4.3% homosexual couples. On average, participants had been together with their partner for 11.9 years ($SD = 12.2$). Originally, 424 participants completed the study but five participants had to be excluded because they indicated they had not answered our questions honestly and accurately, and an additional 20 participants were excluded based on not having followed our manipulation correctly (e.g., they did not describe a real self- or partner-sacrifice in the two sacrifice conditions, or described an insufficiently neutral experience in the control condition). Participants received 1.00£ for completing the study.

Measures and procedure. Participants were randomly assigned to one of three conditions in a between-participants design (self-sacrifice, partner-sacrifice, and control condition). In each condition, participants were asked to recall an experience with their partner and to report how they felt in that experience. In the *self-sacrifice condition*, we asked participants to recall a time (in the last t3 months) in which they sacrificed for their partner (i.e., a time when they did something they did not want or like to do, or

gave up something they wanted or liked to do for their partner). In the *partner-sacrifice condition*, we asked participants to recall a time (in the last 3 months) in which their partner sacrificed for them (i.e., a time when their partner did something they did not want or like to do, or gave up something they wanted or liked for them). Finally, in the *control condition*, we asked participants to recall an average evening out with their partner, in which nothing particularly positive or negative happened. In all three conditions, participants were asked to describe this experience in detail.

Subsequently, we assessed how much ambivalence participants experienced following the event. Specifically, we assessed subjective ambivalence using three items adapted from Priester and Petty (1996): "In the situation you just described, to what extent . . ." (three items; "Did you feel conflicted towards your partner?"; "Did you have mixed feelings about your partner?"; "Were your feelings towards your partner both positive and negative at the same time?"; $\alpha = .89$). Items were rated on a 7-point scale (1 = *not at all* to 7 = *extremely*).

After that we assessed the positive and negative reactions elicited from a sacrifice. We asked participants to reply to two items "In the situation you just described, considering only the POSITIVE feelings you felt toward your partner, and ignoring the negative ones, how positive would you say your feelings toward them were?" and "In the situation you just described, considering only the NEGATIVE feelings you felt toward your partner, and ignoring the positive ones, how negative would you say your feelings toward them were?" Items were rated on a 6-point scale (1 = *not positive/negative at all* to 6 = *extremely positive/negative*). Participants also reported the specific emotional reactions that they experienced in that episode on a 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*). Specifically, participants reported their negative (three items; "distressed," "upset," and "bad"; $\alpha = .91$) and positive mood (three items; "happy," "good," and "relieved"). They also reported on specific emotional reactions they experienced toward themselves or their partner ("guilty," "grateful towards my partner," "exploited by my partner," "appreciated by my partner," "indebted to my partner," "resentful toward my partner," "proud of myself," and "happy for my partner"). Participants also reported on a 7-point scale the likelihood of a future sacrifice (one item; "In the future, if you and your partner encountered a situation in which your preferences were different [e.g., one of you wants to watch a comedy and the other wants to watch a horror movie], how likely do you think it is that . . ." [0 = *My partner would be the one to sacrifice*, 4 = *We are both equally likely to be the one to sacrifice*, 7 = *I would be the one to sacrifice*]). Finally, participants reported on their relationship satisfaction with three items from the Rusbult, Martz, and Agnew (1998) scale ($\alpha = .94$), as well as completed a number of demographic variables and an honesty check as in Study 3.

Results

Analysis strategy. As in Study 3, to test the hypotheses that self-sacrifice would trigger ambivalence and an increase in both positive and negative reactions as compared with control, we computed a dummy variable to assess this contrast (0 = *self-sacrifice*, 1 = *control*). To test the hypotheses that partner-sacrifice would trigger ambivalence and an increase in both positive and negative emotional reactions as compared with control, we computed a dummy variable to assess this contrast (0 = *partner-sacrifice*, 1 = *control*). Comparisons among all the three conditions (including comparisons between self-sacrifice and partner-sacrifice) are reported in Table 2. ANOVA was used to test the differences among conditions. Means and standard deviations of all the dependent variables are shown in Table 2.

Subjective ambivalence. Participants reported greater ambivalence in the self-sacrifice condition than in the control condition, $F(1, 271) = 109.06$, $p < .001$, $d = 1.27$. Participants also reported greater ambivalence in the partner-sacrifice condition than in the control condition, $F(1, 261) = 6.52$, $p = .011$, $d = .31$. We also ran the above analyses controlling for relationship satisfaction. Consistent with the previous results, when controlling for relationship satisfaction, participants reported greater ambivalence in the self-sacrifice condition than in the control condition, $F(1, 271) = 101.90$, $p < .001$, $d = 1.23$. For receiving a sacrifice, results did not change when controlling for relationship satisfaction, $F(1, 260) = 7.03$, $p = .009$, $d = .33$.

Positive and negative reactions. As in Study 3, regarding the comparison between the self-sacrifice and control condition, participants reported greater negative mood and lower positive mood in the self-sacrifice condition than in the control condition, $F(1, 271) = 80.92$, $p < .001$, $d = 1.09$, and $F(1, 271) = 110.36$, $p < .001$, $d = .1.23$, respectively. Participants also reported greater negative feelings toward their partner and lower positive feelings in the self-sacrifice condition than in the control condition, $F(1, 271) = 81.21$, $p < .001$, $d = 1.09$, and $F(1, 271) = 86.41$, $p < .001$, $d = .1.10$, respectively. Participants also felt more guilty, exploited, and resentful in the self-sacrifice condition than in the control condition, $F(1, 271) = 34.68$, $p < .001$, $d = .70$, $F(1, 271) = 45.11$, $p < .001$, $d = .81$, and $F(1, 271) = 52.95$, $p < .001$, $d = .87$, respectively. Finally, participants felt less grateful toward and less appreciated by the partner in the self-sacrifice condition than in the control condition, $F(1, 271) = 99.16$, $p < .001$, $d = 1.21$, and $F(1, 271) = 13.65$, $p < .001$, $d = .45$, respectively.

Table 2
Means and Standard Deviations for All the Dependent Variables for Self-Sacrifice, Control, and Partner-Sacrifice Condition in Study 4

	Self-sacrifice		Control		Partner-sacrifice	
Variables	*M*	*SD*	*M*	*SD*	*M*	*SD*
Subjective ambivalence	3.37^{a}	1.53	1.72^{b}	1.04	2.10^{c}	1.41
Negative feelings	3.46^{a}	1.55	1.94^{b}	1.22	1.66^{b}	1.22
Positive feelings	4.68^{a}	1.45	6.12^{b}	1.04	6.39^{c}	1.03
Negative mood	2.71^{a}	1.59	1.35^{b}	.79	2.13^{c}	1.36
Positive mood	3.19^{a}	1.29	4.78^{b}	1.22	5.19^{c}	1.37
Guilty	2.34^{a}	1.56	1.45^{b}	.81	3.52^{c}	1.63
Proud	3.78^{a}	1.76	3.64^{a}	1.87	2.82^{a}	1.79
Grateful	2.88^{a}	1.55	4.86^{b}	1.72	6.26^{c}	1.27
Exploited	2.40^{a}	1.57	1.37^{b}	.86	1.38^{b}	.89
Appreciated	4.30^{a}	1.88	5.09^{b}	1.63	5.47^{c}	1.63
In debt	1.98^{a}	1.42	2.10^{a}	1.65	3.51^{b}	2.05
Resentful	2.60^{a}	1.66	1.42^{b}	.92	1.41^{c}	.97
Future sacrifice	4.23^{a}	1.44	4.34^{a}	1.35	4.25^{a}	1.40

Note. Means within one row (i.e., self-sacrifice, control, and partner-sacrifice) with different superscripts are significantly different.

Participants did not differ in feelings of pride or indebtedness between the two conditions, $p = .512$ and $p = .505$, respectively.

Regarding the comparison between the partner-sacrifice and control condition, participants reported greater negative mood, felt more guilt, and more in debt in the partner-sacrifice condition than in the control condition, $F(1, 261) = 33.31$, $p < .001$, $d = .70$, $F(1, 261) = 135.75$, $p < .001$, $d = 1.44$, and $F(1, 261) = 37.86$, $p < .001$, $d = .77$, respectively. They also felt less proud in the partner-sacrifice condition than in the control condition, $F(1, 261) = 13.12$, $p < .001$, $d = .45$. Regarding the positive reactions, they also experienced higher positive feelings toward their partner, more positive mood, more gratitude toward, and more appreciation from their partner in the partner-sacrifice condition than in the control condition, $F(1, 261) = 4.52$, $p = .034$, $d = .26$, $F(1, 261) = 6.50$, $p = .011$, $d = .31$, $F(1, 261) = 55.39$, $p < .001$, $d = .92$, and $F(1, 261) = 3.60$, $p = .059$, $d = .24$, respectively. As in the previous study, participants did not differ in feelings of exploitation or resentment between the two conditions, $p = .936$ and $p = .927$, respectively.

Future sacrifice. Participants did not report less willingness to sacrifice next in the self-sacrifice condition than in the control condition, $p = .523$. Similarly, they did not report being more willing to sacrifice next in the partner-sacrifice condition than in the control condition, $p = .596$.

Discussion

Results of this study showed that people reported greater subjective ambivalence when recalling a previous sacrifice they had made for their partner and greater subjective ambivalence when recalling a sacrifice their partner had made for them, compared with when people recalled a neutral situation in their relationship. Examining the specific emotional reactions that people experienced after a sacrifice, participants reported an enhancement in both positive and negative reactions in the partner-sacrifice as compared with the control condition. Specifically, replicating Study 3, after recalling receiving a sacrifice, participants reported greater positive mood, greater positive feelings toward their partner, greater gratitude, and appreciation, but also greater negative mood, guilt, and indebtedness. Furthermore, similar to Study 3, although participants in the self-sacrifice condition reported greater ambivalence than in the control condition, we could not detect the specific positive emotional reactions associated with performing a sacrifice. In fact, participants reported worse general mood and feelings, greater feelings of exploitation, resentment, guilt, less gratitude toward their partner, and lower appreciation from their partner in the self-sacrifice condition than in the control condition. In this study, recalling a past sacrifice did not influence expectations of reciprocation in the near future. This may be due to the fact that in this study participants recalled a sacrifice that occurred in the past three months and, in the meantime, their partner may have already reciprocated this sacrifice.

Study 5

All of the previous studies showed that performing and receiving sacrifices both predicted increased feelings of ambivalence toward a romantic partner. Studies 3 and 4 also showed the specific positive and negative emotional reactions that are enhanced when receiving a sacrifice. However, those studies failed to reveal the specific positive reactions that may be enhanced after performing a sacrifice. Perhaps this is because the emotional reactions were assessed in too generic terms, while the positive reactions associated with performing a sacrifice were more specific. To remedy this limitation, before conducting our final study, we conducted a pilot study in which we asked participants to think about and list all the positive and negative reactions that are involved in performing a sacrifice. We then coded these replies to generate more fine-grained measures of positive and negative reactions elicited by performing a sacrifice. Finally, in Study 5, we tested whether performing sacrifices would enhance those specific positive reactions.

Method

Pilot study. In an online study conducted on Prolific, we asked 52 participants (44 females, eight males; *M*age = 34.73 ± 9.32 years) who were in a relationship for longer than 3 months to recall a time when they made a sacrifice for their partner (identical to the instruction used in the self-sacrifice condition in Study 4), and asked them to list five reasons why they had felt good about sacrificing, as well as five reasons why they had felt bad about sacrificing. Participants were paid 0.50£ for completing the study. After this, their responses were coded by three independent raters and used to create distinct categories of positive and negative reactions related to sacrificing for one's partner, which were then used to formulate more precise reaction items for Study 5 (see Appendix Table B1).

Participants. We recruited 242 participants (162 females, 80 males) from Prolific. Participants were on average 36.5-years-old ($SD = 11.6$). In terms of nationality, 78.9% of participants were from the United Kingdom, and 21.1% were U.S. citizens. About half of the sample (52.9%) was married. The majority of couples (86.8%) were living together and in a heterosexual relationship (92.6%). Participants had been together with their partner for an average of 11.5 years ($SD = 10.9$). Originally, 258 participants completed the study but three participants had to be excluded because they indicated they had not answered our questions honestly and accurately, and an additional 13 participants were excluded based on not having followed our manipulation correctly (e.g., they did not describe a real sacrifice in the sacrifice condition, or described an insufficiently neutral shopping experience in the control condition). Participants received 1.00£ for completing the study.

Measures and procedure. Participants were randomly assigned to one of two conditions in a between-participants design (self-sacrifice vs. control condition). In each condition, participants were asked to recall an experience with their partner and to report how they felt in that experience. In the *self-sacrifice condition*, we asked participants to recall a time (in the last 3 months) in which they sacrificed for their partner as in Study 4. In the *control condition*, we asked participants to recall an instance in which they went grocery shopping with their partner in which nothing particularly positive or negative happened. In both conditions, participants were asked to describe this experience in detail.

After recalling the episode, we assessed subjective ambivalence as in Study 4. Subsequently, participants replied to questions about specific positive and negative reactions. First they replied to general positive and negative feelings about their partner as in Study 4, then we assessed the reactions that were generated based on the

pilot study (see Appendix Table B1). Specifically, participants reported on nine possible positive reactions, including *feeling good from benefitting the partner* (two items; e.g., "I felt good to make my partner happy"; $\alpha = .85$), *benefitting the relationship* (three items; e.g., "I felt good about benefiting the relationship"; $\alpha = .83$), *avoiding a conflict* (one item; "I felt good because I made the interaction with my partner easy (we did not have to argue, discuss, or have a conflict)", and *expecting a future sacrifice* (two items; e.g., "I felt good because I know next time my partner will make a sacrifice for me"; $\alpha = .55$). They also reported on whether they experienced *love* (one item; "I felt love for my partner"), *pride* (three items; e.g., "I felt that I was a good person/partner"), *appreciation* (one item; "I felt appreciated by my partner"; $\alpha = .72$), *self-expansion* (one item; "I felt like I was gaining new experiences"), and *long-term benefits*) (two items; e.g., "I felt like I was benefitting myself in the long run"; $\alpha = .64$).

Participants also reported on eight possible negative reactions, such as feeling in a *bad mood* (one item; "That episode put me in a bad mood"), experiencing *goal blockage* (one item; "I felt bad because I could not pursue my own goals/preferences"), and incurring *practical costs* (one item; "I felt bad because I had some practical costs; e.g., waste of time, energy, money etc."). They also reported the extent to which they felt *powerlessness* (one item; "I felt weak and like I had less power in the relationship"), *guilt* (one item; "I felt guilty"), *resentment* (one item; "I felt resentful"), *unappreciated* (one item; "I felt underappreciated"), and *exploited* (two items; e.g., "I felt exploited"; $\alpha = .91$). Participants then filled out the relationship satisfaction measure used in the previous studies ($\alpha = .94$), and completed several demographic variables. Finally, they filled out an honesty check as in Study 3, were debriefed, and paid.

Results

Subjective ambivalence. Participants reported greater ambivalence, $F(1, 240) = 52.85$, $p < .001$, $d = .94$ in the self-sacrifice condition than in the control condition. Means and standard deviations can be found in Table 3. We also ran the above analyses controlling for relationship satisfaction. Consistent with the previous results, when controlling for relationship satisfaction, participants reported greater ambivalence, $F(1, 239) = 57.98$, $p < .001$, $d = .98$, in the self-sacrifice condition than in the control condition.

Positive and negative reactions. Regarding positive feelings, participants reported higher levels of feeling good about benefitting the partner and the relationship in the self-sacrifice condition than in the control condition $F(1, 240) = 8.74$, $p = .003$, $d = .38$, and $F(1, 240) = 4.59$, $p = .033$, $d = .28$. They also felt good about expecting that their partner will sacrifice next and greater pride in the self-sacrifice than in the control condition, $F(1, 240) = 8.16$, $p = .005$, $d = .37$, and $F(1, 240) = 11.79$, $p = .001$, $d = .44$. However, they did not report greater love ($p = .769$), appreciation ($p = .345$), self-expansion ($p = .192$), beneficial long-term outcomes ($p = .876$), or conflict avoidance ($p = .224$) in the self-sacrifice than in the control condition. Regarding general positive feelings toward their partner, they reported lower positive feelings in the self-sacrifice condition than in the control condition $F(1, 240) = 11.88$, $p = .001$, $d = .44$. Means and standard deviations of the positive feelings can be found in Table 3.

Regarding the negative emotions, participants reported greater negative feelings toward their partner $F(1, 240) = 49.95$, $p < .001$, $d = .91$, greater negative mood, $F(1, 240) = 37.94$, $p < .001$, $d = .80$, feeling bad because of goal blockage, $F(1, 240) = 33.03$, $p < .001$, $d = .74$, and practical costs, $F(1, 240) = 18.04$, $p < .001$, $d = .55$ in the self-sacrifice than in the control condition. Furthermore, participants felt more guilty, $F(1, 240) = 8.29$, $p = .004$, $d = .37$, powerless, $F(1, 240) = 10.67$, $p < .001$, $d = .42$, resentful, $F(1, 240) = 16.40$, $p < .001$, $d = .52$, unappreciated $F(1, 240) = 15.27$, $p < .001$, $d = .50$, and exploited $F(1, 240) = 14.04$, $p < .001$, $d = .48$, in the self-sacrifice than in the control condition. Means and standard deviations of the negative feelings can be found in Table 4.

Table 3
Means and Standard Deviations for Ambivalence and Positive Reactions in Study 5

Variables	Self-sacrifice		Control	
	M	*SD*	*M*	*SD*
Subjective ambivalence	3.12[a]	1.21	2.00[b]	1.18
Positive feelings	4.89[a]	1.53	5.51[b]	1.26
Benefitting partner	5.75[a]	1.18	5.31[b]	1.16
Benefitting relationship	4.94[a]	1.34	4.59[b]	1.17
Love	5.50[a]	1.52	5.44[a]	1.41
Pride	4.94[a]	1.18	4.44[b]	1.05
Appreciation	5.23[a]	1.64	5.04[a]	1.53
Self-expansion	3.57[a]	1.79	3.28[a]	1.68
Benefits for long-term outcomes	4.63[a]	1.42	4.60[a]	1.19
Expectation of partner sacrifice	3.89[a]	1.42	3.38[b]	1.34
Conflict avoidance	4.49[a]	1.69	4.21[a]	1.83

Note. Means within one row (i.e., self-sacrifice vs. control) with different superscripts are significantly different.

Discussion

Replicating the previous studies, results revealed that when people recalled a sacrifice they had made for their romantic partner in the past three months, they reported greater subjective ambivalence than those in a control condition who recalled a neutral activity. Using a more fine-grained assessment of positive and negative reactions to sacrifice, we were able to identify several positive and negative reactions. Specifically, results revealed that after performing a sacrifice, participants felt good about having benefitted the partner and the relationship. They also felt good because they anticipated that their partner would reciprocate the sacrifice in the future, and they felt proud for having behaved as a good person. However, the general positive feelings toward their partner were lowered. This may mean that although several positive reactions were identified when specifically asked, these reactions may not be very salient overall as they did not seem to positively influence the overall positive feelings toward one's partner. Results also revealed that, participants felt bad because they could not pursue their own goals and preferences and also because of the practical costs they had to incur. They also felt less powerful in the relationship, exploited, underappreciated, guilty, resentful, and experienced more negative feelings toward their partner (see Appendix Table B2).

Table 4
Means and Standard Deviations for Negative Reactions in Study 5

Variables	Self-sacrifice		Control	
	M	*SD*	*M*	*SD*
Negative mood	3.22[a]	1.79	1.95[b]	1.41
Negative feelings	3.41[a]	1.58	2.09[b]	1.32
Goal blockage	3.34[a]	1.94	2.15[b]	1.56
Practical costs	3.47[a]	1.93	2.50[b]	1.64
Guilt	2.16[a]	1.39	1.68[b]	1.16
Powerlessness	2.51[a]	1.72	1.87[b]	1.30
Resentment	2.81[a]	1.79	1.96[b]	1.47
Underappreciation	2.84[a]	1.83	1.99[b]	1.56
Unfairness/exploitation	2.43[a]	1.64	1.75[b]	1.18

Note. Means within one row (i.e., self-sacrifice vs. control) with different superscripts are significantly different.

Meta-Analytic Summary

We hypothesized that both performing and receiving sacrifices would increase feelings of ambivalence and would lead to a mix of both positive and negative reactions. Consistent with the hypotheses, in all of the studies in which we assessed subjective ambivalence, we found that people reported to have more mixed feelings toward their partner when a sacrifice occurred (with the exception of at the intake session in Study 2). However, when we assessed the specific positive and negative reactions separately, results were not always consistent with the hypotheses. Therefore, we conducted a meta-analysis of the results across studies of the positive and negative reactions that we hypothesized to be linked to performing and receiving a sacrifice.

Analyses were conducted using the MAJOR approach in Jamovi. We used the correlation as the measure of effect size. For each study, we calculated the mean effect size of the hypothesized positive and negative reactions. Specifically, for the positive reactions of performing a sacrifice, when available in each study, we calculated the mean of positive feelings toward one's partner, positive mood, pride, and all the positive reactions assessed in Study 5. For the negative reactions of performing a sacrifice we calculated the mean of negative feelings toward one's partner, negative mood, feelings of resentment and exploitation, and all the negative reactions assessed in Study 5. For the positive reactions of receiving sacrifice we calculated the mean of positive feelings toward one's partner, positive mood, gratitude, and feeling appreciated. For the negative reactions of receiving sacrifice we calculated the mean of negative feelings toward one's partner, negative mood, feeling guilty, and in debt. Results revealed that when performing sacrifices, participants reported lower positive, $r = -.12$, $p = .038$, 95% CI [−.241, −.007], and higher negative reactions, $r = .31$, $p < .001$, 95% CI [.19, .42]. When receiving sacrifices, participants reported higher positive, $r = .11$, $p = .049$, 95% CI [.001, .22], and negative reactions, $r = .27$, $p = .003$, 95% CI [.09, .45].

General Discussion

In four of our five studies we found that people experienced higher ambivalence toward their partner when a sacrifice occurred as compared with when it did not occur. Participants reported having greater mixed feelings toward their partner when enacting as well as when receiving a sacrifice. The effect of sacrifice on ambivalence also held when controlling for relationship satisfaction. Furthermore, in Study 2 we showed that feeling ambivalent because of sacrifices had downstream consequences for the stability of the relationship. Specifically, we found that when people performed sacrifices, the ambivalence they experienced was linked to thoughts of breaking up and actual breakup, assessed 1 year later. Thus, the frequency of sacrifices can have severe long-term consequences for the stability of the relationship via increased feelings of ambivalence toward one's partner.

We also performed a comprehensive analysis of the specific positive and negative reactions that are elicited by performing a sacrifice and by receiving a sacrifice. For receiving sacrifices, consistent with the hypotheses, we found that people experienced both positive *and* negative reactions, such as higher positive mood, gratitude, and appreciation on the one hand, but also higher negative mood, guilt, and indebtedness on the other. The results of the meta-analysis also highlighted that, overall, people experienced both positive and negative reactions when they received a sacrifice. For performing sacrifices, the majority of the studies mainly revealed negative reactions. Specifically, participants reported greater negative mood and feelings toward their partner, less positive mood, and feeling more exploited, resentful, and guilty. In Study 5, when we used more fine-grained measures, performing a sacrifice also showed an increase in positive reactions, such as feeling happy from benefitting the partner and the relationship, feeling proud to be a good partner, and expecting one's partner to reciprocate the sacrifice. However, the results of the meta-analysis across studies showed that performing a sacrifice was linked to an overall increase in negative reactions and an overall decrease in positive reactions.

Our work shows that sacrifice in close relationships is not inconsequential. Although previous research has not found a robust link between sacrifice and relationship well-being (e.g., Righetti et al., 2019), our work instead shows that, rather than being inconsequential, sacrifice has important aftermaths: People experience several reactions and greater ambivalence toward their partner. We hypothesized that feelings of ambivalence would originate from experiencing both positive and negative reactions after a sacrifice. Results were mainly consistent with this idea regarding receiving sacrifices. Across studies, participants experienced both positive (e.g., gratitude) and negative (e.g., guilt) reactions. However, for performing a sacrifice our data were less conclusive. While people reported experiencing ambivalence after performing a sacrifice, it may be that these mixed feelings were the result of an increase in negative affect toward an attitude object (the partner) that is usually positively evaluated. In fact, across studies, people reported more negative and *less* positive reactions after performing a sacrifice. Nonetheless, our work also shows that, although the majority of the reactions may be negative, there are also some very specific positive reactions that may increase after performing a sacrifice (i.e., being happy for their partner and feeling proud of being a good partner).

An important question for future research is to examine the concurrent and longitudinal implications of feeling ambivalent toward one's partner for the individual and the relationship. Previous research has found that interpersonal ambivalence (at least in

the context of parents and adult children) is highly distressing (e.g., Fingerman et al., 2008) and work on romantic relationships has linked feelings of ambivalence toward one's partner to important health outcomes, such as higher blood pressure (Birmingham et al., 2015), coronary artery calcification (Uchino et al., 2014), and inflammation (Uchino et al., 2013). Thus, repeated sacrifices may chronically alter feelings of ambivalence toward a romantic partner with detrimental consequences for health and well-being.

Furthermore, although not much is known about how ambivalence affects relationship dynamics, our findings suggest that ambivalence may have negative consequences for relationship stability. Specifically, we found that subjective ambivalence experienced during the sacrifices in the diary study was related to thoughts of breaking up and actual break up 1 year later. Ambivalence typically motivates people to reduce their conflict by trying to form a univalent (positive or negative) evaluation through information processing strategies (e.g., Maio et al., 1996; van Harreveld, van der Pligt, & de Liver, 2009). It is possible that because negative affect generally carries more psychological weight than positive affect (Baumeister et al., 2001), negative evaluations may exert a greater influence in forming the univalent attitude when both positive and negative affect are experienced simultaneously. Thus, over time, when people repeatedly try to solve their ambivalence, they may inadvertently move their attitude toward their partner in a negative direction, with detrimental consequences for the relationship.

Furthermore, the present research extends prior work by examining several positive and negative reactions to sacrifice. While previous work has mostly looked at how receiving sacrifices affects gratitude (Visserman et al., 2018, 2019), we have shown that gratitude is only one of the several simultaneous reactions that people experience and that feelings of appreciation, indebtedness, and guilt also accompany this emotion. Furthermore, our work has also unraveled the specific reactions experienced after performing a sacrifice, with feelings of exploitation, resentment, underappreciation, powerlessness, and guilt (perhaps toward the self) arising. However these negative reactions are also accompanied by feelings of pride for being a good and supportive partner, happiness from being able to benefit the partner, and hope that the partner will reciprocate the sacrifice in the future.

Our work also has implications for the study of prosocial behavior. While previous research has found that prosocial behavior has generally positive effects on people's relationships and personal well-being (e.g., Aknin et al., 2013; Aknin, Broesch, Hamlin, & Van de Vondervoort, 2015; Dunn, Aknin, & Norton, 2008), our work shows that sacrifice is a particular type of prosocial behavior that is not always beneficial. As compared with other forms of prosocial behavior, sacrifice requires that individuals subordinate their own goals for the partner/relationship, thus it is a prosocial behavior that entails costs for oneself (e.g., Impett & Gordon, 2008). Clearly, the costs of prosocial behavior vary in a continuous manner, with some behaviors not involving any costs, while others being extremely costly. Our work shows that to the extent that pro-social behavior entails some costs, such as in sacrifices, people do not only experience positive outcomes, but also negative ones. Future research should examine how ambivalence is influenced by the costs of prosocial behavior and whether there are some forms of prosocial behavior that are completely free from ambivalence.

Furthermore, Study 3 suggested that people expected sacrifices to be reciprocated, although this result was not replicated in Study 4. Specifically, in Study 3, when people reported to have sacrificed, they expected their partner to sacrifice at the next divergence of interest, and when people received a sacrifice, they felt indebted and expected to be the one to sacrifice next. These findings have implications for theories on communal and exchange relationships (e.g., Clark & Mills, 1993) as they show that, although romantic relationships are typically characterized by high communal orientation (e.g., Clark & Mills, 2011), when it comes to sacrifices, partners still hold strong reciprocation (i.e., exchange type) norms. Future research should investigate whether these reciprocation norms are particularly salient in prosocial behaviors that are costly (such as in sacrifices) as compared with other forms of, less costly, prosocial behaviors.

Finally, it would be also interesting to explore the conditions under which people experience mostly positive or negative reactions to sacrifice. For example, individuals who are very low in empathic concern may experience high levels of gratitude and positive affect from receiving a sacrifice without experiencing guilt or negative affect because their partner is giving up their preferences. Conversely, individuals who score very high in communal orientation may be so genuinely happy to benefit their partner (Kogan et al., 2010) that they may not experience any resentment and frustration from not being able to fulfill their own goals.

Strengths and Limitations

Before concluding, we should acknowledge some strengths and limitations of the current work. First, we only tested our research questions in Western samples (Dutch, American, and English), and we should be cautious in generalizing the present findings to other cultures. For example, our samples belonged to individualistic cultures (Hofstede, 2001), which are likely to emphasize the importance of pursuing personal goals and preferences (Markus & Kitayama, 1991; Singelis, 1994). Thus, the negative aspects of sacrifice may be especially salient among those from cultures that highly value the achievement of these goals. On the contrary, in interdependent cultures, where there is a major focus on close others and relationships (Markus & Kitayama, 1991; Singelis, 1994), people may not feel ambivalent after a sacrifice because these behaviors are perceived as less damaging to the self and more beneficial to the relationship.

Another important cultural aspect that may play a role in the experience of ambivalence after a sacrifice is dialectical thinking (i.e., the tolerance for holding apparently contradictory thoughts and emotions; Peng & Nisbett, 1999). Western cultures are considered to have lower dialectical thinking than Eastern cultures. In fact, westerners perceive positive and negative affect as mutually exclusive and may be less likely to report the coexistence of these two affective states (Spencer-Rodgers, Peng, & Wang, 2010). On the contrary, East Asian cultures, which are influenced by Buddhist, Taoist, and Confucian philosophies, tend to adopt a more holistic vision in which the presence of opposite emotions is less likely to be seen as contradictory (Spencer-Rodgers et al., 2010). As a result, East Asians are more likely to report the experience of mixed emotions than Westerners (Schimmack, Oishi, & Diener, 2002; Spencer-Rodgers, Boucher, Mori, Wang, & Peng, 2009). In

relation to sacrifice, it may be that East Asians are especially likely to experience ambivalence after a sacrifice. However, it may also be that because they feel more comfortable with this state, they may be buffered against experiencing the negative longitudinal consequences of ambivalence displayed by individuals from Western cultures (Pang, Keh, Li, & Maheswaran, 2017).

Another limitation of the current research is that we assessed ambivalence only with the use of explicit (i.e., self-report) measures. Another important tool to study affect and evaluations is the use of implicit measures, which are typically assessed indirectly, often with reaction time (RT) tasks (e.g., IAT; Greenwald, McGhee, & Schwartz, 1998). Importantly, there is a type of ambivalence that is the result of the discrepancies between explicit and implicit evaluations toward an attitude object (i.e., *implicit ambivalence*; Petty, Tormala, Briñol, & Jarvis, 2006). This state can occur when, for example, someone reports feeling positive toward their partner but their automatic response (as measured by a RT task) is instead negative. Thus, in addition to experiencing more explicit forms of ambivalence, it may be also possible that, after a sacrifice, people experience greater implicit ambivalence. Recent research on ambivalence has used mousetracking (Gillebaart, Schneider, & De Ridder, 2016; Schneider & Schwarz, 2017; Schneider et al., 2015) as a tool to assess implicit ambivalence. In future research, this may provide a powerful method to assess implicit partner ambivalence after a sacrifice.

A third limitation of this study is that our sacrifice measures may have induced participants to think in particular about sacrifices that they did not like or that they felt forced to do (in some cases people may sacrifice a personal preference but may also feel that this was an autonomous choice they made to benefit the partner). It is possible that the negative reactions to a sacrifice may be especially pronounced when thinking about these types of sacrifices and that may explain why we did not find a substantial increase in positive reactions.

A final limitation of this work is that the experimental studies examined the effects of imagining a sacrifice (Study 3) or recalling a sacrifice (Study 4 and 5) rather than assessing whether ambivalence arises right after performing an actual sacrifice. Studies 1 and 2 examined the link between actual sacrifices and ambivalence with a minimal temporal delay (the sacrifices were performed on the same day) but these studies were correlational. Future research should replicate these findings in experimental studies by inducing people to sacrifice for one another in the lab and measuring ambivalence right after this occurrence.

Several strengths of this work should also be acknowledged. This study addressed the research questions with the use of different methodologies, including diary and experimental studies. While the experimental studies helped us to gain more stringent control over the manipulation and assessment of our variables, the diary studies helped us to gain ecological validity by examining relationship dynamics as they unfold in couples' daily lives. Another strength of the current work is that although we included only Western samples, the findings were replicated across three different countries (Netherlands, United Kingdom, U.S.), highlighting the generalizability of the findings across Western cultures. The samples of the different studies also substantially vary in term of age and relationship length, showing that this effect is also generalizable across these characteristics.

Conclusions

Just like every coin has two sides, sacrifice also has two facets. The rosy facet reflects the many benefits that can be derived from this behavior, such as vicarious happiness, gratitude, and pride. The dark facet shows that emotions such as guilt, resentment, and frustration are also part of this phenomenon. Importantly, our work shows that sacrifice is not inconsequential for relationships. Instead, sacrifice leaves people with a bittersweet taste and feelings of ambivalence toward a romantic partner. Thus, the knife of sacrifice cuts on both sides: the good and the bad of our romantic life.

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Appendix A

Manipulations Study 3

Self-Sacrifice Condition

You and your partner are making plans for this Saturday night. You really want to go out with your best friends, as they are all available that night. You haven't seen them for a long time and were looking forward to finally catching up with them again. However, your partner has a different preference for this Saturday night. Your partner would really like to go to the movies with you and watch a new movie that (s)he has been looking forward to seeing, and that has a special premier this Saturday night.

After some consideration, you decide not to go out with your friends and instead to give in to your partner's wishes to go to the movies together.

Imagine that your partner's family has organized a family brunch on Sunday late in the morning. Your partner is very much looking forward to seeing his or her family again, and expresses to you how much (s)he would love for you to be there too. However, you do not really like spending time with your partner's family so much, and would much rather stay home and have some time for yourself, as you would finally have some time to watch your favorite TV series or reading a book.

After some consideration you decide to not stay home and instead give in to your partner's wish to join the family gathering.

Imagine that you and your partner live together, and you are behind on household tasks, such as vacuum cleaning, doing the dishes, laundry, and doing groceries. Although you both like a clean and tidy house, neither of you likes to actually do these household task. It's Saturday morning, your partner has had a busy week, (s)he wants to sleep in and rest, and really doesn't feel like cleaning today. However, today would be the only day that you and your partner would have time for cleaning.

Imagine that you decide to take on all these household tasks by yourself today, and let your partner sleep in and rest.

Partner-Sacrifice Condition

You and your partner are making plans for this Saturday night. You would really like to go to the movies with your partner and watch a new movie that you have been looking forward to seeing, and that has a special premier this Saturday night. However, your partner has a different preference for this Saturday night. S/he really wants to go out with his or her best friends, as they are all available that night. (S)he hasn't seen them for a long time and was looking forward to finally catching up with them again.

After some consideration, your partner decides not to go out with his or her friends and instead to give in to your wishes to go to the movies together.

Imagine that your family has organized a family brunch on Sunday late in the morning. You are very much looking forward to seeing your family again, and you express to your partner how much you would love for him/her to be there too. However, your partner doesn't really like spending time with your partner's family so much, and would much rather stay home and have some time for him/herself, as (s)he would finally have some time to watch his or her favorite tv series or read a book.

After some consideration your partner decides to not stay home and instead give in to your wish to join the family gathering.

Imagine that you and your partner live together, and you are behind on household tasks, such as vacuum cleaning, doing the dishes, laundry, and doing groceries. Although you both like a clean and tidy house, neither of you likes to actually do these household task. It's Saturday morning, you have had a busy week, you want to sleep in and rest, and really do not feel like cleaning today. However, today would be the only day that you and your partner would have time for cleaning.

Imagine that your partner decides to take on all these household tasks by him/herself today, and lets you sleep in and rest.

Control Condition

You and your partner are making plans for this Saturday night. You are thinking to go to the movies with your partner and watch a new movie that has good reviews online, and that has a special premier this Saturday night. However, you know that there are only few tickets available. You go online and try to do your best to get those tickets as soon as possible.

(*Appendices continue*)

Imagine that there is a family gathering for brunch on Sunday late morning. You and your partner need to attend and contribute to the meal with some food. You do not know what to bring but you have recently received a cooking book as a present. You find a nice recipe and go to the grocery store to buy all the ingredients to make the dish just before the brunch.

Imagine that you and your partner live together, and you are behind on household tasks, such as vacuum cleaning, doing the dishes, laundry, and doing groceries. It's Saturday morning and you both wake up early to do all the works in the house. You tide up, you then clean the floors, the bathroom and the kitchen, you vacuum, your wash all your cloths and then you go grocery shopping for the entire week.

Appendix B

Emotion Variables and Items

Table B1
Positive Emotion Variables and Items

Variable	Items
Benefitting partner	I felt good to make my partner happy.
	I felt good to be helpful to my partner.
Love	I felt love for my partner.
Pride	I felt an increased sense of self-worth.
	I felt that I was a good person/partner.
	I felt good because I knew I was morally doing the right thing.
Appreciation	I felt appreciated by my partner.
Benefitting relationship	I felt good about benefiting the relationship.
	I felt good because this helped to preserve the relationship.
	I felt good because this brought us closer together.
Self-expansion	I felt like I was gaining new experiences.
Benefits for long-term outcomes	I felt like I was benefitting myself in the long run.
	I felt like I was benefitting the relationship in the long run.
Expectation of partner sacrifice	I felt good because I knew I would receive a favor from my partner soon.
	I felt good because I knew the next time my partner will make a sacrifice for me.
Conflict avoidance	I felt good because I made the interaction with my partner easy (we did not have to argue, discuss, or have a conflict).

Table B2
Negative Emotion Variables and Items

Variables	Items
Goal blockage	I felt bad because I could not pursue my own goals/preferences.
Practical costs	I felt bad because I had some practical costs (e.g., waste of time, energy, money).
Negative mood	That episode put me in a bad mood.
Powerlessness	I felt weak and like I had less power in the relationship.
Guilt	I felt guilty.
Resentment	I felt resentful.
Underappreciation	I felt underappreciated.
Unfairness/exploitation	I felt exploited.
	I felt treated unfairly.

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