

Psychological Bulletin

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Online First Publication, July 16, 2020. <http://dx.doi.org/10.1037/bul0000297>

CITATION

Righetti, F., Sakaluk, J. K., Faure, R., & Impett, E. A. (2020, July 16). The Link Between Sacrifice and Relational and Personal Well-Being: A Meta-Analysis. *Psychological Bulletin*. Advance online publication. <http://dx.doi.org/10.1037/bul0000297>

The Link Between Sacrifice and Relational and Personal Well-Being: A Meta-Analysis

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Prosocial behavior is often thought to bring benefits to individuals and relationships. Do such benefits exist when prosocial behavior is costly for the individual, such as when people are sacrificing for their partner or relationship? Although different theoretical accounts would predict that sacrifice is either positively or negatively associated with personal and relational well-being, empirical work in this regard has been inconclusive. We conducted a meta-analytic synthesis of 82 data sets and 9,547 effect sizes ($N = 32,053$) to test the link between sacrifice and both personal and relationship well-being for both the individual who performs the sacrifice and their romantic partner. We examined four different facets of sacrifice (i.e., willingness to sacrifice, behavioral sacrifice, satisfaction with sacrifice, and costs of sacrifice). Results revealed that these facets were differently associated with well-being. Specifically, an individual's willingness to sacrifice was positively associated with their own personal and relationship well-being and with their partner's relationship well-being ($.09 < r_s < .27$). However, behavioral sacrifice was negatively associated with own personal well-being ($r = -.07$). Satisfaction with sacrifice was positively associated with individual and partner well-being ($.11 < r_s < .43$). Costs of sacrifice were negatively related to one's own personal and relationship well-being and to the partner's relationship well-being ($-.10 < r_s < -.26$). Some moderators were also identified. We discuss the implications of these findings for research on prosocial behavior and relationships, address the implications of the methodologies used to study prosocial behavior, and suggest directions for future research.

Public Significance Statement

This meta-analysis reveals that although being motivated to sacrifice for the relationship was linked to beneficial outcomes for the individual, the partner, and the relationship, there was a negative association between actually performing sacrifices and people's own well-being. The appraisals of sacrifice as positive or costly were also reliability associated with well-being.

Keywords: close relationships, meta-analysis, prosocial behavior, sacrifice, well-being

Supplemental materials: <http://dx.doi.org/10.1037/bul0000297.supp>

Situations of divergence of interests are an intrinsic part of our social life and especially common in intimate settings in which people preferences and goals do not correspond, and one partner's

preferences are not shared by the other (Righetti, Gere, Hofmann, Visserman, & Van Lange, 2016). Under these circumstances people need to choose whether to sacrifice their own goals for the partner or the relationship, or whether to pursue their own goals independently. Although some sacrifices may be necessary to maintain the relationship, many times people face the dilemma of whether to give up their personal goals or pursue them without their partner, with unknown consequences for personal and relationship well-being. Is sacrifice related to better or poorer personal and relationship well-being?

Numerous studies have shown that prosocial behavior is generally beneficial for people's relationships and for their own well-being (e.g., Aknin et al., 2013; Aknin, Broesch, Hamlin, & Van de Vondervoort, 2015; Dunn, Aknin, & Norton, 2008). However, sacrifice can be considered a special type of prosocial behavior

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because it entails that people give up a personal goal, or a preference, because of their partner or the relationship. Sacrifice is indeed defined as foregoing immediate self-interest to promote the well-being of a partner or a relationship (Day & Impett, 2016; Van Lange, Agnew, Harinck, & Steemers, 1997). Thus, sacrifice is different than simply providing help and support to another person because it involves the provision of a benefit while subordinating a personal goal (e.g., Day & Impett, 2016).

Theories of sacrifice in relationships do not suggest a clear picture of its association with personal and relationship well-being. Some theoretical accounts would predict that sacrifice promotes a climate of reciprocal trust and cooperation in relationships and therefore would be linked to positive outcomes (e.g., Kelley & Thibaut, 1978; Van Lange, Rusbult, et al., 1997). Other accounts suggest that people may develop negative affect toward their partner after sacrificing because their goal pursuit activities have been obstructed by their partner (e.g., Fitzsimons, Finkel, & van Dellen, 2015). Similarly, the empirical evidence collected thus far does not yield consistent results, with some studies showing positive associations between sacrifice and personal and relational well-being (e.g., Ruppel & Curran, 2012; Van Lange, Rusbult, et al., 1997), some studies showing a negative association (e.g., Totenhagen & Curran, 2011; Whitton, Stanley, & Markman, 2007), and others finding no association (Impett, Gable, & Peplau, 2005; Righetti et al., 2016).

Importantly, when scholars have studied sacrifice, they have typically assessed sacrifice in two different ways, including *willingness to sacrifice*, which is the intention, or motivation, to forego personal interest for the partner or the relationship (e.g., Van Lange, Rusbult, et al., 1997), and *behavioral sacrifice*, which refers to whether or not a sacrifice has actually occurred (Impett et al., 2005; Ruppel & Curran, 2012; Visserman, Righetti, Kumashiro, & Van Lange, 2017). Scholars have also assessed appraisals of sacrifice, such as *satisfaction with sacrifice*, which is the extent to which people feel good about sacrificing (Stanley, Whitton, Sadberry, Clements, & Markman, 2006), and *costs of sacrifice*, which is the extent to which people perceive that their sacrifice has entailed costs for oneself (Visserman et al., 2020). Given the theoretical distinctions between these four different assessments, these constructs may have different associations with personal and relationship well-being. For example, whereas being motivated to perform prosocial behaviors for one's partner may be linked to many benefits for the relationship (e.g., Horne, Impett, & Johnson, 2019; Le, Impett, Lemay, Muise, & Tskhay, 2018), enacting a behavioral sacrifice and facing its concrete and emotional costs may take a toll on the relationship. Similarly, whereas being satisfied with the sacrifice may be positively related to well-being, perceiving its costs may hurt the partners and the relationship. Thus, to help scientists and practitioners understand the correlates of sacrifice, we conducted a meta-analysis to test the link between the different aspects of sacrifice and indexes of relationship and personal well-being.

Importantly, although people can sacrifice for a range of different relationship partners such as colleagues (e.g., van Knippenberg & van Knippenberg, 2005), ingroup members (e.g., Atran, Sheikh, & Gomez, 2014; De Dreu, Balliet, & Halevy, 2014), and even strangers (e.g., Morhenn, Park, Piper, & Zak, 2008), this meta-analysis focuses on sacrifice in *romantic relationships*. Indeed, sacrifice has most frequently been studied in this context given that

it is a common, sometimes even a daily, experience (e.g., Impett et al., 2005; Visserman et al., 2019). A broader understanding of the correlates of sacrifice in romantic relationships might provide insights into the ways people feel when they receive and enact these behaviors in other interpersonal contexts. Furthermore, studying sacrifice in romantic relationships provides an optimal context to study dyadic effects (i.e., the effects for the recipients of sacrifices).

Sacrifice and Personal and Relationship Well-Being: Two Different Perspectives

Sacrifices occur in situations of divergence of interests between partners, that is in situations in which partners' initial preferences differ (e.g., Van Lange, Rusbult, et al., 1997). 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, if one partner simply considers their own preferences, they might want to spend the weekend with friends, whereas their partner might prefer to rest and relax together at home. However, after considering the other partner's preferences and having other goals become salient (e.g., wanting to have fun together, wanting to make their partner happy, wanting the best for the relationship), people may undertake a process of "transformation of motivation" and decide to give up their own preferences for the sake of their partner or relationship (Kelley & Thibaut, 1978). Are these sacrifices positively or negatively linked to personal and relationship well-being? Different theoretical accounts, and different empirical studies, would provide support for two different predictions about the link between sacrifice and well-being: one that is positive, labeled the *benefit hypothesis*, and the other that is negative, labeled the *burden hypothesis*.

The Benefit Hypothesis

There are several theoretical accounts that would predict that sacrifice should be beneficial for the partners and the relationship. For example, several scholars have drawn upon insights from Interdependence Theory (Kelley & Thibaut, 1978) to argue that sacrifice should be positively associated with relationship and personal well-being (e.g., Impett & Gordon, 2008; Van Lange, Rusbult, et al., 1997; Wieselquist, Rusbult, Foster, & Agnew, 1999). In fact, sacrifice is often referred to as a "pro-relationship behavior" (Rusbult, Olson, Davis, & Hannon, 2004). From an Interdependence Theory perspective, when partners experience situations in which their individual interests conflict, they experience lower personal and relationship well-being (Gere, Schimmack, Pinkus, & Lockwood, 2011; Righetti et al., 2016). In these situations, partners may have burdensome discussions about how to solve the conflict of interest, experience annoyance at each other's preferences and, in doing so, have their attention drawn to their possible incompatibilities. By sacrificing, people can minimize (or even end) these tense situations and provide a solution in which partners can better coordinate their interests, pursue activities together, and feel closer as a result (Kelley, 1979; Ruppel & Curran, 2012; Rusbult & Arriaga, 1997). In fact, in these circumstances, if neither partner agrees to sacrifice, partners may have to go their separate ways and pursue activities without each other. By

sacrificing, people may be able to spend time together and may engage in novel activities that they eventually find gratifying.

Furthermore, when acts of sacrifice are perceived by the partner, they are likely to be reciprocated (Wieselquist et al., 1999), instigating a climate of trust and cooperation within the couple that should promote greater relationship satisfaction and commitment over time (e.g., Van Lange, Rusbult, et al., 1997). According to Van Lange, Rusbult, et al. (1997), in the context of a loving relationship, it is unlikely that individuals will exploit their partner and not reciprocate a partner's sacrifices. Thus, both individuals should achieve better long-term outcomes if, in repeated interactions, they favor prosocial responses over self-interested ones (Pruitt & Kimmel, 1977). Some empirical research has indeed corroborated these ideas by showing positive associations between sacrifice and relationship functioning (e.g., higher relationship satisfaction, commitment, dyadic coping; e.g., Chen & Li, 2007; Lan et al., 2017; Ruppel & Curran, 2012; Van Lange, Rusbult, et al., 1997; Wieselquist et al., 1999; Zhang & Li, 2015).

Another reason why sacrifice should be linked to greater well-being is that, given the high interdependence that characterizes close relationships in which the outcomes of one partner are highly intertwined with the outcomes of the other partner, people may feel genuinely happy when they sacrifice to make their partner happy (Kogan et al., 2010). Finally, sacrifice is a behavior that is often driven by communal motivation, that is, the motivation to provide care for the well-being and needs of others (Clark & Mills, 2011). A recent meta-analysis has shown that the higher people were in communal motivation, the more they experienced satisfying relationships and positive well-being (Le et al., 2018).

In addition to Interdependence Theory, there are other accounts that support the idea that sacrifice should be associated with positive personal and relationship outcomes. When enacting a sacrifice for their partner, people may feel proud of being good, caring, and responsive relationship partners (Murray & Holmes, 2009; Righetti & Impett, 2017; Righetti et al., 2020; Hofmann, Wisneski, Brandt, & Skitka, 2014). Feeling that they are behaving the "right" way may increase their self-esteem and their general sense of well-being. Finally, much research has shown that prosocial behavior increases one's own well-being (Aknin et al., 2013; Dunn et al., 2008; for a review see Dunn, Aknin, & Norton, 2014) by fulfilling people's relatedness, competence, and autonomy needs (Deci & Ryan, 2000; Martela & Ryan, 2016; Weinstein & Ryan, 2010). Thus, by sacrificing, people have the opportunity to engage in a prosocial behavior that should increase the fulfillment of their needs and their general sense of well-being.

The Burden Hypothesis

Despite the existing theoretical and empirical support for the idea that sacrifice should be beneficial for relationship and personal well-being, there are also some theoretical accounts that would suggest otherwise. According to Transactive Goal Dynamics Theory (Fitzsimons et al., 2015), relationship partners' goals are intertwined and can be characterized as one system. If individuals do not achieve their goals as a result of their involvement with their partner (i.e., goals that they would have achieved on their own, as an independent agent, if they were not in a relationship), they are likely to experience what is called a *transactive loss*. Transactive loss (vs. gain) is theorized to strongly deteriorate

relationship well-being for at least two reasons. First, when people cannot achieve personal goals, they experience frustration and negative affect (e.g., Brunstein, 1996; Carver & Scheier, 1990; Emmons, 1986), which may negatively impact personal well-being and relationship dynamics (e.g., Fincham & Beach, 1999). In fact, when people experience negative affect they also tend to behave more destructively in their relationships (e.g., Carstensen, Gottman, & Levenson, 1995; Karney & Bradbury, 1997), instigating a cycle of negative reciprocal behavior that undermines relationship quality. Second, when they sacrifice, people are aware that they cannot pursue their own preferences and goals because of their partner, who is perceived as the source of goal obstruction. Consequently, people tend to feel less close, satisfied, and motivated to approach a partner whom they feel is undermining, rather than supporting, their own goals (e.g., Brunstein, 1996; Drigotas, Rusbult, Wieselquist, & Whitton, 1999; Fitzsimons & Shah, 2008). Thus, this literature suggests that when people sacrifice, they may realize that their partner interferes with the pursuit of their own personal goals and preferences and, as a consequence, feel frustrated and dissatisfied with their relationship. Consistently, some empirical findings indicate that sacrifice is associated with lower commitment, lower relationship functioning and lower personal well-being (e.g., Righetti et al., 2020; Totenhagen & Curran, 2011; Whitton et al., 2007; Young & Curran, 2016).

In a similar vein, although prosocial behavior can fulfill relatedness, competence, and autonomy needs (Martela & Ryan, 2016; Weinstein & Ryan, 2010), sacrifices made in a relationship might instead put these needs in conflict with one another. Sacrifice is indeed a particular type of prosocial behavior in which people subordinate their own personal goals for their partner or the relationship (Righetti & Impett, 2017). Thus, sacrifice may allow people to fulfill their relatedness needs, but at the expense of their autonomy and competence need fulfillment. If this is true, then on balance, people may experience more thwarted than fulfilled needs after a sacrifice and this should undermine their overall sense of well-being.

Finally, people place themselves in a vulnerable position when they sacrifice. They have incurred some costs for the relationship and their partner may not even recognize and appreciate their sacrifice. Indeed, a recent study using a quasi-signal detection approach to study daily sacrifice in romantic relationships revealed that partners recognize only about half of the daily sacrifices that the other has made (Visserman et al., 2017). When people do not perceive their partner's sacrifice, they do not experience (and express) gratitude, and the person who made the sacrifice feels underappreciated (Righetti et al., 2020). Further, when people do not feel that their sacrifices are appreciated, they are likely to regret them with detrimental consequences for their well-being (Righetti & Visserman, 2018). Thus, people may feel that their sacrifices went unnoticed and were not appreciated, making them feel at a power disadvantage in their relationship and potentially exploited by their partner (Righetti, Tybur, Van Lange, & Gangestad, 2018, 2020).

In sum, there are several empirical and theoretical accounts that suggest that sacrifice is linked with either beneficial or costly outcomes for personal well-being and the quality of romantic relationships. In the current meta-analysis, we put these two different perspectives to the test.

Dyadic Effects

In addition to examining the link between sacrifice and well-being for the individual who makes a sacrifice, another aim of this work is to investigate the link between sacrifice and well-being for the *recipient* of the sacrifice. Thus, we adopted a dyadic perspective and examined the link between the partner's behavior (i.e., partner's sacrifice) and the individual's own outcomes. Although different theoretical perspectives would predict different outcomes (positive vs. negative) for the person who performs the sacrifice, at a first glance, the recipient of sacrifice should have a lot to gain. Besides the tangible gains (i.e., the recipient can pursue their own personal preferences/goals), when people receive a sacrifice it can signal that the partner has their best interests at heart, is committed to the relationship, and is willing to incur some costs to be together (Joel, Gordon, Impett, MacDonald, & Keltner, 2013; Wieselquist et al., 1999). People often monitor whether their partner's behavior deviates from self-interest and engages in transformation of motivation for the relationship (Kelley, 1979). When people perceive such transformations to occur, they feel greater trust in their partner (Wieselquist et al., 1999) and perceive that their partner loves and cares for them (e.g., Reis, Clark, & Holmes, 2004). Furthermore, people typically feel grateful after receiving benefits from others (McCullough, Kilpatrick, Emmons, & Larson, 2001). Consistent with these findings, Visserman et al. (2017) found that recipients of sacrifice felt grateful toward their partner on days when they perceived a sacrifice, even if the sacrifice did not actually occur and was instead misperceived. Gratitude, in turn, generally increases the quality and stability of romantic relationships (e.g., Algoe, Gable, & Maisei, 2010; Gordon, Impett, Kogan, Oveis, & Keltner, 2012) and promotes people's well-being (for a review see Wood, Froh, & Geraghty, 2010). Thus, all these arguments would support the idea that receiving a sacrifice is positively associated with personal and relationship well-being.

However, in contrast to the larger body of empirical research that has investigated the link between individuals' own sacrifice and their personal and relationship outcomes, very few studies have investigated partner effects, that is, effects on the recipient of sacrifice. Those studies have found that receiving a sacrifice is positively associated (Chen & Li, 2007) or not associated (Ruppel & Curran, 2012; Totenhagen, Curran, Serido, & Butler, 2013) with relationship well-being. The lack of partner effects might be attributable to the fact that partner effects are typically smaller than actor effects (e.g., Orth, 2013) and therefore more difficult to detect in studies with small sample sizes. Alternatively, partners might not experience many positive outcomes from receiving sacrifices either because they do not detect them (indeed half of daily sacrifices are missed; Visserman et al., 2017) or because receiving sacrifices can also be costly (Righetti & Impett, 2017). For example, people may genuinely feel sorry for their partner because they had to give up their personal goals or preferences for the relationship, or they may feel indebted toward their partner and obligated to reciprocate (Righetti et al., 2020). Finally, although their partner may have sacrificed for them, people may sometimes prefer a solution in which each partner pursues their own goals independently from the other.

Given the importance of taking a dyadic perspective in studying relationships (Kelley & Thibaut, 1978), it is important to consider how the partner's willingness to sacrifice, actual enactment of

sacrifice, and appraisal of sacrifice affect the individual's outcomes. Thus, in our meta-analysis we investigated the interpersonal, dyadic effects, conducting our analyses according to the Actor-Partner Interdependence (APIM; Kenny, Kashy, & Cook, 2006), and we assessed the link between the partner's sacrifice and the individual's well-being while controlling for the individual's own sacrifice.

Sacrifice Facets

Relationship scientists have typically assessed four different facets of sacrifice: willingness to sacrifice, behavioral sacrifice, satisfaction with sacrifice, and costs of sacrifice. In the current meta-analysis, we investigate how each of these facets are associated with personal and relationship well-being. Willingness to sacrifice represents the intention, or the motivation, to sacrifice and has often been measured via hypothetical scenarios (e.g., Van Lange, Agnew, et al., 1997). Willingness to sacrifice may be related to communal orientation (Clark & Mills, 2011), and communal motivation has been shown to be positively linked to relationship satisfaction and personal well-being (Le et al., 2018). However, willingness to sacrifice is also different than communal orientation because it represents the tendency to engage in prosocial behavior in a very specific context: when partners' preferences differ. In fact, whereas communal orientation represents the tendency to be responsive to another person's needs and welfare in general (Clark & Mills, 2011), willingness to sacrifice represents the readiness to subordinate one's personal goals and preferences when they interfere with those of the partner or relationship. Thus, a person who is high in communal orientation and, generally speaking, enjoys taking care of their partner (e.g., Clark & Mills, 2011) may not be willing to sacrifice in situations in which they have to give up their own desires and preferences.¹ In any case, similar to the effects of communal orientation (Le et al., 2018; but also see Footnote 1), we hypothesize that the motivation to engage in prosocial behavior, even at the costs of self-interest, may be positively related to personal and relationship well-being.

Behavioral sacrifice assesses whether people have actually enacted a sacrifice in their relationship (e.g., Impett et al., 2005,

¹ From an empirical perspective, we tested the distinguishability and incremental validity of Willingness to Sacrifice (WtS) against Communal Strength (CS) in four datasets for which we had the raw data from multiple indicator variables of each (see also Table S1 in the online supplemental materials). Following a similar strategy described in Wang and Eastwick (2020), we used confirmatory factor analysis and found that in all four samples, indicator variables were better represented as two distinguishable, related (Sample 1 $r = .57$, Sample 2 $r = .78$, Sample 3 $r = .70$, Sample 4 $r = .76$), factors of WtS and CS than a singleton latent variable (all $\Delta\chi^2$ tests $p < .001$). Following these tests, we compared two subsequent structural equation models (SEMs) in each sample: the first SEM in which we estimated unique predictive effects of WtS and CS for relationship satisfaction (Sample 1-4, $b = 0.17, 0.06, -0.10, \text{ and } 0.04$, $b = 0.92, 0.89, 1.04, \text{ and } 0.82$, for WtS and CS respectively), happiness (Sample 2 $b = 0.32$ and $b = 0.67$ for WtS and CS respectively), and life satisfaction (Samples 3 and 4, $b = 0.03$ and 0.08 , and $b = 0.43$ and 0.45 for WtS and CS respectively), and the second SEM in which the predictive effects for a given outcome variable were constrained to equality. In all four samples, allowing WtS and CS to have their own distinctive estimates on relationship and personal well-being resulted in significantly improved model fit (all $\Delta\chi^2$ tests $p < .001$). Supplementary files (datasets, scripts, and a reproducible table of output) are available in our OSF repository: https://osf.io/srcyb/?view_only=752007db3c794452a65fb49736e995a6.

2014). What is important to consider is that willingness to sacrifice and behavioral sacrifices may not always correspond. Although many theories, such as the Theory of Planned Behavior (Ajzen, 1985, 1991) and the Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), propose that intentions should predict behavior, several meta-analyses have shown that the link between intentions and behavior is modest (e.g., Armitage & Conner, 2001; Milne, Sheeran, & Orbell, 2000; Webb & Sheeran, 2006). This is because many other factors, such as habits, individual control, and features of the situation (e.g., Carrington, Neville, & Whitwell, 2010; Ouellette & Wood, 1998; Webb & Sheeran, 2006), can interfere with the execution of intentions. Furthermore, ratings of intentions are more colored by socially desirable responding than is actual behavior (e.g., Auger & Devinney, 2007). Thus, reporting a willingness to sacrifice in hypothetical scenarios may only weakly correspond to actually performing these sacrifices in everyday life.² Relevant to the current meta-analysis, we hypothesize that willingness to sacrifice would be more positively (or less negatively) associated with personal and relationship well-being than behavioral sacrifices because when people actually perform a sacrifice they incur actual costs that are only hypothetical when providing ratings of willingness to sacrifice. Regarding the specific hypotheses about the links between behavioral sacrifices and well-being, as previously discussed, different predictions can be made. Behavioral sacrifices may either be more heavily influenced by all the benefits that are theorized to be linked to sacrifice, and therefore we should observe a positive association with well-being, (e.g., see Interdependence Theory) or by all the burdens associated with it, and therefore we should expect a negative association with well-being (see Transactive Goal Dynamics Theory).

Satisfaction with sacrifice represents the degree to which people feel a sense of satisfaction in giving up their own goals and preferences for the sake of their partner or relationship (Stanley & Markman, 1992). Previous research has found that when people feel good about their sacrifices they also tend to feel good about their relationship. In fact, satisfaction with sacrifice was positively associated with global relationship quality and commitment (Stanley & Markman, 1992; Stanley et al., 2006; Whitton et al., 2007). In a similar way, we hypothesized that this particular facet of sacrifice would be positively associated with both personal and relationship well-being.

Finally, costs of sacrifice represent the perception of the extent of the costs a sacrifice has entailed for oneself (e.g., Visserman et al., 2020; Whitton et al., 2007). According to Transactive Goal Dynamics Theory (Fitzsimons et al., 2015), sacrifices may be especially burdensome to the extent that they strongly interfere with the fulfillment of personal goals. In fact, feeling that sacrifices are more costly has been associated with lower relationship satisfaction, commitment and personal well-being (Day & Impett, 2018; Visserman et al., 2020). Thus, we hypothesized that the costs of sacrifice would be negatively associated with personal and relationship well-being.

In sum, in this work, we tested how these different facets are related to personal and relationship well-being according to two different perspectives. The benefit hypothesis would predict a positive association between behavioral sacrifice, willingness to sacrifice, satisfaction with sacrifice, and well-being. The burden

hypothesis would predict a negative association between behavioral sacrifice, costs of sacrifice, and well-being.

Additional Moderators

In addition to testing whether the different sacrifice facets are differentially associated with personal and relationship well-being, we also examined several other possible moderators including: (a) well-being index used, (b) the relationship index used, (c) gender, (d) frequency of sacrifice, (e) type of assessment, (f) publication, (g) relationship length, (h) age, (i) lab, and (l) small study effects.

Personal Well-Being Measures

We assessed whether the links between the different sacrifice facets and personal well-being were moderated by the personal well-being index taken into consideration. Specifically, we examined whether results changed if we considered global assessments of subjective well-being (SWB) or particular emotional states (e.g., stress). Research has shown that these two measures are different, in that subjective well-being includes not only emotional responses but also more global and cognitive judgments of life satisfaction (Diener, Suh, Lucas, & Smith, 1999). These measures are also associated with distinct variables and outcomes. For example, whereas emotional states are more closely linked to daily events (Diener, Kahneman, Tov, & Arora, 2010), life satisfaction is more strongly associated with more stable factors, such as personal achievement, personal education, and wealth (Schimmack & Oishi, 2005). Given that obstruction of goals can elicit strong emotional reactions (Brunstein, 1996; Carver & Scheier, 1990; Righetti et al., 2020), there may be a stronger link between sacrifice and emotional states than between sacrifice and cognitive appraisals of how satisfying one's life is overall.

Relationship Well-Being Measures

Similarly, we examined whether the link between sacrifice facets and relationship well-being was moderated by the type of relationship well-being index that was taken into consideration. Specifically, we examined whether results changed if we considered relationship satisfaction as the key assessment of relationship quality versus another indicator of relationship well-being including commitment, closeness, trust, gratitude, perceived partner gratitude, and perceived partner commitment. Although taken together these variables can be diagnostic of the general health of the relationship, we considered the possibility that sacrifice may be differentially associated with these different components of relationship well-being. For example, although behavioral sacrifice and costs of sacrifice may be more likely to trigger frustration and lower relationship satisfaction (Whitton et al., 2007), enacting a sacrifice may increase commitment because people are investing in the relationship (e.g., Van Lange, Rusbult, et al., 1997). Similarly, the partner who receives a sacrifice may experience an

² In eleven of the datasets, we had estimates of both willingness to sacrifice and behavioral sacrifice so we could calculate the meta-analytical correlation between the two (meta-analyzing 34 effect sizes). Results revealed only a small to medium association between the two ($r = .23$ 95% CI [.121, .339], $SE = .049$, $p \leq .001$).

increase in gratitude, perceived partner commitment, and trust as a result of seeing their partner behave in a benevolent manner toward them (Righetti et al., 2020; Visserman et al., 2019; Wiselquist et al., 1999).

Gender

We also examined whether gender moderated the effects. For example, there are several reasons why behavioral sacrifice may be related to negative outcomes especially for women. According to gender norms, women are expected to make greater investments into their relationships than men (Miller, 1986; Wood, 1993). Thus, women may actually make more frequent or larger sacrifices than men (Ahmed & Shaheen, 2013), and they may therefore incur greater costs, which may breed resentment and frustration over time (Whitton et al., 2007). This negative effect may be exacerbated if men do not reciprocate their sacrifices (Hatfield, Utne, & Traupmann, 1979). Moreover, even in relatively balanced or equitable relationships in which partners sacrifice to a similar extent, because sacrifice is more normative for women than for men, women may receive less appreciation and gratitude from their male partners than men (Zoppolat, Visserman, & Righetti, 2020). As a consequence, it is possible that women may feel less positive about performing sacrifices because they incur greater costs and do not receive as many benefits (e.g., appreciation from their partner and society for prioritizing relationship goals over personal goals).

Frequency of Sacrifice

In our meta-analysis, behavioral sacrifices were assessed either as a frequency of the behavior over an extended period of time (e.g., in the past three months) or as an occurrence on a daily basis (e.g., whether an individual chose to sacrifice or not on a given day). We examined whether this type of measure of sacrifice differentially affected the results. In fact, many of the benefits of sacrifice may be more evident during an extended period of time in which couples are able to establish a climate of reciprocal trust and cooperation (e.g., Van Lange, Rusbult, et al., 1997). In contrast, the emotional frustration of a missed goal or opportunity may be more salient and better captured in daily assessments. Thus, it is possible that the benefits of sacrifice may be most evident when assessing frequency of sacrifice over a longer period of time, whereas the negative effects may be more detectable on a daily basis, such as for example in daily diary studies.

Type of Assessment

In several data sets, the well-being indexes were assessed with single-item measures (given the importance of assessing items in diary studies in particular with only a single item to increase efficiency and minimize participant attrition; Bolger, Davis, & Rafaeli, 2003), rather than with established, multi-item scales. We also considered whether this aspect of measurement moderated the effects. Given that single-item measures may be less reliable than multi-item scales (Lord & Novick, 1968), it is possible that the associations may be easier to detect when using well-validated and established scales than single item measures.

Publication, Relationship Length, Age, Lab, and Small Study Effects

Finally, in exploratory analyses, we also assessed whether publication, relationship length, participant age, lab of data collection (from authors vs. others), and the precision of the estimated effect (i.e., standard error) moderated the effects.

Overview of the Meta-Analysis

We conducted a meta-analysis to test the links between sacrifice (and its facets) and personal and relationship well-being. To examine these questions, we meta-analyzed data from 82 independent samples, 9,547 effects sizes (86.51% unpublished), and 32,053 unique participants. We examined four different assessments of sacrifice: willingness to sacrifice, behavioral sacrifice, satisfaction with sacrifice, and costs of sacrifice. We examined how these assessments were related to personal and relationship well-being. Personal well-being was assessed with ratings of affective states and life satisfaction. Relationship well-being was assessed with specific constructs that have been theorized to impact and have been empirically linked with sacrifice including ratings of relationship satisfaction, commitment, closeness, trust, gratitude, perceived partner gratitude, and perceived partner commitment.

We structured our analyses in two steps. In the first step, we examined whether the different facets of sacrifice were differently associated with personal and relationship well-being (as general indexes). In the second step, we examined whether any heterogeneity in these associations could be explained by the different moderators: (a) well-being index used, (b) relationship index used, (c) gender, (d) frequency of sacrifice, (e) type of assessment, (f) publication, (g) relationship length, (h) age, (i) lab, and (l) small study effects. Importantly we assessed not only the associations between one's own sacrifice facet and one's own well-being but also the associations between one's partner sacrifice facet and one's own well-being. Specifically, to examine the *recipient's* perspective, we assessed the link between the partner's sacrifice and the individual's personal and relationship well-being while controlling for the individual's own sacrifice, following the APIM model (Kenny et al., 2006). Importantly, in each sample, all the correlations were calculated separately for men and women. We took this approach because in a lot of the studies we are drawing upon, analyses were conducted with models distinguishable by participant gender (Kenny et al., 2006). However, in the first two steps of analyses we combined results across gender and in the second step we examined whether gender moderated the effects.

Method

Data Search

We used several methods to search for relevant data for our meta-analysis. We started with searching for relevant articles using PsycINFO and Google Scholar. We first used the keyword *sacrifice* in conjunction with any of the following: *close relationships*, *romantic relationships*, and *dating relationships*. Subsequently, we also used keywords related to our outcome variables: *relationship satisfaction*, *relationship quality*, *trust*, *commitment*, *close-*

ness, inclusion of the other in the self (IOS), gratitude, perceived gratitude, perceived commitment, well-being, life satisfaction, mood, affect, emotions, depression, anxiety, stress, anger, and happiness. Our search included published journal articles, theses, and dissertations. We also used the cross-reference technique (Rosenthal, 1991) to identify additional relevant papers. Furthermore, given that many relationship researchers have larger data sets that contain measures of sacrifice, as well as indexes of relationship and personal well-being, although they have never been published, we also initiated a search for unpublished data. We did so by (a) contacting experts in the area of sacrifice, (b) contacting the first authors of the published articles that we identified during our initial search, and (c) sending announcements to listservs of the Society for Personality and Social Psychology (SPSP), the European Association of Social Psychology (EASP), and the International Association for Relationship Research (IARR).

Researchers were told that we were interested in the associations between different facets of sacrifice (behavioral, willingness, satisfaction with sacrifice and costs of sacrifice) and any index of personal well-being (i.e., any measure of positive and negative emotions, including stress, subjective well-being, happiness, life satisfaction, depression and anxiety) and relationship well-being (e.g., any measure of relationship quality, such as relationship satisfaction, commitment, trust, closeness, IOS, gratitude, perceived partner commitment and perceived partner gratitude). Studies were included if (a) they contained at least one assessment of sacrifice and one of the above-mentioned indexes of relationship or personal well-being, (b) participants were 18 years old or older, and (c) involved in a romantic relationship (see also Figure 1).

When researchers replied to our requests and indicated that they had eligible data sets, we asked them to send us the raw data containing the sacrifice variables and all the relationship or personal well-being indexes. We also asked them to include the

variables gender, age, relationship length, day or wave (for multiple assessments), and the partner's sacrifice variables if they had dyadic data sets. Researchers also communicated which scale or measure they used to assess the relevant variables and whether the variables were reverse coded from the original assessment. Researchers were also given the option to send us the estimated effect sizes rather than the raw data, although all authors chose to send us their raw data. When a given study assessed our key variables with multiple measures (e.g., both willingness and behavioral sacrifice), estimates were calculated for each measure. Furthermore, when a given study assessed the key associations at multiple data points (e.g., diary or longitudinal studies), estimates were calculated separately for each data point. Similarly, when data sets assessed associations in different portions of the study (e.g., in a diary and in a laboratory conversation), estimates were considered separately for each portion.

Coding

Information gathered upon receiving the data included: (a) lab (name of the principal investigator), (b) original sample size, (c) age, (d) relationship length, (e) country of data collection, (f) types of relationships (only same-sex or both mixed-sex and same-sex), (g) couples or individuals in the sample, (h) single or multiple data points, and (i) whether the study included multiple data points, the time gap between data points. Data Sets were from 28 different labs and nine different countries (United States 66.6%, Netherlands 18.5%, Canada 5.3%, China 2.5%, Germany 1.2%, Korea 1.2%, India 1.2%, Italy 1.2%, and Switzerland 1.2%). The majority of the data sets (59.3%) were dyadic, and 56.8% of the samples included same-sex couples (the remaining were only composed of mixed-sex couples). Nearly three quarters (74.1%) of the data sets had only a single data point and 25.9% had multiple data points (diary or longitudinal). Finally, 56 studies tested the associations in general questionnaires, 19 in diary studies, six in experiments, five with behavioral tasks in the laboratory, and two in laboratory conversations. Furthermore, after the effect sizes were computed they were coded according to several effect sizes characteristics, including sacrifice facets, type of type of personal well-being measure, type of relationship well-being measure, frequency versus occurrence of sacrifice, type of assessment, and publication status. *Sacrifice facet* was coded according to whether sacrifice assessed willingness to sacrifice, behavioral (actually performed) sacrifice, satisfaction with sacrifice, or costs of sacrifice. *Personal well-being index* was coded according to whether personal well-being was assessed with a measure of life satisfaction or with a measure of an emotional state (e.g., stress, depression). *Relationship well-being index* was coded according to whether relationship quality assessed with relationship satisfaction, commitment, trust, closeness, IOS, gratitude, perceived partner commitment, or perceived partner gratitude. *Frequency of sacrifice* was coded as whether the behavioral sacrifice measure scale assessed the frequency of the behavior (e.g., frequency of sacrifice in the past month) or whether the behavior occurred in one instance (e.g., a sacrifice that occurred on a given day). *Type of assessment* was coded according to whether the outcome variable was assessed with an established multiple-item scale versus with a single item. We also coded for *publication status* according to whether the specific effect size was published or not. Effect sizes, study char-

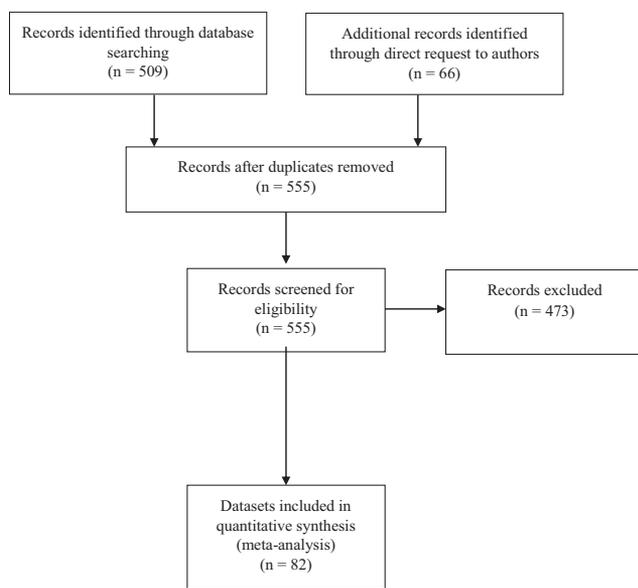


Figure 1. Flowchart detailing article search, article screening, data inclusions, and data exclusions.

acteristics, and analyses can be accessed via the following OSF link: https://osf.io/srcyb/?view_only=752007db3c794452a65fb49736e995a6.

Effect Sizes and Analysis Strategy

We calculated (or converted) effect sizes separately for men and women. First, we assessed the associations between the sacrifice facets and the relationship and personal well-being from the sacrificer's perspective (i.e., the individual who performed the sacrifice). Specifically, we calculated the zero-order bivariate correlations between the individual's reports of sacrifice and the same individual's indexes of relationship and personal well-being, as pseudoactor effects; this analytic strategy enabled us to synthesize effects from samples of individuals alongside similar effects from those in relationships. Second, with the dyadic data sets ($k = 49$), we assessed the associations between sacrifice and personal and relationship well-being from the partner's perspective (i.e., the individual who received the sacrifice). Specifically, following the APIM (Kenny et al., 2006), we calculated the partial correlations between a partner's report of sacrifice and an individual's indexes of relationship and personal well-being, controlling for the individual's report of their own sacrifice.

To account for the dependency introduced by meta-analyzing multiple effect sizes from the same sample, we used the robust variance estimation (RVE) approach (Hedges, Tipton, & Johnson, 2010) via the *robumeta* package (Fisher, Tipton, & Zhipeng, 2018) for R. In brief, RVE meta-analyses yield unbiased estimates and significance tests even when the amount and pattern of dependency among effect sizes is not known, and more recent adjustments to the calculation of degrees of freedom within these models (Tipton, 2015) allow RVE to be used with smaller samples of effect sizes. Relative to other valid alternatives to modeling dependent effect sizes when the amount of dependency is unknown (e.g., Konstantopoulos, 2011), RVE provides better estimation of average effect sizes (Moeyaert et al., 2017), especially when the number of studies is small (as in the present synthesis), at the expense of statistical power when testing moderators in metaregression (López-López, Van den Noortgate, Tanner-Smith, Wilson, & Lipsey, 2017).

In addition to estimating the pseudoactor effects (i.e., zero-order correlations between an individual's sacrifice and their relationship and personal well-being) and partner effects (i.e., partial correlations between an individual's sacrifice and their partner's relationship and personal well-being), we also produced estimates of heterogeneity (Higgins & Thompson, 2002) and performed tests of moderators via metaregression (Thompson & Higgins, 2002). Following the recommendations of Borenstein, Higgins, Hedges, and Rothstein (2017), we report both absolute and relative indexes of effect sizes heterogeneity, including τ (the standard deviation) and I^2 (the proportion of variation in observed effects attributable to variation in true effects, and not sampling error), respectively.

Results

We first report the results for the actor of the sacrifice (i.e., for the person who enacts the sacrifice) and then subsequently report the results for the recipient of sacrifice (i.e., dyadic effects section).

Actor's Sacrifices

Sacrifice facets and personal and relationship well-being.

We first tested whether the associations between sacrifice and personal and relationship well-being differed for the different facets of sacrifice. We dummy coded the sacrifice facets, keeping behavioral sacrifice as the reference group (coded initially as 0), whereas the other sacrifice facets were initially coded as 1 under their respective dummy codes. These results include all the studies that assessed one or both dependent variables. Results revealed that the majority of the effects were different according to the sacrifice facet taken into consideration. Specifically, regarding personal well-being, results revealed that the associations were more strongly positive for willingness to sacrifice ($b = .160$ 95% CI [.078, .243], $SE = .040$, $p < .001$) and satisfaction with sacrifice ($b = .272$ 95% CI [.173, .371], $SE = .047$, $p < .001$) than for behavioral sacrifice. However, the associations were more strongly negative for costs of sacrifice than for behavioral sacrifice ($b = -.165$ 95% CI [-.312, -.018], $SE = .062$, $p = .032$). For this model, the heterogeneity statistics were $T^2 = 0.02$ and $I^2 = 67.20$. Similarly, regarding relationship well-being, results revealed that the associations were more strongly positive for willingness to sacrifice ($b = .257$ 95% CI [.185, .328], $SE = .035$, $p < .001$) and satisfaction with sacrifice ($b = .412$ 95% CI [.325, .499], $SE = .042$, $p < .001$) than for behavioral sacrifice. However, the associations were more strongly negative for costs of sacrifice than for behavioral sacrifice ($b = -.276$ 95% CI [-.348, -.203], $SE = .034$, $p < .001$). For this model, the heterogeneity statistics were $T^2 = 0.03$ and $I^2 = 75.66$. More specifically, and as shown in Table 1, there was a small negative association between behavioral sacrifice and personal well-being, but this association was not significant for relationship well-being. Regarding willingness to sacrifice there were significant positive associations with both personal and relationship well-being. Similarly, for satisfaction with sacrifice, there were positive significant associations with both personal and relationship well-being. Finally, regarding costs of sacrifice, there were negative significant associations with both personal and relationship well-being.

Test of subsequent moderators. In a subsequent step, we also examined whether the associations tested above were different for the different moderators: (a) personal well-being index used,

Table 1
Meta-Analytic Estimates for Actor Effects (τ_r) Between Participant Sacrifice Facets and Their Own Personal and Relationship Well-Being

Sacrifice facet	Outcome	Effect size	SE	p	CILL	CIUL
Behavioral	PWB	-.067	.028	.025	-.124	-.001
Willingness	PWB	.094	.033	.015	.022	.165
Satisfaction	PWB	.205	.037	.001	.120	.291
Costs	PWB	-.232	.057	.007	-.371	-.092
Behavioral	RWB	.015	.025	.537	-.034	.065
Willingness	RWB	.272	.026	.001	.218	.326
Satisfaction	RWB	.427	.034	.001	.354	.501
Costs	RWB	-.260	.026	.001	-.317	-.203

Note. CILL = confidence interval lower limit; CIUL = confidence interval upper limit; PWB = personal well-being; RWB = relationship well-being; SE = standard error.

(b) the relationship index used, (c) gender, (d) frequency of sacrifice, (e) type of assessment, (f) publication, (g) relationship length, (h) age, (i) lab, and (j) small study effects.

Personal well-being index. To test whether the different index of well-being taken into consideration (life satisfaction vs. emotional state) moderated the effects, we dummy coded the different indexes having emotions as the reference category (coded as 0). Results revealed that the effects were moderated by well-being index ($b = .132$ 95% CI [.035, 0.229], $SE = .046$, $p = .010$). Specifically, all the sacrifice facets were more positively associated with life satisfaction ($r = .098$ 95% CI [.027, .169], $SE = .033$, $p = .010$), than with emotional states ($r = -.013$ 95% CI [-.072, 0.046], $SE = 0.029$, $p = .657$). However, none of the moderations between the different sacrifice facets and well-being index was significant, indicating that in general the effects were more positive for life satisfaction than for emotional states for all the different facets of sacrifice.

Relationship well-being index. To test whether the different index of relationship well-being taken into consideration (relationship satisfaction, commitment, trust, closeness, IOS, gratitude, perceived partner commitment, and perceived partner gratitude) moderated the effects, we dummy coded the different indexes having relationship satisfaction as the reference category (coded as 0) and tested whether sacrifice facet and relationship well-being index type interacted to predict pseudoactor effects for relationship well-being. Results revealed only one significant moderation. Specifically, there was a significant interaction between the dummy variables costs of sacrifice (vs. behavioral sacrifice) and trust indexes (vs. relationship satisfaction indexes; $b = .17$ 95% CI [.070, .270], $SE = .048$, $p = .002$). Simple slopes from this interaction are shown in Table 2. Behavioral sacrifice appeared comparably associated with indexes of relationship satisfaction and trust; however, costs of sacrifice were more strongly negatively associated with relationship satisfaction than trust. However, the final simple slope should be interpreted with caution given that our model could not generate a reliable standard error for the effect. In sum, the type of relationship well-being index taken into consideration did not seem to strongly impact the results.

Gender. To test whether gender (men vs. women) moderated the effects, we dummy coded gender with men as the reference category (coded as 0). We assessed these moderation models for their associations with both personal and relationship well-being. For personal well-being, results revealed a significant moderation by gender ($b = -.060$ 95% CI [-.100, -.020], $SE = .019$, $p = .005$). Specifically, all the sacrifice facets were more strongly

negatively associated with personal well-being for women ($r = -.097$ 95% CI [-.163, -.031], $SE = .032$, $p = .006$) than for men ($r = -.037$ 95% CI [-.092, .019], $SE = .027$, $p = .186$). None of the interactions with sacrifice facets was significant. Similarly, for relationship well-being, there was also a significant moderation by gender ($b = -.041$ 95% CI [-.080, -.002], $SE = .019$, $p = .040$). Specifically, all the sacrifice facets were more strongly negatively associated with relationship well-being for women ($r = -.006$ 95% CI [-.057, .045], $SE = .025$, $p = .825$) than for men ($r = .035$ 95% CI [-.021, .091], $SE = .028$, $p = .209$). None of the interactions with sacrifice facets was significant.

Frequency of sacrifice. Frequency of sacrifice was only coded for behavioral sacrifices as it was most suitable for this facet of sacrifice. We assessed whether the effects of behavioral sacrifice on personal and relationship well-being were moderated by whether behavioral sacrifices were assessed over an extended period of time (e.g., how frequently in the previous three months) or soon after one occurrence (e.g., such as in an experiment or in an experience sampling procedure). Results revealed that this different type of sacrifice assessment did not impact the results.

Type of assessment. For all the sacrifice facets, to test whether type of assessment (sacrifice measured with a single-item vs. multiple-item measure) moderated the effects, we dummy coded type of assessment having multiple-item as the reference category (coded as 0). We assessed these moderation models for their impact on both personal and relationship well-being. None of all the possible moderation effects was significant.

Age and relationship length. We also tested whether relationship length and age moderated the effects. Regarding relationship length, none of the moderation tests was significant for either personal or relationship well-being. Regarding age, none of the moderation tests was significant for personal well-being. For relationship well-being, there was a significant moderation across all the sacrifice facets by age ($b = -.008$ 95% CI [-.016, -.000], $SE = .004$, $p = .041$). Specifically, all the sacrifice facets were more negatively related to relationship well-being for older than younger people.

Publication, lab, and small study effects. We tested whether the publication status of the associations moderated the effects. Publication was dummy coded, with unpublished as the reference category (coded as 0). Publication status did not moderate the link between sacrifice and either personal or relationship well-being. We performed similar analyses for lab, dummy coding whether the effect size was derived from one of the authors' labs or another lab, with nonauthors as the reference category (coded as 0). For personal well-being, results revealed a significant moderation by willingness to sacrifice and lab ($b = .321$ 95% CI [.147, .495], $SE = .071$, $p = .004$). Specifically, as shown in Table 3, although behavioral sacrifice was not differently associated with personal well-being depending on the lab, willingness to sacrifice was more positively associated with personal well-being when the effect size came from one of the authors' labs than from others' labs. For relationship well-being, several moderations emerged: by willingness to sacrifice and lab ($b = .143$ 95% CI [.011, 0.276], $SE = .062$, $p = .035$), by satisfaction with sacrifice and lab ($b = .172$ 95% CI [.03, .313], $SE = .065$, $p = .021$), and by costs of sacrifice and lab ($b = .153$ 95% CI [.006, .300], $SE = .063$, $p = .043$). Specifically, as shown in Table 4, although behavioral sacrifice

Table 2

Meta-Analytic Estimates of Actor Effects of Behavioral and Cost Sacrifices for Relationship Satisfaction and Trust

Sacrifice facet	RWB index	Effect size	SE	p	CILL	CIUL
Behavioral	Satisfaction	-.021	.023	.381	-.068	.026
Behavioral	Trust	.002	.042	.955	-.088	.093
Cost	Satisfaction	-.302	.032	.001	-.373	-.232
Cost	Trust	-.099	NaN	NaN	NaN	NaN

Note. CILL = confidence interval lower limit; CIUL = confidence interval upper limit; NaN = not able to be estimated; RWB = relationship well-being; SE = standard error.

Table 3
Meta-Analytic Estimates of Actors Actual and Willingness to Sacrifices Effects for Personal Well-Being Published by Authors and Other Labs

Sacrifice facet	Lab	Effect size	SE	<i>p</i>	CILL	CIUL
Behavioral	Other labs	-.050	.024	.058	-.103	.002
Behavioral	Authors	-.092	.060	.152	-.224	.039
Willingness	Other labs	.047	.025	.100	-.011	.105
Willingness	Authors	.326	.019	.001	.263	.388

Note. CILL = confidence interval lower limit; CIUL = confidence interval upper limit; SE = standard error.

was not differently associated with personal well-being depending on lab, both willingness to and satisfaction with sacrifice were more positively related to relationship well-being when the effect size was derived from the authors' labs than from others' labs. Costs were more negatively related to relationship well-being when the effect sizes were coming from others' labs as compared with the authors' labs. Finally, we assessed whether there was a moderation by effect size precision (i.e., standard error). None of the moderations was significant for either personal or relationship well-being.

Brief discussion. Results revealed that the different facets of sacrifice were differently related to personal and relationship well-being. Consistent with our expectations, willingness to sacrifice and satisfaction with sacrifice were more strongly positively associated with personal and relationship well-being than behavioral sacrifice. In fact, the data showed that willingness to and satisfaction with sacrifice were positively associated with both personal and relationship well-being. However, behavioral sacrifice did not show such positive associations. On the contrary, data revealed a negative association between behavioral sacrifice and personal well-being, although there was no association with relationship well-being. Finally, costs of sacrifice were negatively associated with both personal and relationship well-being. Thus, although results aligned with the benefit hypothesis when considering willingness to sacrifice and satisfaction with sacrifice, data were consistent with the burden hypothesis when considering behavioral sacrifices and costs of sacrifice.

Few moderators emerged across all the sacrifice facets: associations were more positive for life satisfaction than emotional

Table 4
Meta-Analytic Estimates of Actor Sacrifice Facets Effects for Relationship Well-Being Published by Authors and Other Labs

Sacrifice type	Lab	Effect size	SE	<i>p</i>	CILL	CIUL
Behavioral	Other labs	.025	.037	.506	-.051	.101
Behavioral	Authors	.002	.028	.944	-.057	.061
Willingness	Other labs	.250	.030	.001	.188	.313
Willingness	Authors	.371	.031	.001	.296	.445
Benefit	Other labs	.393	.041	.001	.299	.488
Benefit	Authors	.543	.022	.001	.488	.597
Cost	Other labs	-.295	.029	.001	-.362	-.227
Cost	Authors	-.164	.035	.013	-.267	-.062

Note. CILL = confidence interval lower limit; CIUL = confidence interval upper limit; SE = standard error.

states, associations were more negative for women than men (for both personal and relationship well-being), and associations with relationship well-being were more negative for older than younger people (see Table S2 in the online supplemental materials to see these effects separately for each sacrifice type). Few other specific moderations differed by sacrifice facets. Although for behavioral sacrifice there was no appreciable difference between relationship satisfaction and trust, costs of sacrifice seemed to be more strongly negatively related to relationship satisfaction than trust. Some lab moderations also emerged. For personal well-being, whereas behavioral sacrifice was not different depending on the lab, willingness to sacrifice was more positively related to personal well-being when the effect size was derived from one of the authors' labs than from others' labs. For relationship well-being, while behavioral sacrifice was not differently associated with personal well-being depending on the lab, both willingness to and satisfaction with sacrifice were more positively related to relationship well-being when the effect size was derived from the authors' lab than from others' lab. Costs were more negatively related to relationship well-being when the effect sizes were coming from others' labs as compared with the authors' labs. Frequency of sacrifice, type of assessment, publication status, and effect size precision did not affect the results.

Dyadic Effects

An important aim of this meta-analysis was to take advantage of the available dyadic data sets to test partner effects. Specifically, we were interested in investigating the link between the partner's sacrifice and the individual's outcomes controlling for the individual's own sacrifice. We therefore meta-analyzed partial correlations.

Sacrifice facets and personal and relationship well-being. We first tested whether the associations between partner's sacrifice and personal and relationship well-being differed across facets of sacrifice with the same dummy coding procedure as for the pseudo actor effects (see Table 5 for estimates by facet). Regarding personal well-being, results revealed that the associations were more strongly positive for willingness to sacrifice ($b = .071$ 95% CI [.006, .135], $SE = .030$, $p = .034$) and satisfaction with sacrifice ($b = .130$ 95% CI [.092, .167], $SE = 0.017$, $p < .001$)

Table 5
Meta-Analytic Estimates for Partner Effects (pr) Between Partner Sacrifice Facets and Personal and Relationship Well-Being

Sacrifice facet	Outcome	Effect size	SE	<i>p</i>	CILL	CIUL
Behavioral	PWB	-.020	.011	.091	-.043	.004
Willingness	PWB	.051	.028	.114	-.015	.117
Satisfaction	PWB	.110	.014	.001	.076	.143
Costs	PWB	-.124	.053	.088	-.280	.031
Behavioral	RWB	-.001	.015	.962	-.031	.030
Willingness	RWB	.098	.026	.003	.041	.155
Satisfaction	RWB	.143	.028	.001	.078	.208
Costs	RWB	-.102	.022	.002	-.154	-.051

Note. CILL = confidence interval lower limit; CIUL = confidence interval upper limit; PWB = personal well-being; RWB = relationship well-being; SE = standard error.

than for behavioral sacrifice. However, the associations for costs of sacrifice and behavioral sacrifice did not differ (95% CI: $-.252, .044$). For this model, the heterogeneity statistics were $T^2 = 0.01$ and $I^2 = 33.05$. Similarly, regarding relationship well-being, results revealed that the associations were more strongly positive for willingness to sacrifice ($b = .099$ 95% CI $[.040, .159]$, $SE = 0.029$, $p = .002$) and satisfaction with sacrifice ($b = .144$ 95% CI $[.077, 0.211]$, $SE = .032$, $p < .001$) than for behavioral sacrifice. In addition, the associations were more strongly negative for costs of sacrifice than for behavioral sacrifice ($b = -.101$ 95% CI $[-.158, -.045]$, $SE = .025$, $p = .003$). For this model, the heterogeneity statistics were $T^2 = 0.01$ and $I^2 = 45.17$. More specifically, and as shown in Table 5, there were no significant associations between partner's behavioral sacrifice and personal or relationship well-being. Similarly, partner's willingness to sacrifice was not associated with personal well-being, but it was positively associated with relationship well-being. Partner's satisfaction with sacrifice was positively associated with both personal and relationship well-being. Finally, partner's costs of sacrifice were negatively related to relationship well-being but not associated with personal well-being.

Test of subsequent moderators. In a subsequent step, we also examined whether the associations tested above were different for the different moderators.

Personal well-being index. To test whether the different index of personal well-being taken into consideration (life satisfaction vs. emotional state) moderated the effects, we dummy coded the different indexes, with emotions as the reference category (coded as 0). None of the moderation tests were significant.

Relationship well-being index. To test whether the different index of relationship well-being taken into consideration (relationship satisfaction, commitment, trust, closeness, IOS, gratitude, perceived partner commitment, and perceived partner gratitude) moderated the effects, we dummy coded the different indexes, with relationship satisfaction as the reference category (coded as 0). Results revealed only one significant moderation. Specifically, there was a significant interaction between the dummy variable of costs of sacrifice (vs. behavioral sacrifice) and trust indexes (vs. relationship satisfaction indexes; $b = .225$ 95% CI $[.135, .315]$, $SE = .042$, $p < .001$). Specifically, as shown in Table 6, whereas partner's behavioral sacrifice was comparably unrelated to either relationship satisfaction or trust, costs of sacrifice was negatively associated with relationship satisfaction and positively associated with trust, although as with the similar interaction for pseudoactor effects, our inability to reliably estimate a standard error for the

latter effect demands a cautious interpretation. In sum, also for the partner effects, the type of relationship well-being index taken into consideration did not seem to strongly impact the results.

Gender. To test whether gender (men vs. women) moderated the effects, we dummy coded gender, with men as the reference category (coded as 0). We assessed these moderation models for their impact on both personal and relationship well-being. For personal well-being, results revealed a significant interaction between the dummy code of satisfaction with sacrifice (vs. behavioral sacrifice) and the dummy code for gender ($b = .092$ 95% CI $[.024, .161]$, $SE = .032$, $p = .012$). Specifically, whereas for behavioral sacrifices there were no gender differences ($pr = .00$ 95% CI $[-0.04, 0.04]$, $SE = 0.02$, $p = .944$), for satisfaction with sacrifice women reported a more positive association between their partner's satisfaction with sacrifice and their own well-being ($pr = .09$ 95% CI $[0.03, 0.16]$, $SE = 0.03$, $p = .011$). None of the other moderations were significant. Similarly, for relationship well-being, none of the moderations was significant.

Frequency of sacrifice. As for the actor's effects, frequency of sacrifice for partner effects was only coded for behavioral sacrifices. We assessed whether the effects of behavioral sacrifice on personal and relationship well-being were moderated by whether behavioral sacrifices were assessed over an extended period of time or soon after one occurrence. Results revealed that this different type of sacrifice assessment did not impact the results.

Type of assessment. For all the sacrifice facets, to test whether type of assessment moderated the effects, we dummy coded type of assessment having multiple-item as the reference category (coded as 0). For personal well-being, there was a significant interaction between the dummy variable for willingness to sacrifice (vs. behavioral sacrifice) and type of assessment ($b = .212$ 95% CI $[.141, .282]$, $SE = .034$, $p < .001$). Specifically, as shown in Table 7, willingness to sacrifice was more strongly positively associated with personal well-being when assessed with a single item than with a multiple-item measure (although this simple slope should be interpreted with caution given that the model could not estimate the standard error). Behavioral sacrifice was not affected by the type of assessment used. For relationship well-being, none of the moderations was significant.

Age and relationship length. We also tested whether age and relationship length moderated the effects. Regarding personal well-being there was a significant interaction between age and the dummy variable for willingness to sacrifice (vs. behavioral sacrifice; $b = -.010$ 95% CI $[-.016, -.003]$, $SE = .003$, $p = .008$). Specifically, although there were no age differences for behavioral sacrifices ($b = .002$ 95% CI $[-.004, .007]$, $SE = .002$, $p = .431$), the association between partner's willingness to sacrifice and personal well-being decreased as average sample ages increased ($b = -.008$ 95% CI $[-.013, -.003]$, $SE = .002$, $p = .009$). Regarding relationship well-being there was a significant interaction between age and the dummy for satisfaction with sacrifice (vs. behavioral sacrifice; $b = .002$ 95% CI $[.000, .003]$, $SE = .001$, $p = .013$). Specifically, although age did not affect the association between satisfaction with sacrifice and relationship well-being ($b = .004$ 95% CI $[-0.01, 0.01]$, $SE = 0.004$, $p = .335$), the association between behavioral sacrifice and relationship well-being decreased as average sample age increased ($b = -.006$ 95% CI $[-0.01, -0.00]$, $SE = 0.003$, $p = .048$).

Table 6

Meta-Analytic Estimates of Partner Effects of Behavioral and Cost Sacrifices for Relationship Satisfaction and Trust

Sacrifice facet	RWB index	Effect size	SE	p	CILL	CIUL
Behavioral	Satisfaction	-.008	.016	.615	-.041	.025
Behavioral	Trust	.026	.038	.511	-.059	.111
Cost	Satisfaction	-.133	.026	.001	-.195	-.071
Cost	Trust	.098	NaN	NaN	NaN	NaN

Note. CILL = confidence interval lower limit; CIUL = confidence interval upper limit; NaN = not able to be estimated; RWB = relationship well-being; SE = standard error.

Table 7
Meta-Analytic Estimates of Partner Effects of Actual and Willingness to Sacrifices for Scale and Single Item Personal Well-Being Measures

Sacrifice type	Measure type	Effect size	SE	<i>p</i>	CILL	CIUL
Behavioral	Scale	-.014	.013	.307	-.042	.015
Behavioral	Single item	-.028	.018	.169	-.072	.016
Willingness	Scale	.049	.028	.121	-.016	.114
Willingness	Single item	.247	NaN	NaN	NaN	NaN

Note. CILL = confidence interval lower limit; CIUL = confidence interval upper limit; NaN = not able to be estimated; SE = standard error.

Relationship length did not moderate any effects for personal well-being. However, there was a significant interaction between relationship length and the dummy variable for satisfaction with sacrifice (vs. behavioral sacrifice) for relationship well-being ($b = .002$ 95% CI [0.00, 0.00], $SE = 0.001$, $p = .013$). Specifically, although relationship length did not moderate the association between satisfaction with sacrifice and relationship well-being ($b = .001$ 95% CI [-.000, .002], $SE = .000$, $p = .118$), it appeared to affect the association between behavioral sacrifices and relationship well-being, such that the association between behavioral sacrifice and relationship well-being was decreased more reliably (though still not significantly) for samples with a shorter average relationship length ($b = -.001$ 95% CI [-.002, .000], $SE = .000$, $p = .073$).

Publication, lab, and small study effects. We tested whether the publication status of the associations moderated the effects. Publication was dummy coded having not published as the reference category (coded as 0). There was not a significant moderation by publication status for either for personal or relationship well-being. We performed similar analyses for lab, dummy coding whether the effect size was derived from one of the authors' labs or another lab (other labs were the reference category coded as 0). Unfortunately, unlike the analysis of actor effects, our analysis of labs moderating partner effects could not proceed as-specified because too few labs had contributed effects from different facets of sacrifice (i.e., a problem of sparse-data or "separation" among levels of our two predictors). Finally, we assessed whether there was a moderation by effect size precision (i.e., standard error). None of the moderations was significant for personal well-being. For relationship well-being there was a significant interaction by effect size precision and the dummy variable for willingness to sacrifice (vs. behavioral sacrifice; $b = .989$ 95% CI [.055, 1.924], $SE = .395$, $p = .041$). Specifically, although effect size precision did not impact behavioral sacrifice ($b = -.253$ 95% CI [-.752, .247], $SE = .223$, $p = .284$), it had a marginally significant effect on willingness to sacrifice, as more imprecise effects were associated with larger partner effects for willingness to sacrifice ($b = .737$ 95% CI [-.205, 1.679], $SE = .329$, $p = .094$).

Brief discussion of dyadic effects. For the dyadic effects, the different facets of sacrifice were differently associated with personal and relationship well-being. Partner's willingness to sacrifice and satisfaction with sacrifice were more strongly positively related to personal and relationship well-being than behavioral sacrifice. In fact, data showed that partner's willingness to sacrifice and satisfaction with sacrifice were positively associated with relationship well-being (and partner's satisfaction with sacrifice

was also positively associated with personal well-being) However, behavioral sacrifice did not show such positive associations. Finally, partner's costs of sacrifice were negatively associated with relationship (but not personal) well-being. Thus, although results aligned with the benefit hypothesis when considering willingness to sacrifice and satisfaction with sacrifice, data were consistent with the burden hypothesis when considering costs of sacrifice.

Few moderators emerged which differed by sacrifice facets. Similar to the actor effects, although for partner's behavioral sacrifice there was no appreciable difference between relationship satisfaction and trust, partner's costs of sacrifice seemed to be more strongly negatively related to relationship satisfaction than trust. Furthermore, although for behavioral sacrifices there were no gender differences, for satisfaction with sacrifice, women reported a stronger positive association between their partner's satisfaction with sacrifice and their own well-being. In addition, whereas for behavioral sacrifice there was no difference owing to type of assessment, willingness to sacrifice was more strongly positively associated with personal well-being when assessed with a single item than with a multiple-item measure. Age and relationship length also moderated some of the effects. Specifically, although there were no age differences for behavioral sacrifices, the association between willingness to sacrifice and personal well-being decreased as average sample ages increased. Moreover, whereas age and relationship length did not affect the association between satisfaction with sacrifice and relationship well-being, the relationship between behavioral sacrifice and relationship well-being also decreased as average sample ages increased. Finally, although effect size precision did not impact behavioral sacrifice, it trended (albeit not reaching conventional level of significance) to impact the association between partner's willingness to sacrifice and relationship well-being. Frequency of sacrifice and publication status did not affect the results.

Discussion

Different theoretical accounts (e.g., Fitzsimons et al., 2015; Kelley & Thibaut, 1978; Van Lange, Rusbult, et al., 1997) would predict that sacrifice is either positively or negatively associated with personal and relational well-being. We meta-analyzed 9,547 effects sizes derived from 82 independent samples and 32,053 unique participants to shed light on the link between sacrifice and relationship satisfaction and personal well-being. We considered four different facets of sacrifice: willingness to sacrifice, behavioral sacrifice, satisfaction with sacrifice, and costs of sacrifice. We also adopted a dyadic perspective and examined this link from

the perspective of the individual reporting on their own sacrifice and from the perspective of the recipient. Results importantly differed based on the facet of sacrifice taken into consideration. Specifically, both the individual and the partner's willingness to sacrifice and satisfaction with sacrifice were positively linked to relationship satisfaction. Furthermore, the individual and the partner's satisfaction with sacrifice were also positively associated with their own personal well-being. However, such positive associations were not found for behavioral sacrifices. On the contrary, data revealed a negative association between the individual's behavioral sacrifice and personal well-being. In addition, an individual's and partner's costs of sacrifice were negatively related to relationship well-being; the individual's costs of sacrifice were also negatively associated with their own personal well-being. In sum, results generally supported the benefit hypothesis when considering willingness to sacrifice and satisfaction with sacrifice, from both the individual and the partner's perspective. That is, being willing to sacrifice for one's partner and being satisfied with such sacrifices are linked to several benefits. However, the data also provided some support for the burden hypothesis when considering behavioral sacrifices and costs of sacrifice.

Moderators

Some interesting moderators also emerged across all the sacrifice facets for the actor effects. First, sacrifice was more positively (and less negatively) associated with life satisfaction than with emotional states. As anticipated, the goal frustration accompanying sacrifice may be more likely to negatively affect people's emotional reactions than their cognitive appraisals how satisfied they are with their life in general. Second, the associations between sacrifice and personal and relationship well-being were more negative for women than for men. Because sacrifice is more normative for women than for men, women may receive less appreciation and gratitude from their partner (and society more broadly) than do men (Zoppolat et al., 2020). As a consequence, it is possible that women may have more negative attitudes toward sacrifice than men. Third, associations between sacrifice and relationship well-being were more negative for older than younger people. Although we did not anticipate this effect, it may be that older people have accumulated experience with sacrifice and have become more keenly aware of the toll that this behavior takes on their own personal well-being, and hence have more negative attitudes toward sacrifice than younger people.

Some other specific effects were found in the interactions between our moderators and the different sacrifice facets. For the actor effects, costs of sacrifice were more strongly negatively associated with relationship satisfaction than with trust, although this effect should be interpreted with caution given the statistical constraints. We also found that the lab from which the effects were drawn moderated some of the effects. Although the effects for behavioral sacrifice did not differ across lab, willingness to sacrifice and satisfaction with sacrifice were more positively related to relationship well-being when the effect sizes were derived from the authors' labs than from others' labs. Costs were more negatively related to relationship well-being when the effect sizes were derived from others' labs as compared with the authors' labs. We did not anticipate these effects, but overall they suggest that participants recruited from the authors' labs had a more favorable

outlook on sacrifice (although the effects did not differ for behavioral sacrifice) than those recruited from others' labs. This may be attributable to heterogeneous sample characteristics such as country of data collection or typology of studies (e.g., online vs. longitudinal).

For the partner effects, similar to the actor effects, costs were more strongly negatively associated with relationship satisfaction than with trust, although this effect has the same statistical constraints as the actor effect and should be interpreted with caution. Furthermore, the link between a partner's satisfaction with sacrifice and people's own well-being was stronger for women than for men, indicating that women, in particular, may benefit when their romantic partner feels satisfied with the sacrifices that they make. Although it was not hypothesized, age and relationship length also moderated some of the partner effects. Specifically, the partner's willingness to sacrifice was more strongly associated with personal well-being for younger participants than for older participants. In addition, the association between the partner's behavioral sacrifices and relationship well-being was more negative for older (vs. younger) participants and for individuals in longer (vs. shorter) relationship duration.

In general, although we hypothesized that relationship well-being index, frequency of sacrifice, and type of assessment might influence the results, it was interesting that we did not find that these moderators affected the results. Similarly, and as anticipated, publication status and effect size precision did not strongly influence the results.

Motivation and Willingness to Sacrifice

We found that the willingness to sacrifice as measured in hypothetical scenarios was positively associated with both one's own personal and relationship well-being. Furthermore, from a dyadic perspective, having a partner who is willing to sacrifice was also positively associated with relationship well-being. There are at least two reasons why this may be the case. First, being willing to sacrifice may signal that an individual is high in communal orientation and is therefore motivated to care for and respond to their partner's needs (Clark & Mills, 2011). Indeed, research has shown that communally oriented people, as well as their partners, experience greater personal and relationship well-being (e.g., Borelli et al., 2013; Kogan et al., 2010; Le & Impett, 2015; Le et al., 2018; Lemay, Clark, & Feeney, 2007; Reis, Maniaci, & Rogge, 2017). In fact, communally oriented individuals may be more likely to engage in a broad range of prosocial behaviors, including prosocial behaviors that are not particularly costly (e.g., proving support in times of need at no costs for the self, capitalizing on the partner's successes, reassuring the partner when there is a relationship threat), which should enhance the quality of the relationship and personal well-being (Crocker, Canevello, & Lewis, 2017; Gable, Reis, Impett, & Asher, 2004; Holt-Lunstad, Smith, & Layton, 2010; Lemay & Muir, 2016; Rusbult et al., 2009). Similarly, partners of communally oriented individuals may receive diverse types of benefits and care from their partner, enhancing their relationship satisfaction (e.g., Joel et al., 2013; Mills, Clark, Ford, & Johnson, 2004). However, our supplementary analyses also showed that willingness to sacrifice and communal orientation were related but distinct constructs (see Footnote 1). In fact, being willing to sacrifice does not only mean being responsive to one's

partner needs but being willing to do so in situations of divergence of interests, when people need to give up their own preferences and goals for their partner. This motivation seems to be especially beneficial because it may communicate that the individual cares about the relationship and is willing to incur personal costs for the relationship to survive in the long run (Drigotas, Rusbult, & Verette, 1999; Wieselquist et al., 1999). Perceiving that the individual has the motivation to invest and is committed to the relationship may signal to the partner that the individual can be trusted and relied upon in times of need (Holmes & Rempel, 1989; Wieselquist et al., 1999). This should induce partners to also further commit to the relationship, establishing a positive cycle of mutual trust and cooperation that eventually enhances relationship and personal well-being for both partners (Van Lange, Rusbult, et al., 1997; Wieselquist et al., 1999).

In sum, consistent with theoretical accounts provided by Interdependence Theory and by Communal Orientation Theory (Clark & Mills, 2011; Kelley & Thibaut, 1978; Rusbult & Van Lange, 2003), the results of this meta-analysis underscore the importance of being motivated to invest in and, even to incur costs, for the relationship. Although this positive predisposition toward the relationship is positively associated with personal and relational well-being, one of the key aims of this meta-analysis was to investigate the link between actually performing a sacrifice and well-being to test whether these positive associations hold even when people actually enact and experience the costs of sacrifice.

Behavioral Sacrifice

When considering the link between behavioral sacrifice and well-being, results revealed partial support for the burden hypothesis. Specifically, there was a negative association between behavioral sacrifice and personal well-being. However, the effect size was small, indicating that the strain of behavioral sacrifices may be smaller than anticipated by the burden hypothesis. The reason for such a small effect may be that behavioral sacrifice is simultaneously linked to both positive and negative outcomes and that these two forces oppose each other and result in an overall small negative effect on personal well-being. This idea is supported by recent research showing that engaging in sacrifice can be an ambivalent experience in that people experience both positive and negative reactions, although those reactions tend to be more negative than positive (Righetti et al., 2020). However, the studies included in the current meta-analysis likely captured relatively small sacrifices, and future research could examine the effects of larger sacrifices (e.g., moving to another country to promote the partner's career; Horne, Visserman, & Impett, 2020), which may involve more substantial costs and thus be more strongly negatively associated with personal and relationship well-being. Indeed, consistent with this notion, in the present meta-analysis, costs of sacrifice were reliably negatively associated with personal and relationship well-being.

Finally, we did not find any evidence for dyadic effects of behavioral sacrifice; that is, there were no significant associations between the partner's behavioral sacrifices and one's own personal and relationship well-being. Interestingly, the results of this meta-analysis revealed no associations between the partner's behavioral sacrifices and the individual's personal and relationship well-being. At first glance, these results may seem surprising since the

recipient of sacrifice has a lot to gain from their partner's behavior, both practically and symbolically. However, previous research has shown that people are only able to detect about 50% of their partner's daily sacrifices, which means that people do not always capitalize on those gains (Visserman et al., 2017). Furthermore, receiving sacrifices may be less rewarding than people might anticipate, because it might induce people to have negative thoughts and emotions and to devalue the relationship (Righetti & Impett, 2017). For example, recipients may feel guilty that their partner chose to give up their own personal preferences and goals for them as well as indebted to their partner and feeling that they need to make similar sacrifices in the future. Thus, although the recipient of sacrifice may indeed feel appreciated by their partner and grateful that their partner was willing to invest in their well-being, the sacrifice may not be free from emotional burden. Indeed, a recent investigation revealed that when people receive a sacrifice from their partner, they report increases in both positive and negative reactions, contributing to an overall ambivalent experience (Righetti et al., 2020).

Satisfaction and Costs of Sacrifice

The results of the meta-analysis showed that people's own satisfaction as well as their partner's satisfaction with sacrifice were positively associated with their own personal and relationship well-being. Similarly, perceiving that one's sacrifice is costly was negatively associated with personal and relationship well-being and the partner's perception of their own sacrifice costs was also negatively associated with relationship well-being. These effects may be driven by the size of the sacrifice. Arguably, to the extent that people engage in more mundane, daily sacrifices that smoothen interactions and promote harmony in the relationship at low costs for their goals, they should feel satisfied with their behavior and feel good about themselves and their relationship. Similarly, partners should be also likely to benefit from these types of sacrifices. In contrast, to the extent that people engage in larger sacrifices that entail giving up important preferences and goals, they may be especially likely to experience goal frustration and negative emotions with detrimental consequences for themselves and the relationship.

An alternative, although not mutually exclusive, explanation may be that what is most impactful is not the behavior per se but rather the appraisal of the sacrifice. To the extent that people sacrifice and, while doing so, focus on the positive outcomes that are derived from their behavior, they should derive benefits from and experience positive emotions. In contrast, when they focus on the costs that they incur and the losses they experience when they sacrifice, they may be more likely to experience negative outcomes. There are several factors that may influence such appraisals, including the size of the sacrifice. To the extent that the sacrifice is large, the costs may be especially salient and more difficult to deny. Individual differences may play a role as well. For example, and consistent with previous findings (Impett et al., 2005), to the extent that people are approach oriented and focus on gains, they may be more likely to experience positive outcomes from a sacrifice. However, to the extent that people are avoidance oriented and focus on losses, they may be likely to experience negative outcomes. Finally, the partner's response may also play an important role. People may be likely to place their focus on the

benefits rather than the costs of the sacrifice when their partner shows gratitude and appreciation. Consistent with this idea, people reported feeling more satisfied with their relationship when they perceived their partner to be grateful after having made a sacrifice (Impett, Park, Visserman, Sisson, & Le, Stellar, 2020; Visserman et al., 2019).

Implications and Future Directions

The results of the meta-analysis revealed that although being motivated to sacrifice for the relationship was linked to beneficial outcomes for the individual, the partner, and the relationship, there were no such positive associations when people actually performed or received those sacrifices. On the contrary, behavioral sacrifices were negatively associated with personal well-being. In other words, although being motivated to sacrifice for the partner was associated with positive effects, these positive effects were no longer realized when people incurred actual costs. The results of the present meta-analysis have implications for the study of the link between intention and behavior (e.g., Ajzen, 1985; Fishbein & Ajzen, 1975) as well as methodological implications for the way psychologists study research questions related to behavior (e.g., DeSteno, Bartlett, Braverman, & Salovey, 2002; FeldmanHall et al., 2012; Harris, 2003).

The results differed based on whether people reported on their intention to sacrifice versus on their actual behavior. This discrepancy may be caused by the modest link between intention and behavior. In fact, our meta-analysis revealed that willingness to sacrifice and behavioral sacrifice were only moderately related (i.e., $r = .23$; see Footnote 2), an estimate even lower than what is typically found in studies on the link between intentions and behavior (e.g., Armitage & Conner, 2001; Milne et al., 2000; Webb & Sheeran, 2006). This small correlation may be attributable to the fact that when a behavior is particularly costly, it may be even more difficult to enact. Thus, although many people report that they would be willing to incur costs for their relationship, they might choose not to sacrifice when they are actually confronted with these costs in their daily lives. Furthermore, anticipating the experience of costs may have a very different impact on people's relationships and well-being than actually experiencing those costs (e.g., Gilbert & Wilson, 2007; Wilson & Gilbert, 2005).

Across topics and fields, psychologists have typically assessed behavior with the use of hypothetical scenarios, which is a common way to study behavior and decision making (e.g., Kühberger, Schulte-Mecklenbeck, & Perner, 2002). However, as this meta-analysis shows, the inferences that can be drawn from these studies can be very different from the ones obtained when measuring actual behavior. One possibility for the discrepancy of the effects between willingness and behavioral sacrifice may be that people who are willing to sacrifice are also the happiest and most committed individuals and may therefore experience fewer divergences of interest and, as a result, fewer opportunities to sacrifice. Further, even when people do give up their immediate preferences or goals for a partner, they may be less likely to construe and label such actions as a sacrifice.

Regarding the dyadic effects, this meta-analysis shows that a partner's willingness to sacrifice was positively associated with relationship well-being; however, the partner's actual behavioral sacrifices were not. Having a partner who is willing to sacrifice

may signal that the partner is committed to the relationship and willing to incur costs for the relationship to thrive and survive in the long run (Drigotas et al., 1999; Wieselquist et al., 1999). Thus, consistent with the benefits of perceiving the availability of social support (e.g., Cohen & Wills, 1985; Gurung, Sarason, & Sarason, 1997; Rusbult et al., 2009; Uchino, Cacioppo, & Kiecolt-Glaser, 1996), perceiving that the partner has the motivation to sacrifice may signal that partner can be trusted and relied upon in times of need, fostering relationship well-being (Holmes & Rempel, 1989; Wieselquist et al., 1999). However, receiving actual sacrifices does not seem to be related to well-being, possibly because, together with the benefits, the recipient may also experience some costs (e.g., feeling guilty, indebted to the partner, sorry for the partner).

The results of this meta-analysis also have important implications for the study of prosocial behavior more generally (e.g., Dovidio, Piliavin, Schroeder, & Penner, 2017) and for the link between prosocial behavior and well-being. Previous research has found robust positive links between prosocial behavior and both personal and relationship well-being (for a review see Dunn et al., 2014). For example, studies found a positive correlation between charitable giving and happiness across 136 countries (Aknin et al., 2013). Experimental evidence has also shown that spending money on others increases happiness as compared with spending money on oneself (e.g., Dunn et al., 2008, 2014), especially if close others, rather than acquaintances, are the target of prosocial giving (Aknin, Sandstrom, Dunn, & Norton, 2011). In addition to prosocial spending, other forms of prosociality, such as helping and volunteering, have been linked to higher well-being (e.g., Chancellor, Margolis, Jacobs Bao, & Lyubomirsky, 2018; Jenkinson et al., 2013; Thoits & Hewitt, 2001; Weinstein & Ryan, 2010). Similarly, providing help and support to romantic partners is linked to higher relationship satisfaction (e.g., Bodenmann, Pihet, & Kayser, 2006; Reis, 2013).

When people sacrifice, however, they do not simply engage in actions that promote the welfare of their partner or the relationship, they also forego their own personal preferences or goals in the process. Thus, by definition, sacrifice is a type of prosocial behavior that involves giving up one's own self-interest, and the results of this meta-analysis revealed that prosocial behavior may not be associated with positive outcomes when people have to subordinate their personal goals for others. Furthermore, although sacrifice may be most common in close relationships, it certainly also occurs in other interpersonal settings, such as among colleagues (e.g., van Knippenberg & van Knippenberg, 2005), in-group members (e.g., Atran et al., 2014; De Dreu et al., 2014), and strangers (e.g., Morhenn et al., 2008). If sacrifice is not linked to positive outcomes in relationships that are characterized by strong self-other identity overlap, such as among romantic partners (Aron, Aron, & Smollan, 1992), it is possible that sacrifice may have even worse repercussions in relationships that have weaker ties and bonds. For example, our meta-analysis has shown that costs of a sacrifice were negatively related to personal and relationship well-being. Arguably, giving up goals and preferences for nonclose others may be perceived as more costly than doing the same for partners and have negative repercussions for the way people feel about those nonclose others and for their own well-being. In general, findings from this meta-analysis challenge the idea that prosocial behavior is mostly beneficial for the self and for the bond between people, because it is likely that when such

prosocial behavior is costly it may also harm the individual and the relationship.

The results of this meta-analysis did not reveal large associations between behavioral sacrifice and either personal or relational well-being, a finding that is consistent with research showing that personal and relationship well-being are promoted by a balanced dedication to personal and relationship concerns and not by overly sacrificing for the relationship (Kumashiro, Rusbult, & Finkel, 2008; Visserman et al., 2017). However, there may be some other moderators that may create either positive or negative associations between sacrifice and well-being. Previous research has already identified some of these moderators. For example, sacrifice is positively linked to relationship satisfaction when people sacrifice for approach motives (e.g., Impett et al., 2005) or when individuals are communally oriented (Kogan et al., 2010). However, sacrifice is negatively linked to relationship satisfaction when people sacrifice for avoidance motives (Impett et al., 2005, 2014) or when they suppress their emotions (e.g., Impett et al., 2012). Future research should explore other possible moderators. For example, certain individuals may be particularly likely to regret having performed a sacrifice, such as those with low self-esteem (Righetti & Visserman, 2018), or those with an avoidant attachment style or who are low in commitment. Similarly, certain individuals may be more likely to experience the costs of receiving a sacrifice. For example, people high in empathic concern may experience more negative emotions after receiving sacrifice, particularly in cases in which their partner incurred a great deal of costs on their behalf, because they feel guilty or sorry for their partner. Furthermore, recipients who are more exchange-oriented in their relationship may have more negative thoughts about sacrifices because they feel indebted to their partner and feel the need to reciprocate.

Strengths and Limitations

Before concluding, we should acknowledge limitations and strengths of the current work. First, given the correlational nature of the data included in this meta-analysis, we cannot determine the direction of the effects. Given that previous research has shown that prosocial behavior influences relationship well-being, which in turn influences prosocial behavior in a mutual cyclical growth pattern (Wieselquist et al., 1999), we suspect that the link between sacrifice and well-being may be bidirectional. In fact, being willing to sacrifice and having a strong desire to invest in the relationship may lead to higher well-being, but also having higher personal and relationship well-being may lead people to be more willing to give up their preferences for the relationship. Furthermore, when people are happy and willing to sacrifice, they may appraise sacrifices as more satisfying and less costly (Kogan et al., 2010). Much research in relationship science relies on general questionnaires and diary studies, both which prevent us from drawing strong causal conclusions. Although not without challenges (i.e., artificial settings, demand characteristics), future research would benefit from testing ideas related to sacrifice with the use of experimental paradigms in which sacrifice is manipulated in the laboratory.

Second, most data sets in our studies came from Western, educated, industrialized, rich, and democratic (WEIRD) countries, and results obtained in these countries can differ from those obtained in other countries (Henrich, Heine, & Norenzayan, 2010).

For example, most of our samples were collected in North American or Europe and in countries characterized by high levels of individualism (Hofstede, 2001). Participants recruited from these countries may attribute special importance to the self and to the accomplishment of personal goals and may experience behavioral sacrifices as especially costly. In contrast, in interdependent cultures, where there is a major focus on close others and relationships, behavioral sacrifices may be perceived as less damaging and more beneficial to the self. Thus, future research should investigate whether behavioral sacrifices are positively linked to relationship satisfaction and personal well-being in interdependent cultures.

Third, many of the estimates are derived from self-report data from the same individual and the associations may be inflated because of common-method variance. Fortunately, the dyadic effects—which incorporate reports provided by two different partners—do not suffer from the same limitation, but future research could also benefit from the inclusion of third-party or outside observer perspectives or more objective indexes of personal well-being (e.g., cortisol level, inflammation indexes) and relationship well-being (e.g., break-up).

Finally, our estimates were based on concurrent associations between sacrifice and well-being and we cannot draw strong conclusions about the longitudinal implications of sacrifice, although we did not find reliable moderations by whether sacrifice was assessed as a frequency (such as an accumulation of experiences of sacrifice) or as a single occurrence. It is possible that the consequences of sacrifice may be especially harmful (or beneficial) over longer periods of time in relationships. For example, recent research has shown that sacrifice increases ambivalent feelings toward one's partner (Righetti et al., 2020), feelings which are known to have physiological costs, such as higher blood pressure (Birmingham, Uchino, Smith, Light, & Butner, 2015), higher coronary artery calcification (Uchino, Smith, & Berg, 2014), and inflammation (Uchino et al., 2013). Ambivalence may also deteriorate the relationship in the long run by making people act in unpredictable and extreme ways (e.g., Armitage & Conner, 2000; Bell & Esses, 2002). Thus, examining the link between sacrifice and longitudinal outcomes over a longer time span may elucidate the long-term effects of this behavior.

Despite its limitations, this work has several notable strengths. First, this meta-analysis is based on a large number of effect sizes (9,547), and the use of a rigorous contemporary meta-analytic modeling strategy for handling dependent effect sizes (Hedges et al., 2010) enabled tests of moderators. Second, we examined personal and relationship well-being using a broad range on well-being indexes and tested for possible moderations by type of index. The results mostly revealed a general trend for well-being, independent of the specific construct that was taken into consideration. Finally, whereas most research on sacrifice (and prosocial behavior in general) has examined the link between people's own prosocial behavior and their own well-being (Dunn et al., 2014; Righetti & Impett, 2017), we adopted a dyadic approach by examining the link between the partner's sacrifice and the individual's own personal and relational well-being.

Conclusions

Prosocial behavior has often been linked to higher personal and relational well-being (e.g., Aknin et al., 2013, 2015; Dunn et al.,

2008), yet not all prosocial behaviors are the same. In the current meta-analysis, we examined the correlates of sacrifice, which is a type of prosocial behavior in which people subordinate their goals to promote the welfare of their partner or their relationship. Results revealed that whereas the motivation to sacrifice was linked to positive outcomes, actual behavioral sacrifice was not. On the contrary, enacting sacrifices was associated with lower personal well-being. Thus, the current findings shed light on the boundary conditions under which prosocial behavior is linked with intrapersonal and interpersonal benefits and consequences. Importantly, our meta-analysis revealed that the appraisal of the sacrifice is crucial. Being satisfied with sacrifice was positively linked to well-being, whereas focusing on the costs was detrimental. These results suggest that sacrifice is a double-edged sword that entails both gains and losses. Being willing to sacrifice may be valuable for individuals and couples, but when people actually perform this behavior, they maximize their well-being when they focus on the gains rather than the losses.

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Received November 30, 2018

Revision received June 16, 2020

Accepted June 18, 2020 ■