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NOBASCHOLAR

Using Multiple Methods to More Fully Understand Causal Relations: Positive Affect Enhances Social Relationships

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Abstract:
We review research indicating that higher levels of positive affect help produce better social relationships for that person and those around him or her. By better relationships we mean those that are experienced as more pleasant and less aversive, are closer and more supportive, and are long-lasting. We review longitudinal, experimental, experience-sampling, cross-cultural, and other types of evidence that suggest that not only do good relationships produce positive affect, but that positive affect can lead to them as well. We also focus on the mediators that create the association going from positive affect to sociability and high-quality relationships. Finally, we review the unknowns in this area and the types of future research still needed.

Keywords: Positive affect, subjective well-being, relationships, relationship quality

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Is it self-evident that those with the most positive affect would be more socially successful? We think not. For one thing, many consider happiness to be a hedonistic endeavor, which focuses the person on pleasures, often selfish ones. In popular writing, authors such as Ehrenreich (2009) have argued that happiness can lead to problems rather than to success. Thus, we find it implausible that the causal connection we review in this paper is common knowledge, making it even more important to ensure there is a wide range of literature that supports the conclusion that successful social relationships follow from positive affect.

In the following article, we review evidence that indicates that positive feelings do not simply follow from quality social relationships, but in turn increase their likelihood. Most importantly, we point out the holes still remaining in this research area since the earlier review by Lyubomirsky, King, and Diener (2005). Positive affect includes the moods and emotions that people experience as desirable and pleasant. While people who experience more frequent positive feelings tend to have stronger and more supportive social relationships, certain types of studies are still needed to further understand when and why positive affect is beneficial to social relationships. We review the correlational, longitudinal, and experimental evidence that suggests a causal arrow moving from positive affect to quality social relationships (as first proposed by Lyubomirsky et al., 2005). We will also review the mediating mechanisms that help explain the causal connections, as well as the moderators that influence the strength of the connections. Our review focuses on positive feelings as a variable that is separable from low negative affect, and which has a causal influence that goes beyond predictions from negative feelings.

Defining Quality Social Relationships

Before we define what we mean by quality social relationships, we would like to start by introducing several theories of emotion that might predict why positive feelings may benefit social relationships. First, functional approaches to emotion hypothesize that a major function of emotion is to

guide behavior, as well as reinforce behaviors through feelings of reward or punishment (Keltner & Haidt, 1999; Keltner & Kring, 1998). Positive emotions have informational value, telling the individual that the activity is worth repeating, and the pleasant feelings of the positive emotions reinforce the behaviors leading to them. Thus, positive emotions can reinforce social activities such as games and conversation, which are often rewarding, leading people to seek out these activities in the future.

A related conceptual explanation of the connection between positive affect and sociability is in terms of the approach versus avoidance motivational systems (Gable, 2006). Human beings have a fundamental need to belong, and possess a powerful motivation to form and maintain strong and stable interpersonal relationships (see Baumeister & Leary, 1995; Reis, Collins, & Berscheid, 2000 for reviews). Social relationships have the propensity to provide rewards that fulfill interpersonal needs, but also threaten punishments that leave us feeling vulnerable and hurt. As such, individuals are motivated to both approach rewards and avoid the punishments inherently found in social relationships. Positive affect may trigger the approach system, which Gable finds is related to greater relationship satisfaction and less loneliness. The idea is that the behavioral activation system, which underlies positive feelings, should trigger approach tendencies toward others. This is supported by work by Girme, Overall, Simpson, and Fletcher (2015); they studied a New Zealand sample and found that people reported greater life satisfaction when they reported higher approach goals (r = .28 & .3), and this association was stronger for people in romantic relationships.

A third theoretical explanation for the link between positive feelings and better relationship quality is Fredrickson's broaden-and-build model (1998, 2001; Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008). Fredrickson suggests that the reason we experience positive emotions is to broaden and build our resources for the future, and one key type of resource is social support. We experience positive emotions when we have been successful and there are no imminent threats. It is in these situations that people have more freedom to build resources and skills for the future. Therefore, positive feelings allow us to form tighter bonds with others by doing rewarding activities with them, and by helping others in a way that they are likely to reciprocate in the future.

What are high-quality social relationships?

1. The relationships are pleasant and rewarding. People enjoy the relationships and do not experience chronic negative thoughts and feelings in them.
2. The relationships are close and supportive. People can rely on the other person for emotional support, physical support, and understanding. Here, we will also rely on prosocial behavior as outcomes suggesting more supportive relationships. In that prosocial behavior (e.g., donations, aid) are signs of support, we feel that these findings can stand in as proxies of interpersonal support as such tendencies would likely extend to closer relationships as well.
3. The relationships tend to be long-lasting. Relationships that last longer help build predictability and security into people's lives. Although, short-term relationships can be rewarding, they usually do not provide an ongoing basis for achieving goals and providing support and security.

Thus, these are the three characteristics of high-quality social relationships that we concentrate on in this review, and we examine how positive affect increases each of them.

Causal Analysis

Beyond simply reviewing evidence that makes it plausible that there is a causal arrow pointing from positive affect to better social relationships, we plan to also describe research still needed to establish this association. Thus, to understand how positive affect improves social relationships in the natural world, we review various methods, each providing distinct information about the causal system that could provide insight as to whether positive affect causally influences subsequent improvements in social relationships.

We examine simple correlational evidence because it can quickly reveal where associations exist and do not exist. The correlational studies reveal that there is a connection between the two variables in many different groups, including in the many nations that have been studied so far. These data indicate the ubiquity of the association between the two variables. However, it is important to note that correlational research does not on its own indicate causation.

We also describe longitudinal research where we can examine whether a possible cause precedes a hypothesized outcome and whether a change in a causal variable over time precedes a change in the outcome. Although longitudinal studies do not have the same internal validity as formal experiments in terms of inferring causality, more external validity is usually present because longitudinal methods help establish not just that X can cause Y, but that it actually seems to do so in everyday settings where there are a host of interacting forces. Short-term longitudinal studies such as those using the experience-sampling

method help to establish whether two variables move up and down together in short time periods. Long-term longitudinal research reveals the development of the connection over time—its dynamic unfolding.

Formal experiments can manipulate both short-term positive moods and enhance long-term positive affect and examine the short and long-term effects, respectively, on improvements in social relationships. Experiments are thus seen as the strongest evidence of causality due to high internal validity. Experimentation has limitations, despite its internal validity, that the other methodologies can complement with their strengths. For example, experiments usually are relatively low on external validity, and are focused on relatively small samples of participants. Furthermore, experimental manipulations are often not "clean," in the sense that factors are often manipulated beside the concept intended. For example, mood manipulations frequently include social content in the induction. Thus, the researcher cannot be certain that the outcomes are due to the positive affect aspect of the manipulation *per se* or to the priming of social cognitions. In addition, laboratory experiments are subject to biases such as demand characteristics. Finally, experiments must be so carefully focused on controlling the context of the situation that we often gain little insight into the conditions that must be in place for the causal connection to occur. Fortunately, the other methods, although possessing less internal validity, tend to not have the same limitations, and thus are likely to expand understanding beyond that provided from experimentation. Taken together, these methodologies can indicate causal direction and help us understand how the dynamic system functions. Thus, when considering the link between positive affect (PA) and positive social outcomes, it is important to determine the types of studies that are lacking, as the conclusion that positive affect leads to better relationships requires comprehensive evidence.

Beyond these methodologies, scientific understanding of causality also requires understanding of mediators and moderators. The mediators explain the processes that link X to Y, and the moderators place boundaries on the causal sequence. Establishing the moderators allows us to know when the causal sequence will be stronger and weaker, and when it does not occur at all. In sum, several approaches are needed in understanding causal influences in the dynamic networks that psychologists study, such as positive mood causing sociability and social success.

Positive Affect is Linked to Positive and Rewarding Relationships

We first look at research showing how positive affect is linked to what we offered as our first definition of quality relationships, that they be positive and rewarding.

Correlational research. Based on environmental and genetic influences, sociability has been found to correlate with positive emotionality (Eid, Riemann, Angeitner, & Borkenau, 2003; *r's* = .27 to .57). In one study, participants filled out daily reports for six weeks, which were then averaged across days. While extraversion and positive affect were found to be separable, they were highly related (r = .380). These results cannot be attributed to self-report biases, as observer reports were also used to assess the variables (*r's* = .293 to .577) (Fujita, 1991).

Correlational research also supports that positive affect is linked to more rewarding relationships. One study found that extraversion (which is highly related to PA; Fujita, 1991) was associated with making more friends (Feiler & Kleinbaum, 2015; r = .34). However, no correlational research appears to directly link positive affect and the propensity to make friends. Moreover, it has been found that those with high PA are liked more by others. This may be due to the fact that they are judged as more rewarding to spend time with (Harker & Keltner, 2001; r = .70). Diener and Seligman (2002) studied the happiest 10% of students and found that they experienced better romantic relationships (η^2 = .24 to .44). In this study, happiness was determined by examining satisfaction with life, global self-reported affect, informant affect balance, and daily affect balance over 51 days. Affect balance refers to the prevalence of positive affect over negative affect and is used to define "happiness" (Diener, 1984). Thus, because of the important role PA plays in affect balance, here and at other times, we refer to results addressing affect balance because they are important leads and point to a need for additional research, especially when affect balance is the only measure currently available (i.e., little or no evidence in terms specifically of positive affect). Those who experience greater positive feelings also exchange more often during negotiations (Lawler, Thye, & Yoon, 2000; β = .58), suggesting that when people interact with those who have higher levels of positive affect, they can expect more favorable outcomes. Individuals higher in PA can be expected to have more friends, to be rated more positively by others, and to report more positive interactions.

Another correlational finding that can be explored in terms of PA is its relation to sex. While measures of subjective well-being are strongly correlated with frequency of sexual activity (Blanchflower & Oswald, 2004, p. 402; "a large effect"), to the best of our knowledge, this has not been explored a great deal in terms of its relationship to positive affect. For example, Muise, Schimmack, and Impett (2015) did find that there were curvilinear associations of sexual frequency with PA; specifically, having sex once a

week was associated with greater happiness, especially for those currently in romantic/married relationships. However, no additional effect was found for people having sex more than once a week (β = .09 & .35). Thus, while there is minimal research on the association, work suggests PA is positively related to sexual activity.

The specific social skills and traits exhibited by those with high or low PA also needs to be studied in further detail. Depression is highly relevant in this regard, where a key feature of depression is low positive affect (Watson, Clark, & Carey, 1988; *r's* = -.41 to -.37), not simply high negative affect. For example, in a review, depression was associated with a variety of poor social skills (Segrin, 2000) in areas such as paralinguistic behaviors, speech content, posture and gestures, etc. Specifically, the review indicated that the depressed are more verbally aggressive and discuss more negative verbal content. Moreover, low positive affect is accompanied with feeling unsociable, being bored, as well as lacking in energy (Diener, Kanazawa, Suh, & Oishi, 2015), which might detract from maintaining good relationships and engaging in social interactions. Interestingly, anhedonia (i.e., diminished interest/pleasure in response to previously rewarding stimuli) is a symptom of depression (Feighner et al., 1972). Anhedonia has itself been linked to social impairment, and the association between anhedonia and social impairment was partially mediated by poorer attentional control, such that deficits in the ability to engage in self-regulation negatively impacted social functioning and social relationships (Tully, Lincoln, & Hooker, 2014; *r* = .66). Thus, it is possible that less happy people are generally less skilled at maintaining social relationships. Anhedonia has also shown to be associated with lower than normal positivity offset (i.e., mild positive moods when no strong emotional events occur; Strauss, Visser, Lee & Gold, 2017). This might be particularly relevant because prior research has suggested that the positivity offset is beneficial for social relationships (Diener et al., 2015). However, the research on why low positive affect *specifically* is associated with poor social outcomes is still in the preliminary stages, and these effects need to be specified in future research.

Long-term longitudinal data. Studies show that over time, those with higher levels of positive affect have relationships that are more rewarding. One study suggests that positive affect may be able to compensate for low social skills in marriages. For those with low social skills and low PA, the decline in satisfaction is approximately 20+ points over 4 years, but with high PA, this decline is reduced to approximately 10+ points over 4 years (Johnson et al., 2005, p. 23). While the influence of marriage on PA has not been studied, this has been examined for life satisfaction, which we will use here as a proxy as they are closely related (e.g., Lucas, Diener, & Suh, 1996; *r's* = .28 to .52). A meta-analysis indicated that getting married is initially positive for life satisfaction (b_0 = .26), though on average it tends to return toward baseline levels over time (Luhmann, Hoffman, Eid, & Lucas, 2012). While one might expect PA to show a similar course, it would be prudent to study this directly and see how positive affect specifically rises or falls after marriage.

Experience sampling longitudinal data. Experience sampling indicates that positive moods are related to more interactions with others and feeling more sociable. PA/extraversion is related to the frequency (β = .34 & .23) and pleasantness of interactions (β = .32), even after controlling for the related variables of negative affect-neuroticism, openness to experience, conscientiousness, and agreeableness (Berry & Hansen, 1996). As mentioned earlier, correlational research shows that when people are in a naturally occurring positive mood, they also feel more sociable and this result is replicated in longitudinal experience sampling data as well (Diener et al., 2015). Feeling sociable is associated with positive affect over time within individuals. The authors signaled 42 respondents at random moments twice a day for 42 days. In a reanalysis of these data, they found the mean within-persons correlation was *r* = .48 between positive affect and feeling sociable. Importantly, this correlation was significant and positive for 41 of the 42 respondents (see Diener & Larsen, 1984, for a description of this data set). A similar relationship was found between-subjects (*r* = .39).

What the experience sampling studies indicate is that not only do trait levels of positive affect lead to sociability, momentary state levels of positive affect are also associated with feeling sociable. They also reveal that this association is found within most individuals. The within-subject data are important in revealing the effects of momentary mood, but are also pivotal in terms of indicating that the findings in this field are not just due to between-persons response styles.

Experimental—short-term moods. Experimental studies indicate that inducing positive moods in the laboratory can also lead to greater sociability and better social skills. A positive mood induction led people to feel more social (η_p^2 = .07 & .10) and prefer social situations (η_p^2 = .04 & .06) (Whelan & Zelenski, 2012). Those put in a positive mood also showed greater interest in social activities compared to those in a neutral mood (Cunningham, 1988a) as well as those in a depressed mood (Cunningham, Shaffer, Barbee, Wolff, & Kelley, 1990; *r* = .23). Interactions also appear to proceed more favorably when one is in

a positive mood. Inducing positive moods in child psychiatric patients led them to show better social skills compared to those in the neutral condition (Kazdin, Esveldt-Dawson, & Matson, 1982). Another relevant finding is that the implementation of a positive musical mood induction led to both objectively and subjectively greater sexual responses compared to baseline and negative mood inductions (Mitchell, DiBartolo, Brown, & Barlow, 1998). Studies focused on positive mood inductions indicate that positive moods lead individuals to feel more social, exhibit better social skills, and experience greater sexual arousal.

Experimental—inductions that alter long-term PA. Experimental research has also found that manipulating a change in long-term positive affect can lead to lasting interpersonal changes, contributing to more pleasant and rewarding relationships. Loving-kindness meditation is intended to improve relations with others and increase warmth and caring for the self. In one study, those assigned to the loving-kindness meditation condition became more positive (i.e., calm, happy, loving; $\eta_p^2 = .12$) and less negative (i.e., angry, anxious, unhappy; $\eta_p^2 = .04$). Those in the loving-kindness meditation condition also experienced increased positivity toward others ($\eta_p^2 = .03$) (Hutcherson, Seppala, & Gross, 2008). Other studies, such as Fredrickson, Cohn, Coffey, Pek, and Finkel (2008), indicate that we can expect these effects to last at least up to nine weeks. In Fredrickson et al. (2008), loving-kindness meditation increased daily positive emotions. These positive emotions were in turn linked to increases in personal resources, such as positive relations with others. Overall, it was concluded that the increase in personal resources led people to become more satisfied with their lives.

A study by Kemeny et al. (2012) also found long-term social benefits as the result of a meditation intervention. The researchers used a meditation and emotion regulation training intervention to determine how it influenced participants emotionally and socially. The intervention incorporated concentration practices, mindfulness practices, and attempted to promote empathy and compassion and the understanding of the features of emotions and their consequences in one's self and others. Female schoolteachers were randomly assigned to a training group or a control group. Those who received training reported feeling less negative emotion ($r = -.51$), less depression ($d = .81$), and increases in positive affect and mindfulness ($r = .37$) compared to the control group. This was still true five months after the training (e.g., depression: $d = .90$). Those who received training showed greater feelings of compassion, better recognition of others' emotions, and when asked to discuss an upsetting issue with their significant other, they were less hostile during that interaction. This indicates that the intervention helped create closer and more supportive relationships.

One issue with mindfulness interventions is that social feelings tend to be included in the treatment. Thus, it is difficult to determine from these studies alone whether positive feelings alone will lead to improvement in relationships. However, the studies reviewed above have seen encouraging and lasting results. Though additional work is needed, the existing studies suggest that long-term changes in SWB also lead to better relationships and that those benefits persist over time.

Positive Affect is Linked to Closer, Supportive Relationships

We next look at research showing how positive affect is linked to what we offered as our second definition of quality relationships, that they would show evidence of being closer as well as being more supportive.

Correlational research. Relationships with those who have higher positive affect appear to be closer, characterized by holding relational values, experiencing greater liking, and having more meaningful conversations. Positive affect is correlated with having social values, such as placing importance on intimacy and social approval (Kunzmann, Stange, & Jordan, 2005; $r = .27$). Positive affect is also positively associated with friendship, assessed by measuring "liking" for a close friend (Cheng & Furnham, 2002; $r = .31$). Happiness, assessed with an affect balance score, is negatively related to discrepancies between ideal and actual best friendships (Demir & Orthel, 2011; $r = -.21$), indicating that happier individuals are more likely to experience the quality of friendships that they desire. In a study of call center employees, greater verbal fluency during calls (i.e., minimal pausing, fumbling, or use of fillers) was positively associated with their own positive affect after the call (Rothbard & Wilk, 2011), suggesting that higher positive affect is associated with better conversations. Gable, Reis, Impett, and Asher (2004) found that when people shared their positive events with each other, they experienced higher positive affect. Another study by Gable, Gonzaga, and Strachman (2006) established that in discussing positive events together, a phenomenon called "capitalization", couples rated their partners as more responsive when they also perceived that their partner was more excited by the event that they were discussing ($r = .41$ & $.31$). Thus, the display of positive emotions during conversation may make one appear more responsive.

Additional correlational evidence indicates that those with higher PA also experience more supportive relationships. George (1991) found in the workplace that positive mood was linked to helpful behavior, both for actions included (i.e., customer service; $r = .26$) and not included (i.e., altruism; $r = .24$) in one's job. However, the study did find that trait positive affect was not correlated with those behaviors. One possible reason for this finding may be evident in a study by Organ and Ryan (1995). They found that, in a review of 55 studies, self-ratings (vs. ratings by others) are associated with higher correlations within the organizational citizenship behavior literature ($r = .14$). This could be relevant as George (1991) used supervisor ratings of tendency toward behaviors. Additionally, Siedlecki, Salthouse, Oishi, and Jeswani (2013) found that provided support predicts positive affect ($\beta = .13$). Though PA was not linked to other types of social support in this study (i.e., enacted or perceived), other aspects of subjective well-being such as life satisfaction were ($\beta = .13$ & $.18$). In this study, enacted support constituted emotional, tangible, and informational support received from others, yet these individual types of support could also be examined separately for their relations to positive affect. This appears to be a fairly unexplored area, and much research could still be conducted on how positive affect is correlated with specific types of support.

Long-term longitudinal research. Another sign of closeness in relationships is the experience of certain important life events, such as having children, getting separated, or getting divorced. While this has not been studied specifically in regard to PA, those with higher life satisfaction also have a greater likelihood of having children (OR: 1.05 - 1.37 to 1) and a lower likelihood of becoming separated (OR: .58 - .85 to 1), controlling for socioeconomic status (SES) and personality (Luhmann, Lucas, Eid, & Diener, 2013). Positive affect still needs to be studied long term in order to determine how it relates to the major events experienced in close relationships.

Other longitudinal work found PA was linked to less loneliness, stronger friendships, and a decreased likelihood to interact with deviant peers, all factors suggesting the presence of greater available support. Kansky, Allen, and Diener (2016) conducted a longitudinal study of individuals from early adolescence (age 14) to young adulthood (age 25), using a measure of positive affect at Time 1 to predict social outcomes at Time 2. Early positive affect predicted mean levels of later loneliness ($r = -.29$) and sociability ($r = .30$), as well as desirable changes in these over time. Data gathered from friends, a parent, and the romantic partner supported these predictions. Friend reports of attachment ($r = .17$), as well as improvements in this over time, were predicted by positive affect at Time 1. The father's reports of low association with deviant peers ($r = -.38$), as well as decreases in this across time, were predicted by levels of positive affect at age 14. Kansky et al. (2016) controlled a major potential third-variable explanation of the findings, family income, in all their analyses. Thus, this study provides evidence that the effects of positive affect on later quality social relationships emerges early in life, is confirmed by data beyond self-report, and is not due to family resources such as income that might influence both affect and relationships.

Longitudinal research also supports the association between PA and prosocial behavior. Positive affect in Korean teens predicted greater prosocial attitudes and behavior months later, even after controlling for baseline prosociality (Shin, Choi, Suh, & Koo, 2013). Thoits and Hewitt (2001) found that those more satisfied with their lives reported spending more hours volunteering when interviewed three years later. However, to the best of our knowledge, the examination of PA long-term and its relation to prosocial behavior is very rare. This appears to be an area left largely unexplored. This tendency toward helpful behavior in general should have positive effects on one's relationships with others as it indicates an overall greater willingness to provide support. Research suggests that PA should continue to be associated with prosocial actions over longer periods of time.

Experience sampling longitudinal data. Positive moods are also associated with spending more time with others. Specifically, positive moods over time are strongly correlated with time spent in fun/active (i.e., joking with friends; $r = .23$) and necessary/informational types of social interactions (i.e., meeting the job supervisor; $r = .13$), controlling for the dependency in measurement over time (Vittengl & Holt, 1998).

Other work finds a link between happiness and greater empathy toward others. An interesting study by Strayer (1980) consisted of preschool children being observed for eight weeks. Children showing happy displays (versus sad, angry or hurt) were more likely to give empathic responses to others ($r = .59$). This is something that should also be examined for positive mood more specifically. Such research could examine whether this is an association that exists even at a young age. It could be that experiencing positive moods more frequently as children helps establish one's first friendships, and this could lead to more experience or greater ease at socializing when one is older. This potentially greater ability to experience empathy may also help people better support others.

Experimental—short-term moods. Positive mood inductions also lead people in the laboratory to act closer, engaging in more self-disclosure, and more supportively, such as feeling more interested in

prosocial activities and being more cooperative. In regards to discourse, males in a positive mood communicate and self-disclose more to females than those in a negative mood (Cunningham, 1988b; *r's* = .27 to .37). Individuals show greater interest in prosocial activities compared to those in a neutral mood (Cunningham, 1988a). Inducing positive moods in the laboratory has been linked to more helpful behavior (Aknin, Dunn, & Norton, 2012). Those in an elation condition versus a depression condition are more likely to volunteer for a future unpleasant task (Aderman, 1972). Children induced to feel a positive mood, by thinking of happy experiences, donate more money to other children than those in the control or sad conditions (Rosenhan, Underwood, & Moore, 1974). Once again, prosocial behavior as a way of providing support and help to others can be a method of fostering social bonds and increasing closeness in relationships. Thus, we use prosocial outcomes here as a proxy for support in relationships. Another finding is that participants induced with positive moods are more cooperative, using less contentious bargaining strategies (e.g., Carnevale & Isen, 1986). Thus, we see that manipulating positive mood in the lab has been found to cause greater self-disclosure, as well as more prosocial behavior and cooperation.

Experimental—inductions that alter long-term PA. Most of the long-term experimental emotion interventions focus on alleviating depression rather than directly on raising PA in normal populations. Research suggests these interventions can make relationships closer and more supportive. Treatment for depression has been associated with significant increases in one's perceived social support (η^2= .27), utilized social support (η^2= .27), and satisfaction with support (η^2= .09) (Mohr, Classen, & Barrera, 2004), where changes in social support were fully explained by changes in depression. Those in complete remission for depression show less social functioning impairment compared to those in partial remission (Romera et al., 2010). Additionally, Whisman (2001) found improvements in marital adjustment after individuals were treated for depression (η^2= .55), and this change was mediated by changes in depression. Prior research has established that positive affect rises when patients are treated for depression, but only when those patients show a significant decline in depression over time (Kring, Persons, & Thomas, 2007). Overall, research shows that the treatment of depression is linked to better social outcomes over time.

Positive Affect is Linked to Long-Lasting Relationships

Finally, we look at research showing how positive affect is linked to what we offered as our final definition of quality relationships in terms of relationship stability. That our review showed that there was a lack of correlational or experimental evidence should not be surprising, as longitudinal data would be the gold standard in examining the link between positive affect and relationship stability.

Long-term longitudinal research. From the perspective of longitudinal research, those with higher positive affect appear to be in longer lasting relationships. For example, positive expressions in photos predicted future favorable marital outcomes (Hertenstein, Hansel, Butts, & Hile, 2009: *r's* = -.10 to -.28; Seder & Oishi, 2012: *r's* = .25 to .44; see Freese, Meland, & Irwin, 2007 for a non-replication). Similarly, Harker and Keltner (2001) found evidence that more positive facial expressions in photographs predicted better marital outcomes up to 30 years later (*r* = .20), which was little changed when controlling for physical attractiveness (*r* = .16) or social desirability (*r* = .18). While research on subjective well-being has linked it to a greater likelihood of getting married (Marks & Fleming, 1999; OR: 1.5 to 1), this has not yet been studied for the specific construct of positive affect. Thus, while we cannot yet say this conclusively, it is likely married people have higher PA because these individuals are also more likely to get married.

Mediators Established

How do those with greater positive affect experience better relationships? Understanding the mediators of an association between two variables is essential to scientific understanding—what are the processes connecting the cause to the effect? For example, if those with higher PA have better marriages, why is this so? Do they tend to overlook the faults of their partner, do they have more fun with their partner, or do they spend more time with their partner? In order to fully understand causal connections, we need to establish the processes that mediate this connection. For the effects of positive affect on the quality of social relationships, researchers have uncovered a number of mediators.

Sociability

Several studies point to the fact that positive affect is tied to both feeling more motivated to socialize and to actually engaging in more social behavior. It may be this propensity toward sociability which helps drive positive interpersonal outcomes. In a study examining reports of affect balance, those with higher levels of subjective well-being were more social (Diener & Seligman, 2002; η^2'*s* = .24 to .44). Positive affect is linked to more time engaging in social activities (*r* = .19) and with friends (*r* = .18) (Lucas, Le, &

Dyrenforth, 2008). A lack of positive affect is associated with feeling unsociable (Watson et al., 1995; *r* = .19). As indicated before, extraversion is correlated with PA (Fujita, 1991). Thus, it makes sense that research indicates that introversion is correlated with feeling less positive affect (partial η^2 = .05) *and* holding less positive attitudes (partial η^2= .04) about an imagined group discussion (Besner, 2009). Positive affect appears to be linked to feeling more sociable, as well acting on those feelings by actually being more social. As a result of these interactions going well, people may come to expect good outcomes in future interactions. This is supported by a study on customer service. This study found that in salespeople, extraversion (*r* = .194) and conscientiousness (*r* = .111) predicted better sales performance, which appeared to be because those individuals also had higher self-efficacy. This then made them more motivated to interact with customers and to have favorable interactions (Yang, Kim, & McFarland, 2011). This area of research could be strengthened by relying less on a related measure (i.e., extraversion) and focusing on positive affect and its direct links to feeling or acting sociable.

It is More Rewarding to Interact with High Positive Affect Individuals

Not only are those with higher PA more sociable, but a number of studies also suggest that their social interactions are actually more rewarding for them and their partners, which may be another factor causing better relationship quality. Others are more satisfied when interacting with those with higher PA, which may be because they too end up experiencing more positive emotions as a result of those interactions. Individuals who exhibit more positive emotions are viewed as more attractive social partners (as opposed to emotional downers). They are more popular and well liked (see review by Diener & Tay, 2012). The strength of employees' smiles has been found to be positively associated with customers' satisfaction with their interactions (Barger & Grandey, 2006; *r* = .20). Chi, Chung, and Tsai (2011) found that leaders' positive moods were related to better team performance (*r's* = .31 to .38), and emotional contagion was one of the factors mediating this relationship. Thus, spending time with more positive individuals is likely to make a person more positive too. In a longitudinal study, Fowler and Christakis (2008) found that individuals with higher levels of subjective well-being in a social network were arranged in clusters, and this appeared to be due to SWB spreading throughout the network. For example, "a person was 15.3% more likely to be happy if a directly connected alter was happy" (p. 5). For both a short-term positive mood and more long-term positive affect, PA appears to be contagious. Others will find it rewarding to be around those with high PA because they will also end up experiencing more positive affect.

Cooperation and Prosociality

It may also be that those with higher PA are more cooperative and engage in more prosocial behavior and that it is this greater generosity and helpfulness that leads to their interpersonal success. In a longitudinal study from age 14 to age 25, Kansky, Allen, and Diener (2016) found that positive affect in early adolescence predicted lower levels of conflict in relationships in young adulthood (*r* = -.27), as well as a greater decrease in conflict over the intervening years. These trends were supported both by self-report measures and by partner-report assessment (*r* = -.25). Several studies indicate that positive affect reduces the tendency to use contentious strategies when bargaining (Barsade, 2002: *r's* = -.11 to .39; Baron, Rea, & Daniels, 1992; Baron, 1990: ω^2 = .02; Carnevale & Isen, 1986). Specifically, those in a positive mood condition made more concessions in negotiations (e.g., Carnevale, 2007). Even at a young age PA appears to be linked to more cooperative behavior that persists over time, and extensive negotiations research supports this finding. There are many articles indicating PA is linked to more cooperation in negotiations, but future researchers should move beyond this area and explore links to cooperative behavior in other types of social situations.

In general, these individuals also tend to feel more prosocial (Carlson, Charlin, & Miller, 1988: Mean effect size = .54; George, 1991: *r* = .24; Priller & Schupp, 2011: 1-2% more frequent donations). In an experimental study, those placed in an elated mood were more likely than those in a neutral mood to help with both high-interest and low-interest tasks. This was true when they simply offered to help someone else who was volunteering on his or her own and when that person encouraged participants to assist (Cunningham, Shaffer, Barbee, Wolff, & Kelley, 1990). In the workplace, George (1991) found that positive mood was positively associated with helpful behavior, both for behaviors related (*r* = .26) and not related to one's job (*r* = .24). Thus, the finding that PA is linked to prosocial behaviors is not only true in the laboratory, but also in a work setting. This tendency to provide help and support is not limited to only fun or interesting tasks, nor does it appear to only be the result of outside pressure.

Empathy, Compassion, and Perspective Taking

Positive affect is related to feeling interested, caring, and in harmony with others (Diener et al., 2015). Yet another possibility is that the ability of PA to enhance a person's compassion for others may be

a factor that benefits them in their relationships. An experimental study found that being in a positive mood helps people show greater compassion, perspective taking, and sympathy for someone in distress (Nelson, 2009). Induced positive affect increases the likelihood that one will mirror the actions of another person (Kuhbandner, Pekrun, & Maier, 2010; d = .64). Positive affect then not only makes us feel more interested and invested in others, it also helps us take on their perspective, feeling greater sympathy for them and unconsciously mimicking them in a potential effort to facilitate this desire. However, research is still needed in this area. Other than self-reporting that they feel more compassionate (e.g., Nelson, 2009), it also needs to be determined whether people actually act in a more compassionate manner. In addition to mimicking others (e.g., Kuhbandner et al., 2010), taking a more situational perspective (versus dispositional) when viewing another's behavior, or assessing if another's emotional reaction was appropriate (e.g., Nelson, 2009), we need to investigate in what other ways people with higher levels of positive affect attempt to take on others' perspectives. Some research has found that individuals with compassionate goals want to be more supportive (*r's* = .23 to .56) as they have goals to contribute to others' well-being (Crocker & Canevello, 2008). Perhaps future researchers could explore this avenue: do those with higher levels of positive affect show evidence of wanting to contribute to others' well-being? For example, do they report this as a goal or work toward this goal? This could be another way to assess compassion.

Trust and Respect

Other work suggests that PA is tied to the values of trust and respect. Perhaps a focus on these key qualities helps relationships thrive. In the Gallup World Poll we found a positive association between positive affect and both trusting others (r = .06) and feeling respected (r = .36), both at the individual and national levels. Across cultural regions positive emotions are associated with social and respect needs (Tay & Diener, 2011). PA is linked to being more trustful and feeling and desiring respect. There may be something about these qualities that leads to better interactions. Perhaps the need for respect or feeling respected is also linked to showing others more respect. In that case, it would be clear as to why PA is linked to better relationships: because those with higher levels of positive affect treat people with more respect and are more trusting. However, a direct link between PA and treating others with more respect will need to be established. PA also appears to be linked to giving one's trust wisely. Researchers have found that being in a positive mood helps us adjust our level of trust in another person in response to corresponding cues (Lount, 2010; d = 1.21). Thus, this does not appear to be a tendency toward reckless trust. Replications should be conducted to further establish trust as a mediator though.

More Substantive Interactions

Higher PA is also associated with a higher quality of interactions when meeting others. Those with higher trait positive affect experience better interaction quality during first meetings (Berry & Hansen, 1996: *r's* = .27 to .38). More specifically, over time positive emotionality has been found to broaden our feelings of self-other overlap within new relationships (Waugh & Fredrickson, 2006; r = .21 & .27). These studies suggest PA is associated with a higher quality of interactions in new relationships. More work should be conducted on this topic, but it is possible that PA provides a boost when forming relationships that could have long-term positive consequences.

Beyond initial first encounters, other research points to a promising area to further explore: PA and substantive interactions. Research links PA to deeper conversations and positive relationship goals. A study examining satisfaction with life found that those more satisfied spend less time alone (r = -.36), talk to others more (r = .31), and have more meaningful conversations (r = .26) (Mehl, Vazire, Holleran, & Clark, 2010). Determining that this is also true for positive affect would lead to stronger evidence that PA leads to better relationships due to its influence on more meaningful interactions. Another way to assess deeper interactions may be to examine one's relationship goals. Referring back to Crocker and Canevello (2008), they found that those with compassionate goals wanted to be more supportive of others. Perhaps by measuring the goals those with PA have for their relationships (or that their friends/partners have for them), we could examine another way in which those with high positive affect may be experiencing more meaningful relationships and interactions. For example, if those with higher levels of positive affect are more likely to have compassionate goals for their relationships than those with lower positive affect, this would be additional evidence of their more substantive interactions.

Accurate Self and Person Perception

Those with greater levels of positive affect may also be better understood by others, which likely enhances their social interactions. Research by Human and Biesanz examined the "well-adjusted" who are identified using measures of self-esteem, satisfaction with life, positive relations with others, depression, etc. The well-adjusted are more "judgeable" by others (Human & Biesanz, 2011a: *r's* = .09 to .77), probably because they act more genuinely (Human, Biesanz, Finseth, Pierce, & Le, 2014: d = .59). The

well-adjusted also accurately understand what other people are typically like (Human & Biesanz, 2011b: *d's* = -.72 to .58). While not directly focused on measures of positive affect, this does point to one possibility as to how those with higher levels of PA experience better social relationships—by being more readable and by more easily reading others. Initial research supports this, where a sad mood induction caused participants to exhibit significantly lower accuracy in social judgments compared to those in the happy or control group (Ambady & Gray, 2002; r = -.42). Future studies should be conducted to further confirm that positive affect makes one a more accurate judge and to explore whether PA makes one more judgeable.

Coping: A Buffer Against Stress

Positive affect may help people create a reserve of rewarding times or experiences with others, which they can draw upon to serve as a buffer during negative times, protecting their relationships from the negative consequences of stress. For example, Gottman (1994) found that in stable marriages, couples have more positive interactions when trying to resolve conflicts. Their ratio of positive to negative interactions was 5 to 1, in comparison to a ratio of .8 to 1 in unstable marriages. The ability to create more positive moments, even during a conflict, could be one of the ways that positive affect helps people buffer their relationships from the ill effects of stress, but this has not yet been thoroughly tested. This is a particularly interesting area for future research though as we also know that visible emotional support can be helpful for individuals who are highly distressed, but costly for nondistressed recipients (Girme, Overall, & Simpson, 2013). Thus, the creation of these positive moments to help create a buffer against future stress will likely have limitations or may need to be initiated in certain ways so as not to be detrimental to the relationship instead. Another promising line or research regarding this has focused on shared leisure time. Couples were interviewed prior to becoming parents and then were followed up with afterwards. It was found that when wives and husbands reported more shared leisure time prenatally, they experienced more love one year later (Claxton & Perry-Jenkins, 2008). It may be that shared leisure time is one way in which couples build positive moments.

The broaden-and-build theory created by Fredrickson (1998) proposes that positive emotions, such as interest, contentment, and joy, help broaden our thoughts and behavior. Specifically, in a social context, we exchange social smiles, engage in social play, and are more likely to help others. In this way positive emotions help us accumulate lasting social resources. Other research links better social support to more effective coping as well. For example, when people feel they do not have others with whom to share their thoughts and feelings, it can lead to distress, such as rumination and intrusive thoughts (Lepore, 2001). At times, people may also feel that there are *limits* to what they can share about their stress with others. These feelings are also associated with greater distress and poorer adjustment (e.g., Lepore & Helgeson, 1998; β = -.14 & -.18). Furthermore, poor coping is linked to social interactions that are briefer, including the tendency of others to distance themselves from the person in need (Silver, Wortman, & Crofton, 1990). Thus, while this should be more directly examined, it appears that positive affect is likely associated with a greater reservoir of social resources; these resources may help buffer them from the negative effects of stress, allowing their relationships to remain stable.

Mediator Conclusions

Not all of the above mediators contribute to all three of the qualities of a good relationship that were listed previously: pleasant and rewarding, closer and more supportive, and long-lasting. Studies should be conducted that directly test the proposed mediators and to which of the three outcomes they contribute. On the one hand, if a person with high PA is also more sociable, does that sociability lead to a more rewarding relationship? On the other hand, being more sociable may be less likely to contribute to a long-lasting relationship. All of these avenues should be directly explored in future research.

The Need for Moderators Research

Moderators tell us when a causal sequence does and does not occur. Moderators also describe when the relation is stronger or weaker. Understanding the moderators of causal connections is essential to scientific understanding, as these boundaries are needed for complete understanding. Not only do we want to know, as laboratory experimentation can show, that a causal connection can occur, but whether it actually does so in everyday life, and under what conditions. To draw an analogy from medicine, it is not enough to know that a bacterium can make people sick, but that it does so in everyday life, and under what conditions. For example, the bacterium Clostridium difficile can lead to severe gastrointestinal symptoms and even death, but tends to do so primarily when a person's natural gastrointestinal bacteria have been depleted by antibiotics. To understand and control this infection, one must understand the conditions in which the disease-causing bacteria can thrive. Fecal transplants that reintroduces healthy bacteria have thus been much more effective in curing c. difficile than antibiotic treatments. It is not enough to simply know

that one factor can cause another; it is also essential to know when and why it does so in the natural world.

While there is evidence that some of the links exist across an array of cultures, a few studies point to possible limitations to the relationship between subjective well-being and social outcomes. Forgas (2007) found that those in a negative mood actually created better, more effective persuasive interpersonal messages (β*'s* = .288 to .401). Tan and Forgas (2010) also established that positive moods led to more selfish distribution of resources in a game, which may be due to a possible increase in internal focus. Casciaro, Carley, and Krackhardt (1999) found that while positive affect improved accuracy when assessing one's friendship network structure (r = .21), it hindered accuracy in terms of perceiving one's local ties (r = .02), in that they had more unrealistic assessments of those ties. These studies suggest that positive moods may not always lead to more cooperation and prosocial behavior, though the specific reasons for these findings are not yet clear. It also indicates that the benefits of a positive mood may not extend to persuasive communication and that trait positive affect may lead to unrealistic assessments of one's personal ties. Thus, it is clear that negative emotions can help relationships in some cases and positive moods are not invariably beneficial. Thus, we need more systematic research on the circumstances and activities where positive versus negative moods will be most beneficial.

Lucas, Diener, Grob, Suh, and Shao (2000) found that although extraversion and positive affect were related across cultures of the world, this association was stronger in some cultures. Specifically, the correlation between extraversion and positive affect was weaker in collectivist nations (r = .59 vs. .77). Related to this, Fulmer et al. (2010) found that extraverts reported higher life satisfaction if living in an extraverted versus introverted culture (R^2 = 3.30%).

Another interesting moderator may involve the manner in which one seeks subjective well-being. Materialism, or the pursuit of happiness/success based on acquisition of social status and goods, is linked to a decreased desire for interpersonal relationships, including negative attitudes toward marriage and children (Li, Lim, Tsai, & O, 2015: β*'s* = -.26 to -.27). Thus, it may be that when one's positive affect is tied to certain sources, the link between positive affect and good interpersonal outcomes will not occur.

It is also possible that the link between positive affect and good relationship outcomes could be more complicated depending on the attachment style of the person with whom you are interacting. For example, avoidantly attached individuals exhibit negative responses to low or moderate levels of practical support, but they exhibit positive responses to high levels of practical support, showing a curvilinear effect (Girme et al., 2015: r = -.12).

Finally, partner aggression may play a part as well. Arriaga, Capezza, Goodfriend, Rayl and Sands (2013) found that individuals see themselves as being less happy if they were to leave their aggressive relationship. However, they are actually happier compared to their forecast when they finally do exit the aggressive relationship. It could be the case that if positive affect keeps individuals in aggressive relationships, then partner aggression may also eliminate the association we have typically observed between positive affect and relationships.

However, much more research needs to be conducted to clarify the above findings so that we understand when positive affect does not enhance relationships.

Causal Conclusions

An earlier review on subjective well-being and success by Lyubomirsky, King, and Diener (2005) focused on the link between SWB and relational success. This review provided initial evidence (cross-sectional, longitudinal, experimental, etc.) that the causal arrow appeared to go both ways. After examining a greater body of research, the current review focused on positive affect supports their initial conclusion.

So far, the literature indicates that positive affect does not just result from good relationships but can also cause them. The most powerful evidence comes from experimental and longitudinal research, which shows that manipulating subjective well-being in the lab can influence social outcomes and that the naturally occurring association is evident over time, with positive feelings at Time 1 predicting better relationships at Time 2, often controlling for Time 1 relationships (e.g., Kansky et al., 2016). Not only do positive emotions predict better quality social relationships, but they can, at least in some cases, predict relationships that improve over time. Long-term research indicates that often both state and trait positive affect are linked to better relationship outcomes over time. For example, positive moods from moment to moment are linked to more pleasant interactions, and trait PA is also linked to better marital outcomes. The experimental literature also makes a strong case for a link between positive affect and better social relationships. It has been found that inducing a positive mood in the laboratory can positively affect one's interest in social and prosocial activities. We hope that this article can serve as a model for reviewing what evidence exists in a field and what additional evidence is needed.

Conclusions

We have presented compelling evidence that positive affect is likely to be a benefit to high quality social relationships. Several complementary methodologies all point to this conclusion. Although each method has limitations, they tend to converge in their conclusions and not suffer from identical limitations. Another fact that adds to our confidence that positive affect can enhance relationships is that the findings are based on a variety of mood manipulations in the experimental studies and on a variety of types of measures of both positive moods and relationships. Thus, our conclusion is not based solely on correlations found in global self-report measures.

Psychologists have long maintained that supportive social relationships are one key to psychological health and well-being (e.g., Frisch, 2005; 2014; Seligman, 2011). Thus, the fact that positive affect leads to higher quality social relationships has a number of applied implications. First, raising PA and lowering feelings of ill-being has the potential to substantially improve people's social relationships, and such interventions might be useful in both clinical and organizational settings. Alleviating depression and other negative states is likely to lead to both increases in positive affect and to improvements in social relationships. Similarly, raising the positive affect of workers has the potential of improving relationships within the organization, with coworkers, customers, and supervisors.

An important implication of our review is that researchers must be cautious in interpreting correlations that show a relationship between PA and social outcomes. Often it is assumed that the social outcomes have caused higher levels of PA, but our review suggests that PA could be the cause of better relationships.

Despite the extensive research in this field, there is still a need for more studies in many areas, for example experimental treatments to raise long-term levels of positive affect. There is also a need for much more research to determine the moderators, the bordering conditions, in which positive affect enhance relationships. Very little is currently known. Thus, although a connection going from affect to social relationship quality now seems likely, there is much we do not yet understand, and this area continues to be a very promising area of research.

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