

Review

Experimental effects of social behavior
on well-beingAnnie Regan ^{1,*} Nina Radošić ¹ and Sonja Lyubomirsky ¹

Subjective well-being is characterized by relatively frequent positive emotions, relatively infrequent negative emotions, and high life satisfaction. Although myriad research topics related to subjective well-being have been explored – from how it should be measured to how it affects physical health – a key finding is that social connections are crucial. Researchers are therefore increasingly exploring whether subjective well-being can be improved through interventions that encourage specific types of social behaviors, including prosociality, gratitude, extraversion, and brief social interactions. We review this recent work, highlighting potential behavioral and psychological mechanisms underlying the effectiveness of such interventions, along with their boundary conditions.

Social connection and positive psychological functioning

Over the past several decades, psychologists have made significant progress in understanding the causes and correlates of **subjective well-being** (see [Glossary](#)) [1,2]. The burgeoning interest in the science of well-being has yielded far-reaching insights, from how well-being can be measured to how it relates to physical health. Rather than investigating the antecedents or downstream consequences of well-being, research from our laboratory and others has focused on how well-being can be increased through intentional effort. This line of research began with a relatively simple question: does instructing individuals to think and behave in ways characteristic of dispositionally happy people improve their well-being?

Researchers have repeatedly tested this question by randomly assigning participants to engage in brief, self-directed activities known as **positive activity interventions**. Meta-analyses of experimental research have found that these interventions have small to medium effects on increasing well-being [3–5]. Numerous positive activity interventions and experimental paradigms have been used to understand how well-being can be intentionally increased, but some of the most robust effects stem from interventions that encourage connecting with others.

Here, we offer an overview of recent research from the field of well-being science, focusing on behavioral interventions and experiments that investigate the causal link between social connection and well-being. We also discuss the potential mechanisms underlying this link, highlighting areas that are ripe for future work. Although the idea that social connection is crucial to human health and well-being is by no means new, this recent work provides insights into how positive activity interventions that encourage and facilitate social connection might be usefully applied in future experimental research.

Improving well-being through increased social connection

Decades of research across multiple disciplines has demonstrated that social ties and social connection are crucial for both well-being and physical health [6–9]. Similarly, the lack of social connection is associated with multiple mental and physical health problems. Feelings of loneliness and isolation, for example, are associated with depression, heart disease, cognitive dysfunction, and an increased risk of early mortality that is comparable to other health determinants such as smoking [8]. Given its

Highlights

Over the past two decades, hundreds of studies have investigated whether and how subjective well-being can be increased through volitional activities.

Short, self-directed well-being interventions have been shown to increase positive affect and life satisfaction, as well as alleviate symptoms of mental health disorders.

Given established links between social connection and well-being, researchers have focused on interventions that prompt specific types of social behavior, such as doing acts of kindness, expressing gratitude, and acting more extraverted. Furthermore, recent experiments have investigated the social dynamics of these interventions in interpersonal contexts.

Although the boundary conditions and mechanisms of these interventions are only beginning to be understood, they show promise for both increasing well-being and enhancing social connection.

¹Department of Psychology, University of California, Riverside, CA, USA

*Correspondence:
arega008@ucr.edu (A. Regan).

importance to mental and physical health, social connection has been theorized as a fundamental human need [10], and more recently, as a critical public health issue [11].

Much of the existing research linking social connection and well-being has been, by necessity, cross-sectional or longitudinal. Recent experimental work, however, has begun to disentangle the causal relationship between social connection and well-being by instructing participants to engage in specific types of social behavior. In the following sections, we review evidence from both laboratory experiments and longitudinal interventions that examine the causal relationship between specific types of social behavior and well-being.

Prosocial behavior

Prosocial behavior (or kindness) is a unique type of social interaction, enacted with the intention to benefit others. Despite its other-oriented intention, research suggests prosocial behavior has salubrious effects on the actor in addition to its target. Longitudinal studies, for example, demonstrate that volunteers have better mental and physical health [12,13]. Experimental research further suggests a causal link between prosocial behavior and positive outcomes. Indeed, numerous experiments have shown that doing kind acts is a reliable way of improving well-being (including flourishing mental health) and feelings of social connectedness [14,118]. Notably, the benefits of prosocial behavior have been replicated in both laboratory and field settings, in studies ranging from one session to multiple weeks (see [15] for a meta-analysis of kindness-based experiments).

Recently, investigators have begun to ask increasingly nuanced research questions in experimental work about how and why prosocial behavior influences well-being. For example, a recent study investigated the differences between cognitive and behavioral prosocial interventions, testing whether recalling acts of kindness for others yields similar well-being benefits as performing them [16]. Participants in all prosocial conditions (i.e., performing or recalling kindness) reported greater well-being – including decreases in negative affect and increases in positive affect and life satisfaction – relative to controls, and interestingly, did not significantly differ from one another for these outcomes. Other work suggests, however, that although both performing and recalling prosocial behavior boost well-being, the effects are smaller and less robust for recalling prosocial behavior [17]. Future research should continue to investigate how features of prosocial interventions impact their efficacy.

Multiple experiments have shown that the target of kindness interventions matters vis-à-vis effects on well-being, highlighting the importance of one's intent to benefit others rather than oneself. Specifically, engaging in kind acts for others has been shown to confer more well-being benefits than engaging in kind acts for oneself, and prosocial behavior motivated by a concern for oneself [14,18]. Using a novel design, a recent experiment [19] replicated and extended previous work by asking participants to engage in either prosocial behavior, prosocial thoughts (i.e., thinking about others in a positive way), or self-focused behavior over the course of 10 days. Analyses of the full dataset did not detect within- or between-condition differences for well-being outcomes. Analyses including only days when participants complied with study instructions revealed more positive outcomes in all experimental conditions compared to controls, with prosocial behavior demonstrating the most benefits, including greater feelings of purpose and less social isolation. This experiment highlights not only the unique benefits of prosocial behavior (relative to prosocial thoughts or self-focused behavior), but also the importance of measuring and analyzing participant compliance in naturalistic well-being experiments.

Although these studies suggest that prosocial (i.e., other-benefiting) behavior is a more effective route for boosting individual well-being than kind behavior focused on the self, a growing body of research suggests that self-compassion, which involves the tendency to think kindly of oneself in

Glossary

Emotion regulation: changing the intensity, duration, or quality of an emotion.

Fast Friends procedure: a procedure developed to increase interpersonal closeness. In this task, two people ask each other a series of questions that increase in their level of self-disclosure as the task progresses.

Positive activity interventions: experiments in which participants are randomly assigned to engage in short, self-directed activities modeled after the thoughts and behaviors of dispositionally happy people and compared to one or more control groups. Examples include expressing gratitude, cultivating optimism, and engaging in acts of kindness for others.

Self-transcendent emotions: emotions that involve transcending one's own momentary needs and desires to focus on another person (e.g., gratitude, compassion, and awe). Self-transcendent emotions are theorized to facilitate cooperation and social relationships.

Social networking sites (SNSs): a type of digital media designed to facilitate communication and sharing information with others online (e.g., Facebook, Instagram, and Snapchat).

Subjective well-being: the overall sense that one's life is going well. Subjective well-being includes an affective component (experiencing relatively frequent positive emotions and relatively infrequent negative emotions) and a cognitive component (judgment of one's satisfaction with life).

Weak ties: relationships (e.g., with acquaintances) that involve relatively infrequent contact and low intimacy. Research has demonstrated the benefits of engaging in social interactions with one's weak ties.

the face of failure or shortcomings, is a promising avenue for increasing well-being and may act as a protective factor against mental health conditions [20,21]. A full discussion of the benefits of self-compassion is beyond the scope of the present review, however, as these interventions are not usually centered around social interactions with others (see [20,22] for meta-analyses on the relationship between self-compassion and mental health-related outcomes).

Other research has experimentally tested the effects of kindness in the form of a specific type of social interaction – namely, giving compliments. A recent set of experiments, for example, found that although participants consistently underestimated the value of giving a compliment, doing so boosted their mood [23]. Furthermore, people reported a greater likelihood of giving a compliment to a stranger after completing this study – that is, after having complimented another participant in the laboratory. Thus, like other forms of prosocial behavior, the results of this work suggest that giving compliments benefits both the giver and the recipient, despite givers consistently underestimating the value of compliments to recipients [24].

Gratitude

Gratitude is a state or emotional response elicited by the recognition that one has received a benefit from an external source [25]. Like prosocial behavior, expressing gratitude has established benefits for individual well-being; numerous experiments have shown that engaging in gratitude activities leads to positive outcomes such as increased positive emotions, prosocial behavior, life satisfaction, and health behaviors [26–31], although the effect sizes for such interventions tend to be small [32].

Characterized as a **self-transcendent emotion** [33], gratitude is especially relevant in social contexts, and many gratitude interventions involve expressing gratitude to another person (either shared publicly with the benefactor or expressed privately in written form). Indeed, the ‘find, remind, and bind theory’ positions gratitude as an emotion whose main function is to promote and maintain interpersonal relationships [34]. To date, much of the existing research on gratitude focuses only on the well-being benefits for gratitude expressers, often instructing participants to express gratitude privately.

Recent experimental work, however, has begun to investigate how gratitude operates within social interactions, relationships, and networks. A longitudinal experiment, for example, showed that high school students prompted to cultivate and express interpersonal gratitude improved in subjective well-being (including increased positive affect and life satisfaction) and friendship satisfaction relative to waitlist controls [35]. Other recent research suggests that simply witnessing gratitude expressions confers affective and affiliative benefits, shedding light on the function of this emotion in social contexts [36,37]. In addition to dyadic and group contexts, researchers are beginning to apply gratitude interventions to family settings. One study tested a novel gratitude intervention for parents – expressing safe haven gratitude, or, writing a gratitude letter to a person who makes one feel cherished, protected, or accepted [38]. This intervention led to increases in individual subjective well-being (e.g., increased positive emotions and decreased negative emotions) and familial benefits (e.g., greater positive perceptions of children’s behavior) among parents high in attachment insecurity. Because gratitude is a socially relevant, self-transcendent emotion, future research should continue to investigate its social dynamics and implications for strengthening interpersonal relationships and individual well-being.

Extraversion

The positive correlation between extraversion and well-being is well established within the field of psychology [39]. But what is it about extraverts that makes them happy? Trait-level extraversion

has been shown to predict both self- and informant-rated state extraverted behavior (e.g., being talkative or sociable; [40]), and evidence suggests that enacted extraversion is one potential mechanism for the link between trait extraversion and positive affect [41]. Indeed, recent research shows that extraverts are more likely to engage in activities that are associated with higher well-being. For example, a recent study assessed participants multiple times per day over the course of a week and found that extraverts were more likely to report spending time with friends [42].

The robust association between extraversion and well-being has been replicated in recent experimental work. For example, one study instructed participants to act either more introverted or more extraverted than usual for 1 week each [43]. Participants reported boosts in well-being at the end of the extraverted week and declines at the end of the introverted week. A second study compared a 1-week extraversion intervention to active and neutral control conditions and found similar well-being benefits for those instructed to act more extraverted [44]. Unlike the first study [43], these results were moderated by trait extraversion, such that introverts reported smaller increases in positive affect, increases in negative affect and tiredness, and bigger decreases in feelings of authenticity.

Although experimental work on extraversion and well-being shows promise, more research is needed to understand the potential consequences of acting counter-dispositionally (or unnaturally) extraverted. Cross-sectional and longitudinal studies have offered mixed evidence to this end. In a recent experience sampling study, for example, after acting counter-dispositionally extraverted, participants reported increased immediate vitality but decreased vitality 1 h later [45]. A longitudinal study found that negative behavioral deviations from trait extraversion had a dampening effect on mood, while positive deviations had a positive effect, but the effect was stronger in both directions for those high on state extraversion [46]. In addition to trait-level extraversion, the extent to which one identifies as an introvert or extravert may be an important moderator for future extraversion intervention research. For example, a recent experiment randomly assigned participants to engage in a debate either for or against being dispositionally extraverted or introverted and found that those who strongly identified as introverts reported feeling less authentic when making pro-extraversion arguments [47]. In light of growing evidence that acting more social or extraverted may increase subjective well-being [48], we hope future experimental work continues to explore these and other moderators and boundary conditions of acting counter-dispositionally extraverted.

In addition to reporting greater well-being, extraverts seem to have an advantage in the online world. Extraverts are more likely to engage in more active (vs. passive) social media use, such as regularly posting and creating content, as well as engaging with other users [49]. Extraverted Facebook users are also relatively more likely to belong to wide and nonoverlapping social networks, such that many of their personal connections are not acquainted [50]. They are also more successful in using **social networking sites (SNSs)** to build their social capital [51,52]. Importantly, no experimental work to our knowledge has examined whether instructing participants to act more extraverted on SNS yields similar well-being benefits as in-person interventions (see [Box 1](#) for a discussion of technology-mediated social interactions).

Brief social interactions

The quantity of social interactions one experiences in daily life is associated with greater well-being and feelings of social connectedness [53]. Indeed, research suggests that even brief interactions with strangers and acquaintances have a positive impact on affect and well-being (e.g., [54]). For example, a naturalistic study [55] showed that bus riders who were experimentally assigned to interact with the driver on their daily commute experienced higher well-being on the same day, and another experiment found similar effects among students and community

Box 1. Technology-mediated interactions and well-being

Given the ubiquity of smartphones and other digital communication technology, daily social interactions are increasingly likely to occur both in-person and online. Social networking sites (SNSs) have aroused concerns about whether they might be making users lonelier and less happy. Recent work has revealed that the detrimental effects of SNS use are partially dependent on the way they are used, such as looking at others' posts without actively contributing [93] or engaging in social comparison [94,95]. Other ways of engaging with SNSs, such as self-disclosure [96], are associated with increased well-being and reduced loneliness [97,98]. A recent study conducted during the coronavirus disease 2019 (COVID-19) pandemic found that those who interacted more with weak ties online reported greater negative affect and stress, while those who interacted more with close ties online reported greater social connectedness [99]. Finally, recent theorizing suggests looking beyond active and passive engagement with SNSs when trying to understand the link between SNSs and well-being. In their extended active-passive model, Verduyn and colleagues [100] propose decomposing active and passive SNS use into specific dimensions, which dynamically interact with user characteristics. Future experimental work could test such dimensions (e.g., low vs. high self-relevance of posts) and characteristics (e.g., gender and age) to better understand when SNS use improves individual well-being and when it hinders it.

members assigned to interact more with relative strangers (or **weak ties**), such as classmates and service workers [48].

Importantly, communicating with a stranger is beneficial to both the initiator and the responder in an interaction, despite common anxieties about talking to unfamiliar others [56]. Indeed, research suggests that people systematically underestimate the extent to which strangers enjoy conversing with them – a phenomenon known as the 'liking gap' [57]. Similarly, a mini meta-analysis of experiments involving interactions with strangers showed that individuals are more likely to report fears about their conversation partner not liking them or not enjoying the conversation than fears about themselves not liking their conversation partner [58]. Thus, although miscalibrating the positive impact of social interactions might protect people against social rejection, it may also render them less willing to engage in interactions that would likely benefit both parties (see [59] for a review of research on miscalibrated social cognition). Given the established benefits of brief social interactions, future experiments could test interventions that help people overcome barriers to engaging in conversations with strangers or weak ties as a path to increased social connection and well-being.

How does social interaction improve well-being?

So far, we have focused on the direct link between social behavior and well-being, highlighting recent experimental work demonstrating that different types of social interactions represent ways to bolster well-being. But how and why does connecting with others improve well-being? In the following section, we discuss specific proximal mechanisms (i.e., behaviors and psychological processes) that may underlie the relationship between social interactions and well-being and present a model as an organizing framework for these mechanisms in experimental contexts (Figure 1).

In this model, we propose that experimentally manipulated social behavior impacts subjective well-being through inter-related behavioral and psychological processes that underlie the social interactions resulting from these interventions. We suggest that feelings of social connection with others are facilitated both by behaviors (e.g., behavioral synchrony) and psychological processes [e.g., perceived partner responsiveness (PPR)] that, in turn, bolster the short-term affective (i.e., positive emotions) and long-term cognitive (i.e., life satisfaction) components of well-being. Furthermore, because social interactions involve two or more individuals, we suggest that these proximal processes are dynamic and operate both intra- and interpersonally. In the following sections, we describe several examples of candidate (i.e., nonexhaustive) mechanisms underlying the relationship between social behavior and well-being. Although each of the mechanisms described here represents active areas of research, few experimental studies have examined these constructs in the context of improving subjective well-being. We hope

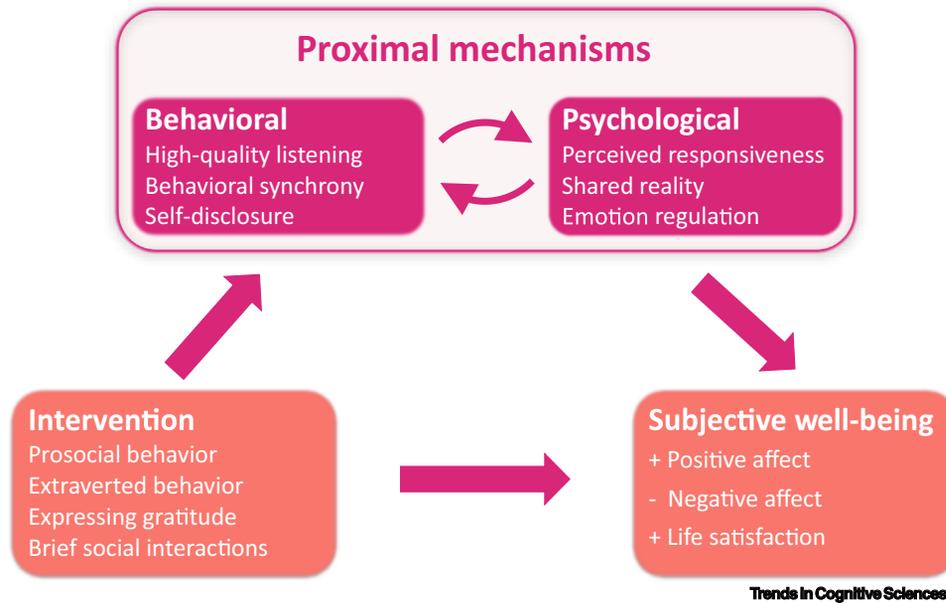


Figure 1. Model of behavioral and psychological mechanisms underlying social behavioral well-being interventions.

this overview of candidate mechanisms will inspire future research to investigate interpersonal, as well as intrapersonal, proximal processes.

Notably, our model aims to categorize processes that are primarily relevant to experimental research and thus does not represent the broader social ecology and contexts in which people are embedded (Box 2). Rather, we hope this framework will help guide future experimental work, with the ultimate aim of clarifying causal pathways that link social connection and well-being, as well as developing more targeted, impactful interventions [60].

Sample behaviors

High-quality listening

Although not always measured in experimental research, behavioral (verbal and nonverbal) features of social interactions likely facilitate positive psychological processes underlying the link between social interaction and well-being. For example, recent research highlights the importance of high-quality listening, which comprises attention, comprehension, and benevolent intention from the listener [61]. A growing literature shows that participants who experience positive listening behaviors from others in controlled laboratory settings – for example, nodding, using a nonjudgmental tone, and asking follow-up questions – report positive outcomes like increased feelings of psychological safety and reductions in social anxiety [62,63]. High-quality listening is also theorized as a key antecedent for fostering PPR (e.g., feeling understood) within interactions [64]. Accordingly, listening may underlie the success of well-being interventions involving social interactions. For example, participants assigned to act more extraverted may experience greater benefits if their newfound loquacity is met with nonjudgmental, responsive listening from their conversation partner.

Self-disclosure

The content of social interactions prompted by social behavioral interventions likely matters, too. Disclosing self-relevant information (e.g., thoughts and feelings) to a responsive partner may bolster feelings of closeness and intimacy, which, in turn, promotes positive psychological and

Box 2. Culture and well-being interventions

To date, most well-being interventions have been conducted with participants from Western cultures, and many were originally developed from an individualist lens [101,102]. Although such interventions have been shown to successfully boost well-being among participants in non-Western nations [103], some research points to cultural differences in their effects – particularly between individualist and collectivist cultures [104]. One recent study, for example, suggests that relative to members of an individualist culture (US), members of a collectivist culture (Hong Kong) – or even those simply primed with their collectivist identities – hedonically benefit more from prosocial interactions with close others than with acquaintances [105].

Some research demonstrates that members of collectivist cultures (e.g., residents of South Korea and Asian-Americans) may benefit less (or not at all) from gratitude interventions [106–108], while other studies do not offer evidence of such cultural differences. A recent experiment, for example, found that Indian adolescents randomly assigned to write and deliver a gratitude letter reported gains in well-being after 1 week [109].

The relationship between extraversion and well-being may also vary by culture, although evidence linking these constructs in non-Western cultures has been mixed. In one study, the association between extraversion and life satisfaction was consistently positive in US samples but weak or nonexistent outside the USA [110]. Conversely, another study detected positive associations between extraversion and life satisfaction in both US and Chinese samples [111]. However, no experiments to date have compared the effects of extraversion or social interaction interventions cross-culturally. Future studies are needed to replicate the well-being effects of such interventions in both Western and non-Western countries, as well as to investigate potential backfiring effects in cultures in which regulated, reserved behavior may be seen as socially desirable [112,113]. Furthermore, future social behavior interventions would do well to consider an intervention's average effect within a specific culture, as well as individual differences in its effectiveness between members of that culture based on how well their values and personality fit cultural prescriptions [114–116].

In light of the mixed evidence for the cross-cultural efficacy of kindness, gratitude, and extraversion interventions, future research is needed to examine if and how these interventions can be tailored to match the salient values of a particular culture to maximize their potential benefits and minimize potential harms.

relational outcomes [65]. Recent experimental research highlights the value of engaging in deep conversations (i.e., involving intimate self-disclosure) versus shallow ones. Participants in one study consistently overestimated how awkward deep conversations would be, and consistently underestimated their enjoyment, feelings of closeness, and their conversation partner's caring about their disclosures in deep versus shallow conversations [66]. This research suggests that although miscalibrated expectations may serve as a barrier to engaging in deep conversations with strangers, doing so may be a (surprisingly) rewarding and connecting experience. Another study found that unacquainted dyads who engaged in a disclosure task (the **Fast Friends procedure**; [67]) reported more closeness and liking after a conversation than those who engaged in small talk [68].

Synchrony

We propose that synchrony is a complex, multifaceted process that both arises from and facilitates positive social interactions, which, in turn, improves subjective well-being. Synchronized movements such as hand gestures and nodding, for example, predict higher ratings of interpersonal rapport, especially within dyads who are just getting to know each other [69]. The relationship between synchrony and greater feelings of social connection may be bidirectional and dependent on features of social interactions. For example, one study showed that experimentally manipulated self-disclosure resulted in greater behavioral synchrony among unacquainted dyads relative to a control task, and that synchrony mediated the relationship between self-disclosure and self-reported rapport [70]. Recent work suggests that the extent to which individuals feel connected to one another, or 'click' in a conversation, also hinges on the speed of their responses [71]. Specifically, conversations in which partners responded to each other faster produced greater feelings of social connection compared to slower conversations. Similarly, behavioral synchrony has been theorized to facilitate perceptions of interpersonal chemistry [72]. Finally, interpersonal synchrony has been theorized as a key mechanism underlying emotion

contagion and could play a vital role in promoting coexperienced positive emotion within social interactions [73,74].

Sample psychological processes

Shared reality

In addition to synchrony within a social interaction, a subjective sense of being in sync with another person may facilitate increased well-being in social behavioral interventions. This perception of being in sync – behaviorally indicated by a dyad finishing each other's sentences or verbally indicating agreement (e.g., exactly!) – is known as a sense of shared reality, or the subjective feeling of sharing one's beliefs, thoughts, and feelings with another person [117]. Such feelings of shared reality are thought to fulfill individuals' needs for validating their own general and social reality [75] and are an important part of interpersonal trust and closeness [76]. After witnessing signals of shared reality, individuals feel greater intimacy and closeness with their conversation partner. Thus, we propose that the perception and subjective feeling of being in sync with another person may be equally important as actual, enacted synchrony in terms of promoting greater feelings of social connection and positive affect within an interaction.

Perceived Partner Responsiveness

PPR refers to one's sense of being understood, valued, and cared for by a relationship partner ([77]; see also [78]). These feelings emerge from mutually responsive interactions in which relationship partners communicate genuine interest and support for one another. PPR is associated with numerous positive outcomes for close and romantic relationships, including greater hedonic and eudaimonic well-being, sleep quality, and emotional expression within romantic relationships [79–81]. PPR may be an especially relevant mechanism underlying the success of gratitude interventions. A recent study instructed participants to express gratitude to a romantic partner, and coders rated the extent to which participants either highlighted the cost (i.e., how much their partner sacrificed) or responsiveness (i.e., how much their partner was responsive to their needs) in the interaction [82]. Partners who received responsiveness-highlighting expressions of gratitude felt more positively about the gratitude expression and about their relationship overall. In addition to manipulating PPR directly, future research could measure the extent to which participants feel understood, valued, and cared for while engaging in their assigned social behavior.

Emotion regulation

Because social behavioral interventions have been shown to increase both cognitive and affective components of well-being, a potential mechanism underlying their effectiveness is likely to be **emotion regulation** [83]. In fact, some scholars have argued that well-being interventions can be considered emotion regulation strategies in and of themselves [84]. Of particular relevance is interpersonal emotion regulation (IER), which is further divided into intrinsic IER (seeking social contact to regulate one's own emotions) and extrinsic IER (attempting to regulate others' emotions) [85–87]. Whether or not participants explicitly intend to regulate their emotions through social interactions, the social and affective benefits reviewed thus far suggest that emotion regulation is likely occurring in well-being interventions. For example, offering social support to another person in the context of a prosocial behavior intervention may result in the momentary upregulation of positive and downregulation of negative emotions for both parties through refocusing attention to another person (for the helper) and modifying a stressful situation (for the recipient). Despite its relevance, most well-being interventions do not include measures of emotion regulation strategy use. Future longitudinal experiments could incorporate brief measures to assess the extent to which participants are engaging in intra- and interpersonal emotion regulation throughout an intervention period, and whether these interventions impact regulatory attempts outside the context of the assigned activities.

Potential backfiring effects

In this review of recent literature, we have largely focused on examples when social behavioral interventions go well – that is, when trying to become more social, kind, or grateful bolsters one's well-being and other positive outcomes. However, instructing people to become more social, kind, or grateful may also backfire. Interventions may do more harm than good via a behavioral path (e.g., verbal rejection from a conversation partner when trying to become more social) or a psychological one (e.g., upregulating negative emotions through rumination). An individual instructed to engage in prosocial behavior, for example, might offer ill-timed support to a loved one, causing them to feel rejected, and perhaps threatening their sense of competence. Whether and how much a particular social behavioral intervention impacts well-being also hinges on the degree to which features of an activity (e.g., talking to strangers vs. close others) match, or fit, with the happiness seeker's attributes (e.g., their personality or baseline levels of well-being), as posited by the positive activity model [88]. Accordingly, activity misfit (e.g., introverts feeling uncomfortable when approaching others; [89]) may result in a greater likelihood of backfiring effects [90]. Some scholars have also proposed that overvaluing happiness may paradoxically thwart attempts at increasing well-being [91,92]. The consequences of overvaluing happiness may be particularly relevant to naturalistic settings – namely, among individuals who chronically pursue happiness as an end rather than cultivating positive emotions through daily experiences. We hope that researchers prioritize identifying potential backfiring effects in future laboratory and field experiments (see [Outstanding questions](#)). Researchers might also consider using meta-analytic techniques or pooled analyses to uncover moderators that may have been overlooked in previous (potentially underpowered) studies.

Concluding remarks

Recent history has seen a proliferation of research on psychological well-being, with a growing number of experiments demonstrating that people can deliberately and effortfully improve their well-being by engaging in particular activities, especially ones that serve to connect them with others. In addition to testing whether a particular activity (like acting more social) works, recent research has focused on increasingly nuanced questions, including attempts to understand precisely how social behavioral interventions operate in dyadic and group settings. That said, the interventions and experiments described in this review are largely focused on individual well-being, are relatively small in scope, and, accordingly, tend to produce small effect sizes [5]. It is critical that researchers continue to study the mechanisms and boundary conditions of these interventions, particularly those relating to social connection. Doing so will not only advance well-being science but also maximize the benefits (and minimize potential risks) of these interventions in real-world contexts, potentially improving the lives of many.

Declaration of interests

No interests are declared.

References

1. Diener, E. (1984) Subjective well-being. *Psychol. Bull.* 95, 542–575
2. Diener, E. *et al.* (2018) Advances and open questions in the science of subjective well-being. *Collabra Psychol.* 4, 15
3. Carr, A. *et al.* (2020) Effectiveness of positive psychology interventions: a systematic review and meta-analysis. *J. Posit. Psychol.* 16, 749–769
4. Sin, N.L. and Lyubomirsky, S. (2009) Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: a practice-friendly meta-analysis. *J. Clin. Psychol.* 65, 467–487
5. van Agteren, J. *et al.* (2021) A systematic review and meta-analysis of psychological interventions to improve mental well-being. *Nat. Hum. Behav.* 5, 631–652
6. Hakulinen, C. *et al.* (2018) Social isolation and loneliness as risk factors for myocardial infarction, stroke and mortality: UK Biobank cohort study of 479 054 men and women. *Heart* 104, 1536–1542
7. Holt-Lunstad, J. *et al.* (2010) Social relationships and mortality risk: a meta-analytic review. *PLoS Med.* 7, e1000316
8. Holt-Lunstad, J. *et al.* (2017) Advancing social connection as a public health priority in the United States. *Am. Psychol.* 72, 517–530

Outstanding questions

What are the boundary conditions for interventions involving brief social interactions? Would sustained engagement in such interactions bolster their efficacy or become burdensome? To what extent does the target of these interactions (e.g., weak vs. strong ties) moderate the intervention's efficacy?

Which characteristics of the individual moderate the effects of specific social behavioral interventions? Is encouraging certain types of social interactions more likely to backfire for some individuals than others?

How durable are the effects of interventions that induce specific types of social interactions? Can these effects be sustained with repeated practice? Do these effects replicate cross-culturally?

How can researchers best isolate the proximal mechanisms of well-being interventions in naturalistic settings? Although such mechanisms are more feasible to isolate in well-controlled, laboratory experiments, understanding how the relevant behavioral and psychological processes unfold *in vivo* is equally important.

Are intra- or interpersonal mechanisms most likely to underlie the success of social behavioral interventions?

Given their relatively small effect sizes and potential backfiring effects, in what contexts and with what caveats should researchers recommend these interventions to the public?

How can researchers tailor well-being interventions to be more effective cross-culturally?

9. Kawachi, I. (2001) Social Ties and Mental Health. *J. Urban Health Bull. N. Y. Acad. Med.* 78, 458–467
10. Baumeister, R.F. and Leary, M.R. (1995) The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychol. Bull.* 117, 497–529
11. Holt-Lunstad, J. (2022) Social connection as a public health issue: the evidence and a systemic framework for prioritizing the “social” in social determinants of health. *Annu. Rev. Public Health* 43, 193–213
12. Burr, J.A. et al. (2016) Volunteering and cardiovascular disease risk: does helping others get “under the skin?”. *Gerontologist* 56, 937–947
13. Lum, T.Y. and Lightfoot, E. (2005) The effects of volunteering on the physical and mental health of older people. *Res. Aging* 27, 31–55
14. Nelson, S.K. et al. (2016) Do unto others or treat yourself? The effects of prosocial and self-focused behavior on psychological flourishing. *Emotion* 16, 850–861
15. Curry, O.S. et al. (2018) Happy to help? A systematic review and meta-analysis of the effects of performing acts of kindness on the well-being of the actor. *J. Exp. Soc. Psychol.* 76, 320–329
16. Ko, K. et al. (2021) Comparing the effects of performing and recalling acts of kindness. *J. Posit. Psychol.* 16, 73–81
17. Aknin, L.B. et al. (2020) Does spending money on others promote happiness?: a registered replication report. *J. Pers. Soc. Psychol.* 119, e15–e26
18. Wiwad, D. and Aknin, L.B. (2017) Motives matter: the emotional consequences of recalled self- and other- focused prosocial acts. *Motiv. Emot.* 41, 730–740
19. Waytz, A. and Hofmann, W. (2020) Nudging the better angels of our nature: a field experiment on morality and well-being. *Emotion* 20, 904–909
20. Ferrari, M. et al. (2019) Self-compassion interventions and psychosocial outcomes: a meta-analysis of RCTs. *Mindfulness* 10, 1455–1473
21. Neff, K. (2003) Self-compassion: an alternative conceptualization of a healthy attitude toward oneself. *Self Identity* 2, 85–101
22. MacBeth, A. and Gumley, A. (2012) Exploring compassion: a meta-analysis of the association between self-compassion and psychopathology. *Clin. Psychol. Rev.* 32, 545–552
23. Boothby, E.J. and Bohns, V.K. (2021) Why a simple act of kindness is not as simple as it seems: underestimating the positive impact of our compliments on others. *Personal. Soc. Psychol. Bull.* 47, 826–840
24. Zhao, X. and Epley, N. (2021) Insufficiently complimentary?: underestimating the positive impact of compliments creates a barrier to expressing them. *J. Pers. Soc. Psychol.* 121, 239–256
25. Emmons, R.A. and McCullough, M.E. (2003) Counting blessings versus burdens: an experimental investigation of gratitude and subjective well-being in daily life. *J. Pers. Soc. Psychol.* 84, 377–389
26. Armenta, C.N. et al. (2017) Functions of positive emotions: gratitude as a motivator of self-improvement and positive change. *Emot. Rev.* 9, 183–190
27. Armenta, C.N. et al. (2020) Satisfied yet striving: gratitude fosters life satisfaction and improvement motivation in youth. *Emotion* 22, 1004–1016
28. Fritz, M.M. et al. (2019) Gratitude facilitates healthy eating behavior in adolescents and young adults. *J. Exp. Soc. Psychol.* 81, 4–14
29. Layous, K. et al. (2017) The proximal experience of gratitude. *PLoS ONE* 12, e0179123
30. Sheldon, K.M. and Yu, S. (2021) Methods of gratitude expression and their effects upon well-being: texting may be just as rewarding as and less risky than face-to-face. *J. Posit. Psychol.* Published online April 19, 2021. <https://doi.org/10.1080/17439760.2021.1913639>
31. Tsang, J.-A. and Martin, S.R. (2019) Four experiments on the relational dynamics and prosocial consequences of gratitude. *J. Posit. Psychol.* 14, 188–205
32. Davis, D.E. et al. (2016) Thankful for the little things: a meta-analysis of gratitude interventions. *J. Couns. Psychol.* 63, 20–31
33. Stellar, J.E. et al. (2017) Self-transcendent emotions and their social functions: compassion, gratitude, and awe bind us to others through prosociality. *Emot. Rev.* 9, 200–207
34. Algoe, S.B. (2012) Find, remind, and bind: the functions of gratitude in everyday relationships: gratitude in relationships. *Soc. Personal. Psychol. Compass* 6, 455–469
35. Bono, G. et al. (2020) A new approach to gratitude interventions in high schools that supports student wellbeing. *J. Posit. Psychol.* 15, 657–665
36. Algoe, S.B. et al. (2020) A new perspective on the social functions of emotions: gratitude and the witnessing effect. *J. Pers. Soc. Psychol.* 119, 40–74
37. Walsh, L.C. et al. (2022) The role of actors, targets, and witnesses: examining gratitude exchanges in a social context. *J. Posit. Psychol.* 17, 233–249
38. Nelson-Coffey, S.K. et al. (2021) Safe haven gratitude improves emotions, well-being, and parenting outcomes among parents with high levels of attachment insecurity. *J. Posit. Psychol.* Published online October 25, 2021. <https://doi.org/10.1080/17439760.2021.1991454>
39. Costa, P.T. and McCrae, R.R. (1980) Influence of extraversion and neuroticism on subjective well-being: happy and unhappy people. *J. Pers. Soc. Psychol.* 38, 668
40. Breil, S.M. et al. (2019) Zooming into real-life extraversion – how personality and situation shape sociability in social interactions. *Collabra Psychol.* 5, 7
41. Wilt, J. et al. (2012) The dynamic role of personality states in mediating the relationship between extraversion and positive affect: personality states as mediators. *J. Pers.* 80, 1205–1236
42. Wilt, J. and Revelle, W. (2019) The Big Five, everyday contexts and activities, and affective experience. *Personal. Individ. Differ.* 136, 140–147
43. Margolis, S. and Lyubomirsky, S. (2020) Experimental manipulation of extraverted and introverted behavior and its effects on well-being. *J. Exp. Psychol. Gen.* 149, 719–731
44. Jacques-Hamilton, R. et al. (2019) Costs and benefits of acting extraverted: a randomized controlled trial. *J. Exp. Psychol. Gen.* 148, 1538–1556
45. Pickett, J. et al. (2020) Concurrent and lagged effects of counterdispositional extraversion on vitality. *J. Res. Personal.* 87, 103965
46. Kuijpers, E. et al. (2021) Do you feel better when you behave more extraverted than you are? The relationship between cumulative counterdispositional extraversion and positive feelings. *Personal. Soc. Psychol. Bull.* 48, 606–623
47. Bossom, I.R.L. and Zelenski, J.M. (2022) The impact of trait introversion-extraversion and identity on state authenticity: debating the benefits of extraversion. *J. Res. Personal.* 97, 104208
48. Sandstrom, G.M. and Dunn, E.W. (2014) Social interactions and well-being: the surprising power of weak ties. *Personal. Soc. Psychol. Bull.* 40, 910–922
49. Bowden-Green, T. et al. (2020) How is extraversion related to social media use? A literature review. *Personal. Individ. Differ.* 164, 110040
50. Tadesse, M.M. et al. (2018) Personality predictions based on user behavior on the Facebook social media platform. *IEEE Access* 6, 61959–61969
51. Cheng, C. et al. (2019) Do the socially rich get richer? A nuanced perspective on social network site use and online social capital accrual. *Psychol. Bull.* 145, 734–764
52. Weiqin, E.L. et al. (2016) Social capital on Facebook: the impact of personality and online communication behaviors. *J. Educ. Comput. Res.* 54, 747–786
53. Sun, J. et al. (2020) Is well-being associated with the quantity and quality of social interactions? *J. Pers. Soc. Psychol.* 119, 1478–1496
54. Epley, N. and Schroeder, J. (2014) Mistakenly seeking solitude. *J. Exp. Psychol. Gen.* 143, 1980–1999
55. Gunaydin, G. et al. (2021) Minimal social interactions with strangers predict greater subjective well-being. *J. Happiness Stud.* 22, 1839–1853

56. Schroeder, J. *et al.* (2022) Hello, stranger? Pleasant conversations are preceded by concerns about starting one. *J. Exp. Psychol. Gen.* 151, 1141–1153
57. Boothby, E.J. *et al.* (2018) The liking gap in conversations: do people like us more than we think? *Psychol. Sci.* 29, 1742–1756
58. Sandstrom, G.M. and Boothby, E.J. (2021) Why do people avoid talking to strangers? A mini meta-analysis of predicted fears and actual experiences talking to a stranger. *Self Identity* 20, 47–71
59. Epley, N. *et al.* (2022) Undersociality: miscalibrated social cognition can inhibit social connection. *Trends Cogn. Sci.* 26, 406–418
60. Cohen, G.L. *et al.* (2017) Turning point: targeted, tailored, and timely psychological intervention, *Handbook of Competence and Motivation: Theory and Application*. The Guilford Press
61. Kluger, A.N. and Itzhakov, G. (2022) The power of listening at work. *Annu. Rev. Organ. Psychol. Organ. Behav.* 9, 121–146
62. Castro, D.R. *et al.* (2018) Mere listening effect on creativity and the mediating role of psychological safety. *Psychol. Aesthet. Creat. Arts* 12, 489–502
63. Itzhakov, G. *et al.* (2018) The listener sets the tone: high-quality listening increases attitude clarity and behavior-intention consequences. *Personal. Soc. Psychol. Bull.* 44, 762–778
64. Itzhakov, G. *et al.* (2022) How to foster perceived partner responsiveness: high-quality listening is key. *Soc. Personal. Psychol. Compass* 16
65. Reis, H.T. and Shaver, P. (1988) Intimacy as an interpersonal process. In *Handbook of Personal Relationships: Theory, Research and Interventions*, pp. 367–389, John Wiley & Sons
66. Kardas, M. *et al.* (2022) Overly shallow?: miscalibrated expectations create a barrier to deeper conversation. *J. Pers. Soc. Psychol.* 122, 367–398
67. Aron, A. *et al.* (1997) The experimental generation of interpersonal closeness: a procedure and some preliminary findings. *Personal. Soc. Psychol. Bull.* 23, 363–377
68. Sprecher, S. (2021) Closeness and other affiliative outcomes generated from the Fast Friends procedure: a comparison with a small-talk task and unstructured self-disclosure and the moderating role of mode of communication. *J. Soc. Pers. Relat.* 38, 1452–1471
69. Fujiwara, K. *et al.* (2020) Rhythmic features of movement synchrony for bonding individuals in dyadic interaction. *J. Nonverbal Behav.* 44, 173–193
70. Vacharkulksemsuk, T. and Fredrickson, B.L. (2012) Strangers in sync: achieving embodied rapport through shared movements. *J. Exp. Soc. Psychol.* 48, 399–402
71. Templeton, E.M. *et al.* (2022) Fast response times signal social connection in conversation. *Proc. Natl. Acad. Sci. U. S. A.* 119, e2116915119
72. Reis, H. *et al.* (2021) Interpersonal chemistry: what is it, how does it emerge, and how does it operate? *Perspect. Psychol. Sci.* 17, 530–558
73. Fredrickson, B.L. (2016) Love: positivity resonance as a fresh, evidence-based perspective on an age-old topic. *Handb. Emot.* 4, 847–858
74. Prochazkova, E. and Kret, M.E. (2017) Connecting minds and sharing emotions through mimicry: a neurocognitive model of emotional contagion. *Neurosci. Biobehav. Rev.* 80, 99–114
75. Hardin, C.D. and Higgins, E.T. (1996) Shared reality: how social verification makes the subjective objective. In *Handbook of Motivation and Cognition, Vol. 3. The Interpersonal Context* (Sorrentino, R.M. and Higgins, E.T., eds), pp. 28–84, The Guilford Press
76. Rossignac-Milon, M. *et al.* (2021) Merged minds: generalized shared reality in dyadic relationships. *J. Pers. Soc. Psychol.* 120, 882–911
77. Reis, H.T. and Clark, M.S. (2013) Responsiveness. In *The Oxford Handbook of Close Relationships* (Simpson, J.A. and Campbell, L., eds), pp. 400–423, Oxford University Press
78. Fiske, S.T. *et al.* (2007) Universal dimensions of social cognition: warmth and competence. *Trends Cogn. Sci.* 11, 77–83
79. Ruan, Y. *et al.* (2020) Can I tell you how I feel? Perceived partner responsiveness encourages emotional expression. *Emotion* 20, 329–342
80. Selcuk, E. *et al.* (2017) Perceived partner responsiveness predicts better sleep quality through lower anxiety. *Soc. Psychol. Personal. Sci.* 8, 83–92
81. Tasfiliz, D. *et al.* (2018) Patterns of perceived partner responsiveness and well-being in Japan and the United States. *J. Fam. Psychol.* 32, 355–365
82. Park, Y. *et al.* (2021) How can I thank you? Highlighting the benefactor's responsiveness or costs when expressing gratitude. *J. Soc. Pers. Relat.* 38, 504–523
83. Gross, J.J. (2015) Emotion regulation: current status and future prospects. *Psychol. Inq.* 26, 1–26
84. Quoidbach, J. *et al.* (2015) Positive interventions: an emotion regulation perspective. *Psychol. Bull.* 141, 655–693
85. Nozaki, Y. and Mikolajczak, M. (2020) Extrinsic emotion regulation. *Emotion* 20, 10
86. Williams, W.C. *et al.* (2018) Interpersonal emotion regulation: implications for affiliation, perceived support, relationships, and well-being. *J. Pers. Soc. Psychol.* 115, 224–254
87. Zaki, J. and Williams, W.C. (2013) Interpersonal emotion regulation. *Emotion* 13, 803–810
88. Lyubomirsky, S. and Layous, K. (2013) How do simple positive activities increase well-being? *Curr. Dir. Psychol. Sci.* 22, 57–62
89. Pressman, S.D. *et al.* (2015) It's good to do good and receive good: the impact of a 'pay it forward' style kindness intervention on giver and receiver well-being. *J. Posit. Psychol.* 10, 293–302
90. Fritz, M.M. and Lyubomirsky, S. (2018) Whither happiness? When, how, and why might positive activities undermine well-being. In *The Social Psychology of Living Well* (Forgas, J.P. and Baumeister, R.F., eds), Routledge
91. Gruber, J. *et al.* (2011) A dark side of happiness? How, when, and why happiness is not always good. *Perspect. Psychol. Sci.* 6, 222–233
92. Zerwas, F.K. and Ford, B.Q. (2021) The paradox of pursuing happiness. *Curr. Opin. Behav. Sci.* 39, 106–112
93. Carpenter, J.M. *et al.* (2011) People or profiles: individual differences in online social networking use. *Personal. Individ. Differ.* 50, 538–541
94. Haferkamp, N. and Krämer, N.C. (2011) Social Comparison 2.0: examining the effects of online profiles on social-networking sites. *Cyberpsychol. Behav. Soc. Netw.* 14, 309–314
95. Vogel, E.A. *et al.* (2015) Who compares and despairs? The effect of social comparison orientation on social media use and its outcomes. *Personal. Individ. Differ.* 86, 249–256
96. Nguyen, M. *et al.* (2012) Comparing online and offline self-disclosure: a systematic review. *Cyberpsychol. Behav. Soc. Netw.* 15, 103–111
97. Clark, J.L. *et al.* (2018) Social network sites and well-being: the role of social connection. *Curr. Dir. Psychol. Sci.* 27, 32–37
98. Seo, M. *et al.* (2016) Frequent interaction and fast feedback predict perceived social support: using crawled and self-reported data of Facebook users. *J. Comput.-Mediat. Commun.* 21, 282–297
99. Tibbetts, M. *et al.* (2021) A week during COVID-19: online social interactions are associated with greater connection and more stress. *Comput. Hum. Behav. Rep.* 4, 100133
100. Verduyn, P. *et al.* (2022) Do social networking sites influence well-being? The extended active-passive model. *Curr. Dir. Psychol. Sci.* 31, 62–68
101. Hendriks, T. *et al.* (2019) How WEIRD are positive psychology interventions? A bibliometric analysis of randomized controlled trials on the science of well-being. *J. Posit. Psychol.* 14, 489–501
102. Ng, W. and Ong, K.R. (2022) Using positive psychological interventions to improve well-being: are they effective across cultures, for clinical and non-clinical samples? *J. Contemp. Psychother.* 52, 45–53
103. Hendriks, T. *et al.* (2018) The efficacy of positive psychology interventions from non-Western countries: a systematic review and metaanalysis. *Int. J. Wellbeing* 8, 71–98
104. Shin, L.J. and Lyubomirsky, S. (2017) Increasing well-being in independent and interdependent cultures. In *Scientific Advances in Positive Psychology* (Warren, M.A. and Donaldson, S.I., eds), pp. 11–36, Praeger/ABC-CLIO
105. Shin, L.J. *et al.* (2021) Cultural differences in the hedonic rewards of recalling kindness: priming cultural identity with language. *Affect. Sci.* 2, 80–90
106. Shin, L.J. *et al.* (2020) Gratitude in collectivist and individualist cultures. *J. Posit. Psychol.* 15, 598–604
107. Boehm, J.K. *et al.* (2011) A longitudinal experimental study comparing the effectiveness of happiness-enhancing strategies

- in Anglo Americans and Asian Americans. *Cogn. Emot.* 25, 1263–1272
108. Layous, K. *et al.* (2013) Culture matters when designing a successful happiness-increasing activity: a comparison of the United States and South Korea. *J. Cross-Cult. Psychol.* 44, 1294–1303
109. Khanna, P. and Singh, K. (2019) Do all positive psychology exercises work for everyone? Replication of Seligman *et al.*'s (2005) Interventions among Adolescents. *Psychol. Stud.* 64, 1–10
110. Kim, H. *et al.* (2018) Extraversion and life satisfaction: a cross-cultural examination of student and nationally representative samples. *J. Pers.* 86, 604–618
111. Lun, V.M.-C. and Yeung, J.C. (2019) Elaborating on the effect of culture on the relations of extraversion and neuroticism to life satisfaction. *Personal. Individ. Differ.* 142, 79–84
112. Cain, S. (2013) *Quiet: The Power of Introverts in a World That Can't Stop Talking*. Broadway Books
113. Xu, Y. *et al.* (2009) Three types of shyness in Chinese children and the relation to effortful control. *J. Pers. Soc. Psychol.* 97, 1061–1073
114. Allik, J. and Realo, A. (2019) Culture and Personality. In *The Handbook of Culture and Psychology* (Matsumoto, D. and Hwang, H.C., eds), Oxford University Press
115. Oishi, S. *et al.* (2021) Culture and personality: current directions. In *Handbook of Personality: Theory and Research* (4th ed.), pp. 686–703, The Guilford Press
116. Ward, C. and Chang, W.C. (1997) "Cultural fit": a new perspective on personality and sojourner adjustment. *Int. J. Intercult. Relat.* 21, 525–533
117. Higgins, E.T. *et al.* (2021) Shared reality: from sharing-is-believing to merging minds. *Curr. Dir. Psychol. Sci.* 30, 103–110
118. Nelson, S.K. *et al.* (2015) 'It's up to you': experimentally manipulated autonomy support for prosocial behavior improves well-being in two cultures over six weeks. *J. Posit. Psychol.* 10, 463–476