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Examining the Social in the Prosocial: Episode-Level Features of Social Interactions and Kind Acts Predict Social Connection and Well-Being

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Experiments prompting people to engage in more prosocial behavior (e.g., acts of kindness) or simple social interactions (e.g., acting extraverted) have both shown promise in boosting well-being. However, little is known about how much the impact on well-being depends on the type of interpersonal interaction (i.e., social vs. prosocial) or on other proximal features (e.g., whether the interaction takes place online vs. in-person, the closeness of the relationship, or amount of social connection associated with a given interaction). We randomly assigned a sample of full-time employees recruited via a special employed mTurk sample ($N = 754$) to perform weekly acts of kindness online versus in-person, to engage in weekly social interactions online versus in-person, or to list their daily activities (control) over the course of 4 weeks. First, on average, all conditions reported improvements in well-being (i.e., increases in positive affect and life satisfaction, decreases in negative affect) across the 4-week intervention period. Second, relative to controls, the four experimental groups reported increases in general social connectedness over time. Finally, according to auxiliary analyses collapsed across the experimental condition, closer relationship with target and non-digital medium of delivery predicted episode-level social connection, which, in turn, was associated with general social connectedness and positive affect. We conclude that the "who" and the "how" of a behavior (i.e., its target, its delivery method, and the feelings of social connection generated) are important for well-being, but not the "what" (i.e., whether the behavior is social or prosocial).

Keywords: prosocial behavior, social interaction, social connection, well-being, digital media

As anyone who has helped a friend move can attest, making the *kind* choice does not always appear personally beneficial. Yet, since ancient times, religious and secular thinkers alike have recommended kindness to others as a virtuous practice with unique potential to reflect great rewards back to the giver. Remnants of such philosophies are studded into everyday speech—for example, in the Golden Rule ("Do unto others as you would have them do unto you"), oft-used aphorisms such as "what goes around comes around," and the common tendency to explain events with karma. These phrases allude to a widespread belief that benevolence to others will somehow advantage the individual in the future.

A plethora of correlational data affirms a link between prosocial behavior (i.e., acting in ways intended to help others, such as performing acts of kindness, support, or generosity) and positive outcomes for the individual, including well-being (i.e., increased life satisfaction and positive affect; decreased negative affect), romantic relationship formation, self-rated physical health, and even mortality (Anderson et al., 2014; Gruenewald et al., 2012; Meier & Stutzer, 2008; Musick et al., 1999; Stavrova & Ehlebracht, 2015). Two recent meta-analyses of close to 4,000 and 200,000 participants, respectively, suggest that performing acts of kindness for others confers medium effect sizes for well-being (Curry et al., 2018; Hui et al., 2020).

Prosociality and Well-Being

To disentangle the directionality between prosociality and well-being, and better understand the mechanisms underlying this relationship, prosocial behavior has been implemented in positive activity interventions, which involve simple, self-administered, low-cost activities that individuals can engage in to increase their well-being

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Data, measures, and analytical code are available at Open Science Framework (https://osf.io/jdw4t/?view_only=845e8c9f2d804bb383b059f89130b989).

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(Layous & Lyubomirsky, 2014). Prosociality-based randomized controlled trials have mainly focused on the effects of charitable giving or engaging in small acts of kindness for other people (e.g., Curry et al., 2018). Experiments conducted in these contexts have generally shown that engaging in prosocial behavior, including acts of kindness and prosocial spending, promotes subjective well-being and physical health. Specifically, acts-of-kindness interventions have led to improved psychological flourishing and well-being (Nelson et al., 2015, 2016; Shin et al., 2020), greater peer acceptance (Layous et al., 2012), and reduced inflammatory-related patterns of gene expression (Nelson-Coffey et al., 2017). Indeed, some researchers have argued that the cross-cultural effects of prosocial spending (e.g., donating money to charity) on well-being constitute a psychological universal (Aknin et al., 2013; but see Falk & Graeber, 2020).

Social Interactions and Well-Being

Paralleling the literature on prosociality, a growing body of experimental research suggests that merely engaging in social interactions with others improves well-being. For example, college students randomly assigned to behave in extraverted ways over the course of a week reported increases in positive affect, relative to those assigned to behave in more introverted ways (Jacques-Hamilton et al., 2018; Margolis & Lyubomirsky, 2020). Similarly, commuters on a train randomly assigned to talk to strangers reported greater enjoyment of their commutes, relative to those assigned to sit in solitude (Epley & Schroeder, 2014). Finally, coffee shop customers assigned to be social (i.e., to try to be genuine and establish connection) during their brief interaction with the barista reported more positive affect, less negative affect, and greater satisfaction with their coffeeshop experience, relative to those assigned to keep their barista interaction as efficient as possible (Sandstrom & Dunn, 2014). Taken together, these experimental findings suggest that merely engaging in more social interactions may foster improvements in well-being.

Disentangling the Social From the Prosocial

No studies to date have empirically tested whether the prosocial component is critical for improving well-being, or if increasing social versus prosocial behaviors produces comparable effects. However, such tests are important for a number of reasons. As described above, the experimental work manipulating social behavior suggests that merely interacting with other humans boosts well-being. Yet, performing acts of kindness for others is almost always a social activity, with an additional component of helping. Like social interactions, prosocial interactions involve another person (actual or implicit/abstract), with the added steps of *anticipating* that person's wants or needs and *addressing* those wants or needs.

Thus, research is needed to address the critique that associations between prosociality and well-being are driven by the social, rather than the prosocial, component. Of note, prosocial interventions have been shown to increase well-being even when the giver does not have direct contact with the recipient (e.g., Aknin et al., 2013, Study 3; Martela & Ryan, 2016). This finding implicates a mechanism other than (or in addition to) increased social engagement. For example, prosocial behavior may bolster self-regard, as one thinks of oneself as a "good person" for helping. Moreover, prosocial behaviors are necessarily costly—in terms of financial (e.g., Aknin et al., 2013) or other resources (e.g., Kraft-Todd & Rand, 2019). Accordingly, little empirical research directly compares prosocial and simply social acts, and more such research is needed to determine whether the prosocial component is a necessary ingredient for promoting well-being, or if merely socializing with others, a generally less costly activity, provides similar benefits.

Social Connection as a Mechanism

Despite decades of research revealing that prosocial behavior is a correlate, antecedent, and cause of well-being (see Hui et al., 2020), little is known about the episode-level features (i.e., characteristics or feelings associated with a specific interaction) of the prosocial interaction that may influence well-being. Specifically, what are the critical happiness-inducing ingredients present *during* a prosocial behavior that may deliver downstream benefits? One potential mechanism through which prosocial—and social—interactions might foster well-being is via increases in social connection occurring *at the time* of the interaction.

A large body of research provides evidence that social connection—or a sense of belonging and closeness with others—is vital for well-being (Baumeister & Leary, 1995; Diener & Oishi, 2005). Social network characteristics such as larger network size, more emotional closeness, and greater proportion of new contacts predict well-being, largely through their effects on increased perceived social support (Zhu et al., 2013). In daily diary studies, daily reports of social connection predict daily reports of well-being (Reis et al., 2000).

In the context of social and prosocial behavior, the literature on social connection largely focuses on feelings of connectedness fostered within close social relationships (e.g., among spouses and friends; Reis et al., 2004) or as a more general, stable construct (e.g., a broad, overall sense of feeling supported by others; Yoo et al., 2016). Measures of social connection typically assess feelings of closeness across relatively long time periods, such as days (e.g., Inagaki et al., 2016), weeks (e.g., Crocker & Canevello, 2008), or years (e.g., Jose et al., 2012). However, these kinds of ties—and a general sense of being connected—are likely to arise from a series of discrete, episodic moments of connection. Indeed, brief or momentary social or prosocial interactions provide a context for people to connect with one another. For example, someone who gifts a book to a friend or who chats briefly with the grocery store cashier might feel more attuned to, invested in, and mutually cared for during these interactions (see Reis & Clark, 2013). Furthermore, these moments may aggregate into longer-term, generalized feelings of social connection. Research linking well-being in long-term relationships to the transient connecting moments that can occur in the short term (i.e., over the course of a few seconds or minutes) remains scant. Examining how feelings of connection might differ during interactions between individuals of varying degrees of closeness (i.e., ranging from romantic partners to complete strangers) could provide valuable insight into whether and how episode-level feelings of connection may generate broad and potentially durable feelings of connectedness.

Emerging work focusing on these comparatively brief moments of interaction suggests that this kind of positive, caring, and synchronous connection may be associated with well-being. Positivity resonance, or episode-level moments of connection in which interaction partners report a sense of warmth and mutual trust, being in sync,

and feeling uplifted, has been found to be linked with greater flourishing, less loneliness, and fewer illness symptoms (Major et al., 2018), and to predict marital satisfaction (Otero et al., 2020). To date, no experimental work has examined whether these types of brief connecting interactions can be experimentally manipulated, and if so, whether increasing them influences subsequent well-being beyond the specific moment of interaction and into a longer time window.

The Role of Technology in Social and Prosocial Interactions

Much of the literature surrounding prosocial and social behavior interventions for well-being assumes that the behavior occurs in-person, as in the case of helping a neighbor carry heavy grocery bags or having a chat with a barista (Curry et al., 2018). However, social interactions in general are increasingly occurring through digital media, including social media platforms, texting, and email (Twenge, 2019). Such online social interactions also create unique opportunities for a wide range of prosocial behaviors, such as leaving a positive review for a local small business, texting a supportive emoji, or sending a digital gift card. Additionally, in contrast to in-person interactions, online interactions occur across a wide range of temporal synchronicity, from being completely synchronous (e.g., engaging in a video call, in which the responses happen in real time) to asynchronous (e.g., responding to a chat message hours after sending it), potentially producing differences in connectedness. Thus, in the present study, we were interested in examining whether the medium (i.e., in-person vs. online) moderates the potential well-being benefits of social and prosocial exchanges.

Prior research provides a mixed perspective on the benefits and consequences of this increasingly digital communication landscape. Some studies, particularly those focused on adolescent and young adult populations, suggest that the shift toward online communication has paralleled increases in depression in this population (e.g., Twenge et al., 2018). Heavy screen-based media usage is associated with less happiness and greater likelihood for socioemotional difficulties in youth, relative to less usage (Booker et al., 2015). In particular, social media use stands out in the literature as rife with potential for reducing well-being. Among young adults, high social media usage predicts depression (Lin et al., 2016), and ecological momentary assessments suggest that use of Facebook in particular is associated with worse mood and lower life satisfaction (Kross et al., 2013). Randomized trials have shown that asking college students to limit their social media usage in particular leads to reductions in loneliness and depression across time (Hunt et al., 2018).

At the same time, other empirical work provides a more nuanced perspective on the potential outcomes across different types of technology-mediated communication (e.g., Odgers & Jensen, 2020; Orben & Przybylski, 2019). Even within the same platform, the type of usage (e.g., active vs. passive social media use) may moderate its potentially harmful effects on well-being (Verduyn et al., 2015). Other work suggests that communication via social networking sites may actually increase, rather than decrease, the likelihood for face-to-face interactions 6 months later (Dienlin et al., 2017), suggesting that these types of computer-mediated communications may strengthen, rather than impair, social relationships. Indeed, technology bears the capacity to connect people across the globe, to foster supportive and collaborative communities among geographically dispersed individuals, and to promote multiple simultaneous exchanges, potentially allowing for more frequent, numerous, and varied interactions. In an increasingly digital world, it is vital to test whether the purported well-being benefits of social and prosocial behavior operate similarly on a digital platform as they do in-person, although the potential for connection might depend on the exact type of online communication.

The Current Study

In the current study, we aimed to test whether prosocial behaviors—relative to social behaviors and a neutral activity—confer unique benefits for well-being (i.e., life satisfaction, affect). Because a prosocial interaction can be considered a type of social interaction, but with the additional element that one person in the interaction has a goal to benefit another person, we hypothesized that individuals who engage in prosocial behaviors will report greater well-being and social connection than those who engage in mere social behaviors, with both groups benefitting more than a neutral control group. However, in light of the growing number of studies suggesting that social behaviors in and of themselves play a key role in well-being, an alternate hypothesis is that social and prosocial behaviors may confer comparable benefits, relative to a control activity. Because our study design prompts participants to engage in parallel social and prosocial behaviors, it allows for such direct comparisons between these two types of interactions.

We also aimed to examine whether these effects were impacted by the medium of delivery—that is, whether the behaviors were conducted in-person or online. We predicted that participants who perform prosocial or social behaviors in-person would report greater increases in well-being and general social connection than those who perform prosocial or social behaviors online, with both groups benefitting more than the control group.[1]

In addition, we sought to test whether one mechanism for the expected well-being benefits of social and prosocial activities is through increases in episode-level connection—that is, connection as it was experienced (or remembered) as part of the specific interaction. To this end, we predicted that, among our four experimental groups, increases in episode-level connection across the intervention period would predict improvements in well-being and general social connection. Importantly, because these moments of connection (which we call episode-level connection) were reported at the end of each week, the current research explores the intermediate effects of connection over a relatively short time period, rather than measuring either overall connection globally or connection felt immediately in the moment.

Finally, we planned to explore whether it mattered who was the target (i.e., recipient) of the prosocial or social acts. Rather than experimentally manipulating the target, we opted to allow participants to self-select the recipient for each social or prosocial act for a couple of reasons. First, we expected there would be natural variation in targets, and second, we wanted to preserve participants' autonomy in selecting who they interacted with, to maximize gains in well-being (Nelson et al., 2015) and avoid potential backfiring effects (cf. Fritz & Lyubomirsky, 2018).

[1] However, although not the focus of the present study, online interactions could reduce connection and well-being if they replace face-to-face interactions, become addictive, or involve cyberbullying.

To this end, we developed a longitudinal randomized intervention comprised of four experimental groups, to disentangle the relative effects of type of activity (i.e., social vs. prosocial) and medium of activity (i.e., online vs. in-person), relative to a control group. All questionnaire materials, data, and R code for this project can be found at https://osf.io/jdw4t/?view_only=845e8c9f2d804bb383b059f89130b989 (Margolis & Radosic, 2023).

Method

Participants

Participants ($N = 754$) were employed adults recruited as part of a larger, prospective, longitudinal workplace study. This panel-like sample of community adults (average age = 38 years, 45% female, 60% Caucasian) was recruited through a specially employed sample from Amazon Mechanical Turk. Eligible participants were those with full-time employment (i.e., not full-time mTurk workers) of at least 35 hr per week. Additional inclusion criteria were as follows: located in the United States, over 18 years of age, and with personal annual income of over $25,000 per year. The vast majority (97.3%) of participants was employed, of which 94.0% were employed full-time and 1.4% were self-employed. Participants worked an average of 41.6 hr per week ($SD = 5.25$), with income ranging from $45,000 to $74,999. This study was approved by the University of California, Riverside Institutional Review Board, and informed consent was obtained from all participants.

Time Period

Data collection for the study took place prior to the COVID-19 pandemic—from March through May of 2018. Therefore, the participants had no atypical constraints on their social or prosocial interactions.

Procedure

Intervention Instructions

Participants were randomly assigned to one of five experimental conditions (i.e., a 2×2 design crossing social/prosocial and online/in-person, with an additional control condition), conducted over the course of 4 weeks, starting the week after pretest (Week 2) and ending 4 weeks later (Week 5). Follow-up measures of well-being (without reports of social interaction) were conducted 2 weeks later (Week 7). Each week during the intervention period, those in the two prosocial (i.e., kindness) conditions—*Prosocial–In-Person* and *Prosocial–Online*—were instructed to perform three extra prosocial behaviors for other individuals during the following day (i.e., three kind acts all in the same day, on 1 day per week for 4 weeks; e.g., Lyubomirsky et al., 2005). Those in the two social conditions—*Social–In-Person* and *Social–Online*—were instructed to have three extra social interactions during the following day (i.e., three interactions all in the same day, on 1 day per week for 4 weeks). As shown in Lyubomirsky et al. (2005), completing several acts in the same day produces more powerful effects than completing the same number of acts across a longer time span. During Weeks 2–4, participants in the prosocial and social conditions were additionally shown the following instructions, respectively: "Try to do different kind [*social*] acts than you did last week—either for the same people or for different people."

The *Prosocial–In-Person* group was told that their prosocial behaviors must be performed in-person and must involve a face-to-face interaction with the recipient. The following examples were provided in the intervention instructions: "bringing in a treat for coworkers, doing a chore for a family member, paying for someone's coffee in line behind you, bringing flowers to a romantic partner, or saying thank you to someone who has helped you with a task at work." The *Prosocial–Online* group was instead instructed that their prosocial behaviors must be performed online and must not involve an in-person interaction. Examples offered as part of the intervention instructions were as follows: "posting something kind on someone's Facebook wall, shipping a family member something from their Amazon wish list, contributing to a coworker's GoFundMe project, or sending an email of gratitude to someone who has helped you with a task at work."

In the *Social–In-Person* condition, the social behaviors were required to occur in-person and to involve a face-to-face interaction with the other person. Examples provided in the intervention instructions were "having a brief conversation with a barista, chatting with someone on your morning commute, having a non-work conversation with a coworker, saying hello to the grocery store cashier, or asking how a coworker's day was." In the *Social–Online* condition, the social behaviors were directed to be performed online, using the internet, social media, and/or apps, and not to involve an in-person interaction. Examples provided were "sharing a news article to a coworker's Facebook wall, texting a friend to say hello, messaging a coworker to ask how their day is going, or sending a funny video to your roommate."

Participants in the control condition were asked each week to track their daily activities on the following day (i.e., track activities on 1 day per week for 4 weeks). They were instructed not to alter their routine and to keep note of factual information about what they did that day. See https://osf.io/jdw4t/?view_only=845e8c9f2d804bb383b059f89130b989 for full intervention instructions for all conditions.

Weekly Check-ins

At the end of each week during the 4-week intervention period, participants logged into the study website to report back on their prior week's activities, to complete both weekly psychological measures, and to receive activity instructions for the upcoming week. Additionally, participants in the social and prosocial conditions were asked to report the number of behaviors they performed during the preceding week, to provide a brief description of each behavior, to rate how difficult and effortful it was to complete the intervention that week (1 = not at all difficult *[not a lot of effort]*, 7 = very difficult *[a great deal of effort]*), and to complete a measure of episode-specific connection for each act. Those in the control condition were asked to report the number of activities they tracked and to provide a brief factual description of each activity.

Follow-up

Two weeks after the end of the intervention, participants in all conditions rated their prior week's well-being only, without reporting on any activities.

Measures

Life Satisfaction

The 5-item Satisfaction With Life Scale (SWLS; Diener et al., 2010) was used to assess respondents' life satisfaction in general at baseline, post-intervention, and 2-week follow-up. Participants responded on 7-point Likert-type scales (1 = *strongly disagree*, 7 = *strongly agree*) to items such as "In most ways my life is close to my ideal" and "I am satisfied with my life." At each time point, McDonald's ω_t equaled 0.93.

Affect

Affect was assessed at all time points using the Affect-Adjective Scale (Diener & Emmons, 1984). This 10-item measure taps a range of positive emotions (e.g., happy, pleased, joyful, enjoyment/fun) and negative emotions (worried/anxious, angry/hostile, frustrated, depressed/blue, unhappy). Participants were asked the extent to which they have experienced the emotions in the past week on a 7-point Likert scale (1 = *not at all*, 7 = *extremely much*). Positive and negative affect had ω_ts between .91 and .94 at all the time points.

Weekly Social Connection

To assess a general sense of social connection, participants reported their feelings of connectedness with others over the past week using the 3-item connectedness (relatedness) subscale of the Brief Measure of Need Satisfaction (BMPN; Sheldon & Hilpert, 2012). At each time point, participants responded on 5-point Likert-type scales (1 = *no agreement*, 5 = *much agreement*) to report how true each of the following statements was over the past 7 days: "I felt a sense of contact with people who care for me, and whom I care for," "I felt close and connected with other people who are important to me," and "I felt a strong sense of intimacy with the people I spent time with." Across all assessments, ω_ts varied between .89 and .91.

Episode-Level Social Connection

As part of their weekly check-in, participants in each of the four experimental groups (i.e., *Prosocial–In-Person*, *Prosocial–Online*, *Social–In-Person*, *Social–Online*) reported their feelings of social connection during each interpersonal episode using the 7-item Perceived Positivity Resonance scale (Major et al., 2018). In this measure, participants are asked to report the percentage of time during an interpersonal interaction that they experienced indicators of positive social connection. For example, participants report the percentage of time (0%–100%) they felt "a mutual sense of warmth and concern toward the other(s)," "'in sync' with the other(s)," and "able to attune to and connect with the other(s)' experiences." Participants completed this scale each week for each of the episodes (i.e., each prosocial or social behavior) described in their check-ins. Across behaviors, ω_t varied between .95 and .98.

Analytic Approach

We tested our predictions using second-order latent growth models, an approach using structural equation modeling techniques to examine change over time in our outcome variables. Furthermore, second-order latent growth models rest on the assumption that the latent constructs underlying our measures remained the same over the measurement period. This assumption is reasonable for our study, given that we measured the same individuals over a relatively short period of time during which their interpretations of items tapping well-being and sense of connectedness were unlikely to change.

In sum, this approach uses structural equation modeling techniques to examine change across time in outcome variables. Using the $\Delta CFI \leq .01$ criterion (Cheung & Rensvold, 2002), all measures achieved strict longitudinal measurement invariance (see Tables B1–B4), which was imposed on all latent growth models. We also included autocorrelations between items, which were constrained such that correlations with the same item over the same duration were equal. We used piecewise latent growth models, with one latent variable representing logarithmic growth from Weeks 1–5 and another latent variable representing linear growth from Weeks 5–7. We considered this to be the optimal approach due to (a) differences in growth trajectories and (b) the study design, in which participants completed the activity in Weeks 1–5, followed up by a survey-only period for Weeks 5–7. To account for regression to the mean, we controlled for latent intercepts (i.e., initial score) when predicting latent slopes (i.e., growth). Because of model complexity and convergence issues when predictors were added to the latent growth model, predictors of growth were instead tested with extracted latent variables, rather than in the latent growth model. Condition was dummy coded with the control condition as the reference group. All structural equation models were estimated with full information maximum likelihood, and the variances of latent intercepts were set to 1, so that slope latent variables represent growth in units of Week 1 standard deviations. Sensitivity analyses using G*Power (Faul et al., 2007) with $N = 754$ participants, assuming $\alpha = 0.05\%$ and 80% power, revealed a minimum effect size of Cohen's $f = 0.05$.

Results

Descriptive Statistics

Overall, participants in the experimental conditions adhered to our intervention instructions, and found the intervention moderately effortful but not very difficult (see Tables 1 and 2 as well as Tables A1 and A2). Additionally, the conditions were similarly difficult and effortful, with only the control condition being rated as requiring more effort than either of the online experimental conditions (see Tables 2 and A2). Qualitatively, participants in the prosocial conditions reported engaging in kind acts such as assisting one's wife with housework, helping fix a tire, and helping a coworker move furniture (*Prosocial–In-Person*), and sending an e-card to a family member who just had surgery, offering someone access to an online service, and leaving a nice message on a Facebook page (*Prosocial–Online*). Participants in the social conditions reported engaging in social acts such as chatting with a cashier, having a conversation with a coworker, and talking to a woman one normally just waves at (*Social–In-Person*), and sending a picture on Facebook to break the ice with an old friend, asking online about a coworker's holiday plans, and sharing recipes with someone on Twitter (*Social–Online*).

Sociality and Prosociality of Acts in the Experimental Conditions

All four experimental conditions were independently coded on a scale ranging from 1 (*not at all*) to 5 (*very much*) for levels of both sociality and prosociality in a randomly selected subsample of 100

Table 1
Average Number, Difficulty, and Effort of Weekly Acts by Condition

Condition	Acts per week ($M \pm SD$)	Difficulty rating ($M \pm SD$)	Effort rating ($M \pm SD$)
Prosocial–in-person	2.95^{a} (± 0.78)	2.46^{a} (± 1.59)	4.61^{ab} (± 1.59)
Prosocial–online	2.96^{a} (± 0.83)	2.21^{a} (± 1.68)	4.29^{a} (± 1.73)
Social–in-person	3.11^{a} (± 0.80)	2.97^{a} (± 1.66)	4.80^{ab} (± 1.57)
Social–online	3.08^{a} (± 0.84)	2.65^{a} (± 1.65)	4.38^{a} (± 1.72)
Control		2.70^{a} (± 1.62)	4.99^{b} (± 1.63)

Note. All means were weighted to account for differences in cell sizes at different weekly time points. All means within the same column that do not share the same superscript are significantly different from one another. The only significant group differences that emerged were between the control condition and either online condition, with the control condition showing higher effort ratings in both cases.

participants (IRR $>$ .95). Welch two-sample t tests revealed significant differences between the conditions, in line with our initial hypotheses: The prosocial condition showed the highest levels of prosociality; the social condition showed the highest levels of sociality; and the control condition showed the lowest ratings on both sociality and prosociality (see Tables 2 and A3).

Which Groups Increased in Well-Being and Social Connection?

Contrary to our hypothesis, all five groups, including the control condition, reported increases in well-being across the intervention period. Regardless of assigned activity, participants on average reported increases in both life satisfaction and positive affect, as well as decreases in negative affect, across time (see Table 3 and Figure 1). Experimental groups did not differ from the control group in rates of growth over time (ps ranging from .051 to .94).

Correlational analyses of overall connection and affect showed the expected pattern of relationships: Social connection and life satisfaction were positively related to each other and to life satisfaction, while negative affect was negatively related to all these variables (see Table 4).

Consistent with our alternative hypothesis, however, participants in each of the four intervention groups reported larger increases in weekly social connectedness than did control participants (see Table A1; ps for tests comparing each of the experimental conditions to the control condition range from .011 to 5.93×10^{-5}).

What Does Episode-Level Connection Predict?

Because the experimental condition did not predict our main outcomes of interest, the next set of analyses were conducted collapsed across conditions, to examine changes in outcome variables across time. Average feelings of connection across episodes (e.g., feeling in sync with the person they helped) were positively related to feelings of positive affect ($\beta = .337$, 95% CI = [0.250, 0.426], $p = 1.56 \times 10^{-13}$) and weekly social connectedness (e.g., feeling intimacy with people in their life) ($\beta = .423$, [0.345, 0.501], $p = 2 \times 10^{-16}$), but not significantly related to negative affect ($\beta = -.039$, [−0.112, 0.034], $p = .292$) or life satisfaction ($\beta = .078$, [−0.004, 0.159], $p = .062$) across the intervention period, controlling for baseline levels of those outcomes. In other words, supporting our predictions, the greater feelings of connection experienced during the prosocial or social acts, the more participants in all our experimental groups increased in weekly (overall) social connection and weekly positive affect across time.

What Predicts Episode-Level Connection?

Given the importance of episode-level connection to our outcomes, we further explored episodic connection scores for each activity for each person at each time point. Due to this nesting, we used a three-level multilevel model. We used the Satterthwaite approximation to calculate degrees of freedom and, as a result, p values. These estimates of degrees of freedom were also used in conjunction with the t values to calculate effect sizes for each predictor on the Pearson correlation scale (i.e., from −1 to +1). We included time, condition, actual medium used (e.g., video chat), and target (e.g., coworker) as predictors.

For condition, we included a dummy-coded condition variable indicating whether the condition was in-person (1) or online (0). However, many participants completed their behaviors in a medium not assigned to them. In the in-person conditions, 91.4% and 84.6% of prosocial and social behaviors were done in-person, respectively. However, in the online conditions, only 54.6% and 69.7% of prosocial and social behaviors were done online, respectively. Thus, we included actual medium as a predictor (reference group: in-person). Lastly, we included target as a predictor of episode-level connection (reference group: partner). Because the experimental conditions did not differ on our primary outcomes of interest, we collapsed this analysis across social and prosocial conditions, so that all four experimental conditions were combined. See Table 5 for parameter estimates from models. Additionally, we were interested in the potential condition differences with regard to target: Because some relationships are more communal than others, varying expectations and social norms with respect to social interactions (e.g., just chatting) versus prosocial interactions (e.g., helping someone move) might result in more

Table 2
Within-Condition Welch Two-Sample t *Tests on Ratings of Sociality and Prosociality*

	Prosociality		Sociality					
Condition	M	SD	M	SD	t	Lower CI	Upper CI	p
Prosocial	3.537^{a}	0.954	2.154^{b}	0.945	19.809	3.537	2.154	2.2×10^{-16}
Social	1.489^{a}	0.883	3.405^{b}	0.883	−29.390	−2.054	−1.796	2.2×10^{-16}
Control	1.236^{a}	0.679	1.669^{b}	1.112	−3.996	−0.646	−0.219	8.59×10^{-5}

Note. All means within the same column that do not share the same superscript are significantly different from one another. The Prosocial condition showed significantly higher ratings on prosociality compared to sociality; the Social condition showed significantly higher ratings on sociality compared to prosociality; the Control condition was significantly higher on sociality than prosociality.

Table 3
Growth Rates in Outcomes by Condition

Outcome	Condition	Growth rate	Lower CI	Upper CI	p
Life satisfaction	Social–online	−0.093	−0.192	0.006	.064
	Social–in-person	−0.097	−0.196	0.002	.054
	Prosocial–online	−0.048	−0.147	0.051	.339
	Prosocial–in-person	−0.100	−0.198	−0.001	.048
	Control	0.133	0.051	0.215	.001
Positive affect	Social–online	−0.035	−0.101	0.030	.286
	Social–in-person	−0.019	−0.084	0.046	.558
	Prosocial–online	−0.047	−0.112	0.018	.156
	Prosocial–in-person	0.008	−0.057	0.073	.811
	Control	0.094	0.050	0.137	1.87×10^{-5}
Negative affect	Social–online	−0.014	−0.072	0.043	.625
	Social–in-person	0.004	−0.054	0.061	.904
	Prosocial–online	−0.027	−0.085	0.030	.351
	Prosocial–in-person	−0.042	−0.100	0.015	.149
	Control	−0.051	−0.102	−0.001	.023
General social connection	Social–online	0.158	0.087	0.230	1.36×10^{-5}
	Social–in-person	0.207	0.132	0.282	1.18×10^{-7}
	Prosocial–online	0.204	0.130	0.278	1.38×10^{-7}
	Prosocial–in-person	0.230	0.158	0.303	2.08×10^{-9}
	Control	0.029	−0.050	0.109	.236

Note. Estimates for the control condition test rates of growth over time from baseline. Estimates for the four experimental conditions (i.e., social–online, social–in-person, prosocial–online, and prosocial–in-person) test differences in rates of growth relative to the control condition.

or less reported closeness across these two conditions (see Tables 6 and 7 for parameter estimates).

Across all conditions, episode-level connection increased on average across the intervention period ($b = 0.65$, 95% CI = [0.28, 1.01], $p = .0004$; see Table 5). Experimentally assigned medium (in-person vs. online) did not have a significant effect on episode-level connection, but actual self-reported medium had a large effect. The actual medium dummy codes accounted for 4.7% of the level-1 variance in episode-level connection scores (pseudo-$r = .217$). As shown in Figure 2, behaviors completed via video chat or phone generated comparable episode-level connection levels to in-person behaviors, whereas behaviors completed via text message, email, website, or social media generated significantly less episode-level connection than in-person behaviors.

Lastly, target was an important predictor of episode-level connection, explaining 17.7% of the level-1 variance (pseudo-$r = .421$). As shown in Figure 3, behaviors targeting partners were associated with the most episode-level connection, followed by family and friends, followed by coworkers, neighbors, and acquaintances, with behaviors targeting strangers leading to the least episode-level connection. When comparing groups, participants in the social and prosocial conditions did not report significantly different levels of connection and showed similar rankings of most to least connection per target type (excluding friends; see Tables 6 and 7).

Discussion

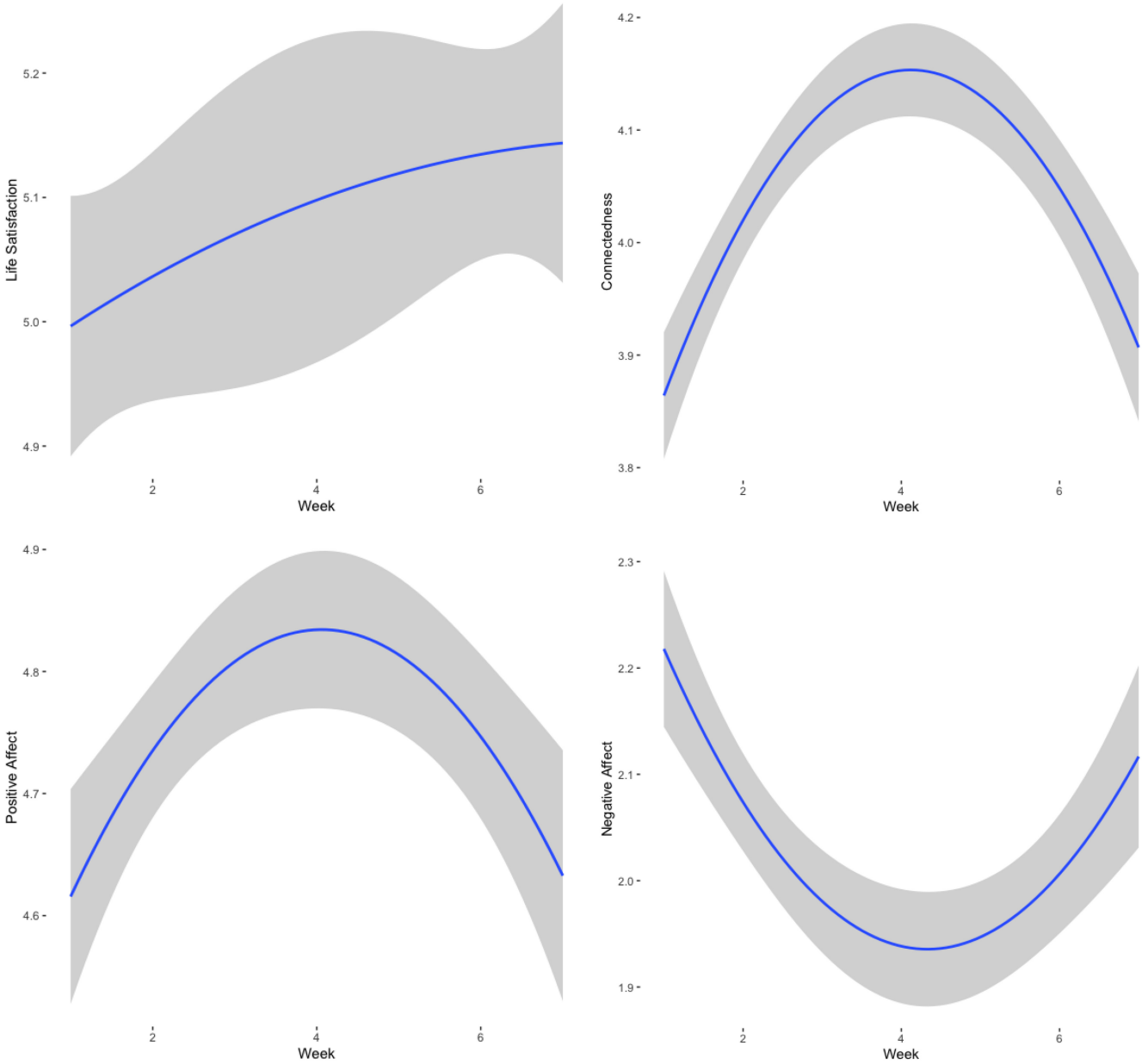
Contrary to our predictions, all participants, including those in the control condition, reported improvements across time in indicators of well-being, including increases in life satisfaction and positive affect, and decreases in negative affect. We propose a couple of explanations for this finding. First, similar levels of growth among conditions might have reflected demand characteristics. This experiment was presented as a study of positive experiences; thus, it is possible that our participants' reports of increased well-being were influenced by these relatively subtle cues and expectations. Alternatively, it is also possible that all conditions, including tracking daily activities, led to actual gains in well-being. People tend to perceive life events as generally positive, and positive affect from life events may be slower to fade, relative to negative affect (Walker et al., 2003). Thus, despite our attempt to design a neutral control, our participants, who expected a positive intervention when asked to track their daily activities, may have reflected on and tracked social behaviors and acts of kindness from their daily lives, which may have inadvertently boosted well-being (e.g., through positive reminiscence; Pinquart & Forstmeier, 2012). Keeping track of daily activities might also have inspired our participants to notice and reduce well-being-detracting activities (e.g., idly scrolling through social media) and step up well-being-enhancing activities (e.g., being more active).

In addition, participants across conditions showed a quadratic trajectory for positive and negative affect, as well as for life satisfaction, starting toward the end of the intervention period (see Figure 1). We speculate that this pattern of results is a consequence of hedonic adaptation (Lyubomirsky, 2011), such that the longer participants performed the experimental activities, the more they hedonically adapted to their repeated behaviors, especially with respect to the emotional aspects of well-being and less so for life satisfaction.

Consistent with our theorizing, all four experimental conditions reported increases in weekly social connection, relative to control. Thus, over the intervention period, engagement in both prosocial and social behaviors led our participants to report increases in a sense of intimacy and closeness with the people they care about. It is important to note that our measure of weekly connection was not specific to any relationship or target. Thus, in line with positivity resonance theory (Major et al., 2018), the participants felt a sense of warmth and connection with their targets, and these feelings appeared to spread to how they experienced all their relationships. Hence, the broad feelings of social connection generated by our intervention might not have been limited to just the targets of these acts. This is

Figure 1

Changes Over Time, Collapsed Across All Conditions, for Life Satisfaction and Social Connection (Top) and for Positive and Negative Affect (Bottom)



Note. See the online article for the color version of this figure.

Table 4

Correlations Between Grand Means for Social Connection, Life Satisfaction, and Well-Being

Outcome	Positive affect	Negative affect
Social Connection	0.654	−0.508
Life satisfaction	0.696	−0.505
Positive affect		−0.577

Note. All correlations are significant at the $p < .01$ level.

not surprising, given that both social and prosocial interactions bring an individual into closer contact with others, potentially boosting a sense of warmth, closeness, and belonging. Notably, one potentially important implication of this finding for future researchers and practitioners is that the previously reported well-being benefits of prosocial behavior could be due to its social rather than *prosocial* nature.

A novel contribution of our study is its attempts to compare the method of delivery for social and prosocial acts. Although no differences emerged between our online and in-person conditions on well-

Table 5
Multilevel Model Predicting Episode-Level Connection Across All Conditions

Predictor	*b* [95% CI]	*r* [95% CI]	*t*	*df*	*p*
Intercept	83.16 [79.90, 86.43]		49.98	806	4.59×10^{-249}
Time	0.65 [0.28, 1.01]	.09 [0.04, 0.14]	3.50	1,414	4.77×10^{-4}
Video chat	−0.46 [−3.44, 2.52]	.00 [−0.03, 0.02]	−0.30	4,784	.762
Phone	−1.01 [−2.80, 0.78]	−.02 [−0.04, 0.01]	−1.11	4,828	.267
Text message	−3.16 [−4.89, −1.42]	−.05 [−0.08, −0.02]	−3.57	5,133	3.58×10^{-4}
Email	−4.53 [−6.58, −2.48]	−.06 [−0.09, −0.03]	−4.33	5,108	1.54×10^{-5}
Website	−5.86 [−8.21, −3.52]	−.07 [−0.09, −0.04]	−4.90	5,173	9.88×10^{-7}
Social media	−6.81 [−8.51, −5.10]	−.11 [−0.14, −0.08]	−7.83	5,057	6.07×10^{-15}
Family	−3.45 [−4.88, −2.01]	−.07 [−0.10, −0.04]	−4.70	4,633	2.67×10^{-6}
Friend	−5.17 [−6.65, −3.69]	−.10 [−0.13, −0.07]	−6.87	4,641	7.42×10^{-12}
Coworker	−11.09 [−12.60, −9.58]	−.21 [−0.24, −0.18]	−14.42	4,542	4.22×10^{-46}
Neighbor	−12.66 [−14.72, −10.60]	−.17 [−0.2, −0.15]	−12.06	4,649	5.32×10^{-33}
Acquaintance	−14.40 [−16.45, −12.34]	−.19 [−0.22, −0.17]	−13.75	4,874	3.09×10^{-42}
Stranger	−20.44 [−22.02, −18.87]	−.35 [−0.37, −0.32]	−25.43	4,745	6.76×10^{-134}
Condition in-person	−0.78 [−5.00, 3.43]	−.02 [−0.10, 0.07]	−0.36	590	.715
Condition prosocial	0.24 [−3.93, 4.42]	.00 [−0.08, 0.09]	0.12	570	.908
Condition interaction	1.05 [−4.80, 6.91]	.01 [−0.07, 0.10]	0.35	565	.724

Note. CI = confidence interval; Condition interaction = interaction of condition dummy variables. The medium predictors (e.g., video chat) were dummy coded with "in-person" as the reference group. The target predictors (e.g., family) were dummy coded with "partner" as the reference group.

being or social connection, this finding may reflect the fact that a relatively large proportion of the acts that were assigned to be done online were actually done in-person, obfuscating potential differences. The participants' reluctance to perform these acts online rather than in-person (as seen in the much lower compliance rates among those who were assigned to the online condition) speaks to the possibility that in-person behaviors are generally more desirable and appealing. Indeed, acts conducted in-person or using media closely mimicking in-person communication were reported to be the most connecting. In other words, our analyses involving self-reported (rather than assigned) medium of delivery suggest that acts performed in-person or via video chat or phone are associated with the greatest amounts of episode-level connection.

Both prosocial and social interactions are likely to be more powerful, memorable, and intimacy-building when conducted in-person, or when using interactive technology like video chat that approximates face-to-face interactions, as compared to using asynchronous or indirect modes of communication. Indeed, humans arguably did not evolve to interact via text, and the evolutionarily-based "need to belong" is more likely to be fulfilled by interactions that involve eye contact, voice, gesture, touch, and smell (Baumeister & Leary, 1995). Accordingly, our participants' interactions were characterized by more episode-level connection when they took place in a medium that operates via one or more of these channels. These findings of the potential benefits of (some forms of) digital communication are especially important during the current pandemic and post-pandemic periods, in which online communication has become ubiquitous, as well as for individuals who for various reasons (e.g., disability, physical distance) may not be able to interact in-person on a regular basis.

We also found that retrospective episode-level connection accrued over time was associated with increases in well-being (i.e., increases in positive affect) and weekly social connection. In other words, participants who reported that a larger percentage of each of their social or prosocial interactions was characterized by feelings of mutual care, warmth, and responsiveness with their interaction partner also reported feeling more *generally* socially connected to people in their lives and

Table 6
Multilevel Model Predicting Target-Specific Episode-Level Connection for Prosocial Acts

Predictor	*b* [95% CI]	*r* [95% CI]	*t*	*df*	*p*
Intercept	83.16 [79.70, 86.35]		49.09	423	6.95×10^{-177}
Time	0.25 [−0.20, 0.70]	.04 [−0.03, 0.11]	1.09	702	.276
Family	−3.09 [−4.70, −1.48]	−.08 [−0.12, −0.04]	−3.66	2,294	1.67×10^{-4}
Friend	−6.19 [−7.91, −4.48]	−.15 [−0.18, −0.11]	−7.08	2,321	1.92×10^{-12}
Coworker	−10.13 [−11.88, −8.37]	−.23 [−0.27, −0.19]	−11.32	2,276	6.44×10^{-29}
Neighbor	−10.16 [−12.51, −7.81]	−.17 [−0.21, −0.14]	−8.49	2,295	3.62×10^{-17}
Acquaintance	−11.51 [−14.30, −8.71]	−.16 [−0.20, −0.12]	−8.07	2,398	1.09×10^{-15}
Stranger	−17.90 [−19.74, −16.07]	−.37 [−0.40, −0.34]	−19.12	2,305	1.00×10^{-75}
Condition in-person	−0.23 [−4.55, 4.09]	−.00 [−0.12, 0.11]	−0.10	304	.917

Note. The target predictors (e.g., family) were dummy coded with "partner" as the reference group. CI = confidence interval.

Table 7
Multilevel Model Predicting Episode-Level Connection for Social Acts

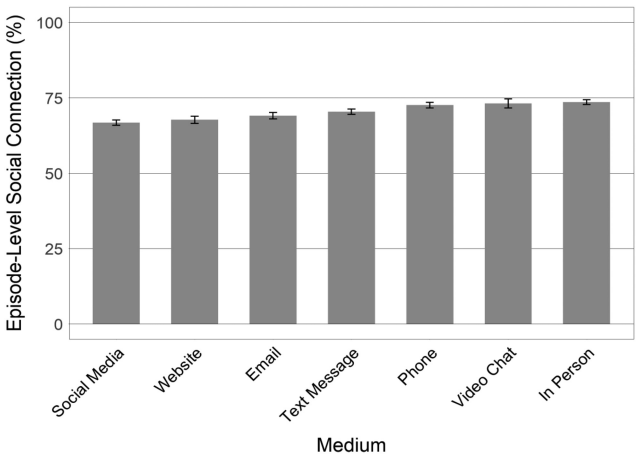
Predictor	*b* [95% CI]	*r* [95% CI]	*t*	*df*	*p*
Intercept	84.53 [80.80, 88.25]		44.59	712	2.70×10^{-208}
Time	1.04 [0.47, 1.61]	.13 [0.06, 0.13]	3.59	702	3.54×10^{-4}
Family	−4.17 [−6.74, −1.61]	−.07 [−0.11, −0.03]	−3.20	2,303	1.41×10^{-3}
Friend	−4.97 [−7.50, −2.43]	−.09 [−0.12, −0.04]	−3.84	2,284	1.27×10^{-4}
Coworker	−13.06 [−15.65, −10.46]	−.20 [−0.24, −0.16]	−9.87	2,239	1.54×10^{-22}
Neighbor	−16.95 [−20.52, −13.39]	−.19 [−0.23, −0.15]	−0.32	2,337	2.68×10^{-20}
Acquaintance	−17.38 [−20.56, −14.21]	−.21 [−0.25, −0.17]	−10.73	2,452	2.86×10^{-26}
Stranger	−23.92 [−26.64, −21.19]	−.33 [−0.36, −0.30]	−17.23	2,412	7.57×10^{-63}
Condition in-person	0.06 [−4.10, 4.23]	.00 [−0.11, 0.11]	0.03	312	.976

Note. The target predictors (e.g., family) were dummy coded with "partner" as the reference group. CI = confidence interval.

experienced more overall positive emotions each week. This finding supports the notion that one potential shared mechanism through which social and prosocial activities may increase well-being and broad social connection is through generating episode-level feelings of social connection. That is, how one remembers feeling specifically *during* an act of helping or reaching out to someone might serve as a predictor of how one feels in general *long after* the act—at least 1 week later, and potentially longer. In our study, feelings of connection generated *during* a kind or social interaction not only accrued over time to bolster connection within that specific relationship but also *generalized* to other people, such that participants who reported feeling more connection in that moment with their interaction partner also reported feeling more generally connected to other people in their lives. In addition, this connecting effect was produced by people merely reflecting on a social or prosocial behavior days later—a finding that points to the potential benefits of simply recalling previous moments of connection (see also Ko et al., 2021). However, future research is needed to investigate both the duration of these effects and the direction of causality. Of course, the reverse causal path—that individuals who feel happy and connected overall are relatively more likely to feel connected during specific interpersonal interactions—must also be considered.

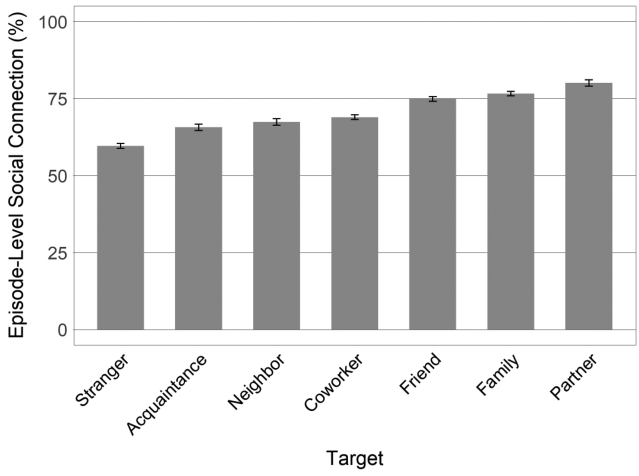
Importantly, our exploratory analyses suggest that episode-level connection is more likely to occur when individuals engage with relatively close targets (e.g., family members) and through more proximal methods (e.g., video chat or in-person). This finding of stronger well-being benefits for kind and social acts in the context of strong (vs. weak) ties parallels the prosocial spending literature (e.g., Aknin et al., 2011). In addition, our finding that more proximal communication methods were associated with greater social connection dovetails with a recent study that found interactions involving voice-based communication (e.g., phone or video chat) create stronger social bonds (Kumar & Epley, 2021) relative to interactions lacking voice-based communication. Considered in conjunction with our lack of episode-level connection effects between conditions, these findings provide initial evidence that the target and the medium (i.e., the "who" and the "how") may be equally or more important factors for eliciting episode-level social connection than the type of interaction (i.e., the "what").

Figure 2
Episode-Level Social Connection by Medium, Collapsed Across All Four Experimental Conditions (i.e., Social–Online, Social–In-Person, Prosocial–Online, and Prosocial–In-Person)



Note. Estimates obtained from multilevel models with non-medium categorical variables effects coded. Error bars indicate ±1 *SE*.

Figure 3
Episode-Level Social Connection by Target, Collapsed Across All Four Experimental Conditions (i.e., Social–Online, Social–In-Person, Prosocial–Online, and Prosocial–In-Person)



Note. Estimates obtained from multilevel models with non-medium categorical variables effects coded. Error bars indicate ±1 *SE*.

Limitations and Future Questions

Our study could be improved in several ways. First, given the lack of condition differences, it is possible that our manipulations were not powerful enough to distinguish between social and prosocial activities. Notably, the social versus prosocial nature of any act may depend on multiple factors, including the context of the act (e.g., texting a friend to say hello may be considered social under typical circumstances, but prosocial if that friend is going through a breakup). Additionally, our neutral control activity (i.e., to list daily activities) may have overlapped with social and prosocial activities. However, our auxiliary analyses involving codings of what participants actually did revealed that the behaviors performed in the prosocial condition were indeed generous and kind—that is, they were rated highest on prosociality. Furthermore, the behaviors performed in the social condition did indeed involve social interactions (i.e., were rated highest on sociality). Finally, the behaviors in the control condition were rated as lowest on both prosociality and sociality. These coder-judged differences provide evidence of moderate adherence to condition assignment; however, they do not betray the participants' motives to perform the acts or their construals of the sociality or prosociality of the acts. Future work should attempt to further disentangle prosociality from sociality in this type of intervention, as well as strengthen experimental designs by including alternative control conditions.

Second, ratings of the acts—whether they involved bringing one's colleague a donut or asking about their vacation—were reported retrospectively, at the end of each week. Thus, participants were relying on their memories of how the social or prosocial interaction felt to them.

This means that the time elapsed between the act and its reporting could have been anywhere from a few hours to almost a week. Although our results indicate that participants did show an elevation in well-being during the weeks in which they were actively participating in the assigned activities, the lack of condition differences might be related to the lack of momentary assessment. To establish both immediate and time-lagged effects of social and prosocial interactions, future investigators would need to assess affect and well-being both in the moment and retrospectively.

Third, our participants reported lower-than-expected adherence to our online intervention instructions. These instructions were carefully and deliberately composed to make online acts feel as natural and comfortable as possible and to include multiple examples. Additionally, participants in the online conditions rated the intervention as comparably difficult, and performed the same number of acts each week, as those in the in-person conditions. Nonetheless, our participants in both the social and prosocial online conditions exhibited poor fidelity to our instructions. As a result, we conducted our analyses by examining participants' self-reported or actual (in-person vs. online) medium during which their interactions took place rather than their experimentally-assigned medium. Future investigations could clarify why this population was not as able or willing to engage in social and prosocial behaviors through technologically mediated platforms as we expected. Because humans evolved for face-to-face communication, online communication may be relatively less natural and less rewarding, such that people find it challenging to generate ideas for or encounter situations that facilitate virtual social and prosocial interactions. It is also possible that a younger sample such as Gen Z (Twenge, 2019), who grew up with technologically mediated communication, would have found online activities relatively more natural and effortless.

Fourth, several confounding factors between online versus in-person behaviors may have impacted our results. Specifically, behaviors performed online may naturally involve more asynchronous communication, as responses to emails and text messages may not be immediate. By contrast, face-to-face behaviors, particularly those of a social nature, are more likely to involve synchronous communication—for example, during a conversation that unfolds in-person or over phone or video. Additionally, with the exception of video chats and phone calls, behaviors performed online may be more frequently characterized by written, rather than verbal, communication. In contrast to face-to-face communication, written format communication (e.g., texts, emails, and direct messages) is considered permanent, as it enables people to re-read received messages or to rephrase messages before sending them. These and other factors (e.g., anonymity, latency, physicality; see McFarland & Ployhart, 2015) may further moderate the benefits of social and prosocial behaviors. The present study design limited our ability to disentangle these factors, but future work could examine whether and how these characteristics may bolster or impede the well-being benefits of social and prosocial behavior.

Fifth, many of our findings are correlational, rather than experimental, in nature. All participants self-selected the target for their prosocial or social act, and many opted to perform these acts in-person, despite having received online instructions. In addition, the nature of the study does not allow for exclusion of possible covariates. Thus, we advise caution in interpreting these findings, as we are unable to infer causality or directionality. It is possible that individuals who generally experience more episode-level connection are more likely to select close targets and/or in-person methods when they interact with others (perhaps because they have found them rewarding in the past), or that a third variable (e.g., personality traits, social network characteristics) may be responsible for this relationship. In addition to developing more sensitive online versus in-person interventions, one key priority for future research is to extend the present findings by experimentally manipulating the targets of prosocial or social acts.

Finally, it is critical to acknowledge the conceptual overlap between what sort of acts are considered social versus prosocial, as the context in which these acts occur could significantly alter their meaning. For example, the knowledge that a friend had recently received a scary diagnosis could transform the act of asking how they are feeling from social (e.g., making small talk) to prosocial (e.g., showing compassion and care during a stressful time). Furthermore, some research suggests that merely *recalling* past acts of kindness increases well-being (e.g., Aknin et al., 2011; Otake et al., 2006), possibly even to a comparable degree as *performing* new kind acts (Ko et al., 2021). In sum, the context, framing, and perception of these acts by the doer as either kind or social may be vital to their benefits. In the present study, we wanted to avoid constraining our participants; hence, we provided examples, but ultimately allowed them to define what constituted a social or prosocial act. Future investigators could document lay definitions of social and prosocial acts and use them as a foundation to develop and test a clearer taxonomy.

Conclusion

Our study is among the first to directly compare the well-being benefits of social and prosocial activities. Although *all* of our participants reported comparable boosts in well-being on average across the

4-week intervention period, only the social and prosocial interventions led to increases in general feelings of social connection across time, relative to controls. Perhaps most important, collapsing across conditions, social and prosocial acts delivered face-to-face (e.g., in-person, via video) or ear-to-ear (e.g., via phone) and toward relatively close targets were associated with stronger episode-level feelings of connectedness, which, in turn, predicted boosts in positive affect and even greater general connectedness over time. Our findings suggest that engaging in more weekly social and prosocial activities—a relatively simple, self-administered, low-cost, accessible, and nonstigmatizing strategy—may serve as effective approaches for improving the social connection of community adults. Importantly, one key diagnostic feature of these activities is the amount of positive social connection experienced *during* them. In sum, the more a particular social or prosocial interaction is characterized by mutual concern, warmth, and connectedness, the more subsequent positive affect and general social connection the individual may experience.

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(*Appendices follow*)

Appendix A

Additional ANOVA Tables

Table A1
ANOVAs Comparing Conditions on Difficulty, Effort, and Number of Weekly Acts

Measure	SS_{Bw}	SS_{Wn}	df_{Bw}	df_{Wn}	F	p
Difficulty	19.601	1,636.659	4	609	1.823	.1227
Effort	36.162	1,644.065	4	603	3.316	.011
Number of acts	2.378	317.759	3	497	1.2399	.2946

Note. ANOVA = Analysis of Variance.

Table A2
Tukey HSD Tests Comparing Conditions on Difficulty, Effort, and Number of Acts

Group 1	Group 2	HSD	Lower CI	Upper CI	p
Difficulty					
1. Prosocial–in-person	2.	0.068	−0.504	0.640	.998
	3.	0.513	−0.516	1.078	.095
	4.	0.197	−0.375	0.769	.881
	5.	0.240	−0.326	0.806	.774
2. Prosocial–online	3.	0.445	−0.129	1.019	.213
	4.	0.128	−0.453	0.710	.975
	5.	0.172	−0.404	0.747	.926
3. Social–in-person	4.	−0.317	0.891	0.258	.558
	5.	0.2731	−0.295	0.841	.682
4. Social–online	5.	−0.273	−0.841	−0.295	.682
5. Control					
Effort					
1. Prosocial–in-person	2.	−0.314	−0.891	0.262	.568
	3.	0.084	−0.492	0.660	.995
	4.	−0.225	−0.801	0.351	.823
	5.	0.377	−0.193	0.947	.369
2. Prosocial–online	3.	0.398	−0.187	0.984	.340
	4.	0.089	−0.496	0.675	.994
	5.	0.691	0.112	1.271	.010
3. Social–in-person	4.	−0.309	−0.894	0.277	.600
	5.	−0.293	−0.286	0.873	.638
4. Social–online	5.	0.602	0.023	1.182	.037
5. Control					
Number of acts					
1. Prosocial–in-person	2.	0.006	−0.254	0.266	1.000
	3.	0.151	−0.106	0.409	.431
	4.	0.128	−0.132	0.387	.584
2. Prosocial–online	3.	0.145	−0.116	0.406	.480
	4.	0.122	−0.142	0.385	.633
3. Social–in-person	4.	−0.024	−0.284	0.237	.996

Note. The only significant group differences that emerged were between the control condition and either online condition, with the control condition showing higher effort ratings in both cases. HSD = high speed data; CI = confidence interval

(*Appendix continues*)

Table A3
Between-Condition Welch Two-Sample t *Tests on Ratings of Sociality and Prosociality*

Conditions compared	*t*	Lower CI	Upper CI	*p*
Prosociality				
Prosocial vs. social	30.383	1.924	1.480	2.2×10^{-16}
Prosocial vs. control	31.006	2.155	2.447	2.2×10^{-16}
Social vs. control	3.287	0.098	0.389	.001
Sociality				
Prosocial vs. social	−18.483	−1.383	−1.117	2.2×10^{-16}
Prosocial vs. control	4.608	0.278	0.693	6.65×10^{-6}
Social vs. control	16.908	1.533	1.938	2.2×10^{-16}

Note. All *t* tests showed a significant difference between conditions. Prosociality was highest in the prosocial condition, followed by the social and control conditions. CI = confidence interval.

Appendix B

Fit Statistics

Table B1
Life Satisfaction

Model	Label	χ^2	*df*	*p*	AIC	BIC	CFI	TLI	RMSEA	LL90	UL90	Compared	$\Delta\chi^2$	Δdf	Δp
1	Configural	226.696	72	.000	25,211.033	25,502.433	0.989	0.984	0.053	0.046	0.061	—	—	—	—
2	Weak	229.913	77	.000	25,204.250	25,472.522	0.989	0.986	0.051	0.044	0.059	M2 vs. M1	3.217	5	.000
3	Strong	244.090	87	.000	25,198.426	25,420.445	0.989	0.987	0.049	0.042	0.056	M3 vs. M2	14.177	10	.000
4	Strict	272.951	97	.000	25,207.288	25,383.053	0.988	0.987	0.049	0.042	0.056	M4 vs. M3	28.861	10	.000

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; LL90 = lower limits of the 90% confidence interval; UL90 = upper limits of the 90% confidence interval.

Table B2
Positive Affect

Model	Label	χ^2	*df*	*p*	AIC	BIC	CFI	TLI	RMSEA	LL90	UL90	Compared	$\Delta\chi^2$	Δdf	Δp
1	Configural	378.432	213	.000	39,841.472	40,354.890	0.991	0.988	0.032	0.027	0.037	—	—	—	—
2	Weak	391.446	222	.000	39,836.486	40,308.276	0.991	0.989	0.032	0.027	0.037	M2 vs. M1	13.028	9	.000
3	Strong	421.447	242	.000	39,826.487	40,205.769	0.990	0.989	0.031	0.026	0.036	M3 vs. M2	30.001	20	.000
4	Strict	451.119	262	.000	39,816.159	40,102.934	0.990	0.989	0.031	0.026	0.036	M4 vs. M3	29.672	20	.000

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; LL90 = lower limits of the 90% confidence interval; UL90 = upper limits of the 90% confidence interval.

Table B3
Negative Affect

Model	Label	χ^2	*df*	*p*	AIC	BIC	CFI	TLI	RMSEA	LL90	UL90	Compared	$\Delta\chi^2$	Δdf	Δp
1	Configural	868.192	360	.000	48,717.966	49,342.393	0.974	0.968	0.043	0.040	0.047	—	—	—	—
2	Weak	907.651	374	.000	48,729.425	49,289.097	0.973	0.968	0.044	0.040	0.047	M2 vs. M1	39.459	14	.000
3	Strong	961.319	399	.000	48,733.092	49,177.130	0.971	0.968	0.043	0.040	0.047	M3 vs. M2	53.668	25	.000
4	Strict	1,083.842	424	.000	48,805.615	49,134.018	0.966	0.965	0.045	0.042	0.049	M4 vs. M3	122.523	25	.000

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; LL90 = lower limits of the 90% confidence interval; UL90 = upper limits of the 90% confidence interval.

(*Appendix continues*)

Table B4
Connectedness

Model	Label	χ^2	*df*	*p*	AIC	BIC	CFI	TLI	RMSEA	LL90	UL90	Compared	$\Delta\chi^2$	Δdf	Δp
1	Configural	158.417	102	.000	22,630.967	23,033.376	0.995	0.992	0.027	0.018	0.035	—	—	—	—
2	Weak	166.986	106	.000	22,631.536	23,015.444	0.994	0.992	0.028	0.019	0.035	M2 vs. M1	8.569	4	.000
3	Strong	181.340	121	.000	22,615.891	22,930.417	0.994	0.993	0.026	0.018	0.033	M3 vs. M2	14.354	15	.000
4	Strict	214.977	136	.000	22,619.528	22,864.673	0.992	0.991	0.028	0.020	0.035	M4 vs. M3	33.637	15	.00

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; LL90 = lower limits of the 90% confidence interval; UL90 = upper limits of the 90% confidence interval.

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