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Article in *The Journal of Positive Psychology* · March 2021

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**Happiness Comes from Trying to Make Others Feel Good, Rather Than Oneself**

Liudmila Titova<sup>1,2</sup> and Kennon M. Sheldon<sup>1,3</sup>

<sup>1</sup>Department of Psychological Sciences, University of Missouri-Columbia

<sup>2</sup>Department of Psychology, Elon University

<sup>3</sup>International Laboratory of Positive Psychology of Personality and Motivation,  
National Research University Higher School of Economics

**Author Note:**

We have no conflicts of interest to disclose

Correspondence concerning this article should be addressed to Liudmila Titova, Department of Psychology, Elon University, 100 Campus Drive, Elon, NC. Email: [mtitova@elon.edu](mailto:mtitova@elon.edu).

The paper was supported by the Russian Academic Excellence Project ‘5-100’ (Kennon M. Sheldon).

The authors extend our immense gratitude to Dr. Laura King for invaluable feedback on this project.

### Abstract

Americans are guaranteed the right to “pursue happiness” for themselves. But might they be better off if they pursued happiness for others? In five studies we compared the two strategies, showing that, ironically, the second pursuit brings more personal happiness than the first. Retrospective study 1 ( $N = 123$ ) and experimental studies 2 ( $N = 96$ ) and 3 ( $N = 141$ ) show that trying to make someone else happy leads to greater subjective well-being than trying to make oneself happy. In all three studies, relatedness need-satisfaction mediated the condition differences. Study 4 ( $N = 175$ ) extended the findings by showing that trying to make others happy is more personally beneficial than when others try to make us happy. Study 5 ( $N = 198$ ) found that feeding strangers’ parking meters produced the effect even though the participant did not interact with the targeted other.

*Keywords:* well-being, happiness, SDT, relatedness

### **Happiness Comes from Trying to Make Others Feel Good, Rather Than Oneself**

“The surest way to be happy is to seek happiness for others.”

– Martin Luther King Jr.

Happiness is a desire for most people, and, therefore, interest in learning about ways to increase happiness is high among the public. Many Westerners, particularly Americans, see the pursuit of happiness as a personal endeavor, which requires action towards self-serving goals and agendas (Lu & Gilmour, 2004; Oishi et al., 2013). However, as the above quote suggests, it may be that switching one’s concentration from the self to other people could be a more effective way to achieve personal happiness. Perhaps counterintuitively, making oneself truly happy may require one to forget about oneself, and to instead care mainly about the happiness of others.

#### **Other-Targeted Activities are More Effective**

Some studies examine differences between self-targeted and other-targeted happiness-promoting behaviors, showing that focusing on others rather than the self may supply a more reliable route to happiness. For instance, Dunn and colleagues (2008) found that participants randomly assigned to spend money on others subsequently felt happier than participants assigned to spend the same amount of money on themselves. Ensuing research showed that this effect occurs in other cultures, suggesting that the rewarding effects of such spending are observed in many human societies (Aknin et al., 2013a; Dunn et al., 2014). However, these researchers have concentrated primarily on the effects of spending money on self or other and have not examined the phenomenon in a more general way.

Nelson and colleagues (2016) took a first step towards such generalization, comparing self-focused acts of kindness with other-focused acts of kindness. They demonstrated that being kind to others led to more positive emotion, less negative emotion, and more psychological

flourishing, compared to self-focused acts of kindness. Additionally, Martela and Ryan (2016a) showed that prosocial behavior increases well-being even without interpersonal interaction.

Participants who played a computer game that allowed them to have a prosocial impact experienced more positive affect, meaning and vitality compared to those who did not engage in prosocial behavior. Moreover, a recent meta-analysis found that engaging in kind acts towards others leads to improvement in well-being for the person engaging in these kind acts which is not moderated by age, gender, outcome measures or control conditions (Curry et al., 2018).

Additionally, according to the Eudaimonic Activity Model (EAM; Sheldon, 2016, 2018; Sheldon et al., 2019) improvements in subjective well-being and happiness cannot be achieved directly, instead, they can be achieved through engagement in eudaimonic activities (such as activities connected to growth and development, meaning and purpose, promoting intrinsic values and pro-sociality). Therefore, according to the EAM, making others happy should prove more successful for one's own well-being as it does not target the actor's own happiness directly, but leads to benefits via pro-social behavior.

### **Why are Other-Targeted Activities More Effective?**

As shown above, several studies thus far provide preliminary support for the idea that focusing on others instead of the self may be a more effective route to personal happiness. Thus, an important question concerns the underlying mechanism for these benefits. A logical candidate is the feelings of connection that arise between the giver and the target. Many theories propose, and many studies have found, that close relationships are an important determinant of people's well-being (Diener & Seligman, 2002; Lyubomirsky et al., 2005), and that happier people usually have larger social networks and have more friends compared to the less happy ones (Myers, 2000). Self-determination theory (SDT) formalizes this idea by suggesting that all

people have a need for relatedness with others, and SDT research shows that feelings of daily relatedness, along with feelings of competence and of autonomy, are important predictors of well-being on a particular day or in a particular context (Reis et al., 2000; Sheldon et al., 1996). Moreover, when examining prosocial tendencies Martela and Ryan (2016b) found that the relationship between prosocial behavior and well-being can be explained by basic psychological needs fulfillment and also by feelings of beneficence. It seems logical that the attempt to make another person happy would inspire feelings of closeness (i.e. relatedness need-satisfaction), in the person making the attempt. These feelings might then explain the positive effects of the other-focused activity upon the well-being of the actor. Supporting this, work by Aknin and colleagues (2013b) showed that the well-being benefits of prosocial spending were highest when such spending promoted social connection, highlighting the importance of connection to others. However, we thought that not just any social experience leads to improved well-being, but rather, experiences in in which we are focused on the happiness of others rather than of ourselves.

Another possible explanation for the benefits of focusing on others instead of self could be a “spillover” effect that is created by the presence of happy people in one’s life. In this view, one’s attempts to make others happy, when successful, create positive emotions in others, which in turn spill over back to the self. Supporting such a “spill-over” interpretation, a longitudinal study which spanned 20 years found greater increases in well-being among people surrounded by happy people, an effect explained by the spread of happiness through the network rather than by simple assortation (Fowler & Christakis, 2008). These results led Fowler and Christakis (2008) to conclude that happiness is contagious, such that one person’s happiness in a network tends to spill over to others, which eventually spills back to the initial person, raising the emotional

capital of the entire network. This line of reasoning suggests a process in which trying to make someone else happier leads to improvements in that other person's well-being, which indirectly improves the well-being of the person who initiated the activity.

Importantly, however, people may not always know if their attempts to make others happier have succeeded. In fact, it may be that the mere *perception* that one's attempt has been successful would explain the effect. In this research we consider both possibilities: (1) that the person who is being made happy must report an actual boost in happiness, and (2) that the person who is trying to make another happy merely needs to think that they caused a happiness boost in the other.

In studies 4 and 5 we also examined a different but related question – namely, how do people feel when *others* try to make *them* happy? Is it better to strive towards other's happiness, or to have others strive for our happiness? Here, the comparison condition for the other-focused happiness strategy is not a time people tried to make themselves happy, but rather, a time when others tried to make them happy. Interestingly, a similar question has been studied by researchers interested in the health benefits of social support. Inagaki et al. (2016) concluded that giving versus receiving support is better for one's own health and suggested that supporting others is a rather overlooked way to gain personal health benefits. Similarly, giving in general is connected to more long-term benefits for happiness of the giver compared to receiving it (O'Brien & Kassirer, 2019). Moreover, the happiness of a giver did not decline even when they were asked to perform identical behaviors every day for a period of 5 days (O'Brien & Kassirer, 2019). These results lead to our own study hypothesis, that trying to support other's happiness might even be more important for us, than when others try to support our own happiness.

### **Overview of the Studies**

The studies discussed so far suggest that trying to make someone else happier will lead to higher well-being than trying to improve one's own well-being, although no studies have directly compared the effects, upon happiness, of the two very general goals of "trying to make oneself happy" versus "trying to make another person happy." In the first three studies we investigate this question. In retrospective Study 1 we examine whether an attempt to make someone happy in the past was associated with higher well-being at that time, than a past attempt to make oneself happier. In experimental Study 2, we extend the results by randomly assigning participants to one of the two strategies, or to a control condition (mere socializing). In experimental Study 3 we try to replicate the findings of Study 2 while also asking "which is most important for raising the participant's mood: mere perceived success, or actual measured success, in boosting the other's mood?" In retrospective Study 4 we evaluate whether an attempt to make another happy was more beneficial for participants at that time, than an attempt by another to make oneself happy. In Study 5, an experimental field study, participants were given money -- either to keep, to feed their own parking meter, or to feed a stranger's parking meter.

### **Study 1**

First, via a retrospective methodology and a within-subjects design, we tested our initial hypothesis that trying to make someone else happy is associated with greater well-being than trying to make oneself happy. We also wanted to test if this effect could be explained via SDT's conception of basic need-satisfaction. More specifically, we expected that trying to make another happier is more beneficial for personal well-being due to higher experienced levels of relatedness need satisfaction, which should mediate the effect.

### **Method**

#### **Participants**



Participants were 123 students from a large Midwestern University who participated in exchange for extra credit in an upper level psychology course. The study was approved by the Institutional Review Board prior to data collection. The sample size was limited by the enrolment in the course. Ages ranged from 18 to 64 ( $M = 21.66$ ,  $SD = 3.99$ ); 52% women, and 85% were White. The study was administered online, and the materials for this study were a part of a larger assessment including other study's materials unrelated to the current study. Post-hoc power analysis using G\*Power suggested that the power was .89.

### Procedure

Participants completed the study online. They recalled a recent time when they tried to make someone in their life happier or improve their mood and a recent time when they tried to make themselves happier or improve their own mood (in a counterbalanced order<sup>1</sup>). The specific prompt for the first condition stated: "Think of a recent time when you did something **to improve your OWN mood and happiness** (for instance, something fun, like listening to a favorite song, going for a run, or treating yourself to a lunch out). Write 3-5 sentences describing what you did". The prompt for the other condition was nearly identical, asking participants to recall a time when they did something to improve someone ELSE's mood and happiness. After participants recalled each time and wrote about it, they were given the assessment of basic psychological needs satisfaction derived from the activity and subjective well-being.

### Measures

**Basic Psychological Need Satisfaction (BPNS).** To measure need satisfaction derived from the happiness and mood inducing activity we used a short adjective-based measure of psychological need-satisfaction, which contained four words for each of the three needs, two positively-worded (e.g., connected, masterful, or free) and two negatively worded (e.g., lonely,

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<sup>1</sup> There were no order effects,  $F(1, 115) = 2.67$ ,  $p = .105$ .

incompetent, or pressured) (Titova & Sheldon, 2021). A 7-point Likert scale was used, and the opposite words were used as anchor points in the scale with the higher scores representing more need fulfillment (e.g. incompetent (1) – masterful (7)). The prompt asked: “How did you feel while doing it? I felt...” Cronbach’s alphas were .86 for relatedness, .78 for competence, and .73 for autonomy.

**Subjective Well-Being (SWB).** To measure satisfaction with life (SWLS), we used a single item measure which asked: “How satisfied with your life did you feel during the happiness activity?”, which was rated on 1 (not very satisfied) to 7 (very satisfied) Likert Scale. We also used a measure of positive and negative affect (Emmons, 1991) which consisted of four positive (PA; e.g. happy, joyful;  $\alpha = .92$  and five negative (NA; e.g. sad, unhappy;  $\alpha = .90$  emotions, and participants rated to what extent they felt that way on a scale from 1 to 7. Using standard procedures to calculate an aggregate SWB score (Busseri & Sadava, 2011; Sheldon & Elliot, 1999; Sheldon & Kasser, 2001), we summed the SWLS and PA scores and subtracted the NA score, making reliability coefficients for a combined measure  $\alpha = .93$ .

### Results and Discussion

Results are shown in Table 1. To test our first hypothesis, we conducted paired-sample t-tests. The results showed that an attempt to make another person happy was associated with more recalled SWB at that time, than an attempt to make oneself happier. Paired t-tests also showed significant differences; prior other-targeted activity was associated with more recalled relatedness and competence, but with less autonomy, compared to prior self-targeted activity. Moreover, the relatedness need-satisfaction effect was considerably larger than the other two need effects.

To test our second hypothesis, that the differences in well-being is mediated by relatedness need satisfaction, we conducted a within-subject mediation analysis using bootstrapping procedure via MEMORE Macro for SPSS (Montoya & Hayes, 2017) with 5000 bootstrap samples (see Figure 1). As expected, relatedness need satisfaction mediated the difference between making others happier versus making self happier on SWB, which was indicated by the 95% confidence interval for indirect effect which did not include zero [.17, .83]. Two additional mediational analyses, one for competence and one for autonomy, showed that the other two basic psychological needs did not mediate the effect.<sup>2</sup>

Study 1 found support for both of our hypotheses, suggesting that trying to improve the mood of others leads to higher levels of own SWB compared to trying to improve one's own mood and happiness. Moreover, this effect can be explained via SDT's need-based perspective – when focusing on others' well-being we better satisfy one of our own basic psychological needs (relatedness), which in turn leads to higher levels of SWB.

However, this study had limitations. First, the design of the study was retrospective, which might have led to inaccuracy in remembered feelings and events. Additionally, the within-person design creates the possibility that participants compared the two conditions to each other, applying a (perhaps-mistaken) lay belief that making others happy “ought” to be more rewarding. Still, we did not find an order effect of condition, indicating that the effect found cannot be solely explained by the within-subject design. Another alternative explanation for the results, not examined in Study 1, is that simply having been with another person, without specifically having tried to make them happy, explains the higher levels of well-being. This

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<sup>2</sup> We also conducted mediation analyses with all three basic psychological needs entered into the model simultaneously. The results showed that only relatedness served as a mediator, as suggested by the confidence intervals not including zero for relatedness indirect effect  $B = .32$  (.08, .65) and including zero for direct effect  $B = .28$  (-.24, .80).

suggests that an important control condition might be “mere social experience,” with no specific agenda regarding the other’s state of mind.

## **Study 2**

In Study 2 we sought to replicate the finding that focusing on making others happier rather than the self leads to greater happiness, using a between-subjects experimental design instead of a repeated-measures retrospective design. Additionally, we asked participants to perform the behavior, rather than rely on recollections. Moreover, we wanted to rule out the alternative explanation that it is simply being with others that accounts for the effect, rather than purposefully trying to improve their well-being. Therefore, we hypothesized that participants assigned to actively trying to make someone else happier would show a greater increase in subjective well-being compared to those assigned to engage in a mere social interaction, as well as compared to those assigned a self-happiness focus. We also expected that the other-enhancing group would be resultantly higher in levels of felt relatedness, and that relatedness would play a mediating role in the increased subjective well-being.

## **Method**

### **Participants**

Participants were 119 students from the introductory psychology course at a large Midwestern University who participated to fulfill course requirements. The study was approved by the Institutional Review Board prior to data collection. We recruited participants throughout the semester to get as many participants as possible. Ages ranged from 18 to 22 ( $M = 19.01$ ,  $SD = 1.13$ ); 82% percent of the participants were White, and 55% were women. Ninety six participants participated in the follow-up portion of the study within the timeframe instructed and/or followed all the instructions; the other 23 participants were excluded from the analyses

(one did not complete the follow-up in time, two reported not doing the activity they were instructed to do, and 20 did not complete the second survey at all)<sup>3</sup>. We conducted post-hoc power analysis using G\*Power which showed that achieved power was .78.

### **Procedure**

An initial online survey consisted of demographic assessments and a baseline assessment of SWB. In this survey, participants were randomly assigned to one of the three conditions: make self happier ( $n = 30$ ), make another happier ( $n = 30$ ), or socialize ( $n = 36$ ) (see Table S1 in supplemental materials for detailed instructions). They were instructed to participate in the assigned activity before 8 PM. After participants were notified of their experimental task, they were asked what activity they were planning to do. At 8 PM, participants received a link to a second online survey, which assessed their SWB and need-satisfaction during the activity. Participants were instructed to complete this second survey by the end of the day. Control questions also assessed how much time and money participants spent on the assigned activity. All the outcome variables and conditions of the study are reported.

### **Measures**

**Basic Psychological Need Satisfaction.** To measure need satisfaction derived from the activity we used the same measure as in Study 1, worded: “How did this activity make you feel? “After doing this activity I felt...”” Cronbach’s alphas were .88 for relatedness, .70 for competence, and .78 for autonomy.

**SWB.** To measure subjective well-being of participants, we used the Satisfaction with Life Scale (SWLS; Diener et al., 1985), which consists of five items rated on a 7-point Likert Scale (e.g., “I am satisfied with my life”,  $\alpha = .87$ ). To measure PA and NA we used the same

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<sup>3</sup> We conducted attrition analyses and found that those who remained in the study and those who dropped out did not vary in terms of SWB ( $F(1,113) = 1.96, p = .164$ ), gender ( $F(1,116) = 1.00, p = .319$ ), or the condition that they were assigned to ( $F(1,118) = .05, p = .830$ ).

measure as in Study 1 ( $\alpha = .90$  for PA and  $\alpha = .85$  for NA). We again summed the SWLS and PA scores and subtracted the NA score to calculate aggregate SWB scores ( $\alpha = .86$ ).

## Results

Table 2 provides means and standard deviations as a function of condition. As can be seen, there was a failure of random assignment, in that T1 SWB was greater in the “make other happy” group than the other two groups. However, this was not a problem since we planned to employ ANCOVAs which would control for this difference.

### Main Effects

A planned comparison analysis via between-subject ANCOVA controlling for baseline subjective well-being level (where other happy group was coded as 1, and self happy and socializing group coded as -.5) showed that there was a significant difference between the groups,  $F(2,93) = 4.93, p = .012, d = .55$ . Participants who were asked to make someone else happy showed significantly higher level of SWB after engaging in the activity compared to participants in the other two conditions.

A planned contrast comparing the felt need satisfaction after the activity for all three experimental conditions showed a significant difference between groups on the relatedness variable,  $F(2, 93) = 10.11, p = .003, d = .63^4$ . This demonstrated that relatedness was significantly higher for the participants who were instructed to make someone else happy, and there was no significant difference between participants who did a self-focused activity or merely socialized.

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<sup>4</sup> A planned contrast analysis was also done controlling for T1 SWB, which resulted in a significant difference in relatedness for the group who was instructed to makes others happy compared to the other two groups,  $F(2, 93) = 5.31, p = .024, d = .51$ .

Finally, we found no effects of the amount of money and time spent on the activity, nor of the type of the activity participants chose. There was also no effect of gender. Moreover, controlling for these variables does not change the effect.

### **Mediation analysis**

We performed a mediation analysis to test if the increase in level of subjective well-being in the other-focused happiness-condition was achieved via the sense of relatedness controlling for the baseline level of SWB. We used contrast coding to compare the other-focused condition to the other two conditions combined, as main effect analyses did not show significant differences between these two latter groups. Therefore, the contrast variable was used as the predictor variable in the mediation analysis (other = 2, self = - 1, socializing = - 1). In this analysis we also controlled for the orthogonal control contrast (other = 0, self = - 1, socializing = 1). The coding scheme was performed following the procedure suggested by Hayes and Preacher (2014). The mediation analyses were done via a bootstrapping procedure using PROCESS macro for SPSS (Hayes, 2013) with 5000 bootstrap samples. Results are shown in Figure 2. The 95% confidence interval did not include zero [.01 to .30], which suggests that relatedness mediated the effect of other-focused happiness-promoting activity on subjective well-being. Two additional analyses again showed that the other two basic psychological needs did not mediate the effect.<sup>5</sup>

### **Discussion**

Results replicated and extended the Study 1 findings, via an experimental design. We demonstrated that it is not simply social interaction with another person that drives the effects of other-directed happiness-boosting activities on people's own subjective well-being levels. We

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<sup>5</sup> Interestingly, when all three basic psychological needs were tested for mediation simultaneously, neither of them emerged as significant mediators, and the direct effect of the model remained significant ( $B = .36 (.03, .69)$ ).

also showed that other-focused activity led to more relatedness need fulfillment, but not to more autonomy or competence need fulfillment. Moreover, the effect of other-focused happiness activity on the participant's own SWB was mediated by relatedness need-satisfaction. It is important to note, however, that the experimental conditions differed in SWB levels at baseline, for unknown reasons. This calls for caution in interpretation of the results of this study. In the next study, we attempted to replicate these experimental results as well as explore other variables which might explain the effect.

### Study 3

Studies 1 and 2 showed that engaging in other-focused happiness improving activity leads to higher well-being and that this boost in well-being was explained by relatedness need satisfaction. However, these studies only focused on the well-being of the actor initiating the interaction, and not the target. By looking only at one person within the interaction we might not be doing justice to the shared and rich dyadic experience that is created by one person's attempt to make another person happy. In Study 3, we also measured the *target's* SWB, after the activity had taken place. As discussed earlier, we wanted to investigate a possible dyadic spillover of positive experience occurring between the two participants in the dyadic interaction. We expected that being a target of another person's activity, whose sole purpose is to make the target happier, should be associated with the target's SWB, as that was the goal of the activity. We also thought that this increase in the SWB of a target person would play a role in the increased SWB in the actor, supporting a spillover effect conception of how new happiness is attained. We also measured the felt relatedness need-satisfaction of the target person, expecting that it would be boosted by the participant's happiness attempt and might account for the effects of that attempt on the participant's own SWB.



However, it is also possible that the actual feelings and state of the target are not as important as the actor's own perceptions of the target. Maybe just thinking that one has made another happier is more important than the target's actual feelings. To allow for this possibility we measured participants' perceived *success* at making the other happier, while also measuring the *effort* that they reported putting into the assigned activity.

## Method

### Participants

Participants were 163 psychology students who participated in exchange for research credit. Their ages ranged from 18 to 25 ( $M = 19.43$ ,  $SD = 1.24$ ). The study was approved by the Institutional Review Board prior to data collection. Similar to Study 2, we aimed to recruit as many participants as we could during the semester. Eighty two percent of the participants were Caucasian, and 60% were women; 141 participants (65 in the "make self happy" condition and 76 in "make other happy" condition) participated in the follow-up portion of the study within the timeframe instructed and/or followed all the instructions (eight reported not doing the activity they were instructed to do, and 14 did not complete the second survey at all)<sup>6</sup>. Participants in the 'make other happy' condition also supplied the email address of a particular person who was to be the target of their assigned activity. That person was sent a survey (after the happiness-boosting activity occurred), which they were asked to complete in exchange for a \$5 gift card. We were able to recruit 50 targeted others for this sub-sample. Again, we conducted post-hoc power analysis using G\*Power that showed the power of .76.

### Procedure

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<sup>6</sup> We conducted attrition analysis and found that those who remained in the study and those who dropped out did not vary in terms of SWB ( $F(1,162) = .01$ ,  $p = .995$ ), gender ( $F(1,161) = .02$ ,  $p = .887$ ), or the condition that they were assigned to ( $F(1,162) = 1.74$ ,  $p = .236$ ).

The procedure was similar to Study 2, and the study took place completely online, in two parts. First, participants completed the first part of the online questionnaire, before 2 PM on the day of the activity. In this first part, we measured their current well-being level, before randomly assigning them to experimental condition. In Study 3 we changed the instructions slightly in order to allow for social interaction in the self-focused condition (see Table S2 in supplemental materials for detailed instructions). This change in the instructions allowed for participants to interact with others as a legitimate strategy for improving one's own mood and happiness. Additionally, they were asked what they were planning to do specifically.

At 8 PM that evening, participants received the follow-up survey which assessed their well-being and basic psychological needs satisfaction, and which also asked the control questions (how much money and time they spent on the activity, and what did they do specifically). Participants were also asked to rate to what extent they succeeded in improving someone else's (or their own) mood and happiness and how much effort did they put into improving someone else's (or their own) mood and happiness. For those in a 'self happy' condition, we also asked them if they did the happiness boosting activity alone or with others.

At the same time, a similar questionnaire was sent to the target person of the activity. It also assessed subjective well-being and psychological needs satisfaction.

All the outcome variables and conditions are reported. We also tested a number of moderators in this study and these results are included in the supplemental materials.

## **Measures**

**SWB and Basic Psychological Need Satisfaction.** These variables were assessed using the same methodology described in Study 2. In terms of the main participant's assessments, Cronbach alphas for need-satisfaction were .85 for relatedness, .66 for competence, and .68 for

autonomy. Cronbach's alpha for PA was .90, for NA it was .87, and for SWLS it was .86. As before, we aggregated the scores into one measure of SWB ( $\alpha = .89$ ).

**Effort and Success.** We also measured how much effort participants put into the activity and how successful they thought they were with two questions using a slider scale from 1 to 100. These included, "How much effort did you put into..." and "To what extent did you succeed in..." improving someone else's mood and happiness (or your mood and happiness)?

## Results and Discussion

### Main Effects

Table 3 provides means and standard deviations for conditions. Analyses first sought to replicate the Study 2 results. We conducted a between-subject ANCOVA controlling for participant's baseline subjective well-being level, finding a significant difference between the two experimental conditions,  $F(1,139) = 4.88, p = .029, d = .35$ . Participants asked to improve someone else's mood and happiness experienced a higher level of SWB than those asked to focus on their own mood and happiness.

Similarly, for relatedness need satisfaction, we conducted a one-way ANOVA comparing relatedness need-satisfaction between the two experimental conditions. We found a significant difference between groups on the relatedness variable,  $F(1, 139) = 24.91, p < .001, d = .87$ , such that relatedness was higher for the participants who were instructed to make someone else happy. Also, we did not find a significant difference between the groups for autonomy or competence need-satisfaction. Additionally, we again found no effect of the control variables or of gender no effect of the effort participants reported to put into the activity they were assigned to do. Within the "make self happy" condition we also found no difference in SWB between those who were engaged in improving their own mood and happiness alone ( $n = 37$ ) or with others ( $n = 22$ ). This

again shows that it is not just simply interacting with others that really matters for SWB, but rather, having the goal of improving someone else's happiness.

### **Mediation analysis**

Similar to Study 2, we performed mediation analysis to test if the differences in subjective well-being between the groups was achieved via differences in experienced relatedness using the same procedure as before. The 95% confidence interval did not include zero [.17 to .98], which suggests that relatedness mediated the effect of other-focused happiness-promoting activity on subjective well-being (see Figure 3 for details). In other words, participants in the 'make other happy' condition reported higher levels of SWB which was mediated by a stronger experience of relatedness compared to those who were instructed to improve their own happiness. Also, as in previous studies, the other two basic psychological needs did not mediate the effect. All mediation analyses were independent.<sup>7</sup>

### **The Role of a 'Target' of Happiness Boosting Activity**

Since we only had information for a target participant in the "make another happy" condition, we could not test mediational models of the condition differences. However, we were able to test whether there was a correlational relationship between the experiences reported by participants in this condition and the experiences of the target of their activity. As can be seen in Table 4, there were no correlation between participant's SWB and target's SWB, nor between their levels of need-satisfaction. Therefore, contrary to our "spillover" hypothesis, we were unable to find a link between the SWB reported by participants and the SWB reported by the target of their happiness boosting activity.

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<sup>7</sup> We also tested for simultaneous mediation. Similar to Study 2, the results showed that none of three basic psychological needs emerged as significant mediators.

Finally, we examined what role the belief that our participants were successful at their assigned activity played in this relationship. First, via regression analysis controlling for baseline SWB, we found that self-reported success at the activity assigned was a significant predictor of SWB at T2,  $\beta = .34$ ,  $t(139) = 4.97$ ,  $p < .001$ , collapsing across the two conditions. This suggests that the subjective perception of success in the experimental task is associated with improved SWB in both conditions. Next, we examined whether experimental condition moderated the success effect on changes in SWB. A regression analysis found that there was a main effect of success ( $\beta = .32$ ,  $t(139) = 4.48$ ,  $p < .001$ ), main effect of condition ( $\beta = .68$ ,  $t(139) = 2.27$ ,  $p = .025$ ), as well as a success by condition interaction ( $\beta = .22$ ,  $t(139) = 2.10$ ,  $p = .038$ ). These results suggest that felt success played a more important role for those who were instructed to improve their own happiness. This is not surprising, because participants can have a better grasp of their own feelings and experiences than those of others.

Study 3 successfully replicated the main findings of Study 2, showing once again that trying to make someone else happier leads to higher SWB than trying to make oneself happier, and that this effect is mediated through fulfillment of relatedness need satisfaction. Additionally, we were able to take an initial look at how the experience of the target of the participant's happiness boosting attempt relates to the observed effects. Contrary to our predictions, we found no relationship between the SWB of the participants and the SWB of their targets. Neither was there a relationship between the relatedness need satisfaction of participants and targets. However, it is important to note, that we did not have baseline measures of SWB for targets, so it is possible that participants and targets started at a different baseline for SWB and that this explains the absence of the effect. Interestingly, we found that participant's self-reported success at the activity that they have been assigned was a strong significant predictor of their SWB at T2,

in both conditions. So, it appears that regardless of whether or not participants actually succeeded at improving someone else's mood and happiness, what really matters is whether participants *think* they have succeeded. Unfortunately, we did not have a measure of success from the targets of happiness boosting activity, which, in addition to baseline SWB scores for targets, could have shed light on whether or not participants were actually successful.

### **Study 4**

In the first three studies we demonstrated the benefits of concentrating on improving someone else's happiness and mood rather than one's own. However, a related question is whether it is better trying to make someone else happy, versus having somebody else trying to make us happy. In the last two studies we asked participants to do something in all conditions. But what if we compare actively trying to make someone happier, to passively accepting the same from others? We addressed this question in the next two studies. In Study 4 we returned to a retrospective methodology, and asked participants to recall past events. We expected that trying to make others happier would still be the best way for improving SWB comparing to being a recipient of such efforts, because caring for another is an active process that has been linked to health and well-being benefits that are stronger and more lasting (Inagaki et al., 2016, O'Brien & Kassirer, 2019). As in the first three studies, we hypothesized that this effect should be explained by relatedness need satisfaction.

### **Method**

#### **Participants and Procedure**

Participants were 175 students in an upper level psychology course from a large Midwestern University who participated in exchange for course credit. The study was approved by the Institutional Review Board prior to data collection. The sample size was limited by the

enrollment in the class. Ages ranged from 19 to 35 ( $M = 20.89$ ,  $SD = 2.43$ ). Fifty nine percent of participants were female and 79% were White. The study was administered online, and the materials for this study were a part of a larger assessment including other study's materials unrelated to the current study. We conducted post-hoc power analysis using G\*Power that showed power of .96.

The within-subjects design was similar to that of Study 1. Participants completed the study online, where they were asked to recall both a recent time when they tried to make someone else happier and a recent time when someone else tried to make them happier (in counterbalanced order<sup>8</sup>). The specific prompt for the first condition was exactly as in Study 1, and for the second condition it was as follows: "Think of a recent time **someone in your life did something to improve YOUR mood and happiness** (for instance, something fun, like playing your favorite song, went on a run with you if you like being active, or taking you out for lunch). Write 3-5 sentences describing what **THEY** did for **YOU**." As in Study 1, after participants recalled and wrote about each time, subjective well-being and basic psychological needs satisfaction derived from the activity were measured.

### Measures

**BPNS.** The same measure as in Study 1 was used with a scale range from 1 to 5 ( $\alpha = .91$  for relatedness,  $\alpha = .87$  for competence, and  $\alpha = .82$  for autonomy).

**SWB.** The same measures as in Study 1 were used to assess positive and negative affect with a scale range from 1 to 5. Cronbach's alphas were .92 for PA and .94 for NA. We used a 1 item measure to assess satisfaction with life which read: "How satisfied with your life did you feel after doing this?". As before we calculated aggregate measure of SWB ( $\alpha = .93$ ).

### Results and Discussion

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<sup>8</sup> There were no order effects,  $F(1, 167) = 1.63$ ,  $p = .203$ .

Results are shown in Table 5. To test our first hypothesis, we conducted a paired-sample t-test. As predicted, recalling a time when one tried to make another happier was associated with more SWB at that time, then recalling a time when another tried to make oneself happy. Paired t-tests also showed a significant difference such that recalling the other-targeted activity led to the experience of more relatedness and competence compared to recalling being made happy by others. No difference emerged for autonomy need satisfaction.

To test the mediating effect of relatedness need satisfaction we conducted a within-subject mediation analysis using a bootstrapping procedure via MEMORE Macro for SPSS (Montoya & Hayes, 2017) with 5000 bootstrap samples. Results are shown in Figure 4. As expected, we found that relatedness need satisfaction mediated the difference between making others happier versus making self happier on SWB, which was indicated by the 95% confidence interval for indirect effect that did not include zero [.02, .21]. However, the mediation was only partial, because the direct effect was still significant in this analysis. Contrary to our expectations, a second analysis showed that competence also partially mediated the effect on difference in SWB [.03, .26]. However, a third analysis showed that autonomy was still not a mediator.<sup>9</sup>

This study extends the findings of Studies 1, 2 and 3 and indicates that trying to make another happy is more beneficial for one's well-being than when another is trying to do the same for you. Again, we demonstrated that this effect can be at least partially explained by relatedness need satisfaction. Unexpectedly, we found that competence was also a mediator. This might be due to the difference in conditions compared to Studies 1 through 3. This time the comparison condition was when someone else tried to make the participant happy, which takes away an

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<sup>9</sup> We also conducted a mediation analysis where all three basic psychological needs were entered simultaneously. We found that only relatedness remained a significant mediator ( $B = .09, (.21, .07)$ ), although the mediation was only partial ( $B = 1.67 (1.95, 1.38)$ ).



active role from the participants in that condition, perhaps resulting in higher competence in the condition where they play an active role. However, the study used a retrospective methodology and correlational design, which does not allow for inferences about causation. We address these limitations in Study 5.

### **Study 5**

In this study we wanted to extend the findings of Study 4 and compare the effects of making another happy versus being made happy by others, using an experimental methodology. Additionally, in the first four studies, when we asked our participants to recall or engage in improving others mood and happiness, it often involved a face-to-face interaction with that other person. Previous research on prosocial behavior suggests that face-to-face interactions might not be necessary (Martela & Ryan, 2016a), so we wanted to test whether if this is the case for this particular effect. Additionally, in the first three studies when our participants tried to make others happy, these others were friends and family members of participants. We wanted to test whether the effect can be produced when the ‘others’ are strangers, unknown to the participants.

In this study, participants were approached on the street and were given two quarters, either as a simple reward for completing the survey (control condition), to put in their own parking meters (being made happy condition), or to put in another person’s meter (making others happy condition). Moreover, we included two different versions within the latter category – one in which the benefactor would not specifically know that their meter had been fed, and another in which we asked participants to leave a note to make sure that the beneficiary knew that someone had done a good deed for them.

We expected that there would be a significant omnibus difference between the experimental conditions in the resulting level of SWB. Specifically, we expected that participants

in the control condition would have the lowest level of SWB, followed by participants in the “feed your own meter” condition (conceptualized as the “others try to make me happy” condition). However, these participants would have lower SWB than those in the “feed somebody else’s meter” condition. Finally, we expected that participants in the “feed somebody else’s condition and leave a note” condition would derive the highest level of SWB compared to all other conditions. Additionally, we expected that the effect would again be mediated through relatedness need satisfaction.

## Method

### Participants and Procedure

Participants were 200 people approached on the streets in a Midwestern city. The study was approved by the Institutional Review Board prior to data collection. We aimed to recruit 50 people per condition. Ages ranged from 18 to 85 ( $M = 29.04$ ,  $SD = 12.92$ ), and 51% were male. One participant was excluded from the data analysis for suspected intoxication, and another participant was excluded because they answered ‘4’ to every single item on the survey, leaving a final sample of ( $N = 198$ ). We conducted a post-hoc power analysis using G\*Power that showed power of .95.

Participants were approached on the street near parking meters and were randomly assigned into one of four conditions. In the control condition they were just asked to fill out the questionnaire in exchange for 50 cents. In the second condition, participants who had just parked by a meter were approached and given two quarters to put in their parking meter, and then asked to respond to the questionnaire. In the third condition, participants were approached close to the meter which had already expired or was about to expire (10 min left or less) that was not theirs. Research assistants told them that they were from a Positive Psychology lab on campus, studying

the effects of asking people to make other people happy by feeding their parking meters. They were given two quarters to put into a nearby car's meter, then asked to take the questionnaire. The fourth condition was identical to the third, with the exception that after participants put the money into another's meter, they were also asked to leave a note under the windshield of the car saying that they fed that meter. Only then did they respond to the questionnaire. All the variables and the conditions are reported.

### **Materials**

**BPNS and SWB.** To measure BPNS the same measure was used as in Study 2 and 3 (relatedness:  $\alpha = .89$ , competence:  $\alpha = .64$ , autonomy:  $\alpha = .71$ ). The same measures were used to assess SWB as in Studies 2, 3 and 4. All items were rated on a Likert Scale from 1 (Strongly Disagree) to 7 (Strongly Agree). Cronbach's alphas for PA, NA, and SWLS were .90, .86, and .88, respectively, and an aggregate SWB score was again computed from the three variables ( $\alpha = .92$ ).

### **Results and Discussion**

First, we used a one-way ANOVA to test for SWB differences between the experimental conditions. As expected, we found that there was a significant omnibus difference,  $F(3,194) = 9.26, p < .001$ . Means, standards deviations, and post hoc pairwise comparisons between the groups are shown in Table 6. Results showed that the fourth condition, where participants were asked to feed someone else's meter and then leave a note, showed the highest level of SWB which was significantly different from the control condition and the condition in which participants were given money for their own meter. Although the difference between the third and fourth conditions was not significant, it was close at  $t(97) = 1.95, p = .054, CI = [-1.88, .02]$ .

Next, we tested the differences for BPNS. As we would expect, we found no difference between the groups for autonomy,  $F(3,194) = 2.05, p = .108$ . However, there was a difference between the groups for competence ( $F(3,194) = 3.87, p = .010$ ), with post hoc comparisons showing that the difference was driven by lower competence in the control group. Participants in the control condition were not asked to do anything, unlike in the three experimental conditions, which supplies a potential explanation for the lower level of competence need satisfaction reported by those in the control group. As expected, we found a significant difference for relatedness,  $F(3,194) = 4.16, p = .007$ . Post hoc pairwise comparisons suggested that this difference was driven solely by the fourth condition, which showed the highest level of relatedness need satisfaction. It appears that leaving the note for the person whose meter participants fed gave a boost to the relatedness need satisfaction of the participant, despite the lack of face-to-face interaction. Interestingly, the third condition, in which participant feed someone else's meter but did not leave a note, did not differ in the level of relatedness from the other conditions. One possibility is that leaving a note makes sure one's good deed is recognized by the stranger, which could be important for the satisfaction of the relatedness need in such situations. However, another possibility is that by writing a note, participants in this condition were given an additional opportunity to make someone else happy beyond just paying for their meter – so they had a chance to do two happiness promoting deeds instead of one, which led to more relatedness and SWB.

Similar to Study 2 and 3, we performed the same type of mediation analysis to test if the difference in SWB between conditions was due to relatedness need satisfaction. For this analysis we only compared two conditions – condition two (participants given money to put in their own parking meter) and condition four (participants are asked to feed someone else's meter and then

leave a note saying that they have done so). We reasoned that these conditions best mirrored the comparison of Study 4, involving a situation where somebody else tried to make us happy and we knew they were doing so, and a situation where we tried to make somebody else happy, and the other was aware of these efforts.

We found that the 95% confidence interval did not include zero [.10 to .68], which suggests that relatedness mediated the effect of other-focus on participant SWB (see Figure 5), although the direct effect was not eliminated by including relatedness, which suggest that the mediation was only partial. In other words, when participants concentrated on improving another's happiness, they felt more connected to them, which in turn resulted in a boost to their own happiness.<sup>10</sup>

However, it is important to mention that we assumed that feeding someone's meter is an instance of "trying to make that person happy." It is possible that some of our participants did not perceive it in this way, which is a limitation of this study's design.

### **General Discussion**

In Study 1, using a retrospective methodology, we found that recalling trying to make someone else happier or improve their mood was associated with higher SWB than recalling doing so for oneself. In Study 2, using an experimental methodology, we showed that doing something to make someone else happier led to a higher increase in SWB compared to trying to make oneself happier or spending time socializing with others. We were also able to replicate this effect with a slightly different design in Study 3. In Studies 4 and 5, we used a new comparison condition – being made happier by others. We again found that trying to make others happy is a better way to one's own happiness, even more than when others try to make us happy.

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<sup>10</sup> We also tested all three basic psychological needs as mediators simultaneously. Only relatedness emerged as a significant mediator ( $B = .17 (.05, .34)$ ), although the mediation remained partial ( $B = .63 (.32, .94)$ ).

Additionally, we found that the difference between experimental conditions was consistently mediated by relatedness need satisfaction, in all of the studies. As suggested by SDT, people need to fulfill all of the three basic needs in order to live a fulfilling life (Ryan & Deci, 2000a; 2000b). It is not surprising that relatedness need-satisfaction, specifically, would result from an activity designed to make another person feel good. It is also important to note that in most of the studies there was no significant difference between other basic needs (autonomy and competence) between the conditions. There were differences connected to autonomy in Study 1 and connected to competence in Study 1 and Study 4. However, these effects were non-central to the phenomenon because in no cases did autonomy mediate the SWB effects, and we found mediation for competence only in Study 4.

Importantly, in Study 3, we were able to bring in the experience of the target person of the happiness boosting activity into the analyses. While we expected that there would be a connection between the participants' SWB and the SWB of the person who they tried to make happier, we were unable to find such relationship. We were also unable to find a connection between the relatedness need satisfaction derived from the activity by the participant and their target. Since we did not have an opportunity to measure targets' baseline SWB and need satisfaction or perceived success of participants reported by targets, we cannot definitively conclude that our participants did not succeed in improving mood and happiness of the targets. These limitations in measurement might have contribute to the fact that we did not find support for spillover effect that was found by Fowler and Christakis (2009).

Still, our hypothesis that the target's experience is important for the participant's SWB was indirectly supported by the significant positive correlation between participant's reported

success in performing the assigned activity and their SWB. In other words, participants who felt that they succeeded in making someone else in their life happier felt happier themselves.

Studies 4 and 5 demonstrated that making others happier is a better way to one's own happiness even when compared to being made happy by others. Again, it appears that the key difference lies in the satisfaction of the relatedness need which gives an extra boost to well-being. In Study 5, we also showed that face-to-face interaction with the 'target' person is not necessary – our participants still experienced benefits from trying to make others happy even without ever seeing or talking to them, although the effect was stronger when they left that other person a note referring to their good deed. Moreover, 'targets' in this study were complete strangers, so the level of familiarity with the 'target' of the happiness boosting activity is not necessarily important for the effect either.

Although this study is not longitudinal and we did not observe changes overtime, it seems that if a person will engage in improving mood and happiness of others instead of their own, incremental changes that they will receive from engaging in this behavior each time will add up and lead to maintenance of elevation of SWB.

Our studies also support EAM that states that working on improving one's own happiness directly is not a viable way to becoming happier in life (Sheldon, 2016, 2018; Sheldon et al, 2019). Instead, focusing on eudaimonic endeavors, which includes shifting focus from self to others, is a recommended way to personal flourishing.

### **Limitations and Future Directions**

There are important limitations to the studies presented which suggest directions for the future research. First, four out of five studies were done entirely online, and thus we did not have full control over the experimental activities performed by the participants. Still, we asked our

participants if they followed the instructions of the study and were able to exclude participants who did not. Future studies could employ a lab setting so that the effect can be tested in a fully controlled environment. Additionally, our studies were not fully able to answer the question of whether or not *actual success* at making another happier plays a role in participant's improvement in SWB levels. Although perceived success was shown to be important, the SWB of targets did not predict participants' SWB. However, the number of target participants was quite small, and we also did not obtain baseline data from those targets. Relatedly, it would be beneficial to examine the effect in a full actor-partner model, where both participants have a chance to do something to improve mood and happiness of one another. Such a design would allow for a better test of potential spillover effects between dyad members. Additionally, because the outcome measure and mediators were measured during the same assessment, we cannot infer causality from this correlational data, although the possibility is implied.

Additionally, the samples in our research provide a limitation. The sample sizes were limited and mostly comprised of college students from a large Mid-Western university, limiting the diversity of our samples. Moreover, post-hoc power analyses showed that studies 2 and 3 were underpowered, with power slightly lower than .80 cutoff. Finally, it is important to note that this study did not examine effects in the long-term, instead focusing on a single recalled or induced experience. Future research might try to test the "make other happy" strategy in a longer-term context, or as an overall life-strategy.

## **Conclusion**

The results of these studies extended findings from previous research by showing that people derive boosted personal happiness from attempts to make other people happy – an approach that might seem counterintuitive for a lot of people at first. These boosts were greater



compared both to the effects of trying to make themselves happy, and the effects of others trying to make them happy. In addition to showing that this counterintuitive way to personal happiness is more effective, we also explained, at least to a degree, why this effect occurs. Specifically, we showed that relatedness need satisfaction is an important mediator of this difference. Finally, this research was the first to consider how the experience of the target of the happiness-boosting activity relates to the experience of the person performing such activity. Although we did not find a connection, we hope that future research will examine this issue in greater detail.

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Table 1

*Means, Standard Deviations, and t-tests for Study 1*

	Self Happy		Other Happy		<i>t</i>	<i>p</i>	<i>d</i>	<i>CI</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
SWB (Self vs. Other)	8.45	3.26	9.00	3.13	2.17	.034	.17	.05, 1.02
Autonomy (Self vs. Other)	5.29	1.22	4.98	1.28	-2.52	.013	.24	.07, .55
Competence (Self vs. Other)	5.11	1.38	5.41	1.30	2.09	.039	.22	.02, .59
Relatedness (Self vs. Other)	5.07	1.53	5.85	1.43	4.69	<.001	.53	.46, 1.12

Table 2

*Means for Time 1 and Time 2 Assessments (Study 2)*

Variable	Time 1			Time 2		
	Self	Other	Social	Self	Other	Social
	Happy	Happy	Experience	Happy	Happy	Experience
SWB	6.42 <sub>a</sub>	7.83 <sub>b</sub>	6.41 <sub>a</sub>	6.83 <sub>a</sub>	9.14 <sub>b</sub>	6.91 <sub>a</sub>
	(2.75)	(2.28)	(2.63)	(3.01)	(1.88)	(3.64)
Autonomy				5.27 <sub>a</sub>	5.02 <sub>a</sub>	4.78 <sub>a</sub>
				(1.07)	(.95)	(1.25)
Competence				5.27 <sub>a</sub>	5.55 <sub>a</sub>	5.21 <sub>a</sub>
				(.89)	(.97)	(1.08)
Relatedness				5.46 <sub>a</sub>	6.38 <sub>b</sub>	5.85 <sub>a</sub>
				(1.12)	(.77)	(1.25)

*Note.* Standard deviations appear in parentheses below means. Means with differing subscripts within rows for each time of the testing are significantly different at the  $p < .05$  level based on Fisher's LSD post hoc paired comparisons.



Table 3

*Means for Time 1 and Time 2 Assessments (Study 3)*

Variable	Time 1		Time 2	
	Self	Other	Self	Other
	Happy	Happy	Happy	Happy
SWB	6.27 <sub>a</sub>	6.46 <sub>a</sub>	8.20 <sub>a</sub>	9.17 <sub>b</sub>
	(2.71)	(2.94)	(2.81)	(2.72)
Autonomy			4.99 <sub>a</sub>	5.09 <sub>a</sub>
			(1.19)	(1.02)
Competence			5.45 <sub>a</sub>	5.56 <sub>a</sub>
			(1.18)	(.93)
Relatedness			5.33 <sub>a</sub>	6.24 <sub>b</sub>
			(1.23)	(.84)

*Note.* Standard deviations appear in parentheses below means. Means with differing subscripts within rows for each time of the testing are significantly different at the  $p < .05$  based on one way ANOVA.

Table 4

*Correlations between Participant's Measures at Time 2 Assessment and the Target (Study 3)*

	P's Aut	P's Comp	P's Rel	T's SWB	T's Aut	T' Comp	T's Rel
P's SWB	.12	.45**	.34**	.09	-.07	-.08	-.06
P's Autonomy	1	.32**	.35**	.04	.12	.06	-.10
P's Competence		1	.49**	-.04	.14	-.01	-.03
P's Relatedness			1	.05	.11	.01	.05
T's SWB				1	.30*	.39**	.42**
T's Autonomy					1	.31*	.31*
T's Competence						1	.63**
T's Relatedness							1

*Notes.* *N*'s for the Participants (P) ranged from 131 to 141, and *N*'s for the Target (T) ranged from 48 to 50 due to missing data. \*  $p < .05$ , \*\*  $p < .01$ .

Table 5

*Means, Standard Deviations, and t-tests for Study 4*

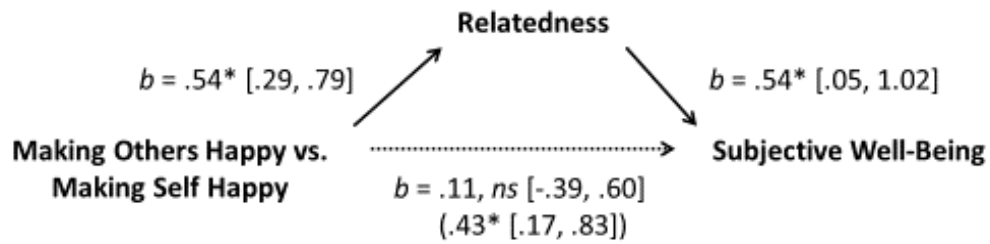
	Other Made P Happy		P Made Other Happy		<i>t</i>	<i>p</i>	<i>d</i>	<i>CI</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
SWB	5.20	2.08	6.89	2.48	11.77	<.001	.78	1.42, 1.99
Autonomy	5.79	1.20	5.72	1.22	.77	.44	.06	-.10, .24
Competence	5.55	1.25	5.80	1.17	2.77	.006	.21	.07, .43
Relatedness	6.13	1.13	6.30	1.04	2.08	.039	.16	.01, .33

Table 6

*Means for Study 5*

Variable	Condition			
	Control	\$ for own meter	\$ for other's meter	\$ for other's meter + note
SWB	6.94 <sub>a</sub> (3.45)	8.02 <sub>ab</sub> (2.76)	8.83 <sub>bc</sub> (2.54)	9.76 <sub>c</sub> (2.21)
Autonomy	4.20 <sub>a</sub> (1.38)	4.44 <sub>ab</sub> (1.35)	4.63 <sub>ab</sub> (1.51)	4.89 <sub>b</sub> (1.46)
Competence	4.34 <sub>a</sub> (1.43)	5.05 <sub>b</sub> (1.25)	4.88 <sub>b</sub> (1.30)	5.13 <sub>b</sub> (1.11)
Relatedness	5.14 <sub>a</sub> (1.49)	5.07 <sub>a</sub> (1.61)	5.16 <sub>a</sub> (1.37)	5.94 <sub>b</sub> (1.16)

*Note.* Standard deviations appear in parentheses below means. Means with differing subscripts within rows for each time of the testing are significantly different at the  $p < .05$  based on Fisher's LSD post hoc paired comparisons.



*Figure 1.* Conceptual representation of within-subject mediation analysis using MEMORE macro for SPSS (unstandardized coefficients and 95% confidence intervals are displayed. \* $p < .05$ ) (Montoya & Hayes, 2017).

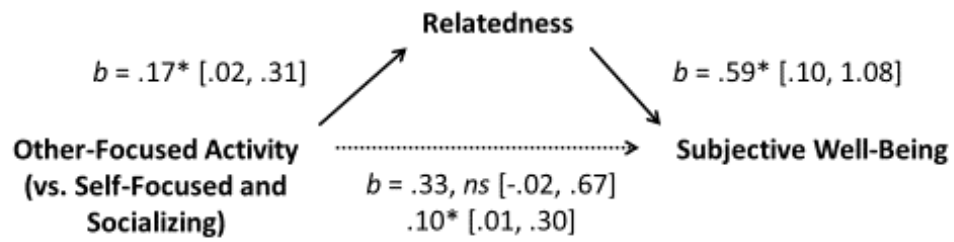


Figure 2. Mediation model for Study 2. Unstandardized coefficients are displayed. \* $p < .05$ .

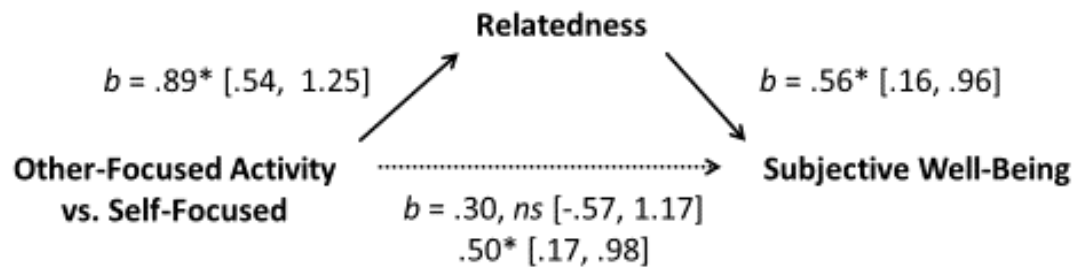


Figure 3. Mediation model for Study 3. Unstandardized coefficients are displayed. \* $p < .05$ .

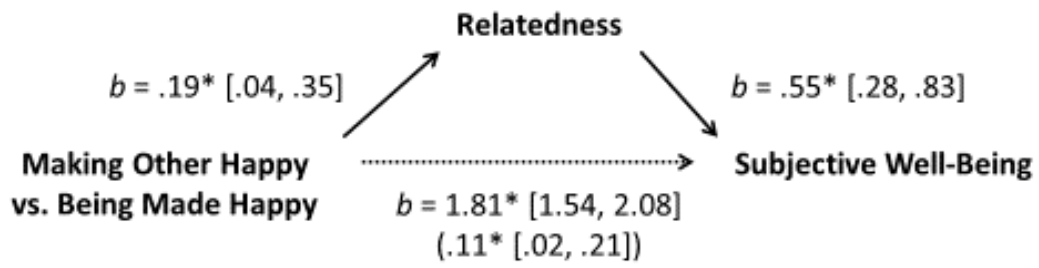


Figure 4. Mediation model for Study 4. Unstandardized coefficients are displayed. \* $p < .05$ .



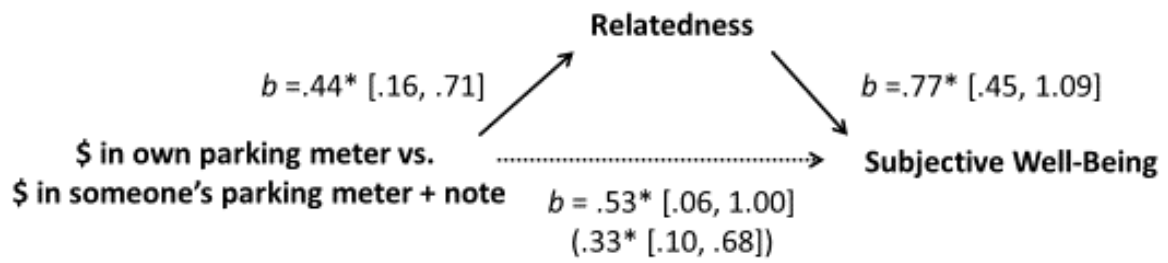


Figure 5. Mediation model for Study 5. Unstandardized coefficients are displayed. \* $p < .05$ .