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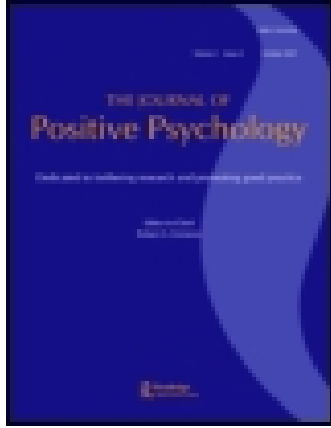
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It's good to do good and receive good: The impact of a 'pay it forward' style kindness intervention on giver and receiver well-being

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Despite the popularity of the 'pay it forward' (PIF) concept in textbooks and popular culture, to date, no study has tested the effectiveness of a brief, one-time PIF activity on the well-being of those who do good and those who receive good. To test this, 83 undergraduates ('givers') performed random kind acts for 1.5 h. PIF resulted in a wide range of well-being benefits for givers (e.g. greater positive and lower negative affect), with females showing greater positive affect benefits. Receivers of kindness ($N = 1014$) also benefited as evidenced by greater smiling behavior and more sincere smiles vs. controls ($N = 251$). Of the 48 receivers who completed a follow-up online questionnaire, the majority indicated that they would also PIF, with almost 40% indicating that they already had. Results indicate that a one-time brief PIF intervention can have broad benefits for those involved.

Keywords: pay it forward; acts of kindness; positive psychology; well-being; altruism; positive affect; negative affect

Remember there's no such thing as a small act of kindness. – Scott Adams

It is well established that doing good is, in fact, good for you. Numerous studies have documented the many psychological and physical benefits that can result from engaging in kind and altruistic behavior. For example, naturally occurring altruism and volunteering behavior have been related to increased life satisfaction, decreased depression, lower blood pressure, and even increased longevity (Burr, Tavares, & Mutchler, 2011; Dulin, Gavala, Stephens, Kostick, & McDonald, 2012; Lyubomirsky, King, & Diener, 2005; Musick & Wilson, 2003; Post, 2005; Wheeler, Gorey, & Greenblatt, 1998; Windsor, Anstey, & Rodgers, 2008). While the breadth of findings is impressive, concern remains that those who self-select into volunteering may somehow be different than those who choose not to volunteer. Indeed, research has shown that individuals who report higher levels of happiness also report more interest in helping others (Feingold, 1983) and greater intention to perform kind or altruistic acts at work (Williams & Shiaw, 1999). This makes it unclear whether altruism-related benefits could still be experienced when helping other people is obligatory, as is the case in many positive psychology interventions. Because most altruism benefits have been studied in naturalistic settings and on people who choose to spend their time behaving prosocially (e.g. Oman, Thoresen, & McMahon, 1999; Rietschlin, 1998; Wilson & Musick, 1999), more research is needed on whether

'forced kindness,' where individuals are required to help others regardless of autonomous motivation, elicits similar well-being benefits.

Weinstein and Ryan (2010) have specifically argued that autonomous motivation of the volunteer is necessary for both the giver and receiver of the good deed to experience well-being benefits. This may be because the quality of help and the effort put into helping from autonomously motivated people is greater, which positively affects the relationship between the giver and the receiver. Other researchers (Deci & Ryan, 1985; Nix, Ryan, Manly, & Deci, 1999) have suggested that when people volunteer for external reasons (e.g. being convinced by others to do so or when forced), they lose the sense of personal competence otherwise associated with autonomously motivated kind acts and, therefore, many of the benefits. One study even found that extrinsic motives for volunteering were associated with *decreased* volunteer satisfaction (Finkelstein, Penner, & Brannick, 2005). In addition, the feeling of connection that often appears between the givers and receivers of help is diminished if autonomous motivation is not present on the side of the giver (Deci & Ryan, 1985; Nix et al., 1999).

Despite these concerns over non-autonomously motivated kindness, positive psychology interventions have successfully manipulated prosocial behavior experimentally, resulting in multiple well-being benefits (Seligman, 2003). This is typically done via interventions where

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individuals perform random acts of kindness (RAK), often over the course of several weeks. For example, in one study, participants who engaged in 10 weeks of RAKs reported higher happiness and subjective well-being and lower negative affect (NA) at a one-month follow-up as compared to controls who did not participate in RAKs (Tkach, 2006). Alden and Trew (2013) also found that people with high social anxiety who engaged in kind acts for four weeks sustained higher PA over the course of the study vs. controls. Forced kindness has also been shown to effectively increase student happiness and subjective well-being. For example, students who performed five acts of kindness one day per week showed a significant increase in well-being over a six-week period compared with a control group (Lyubomirsky, Sheldon, & Schkade, 2005; Lyubomirsky, Tkach, & Sheldon, 2004). Similarly, preadolescent students who performed three acts of kindness every week for four weeks experienced greater peer acceptance (Layous, Nelson, Oberle, Schonert-Reichl, & Lyubomirsky, 2012). These types of findings have also been echoed cross-culturally, suggesting some universal benefits of kindness interventions (e.g. Layous, Lee, Choi, & Lyubomirsky, 2013; Otake, Shimai, Tanaka-Matsumi, Otsui, & Fredrickson, 2006). For example, one study conducted in the United States and South Korea found that participants from both cultures increased in well-being when performing kind acts over a few weeks (Layous et al., 2013).

As is evident from the above examples, most of these studies require multiple weeks of effort and kindness behavior. This leaves open an important question: Do very *brief* kindness activities (e.g. a single day, a few minutes) have benefits? To date, only a few studies have examined this. While not ‘forced’ kindness, two early studies found that participants who were asked by a confederate for help on a single occasion reported greater positive mood than those who were not given the opportunity to help (Harris, 1977; Williamson & Clark, 1989). A more relevant study investigated whether a specific and mandated act of prosocial behavior on a single day would increase mood. This study determined that participants who were randomly assigned to spend \$5 or \$20 on others were happier at the end of the day than those who spent the same amount of money on themselves (Dunn, Aknin, & Norton, 2008). While the evidence available is narrow, these studies suggest that some specific acts of help, even short-lived ones, may have benefits for the giver of the good deed.

Relevant here is that one of the most *popular* concepts in the area of kindness interventions (e.g. in the media and positive psychology instruction) is completing a random act of kindness via a ‘pay it forward’ (PIF) activity, often over one day or during a single interaction. PIF encompasses the idea that receivers of good

deeds can repay altruistic behavior by helping *others* instead of directly reciprocating to the original giver of the act. PIF activities ask individuals to complete an act of kindness and then to encourage the recipients to continue the chain of kindness. The PIF concept dates back to the 317 BC play *Dyskolos*, in which one of the main characters says everyone has a responsibility to ‘make rich as many people as you can by your own efforts’ (807–808). More recently, the concept was popularized in a movie of the same name (Abrams & Leder, 2000; Ryan-Hyde, 1999). To our knowledge, the broadly advertised single-day/brief PIF activity has yet to be empirically examined, despite massive campaigns (Pay It Forward Foundation, 2013) and broad public endorsement. For example, this year alone, over 800,000 individuals have posted a PIF-style promise on their Facebook profiles (Meyer, 2014). Thus, while the theory behind PIF is popular, no study has tested whether a one-time ‘forced altruism’ PIF activity (like that executed on ‘Pay it Forward Day’) increases well-being in the giver and/or whether the good deeds are spread. While there are related longer-lasting kindness studies, and a handful of studies of brief events of kindness, it is clear that there are notable gaps in the literature. This study will test whether utilizing the PIF concept specifically results in benefits to the givers of kindness despite the short period of execution and the lack of autonomous motivation.

Another noted hole in past kindness studies is that the *receiver* of kindness is frequently ignored. Although the benefits of doing good on the actor are well documented in volunteer studies and in the RAK activities discussed above, the benefits for the receiver are less consistent and/or less documented. There are reasons to believe that kind acts may not always be beneficial for receivers. For example, while receiving support has been shown to increase feelings of competence, social connection, and closeness (Gleason, Iida, Bolger, & Shrout, 2003; Gore, 1981), researchers have discovered that it can also challenge an individual’s sense of self-esteem and autonomy (Ryan & Solky, 1996) and lead to negative self-attributions (Newsom, 1999) as well as feelings of sadness and anxiety (Maisel & Gable, 2009). Correlational designs in some of these studies leave open the possibility that NA can elicit received support; however, it also a real possibility that getting help can have drawbacks. Despite this, it should be noted that support figures in these studies are typically close family and friends. The support in PIF is qualitatively different because it is not necessarily being provided in response to stress or NA and it is typically coming from a stranger. Therefore, it is plausible that participants in PIF style kindness activities will not suffer the same negative impacts due to reduced threat to their self-esteem and/or a lack of guilt about the support they are receiving.

To this end, hospital-based and home-based visitor programs where kindness is provided by volunteers *unknown to the recipient* are popular, and studies have reported a wealth of related benefits such as lower medication use, increased happiness and vigor, and increased cognitive functioning (Reinke, Holmes, & Denney, 1981; Schulz, 1976; Wheeler et al., 1998). Also unique to PIF is the possibility that individuals can *help someone else* in return, potentially ameliorating the negative effects described above. With these factors in play (i.e. kindness from strangers and the ability to ‘pay it back’ to help others), receivers of PIF kindness should show well-being benefits from the PIF activity.

The primary goals of the current study were to first, determine the psychological impact of a one-time, brief PIF style intervention on the individuals who ‘do good’ for others (i.e. the givers) and second, to assess the benefits of being on the receiving end of this activity (i.e. the receivers). We hypothesized that the intervention would increase levels of positive affect (PA) and reduce NA for the givers. Because of the nature of this type of intervention, baseline levels of affective state could not be collected for receivers since they are picked naturally in the moment, and asking them to fill out a survey would disrupt the flow of the interaction. Therefore, in order to assess PA benefits to receivers, we assessed whether community members interacting with the group were more likely to smile (and smile to a greater degree) as compared to the control participants who did not interact with the PIF group. While different from self-reported PA, smiling has long been shown to communicate pleasurable experiences (Messinger, Cassel, Acosta, Ambadar, & Cohn, 2008). While smiles can be artificial (i.e. *not* indicating positive affect), researchers have identified Duchenne smiles (with both cheek and eye muscle activity; Duchenne, 1862/1990) as markers of sincere positive emotion (Ekman, Davidson, & Friesen, 1990; Ekman & Friesen, 1982).

Because of the novelty of the PIF paradigm in research, additional exploratory analyses were conducted in order to gain insight into various aspects of the intervention, including an examination of whether existing characteristics of participants (e.g. demographics, affect) correlated with the efficacy of the activity. Finally, we examined whether individuals who were on the receiving end of the activity actually intended to do a good deed for someone else, and whether those who had engaged in a good deed experienced higher well-being. Although our intervention is more similar to a brief RAK intervention (because the givers are at the beginning of the PIF chain of good deeds), this final investigation allowed us to determine whether this chain had been successfully initiated and/or whether receivers of good deeds felt compelled to PIF themselves.

Method

Two separate groups were of interest throughout the current study: the givers (those delivering the PIF activity) and the receivers (those receiving kind acts from the givers). Because of this, methods and results will be split to display the results for these groups separately.

Participants

Participants in the giver group were 83 individuals enrolled in a positive psychology course at a large Midwestern University (59% female, 87.5% Caucasian, aged 19–56 years with a mean age of 22.6). Participants consented to participate in research over the course of the semester in the first week of classes (study was approved by the University of Kansas Human Subjects committee). Participants were randomized into 10 giver PIF groups that roamed the university campus and the broader Lawrence, Kansas, community for approximately 90 min.

The receiver group included any individual (e.g. community member, faculty, student, staff) who happened to be close in proximity to one of the PIF groups. This included 1014 individuals who were recipients of the PIF activity and 251 individuals utilized as control subjects (e.g. individuals who were not part of the activity because of distance or because they were encountered after the activity was complete). All individuals in the recipient group had their faces coded by students trained to identify Duchenne and non-Duchenne smiles. Self-reported demographic information on receivers was not collected given our desire not to interfere with the natural flow of the interactions, in addition to the large number of receivers as compared to coders and the brief time span. A small subsample of receivers ($N = 48$) voluntarily completed an online self-report questionnaire shortly after the activity to examine whether they engaged in PIF themselves and to report on their mood state.

Measures

Givers: pre-post intervention measures

Mood (state affect) change due to PIF activity in the givers was tested via a pre-post measurement of the 20-item state PANAS assessment (Watson, Clark, & Tellegen, 1988), as well as the PANAS-X joviality scale (Watson & Clark, 1994). Both measures have been shown to be reliable and valid in measuring positive and negative affect (Crawford & Henry, 2004; Watson, 1988). Items relating to other positive constructs were drawn from dispositional scales and reworded to ask about how they felt over the *last day*, including gratitude (assessed with gratitude scale items ‘grateful’ and ‘thankful’) (McCullough, Emmons, & Tsang, 2002), optimism (assessed with items ‘hopeful’ and ‘optimistic’) (Scheier,

Carver, & Bridges, 1994), and ‘satisfied with my life’ (Diener, Emmons, Larsen, & Griffin, 1985). Items were all ranked on a 0–4 scale, where 0 indicated very slightly or not at all and 4 indicated extremely. This pretest was administered to givers one week before the PIF intervention. The posttest was available one day after the intervention and was completed by the last participant four days post-activity.

Givers: pre-intervention disposition

In addition to these pre-post intervention measures, participants also completed a number of questionnaires three months before the activity. These were used to determine whether baseline characteristics would alter the experience of the PIF activity. **Satisfaction with life** was measured using the five-item Satisfaction with Life Scale (Diener et al., 1985). Example items included, ‘The conditions of my life are excellent’ and ‘In most ways my life is close to my ideal.’ **Gratitude** was measured using the six-item Gratitude Questionnaire (McCullough et al., 2002), which included items like ‘I have so much to be grateful for’ and ‘If I had to list everything that I felt grateful for, it would be a very long list.’ **Optimism** was measured using the 10-item Life Orientation Test-Revised (Scheier et al., 1994). Example items included ‘I am always optimistic about my future’ and ‘In uncertain times, I usually expect the best.’ **Trait affect** was measured using a 19-item scale drawn from the Larsen and Diener Circumplex model (Larsen & Diener, 1992). Responses for this scale ranged from 0 to 4, with 0 indicating that the item was not at all accurate and 4 indicating that the item was extremely accurate in describing how the participant felt generally. Adjectives assessed a range of positive (calm, happy, enthusiastic) and negative (tired, nervous, sad) emotions. Three additional items were also added to measure general stress and boredom (overwhelmed, stressed, and bored; see Miller et al., 2004).

Givers also self-reported **demographic** variables including age, sex, and race.

Receivers: smiling

A set of giver participants were responsible for coding facial expressions of receivers and controls. Coders were trained via photographic displays and in-class instruction on how to recognize the Duchenne smile (Duchenne, 1862/1990; Ekman & Friesen, 1982) via identification of activity in both the zygomaticus major muscles (cheek) and the orbicularis oculi muscles (adjoining the eye). Non-Duchenne smiles (zygomaticus major activity only) were coded as ‘standard’ smiles, and all other expressions (negative, neutral) were coded as ‘no smile.’ Smiling behaviors were rated on a scale of 1–3 according to

degree of smile (3-Duchenne smile, 2-non-Duchenne smile, 1-neutral/negative expression).

Receivers: self-reported effects of PIF

Participants were asked how likely they were to pay the good deed forward on a scale from 1 to 7, 1 signifying ‘very unlikely’ and 7 signifying ‘very likely.’ Participants were asked whether or not they had already paid the good deed forward, and, if so, to describe how they did so.

Participants also reported current mood via a subset of items drawn from the emotion scales discussed above for givers. Positive emotion items included happiness, cheerfulness, pride, excitement, thankfulness, and optimism, and negative emotion items included anger, stress, sadness, nervousness, and loneliness. The same Likert scale described above for givers’ was utilized. Positive emotion scores were averaged to calculate a positive mood recipient response, and negative emotion scores were averaged to calculate a negative mood response.

Procedure

One week prior to participating in the PIF event, givers completed baseline mood questionnaires (demographics and trait measures were assessed three months pre-activity). The day of the PIF activity, givers participated in 90 min of activities. Groups of givers were provided with a geographic target area (e.g. inside office buildings, cafeterias, areas of campus), instructions, smiling scoring sheets, and an array of suggested kind behaviors (e.g. hold a door open, offer to help someone carry something, give a compliment, feed a parking meter, high five someone, pick something up for someone), as well as gifts to give to individuals as they interacted with them (e.g. chocolate, cookies, positive message cards, gifts, and certificates donated by local merchants). Givers were instructed to engage with and facially code whomever they encountered. Whenever possible, recipients were also informed of the PIF concept. Each giving group had two individuals coding smiles of those who did and did not participate in PIF.

Following PIF interactions, a small subset of receivers (at random) were offered a card containing a website directing them to a survey about their experience with PIF. Those who chose to complete the survey answered questions anonymously about their current emotional state and whether they ‘paid it forward’ by doing a good deed. The survey was optional and participants were offered the possibility of winning a \$25 gift certificate if they provided their email address. Givers and receivers (given the survey card) were asked to complete the follow-up surveys within 24 h.

Facial coders were instructed to code ‘control’ participants both during PIF (e.g. if there were individuals on the other side of the street whose faces they could see but who could not interact with the PIF group) and after the PIF activity when good deeds were no longer being completed. Participants had between a 10 and 30 min walk back to the meeting location to return materials; thus, the majority of facial coding occurred once the PIF activity was over, as individuals could easily code faces on the way back to the larger group.

Statistical approach

Within-subjects *t*-tests were conducted for pre-intervention and post-intervention data. Because not all givers completed their follow-up surveys immediately following the activity, an ANOVA was conducted to determine whether amount of time post-intervention that the survey was completed was correlated with mood change score differences. Pearson correlation coefficient tests were conducted to examine whether baseline traits were correlated with the change scores resulting from the PIF activity (pre-post difference scores). ANOVA was utilized for bivariate variables and group difference tests (e.g. for facial expression comparisons across receivers and controls). Partial correlations and ANCOVAs were utilized when covariates were necessary.

Results

Preliminary analyses

Givers

Seventy-eight participants completed both the pre- and post-data and were considered in mood change analyses. Five individuals were lost due to absence on the day of the activity or missing surveys. The largest portion of Time 2 data was collected within 24 h of the event (43%), with the last student completing the questionnaire four days after the event. Amount of time post-intervention that the survey was completed was generally not correlated with mood change score differences; however, an ANOVA revealed that joviality (PANAS-X subscale) was significantly higher for those who completed the response within 24 h of the activity ($F(1,78) = 4.84$, $p < 0.05$), with a 1.12 unit increase in the within 24 h group and a 0.75 unit increase in the late group (over 24 h post-intervention). This reveals that the effects of the activity deteriorated over time, but were still present several days after the intervention.

Receivers

The PIF givers coded 1265 individuals for facial expression, with approximately 175 of these participants

receiving cards with the website for a self-report survey (500 cards were given to the givers to hand out at random and 325 were returned). Participation in the online survey was voluntary. The website link was simply provided on the back of a card to random community members who interacted with the group, along with a positive or complimentary saying on the front. Forty-eight participants completed the online survey, making the response rate approximately 27%. Of these participants, 83% completed the questionnaire on the same day as the PIF event. The last entry was approximately 48 h after the event.

Was the PIF intervention effective?

Givers

Positive and negative state affect. All mood change results tested via pre-post paired sample *t*-tests were significant and in the anticipated directions. Participating in PIF resulted in decreases in NA ($t(78) = -4.53$, $p < 0.001$; $d = 0.38$) and increases in PA ($t(78) = 8.40$, $p < 0.001$; $d = 0.90$), optimism ($t(78) = 6.33$, $p < 0.001$; $d = 0.67$), gratitude ($t(78) = 3.15$, $p < 0.001$; $d = 0.32$), life satisfaction ($t(78) = 3.80$, $p < 0.001$; $d = 0.36$), and joviality ($t(78) = 10.47$, $p < 0.001$; $d = 1.13$). Mean difference scores (Time 2 – Time 1) can be seen in Figure 1, with the largest difference found in PANAS joviality and the smallest in overall NA.

While all mean changes across the group were in the expected directions, not all participants had the expected direction of change. For example, optimism and gratitude change scores had a range of -2 to $+3$, PA -2 to $+2$, life satisfaction -1 to $+2$, NA -1.8 to $+0.8$, and joviality -1 to $+3$. This indicates differences in activity effectiveness, with some givers showing negative effects from the activity. However, these differences represented a small percentage of the overall sample: only 2.5% of givers showed a decrease in joviality, 5.1% in PA,

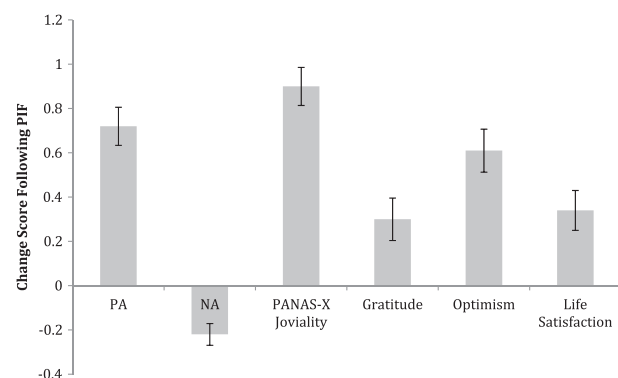


Figure 1. The magnitude of the mean change scores in affect, optimism, and life satisfaction following PIF for givers (\pm SE). Scores are calculated as Time 2 – Time 1.

10.1% in hope, 11.4% in life satisfaction, and the largest percentage (20.3%) showed a decrease in gratitude. 10.1% of givers showed an increase in NA after the PIF activity.

Demographic and baseline differences in PIF effects. Sex was associated with changes in the PANAS PA and the PANAS joviality scales ($F(1,67) = 11.08$ and 9.15 , respectively, $ps < 0.01$), with females having larger PA increases in response to the activity. This difference persisted after controlling for post-intervention (T2) lag measurement (how many days late T2 was; both $ps < 0.01$) in an ANCOVA. Other change scores were in the same direction (with females reporting greater benefits), but nonsignificant. Race and age were not associated with mood outcomes; however, there was little variance in these demographic measures (over 85% white, 87.5% aged 25 and under).

Partial correlations controlling for sex were used to examine baseline psychological traits as possible correlates of the change effects of PIF. Generally, baseline traits did not predict PIF-related change scores, with a few exceptions. Higher baseline optimism and stress were both correlated with greater increases in optimism during PIF ($r = 0.37$, $p < 0.01$ and $r = 0.27$, $p = 0.05$, respectively). Greater NA at baseline was associated with greater increases in joviality following PIF ($r = 0.31$, $p < 0.05$). Controlling additionally for T2 survey lag time for the NA analysis (given the known association with joviality) did not substantially alter this association (new $r = 0.30$, $p < 0.05$).

Receivers

Smiling. Individuals who interacted with the PIF group ($N = 1014$) showed significantly greater smiling expressions than those who did not interact with the group ($N = 251$) ($F(1,1263) = 246.16$, $p < 0.001$) (Figure 2). Of the controls, 59% were not smiling vs. only 15.1% in the PIF receiver group. Similarly, only 14.3% of controls had Duchenne smiles vs. 51.3% of those who interacted with the PIF group.

Did the receivers PIF?

Online survey participants were also asked how likely they were to PIF on a 1 (will not PIF) to 7 (definitely will PIF) scale. The mean was 6.35 for respondents, and all but one participant (who answered with a 1) rated a 5 or above on this scale. Of these, 38.5% had already paid it forward at the time of the questionnaire. These acts ranged from picking up books for someone, telling a stranger to have a wonderful day, smiling at strangers, holding doors open, giving away or sharing food, complimenting others, hugging others, giving up a seat on

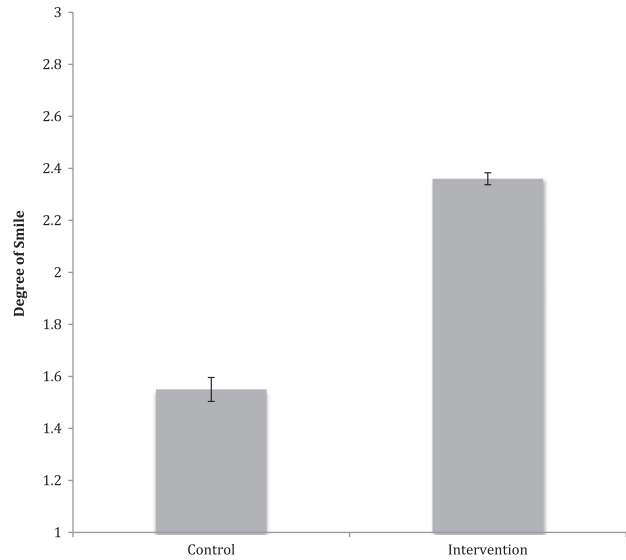


Figure 2. Average smiling differences (\pm SE) between individuals who interacted with the PIF group (intervention) vs. those who did not (control). Smiles were coded so that 1 indicates no smile, 2 indicates a standard [non-Duchenne] smile, and 3 indicates a Duchenne smile.

the bus, helping someone with work or homework, and donating blood.

Self-reported psychological impacts. Receivers who completed the PIF online survey had a positive mood mean of 3.22 on a 0–4 scale ($SD = 0.52$, range = 1.7–4) and a negative mood mean of 0.98 on a 0–4 scale ($SD = 0.73$, range = 0–2.2). When examining differences between those who had already engaged in a kind deed vs. those who had not yet done so, there was no overall difference in PA or NA, although there were nonsignificant trends in specific *types* of emotions. Individuals who had already engaged in a kind act trended toward more excitement ($F(1,45) = 3.89$, $p = 0.05$), more happiness ($F(1,45) = 3.3$, $p = 0.08$), and less anger ($F(1,45) = 3.318$, $p = 0.08$).

Discussion

This study is the first to show that a one-time, brief PIF style intervention can positively impact the well-being of both givers and receivers of the activity in the days immediately following the experience. For both groups, the intervention most effectively increased positive constructs but also had some benefits in decreasing negative affectivity. PIF givers reported increased overall PA, optimism, gratitude, life satisfaction, and joviality, with the largest changes found in PA and joviality. This is not surprising given that state affect is likely easier to manipulate via a short activity as compared to more

stable factors such as life satisfaction or optimism. These findings contradict previous research that has indicated that autonomous motivation is necessary for psychological benefits for both givers and recipients of help, as the PIF activity was a forced kindness intervention. Participation was assigned as a class activity and givers were not permitted to miss it except for illness or emergency. These findings also add on to past studies showing benefits of extended periods of kind activities (e.g. Layous et al., 2012; Lyubomirsky et al., 2004; Lyubomirsky, Sheldon, et al., 2005) by showing that even brief activities can alter well-being up to a couple of days later. It also adds to the small literature showing that brief prosocial acts can also have mood benefits for the giver (Dunn, Aknin, & Norton, 2008; Harris, 1977; Williamson & Clark, 1989), and is the first to document receiver benefits in this context.

Although the widespread commercial popularity of the PIF concept led to strong hypotheses that a PIF intervention would lead to positive outcomes, less certainty remained about whether PIF would be effective for everyone. While there were ranges of responses to the activity from the givers, demographic factors such as age and ethnicity were not connected with self-reported mood change. The only demographic factor that made a significant difference for the givers was sex, with females reporting higher increases in PA and joviality than males. It may be that females benefit more, but more likely this is an example of emotional reporting differences and affect intensity differences frequently found in the psychological literature (e.g. Fujita, Diener & Sandvik, 1991; Kring & Gordon, 1998). Similarly, baseline trait affect did not predict major PIF effects, with the exceptions of baseline optimism (which predicted higher increases in optimism/hope), baseline stress (which also predicted greater increases in optimism/hope), and negative affect (which predicted higher levels of joviality after the activity). This suggests that those with more negative affect and stress might especially benefit from a PIF activity. Alternatively, this could also be partially due to ceiling effects since these high NA individuals have more room to change in their well-being scores.

When considering the small percentage of people who experienced negative effects from PIF (2.5–20.3% depending on the outcome), it remains unclear as to who these individuals are. Qualitative descriptions of the experience not described in the results suggest that some of those who did not like the intervention were more introverted and shy (e.g. ‘I am kind of shy, so putting myself out there like that was uncomfortable’ and ‘I was really nervous for the activity, I usually do not like walking up and starting conversations with random people’) or did not like that some individuals were unresponsive to them (e.g. ‘It made me a little sad that people were so

unresponsive’). Given these types of descriptions, it is possible that introversion or other social relationship relevant factors might predict the effectiveness of this type of activity. Future research should include these types of variables.

Social activity may be an important mediating factor of the positive effects of the PIF intervention on both givers and receivers. All individuals engaged in the PIF intervention as part of a group, and the activity involved doing something prosocial for another person. The ‘other people matter’ effect (Peterson, 2006) is well established in the health and well-being literature, with social connections being tied to increased longevity, increased physical health, increased cognitive performance, and better mental health (Holt-Lunstad, Smith, & Layton, 2010; House, Landis, & Umberson, 1988; Robles, Slatcher, Trombello, & McGinn, 2014). Thus, testing this as an individual activity or having individuals ‘do good’ online, where feelings of social connectedness may be reduced, would be interesting follow-ups.

Recipients also benefited from the intervention. They showed greater levels of Duchenne smiles (51.3% receivers vs. 14.3% controls) and very few non-smiles (15.1% receivers vs. 59% controls), providing behavioral evidence that this activity was sincerely enjoyable and pleasant for recipients. While self-report data days later may have been a better indicator of the lasting effects of this activity, it is clear that in the moment, the majority of individuals who received kindness from the PIF activity sincerely enjoyed it, as evidenced by only a small percentage of individuals not showing Duchenne or standard smiles in response to the interaction. A subset of receivers reported their affect in the day(s) following the PIF event and revealed very high means for positive mood and low means for negative mood. While there is no control group or baseline data for this sample, means on the same scales were retrieved from a University of Kansas Health Psychology course ($N = 48$) a few weeks after the PIF activity (during a non-examination week) as a comparison point (not reported in results). Indeed, mean positive mood for this non-PIF group was significantly lower than the receivers of the PIF activity (mean of 2.6 vs. 3.2 on a 0–4 scale, $F(1,96) = 5.12$, $p < 0.05$). While not a perfect control group, this does indicate that the recipients of the PIF activity were generally feeling quite positive. Thus, unlike some studies of received social support, when an individual receives help or kindness in the context of PIF, the receiver responds positively as evidenced by positive emotional expression and, to some extent, in self-reports of mood. Future studies should explore the mechanisms underlying these benefits as compared to studies of support (e.g. Is self-esteem maintained? Is this due to it being a stranger or because of the ability to PIF to someone else in need?), and should explore the mood benefits more explicitly.

Although results reveal that PIF was effective for both the givers and receivers, there were a number of limitations. First, givers were not blind to the hypothesis that PIF should increase well-being. Most positive psychology interventions face this limitation because it is difficult to mask hypotheses when mood is being overtly manipulated. That being said, givers were told repeatedly that not all positive psychological interventions work for everyone, and, accordingly, some givers reported decreases in PA and increases in NA. Furthermore, givers took the state affect pretest one week before the PIF activity, so it is unlikely that they remembered their initial reported affect levels. Next, because givers rated facial expressions, it is possible that demand characteristics played a role in their ratings of receivers. That being said, student participants were extensively trained in scientific research methodology as part of the course content, and this was not their first research project or their first experience with facial coding. Another potential concern is that those who elected to participate as receivers were inherently different from those who did not interact with the PIF group. Instructing givers to interact with and code *every encountered individual* minimized this limitation. This included those who quickly walked by (e.g. grabbed a cookie and kept going, read a 'free hug' sign and declined) as well as those who interacted for longer periods. It also encompassed interactions with individuals who had no choice but to be PIF receivers (e.g. individuals in offices who were visited) because they were in a room that was coded in its entirety. Another concern may be that students in a positive psychology class (i.e. the giver sample) may not be representative of the broader general population. Most notably, although these students were 'forced' to take part in this intervention, they may not have truly felt forced because of the voluntary nature of their decision to sign up for the class and their previous interest in the subject matter. This may limit the generalizability of these results; however, this volunteer bias is similar to that of any participant who signs up voluntarily for any research study. Future studies should include a measure of person-activity fit to assess the degree to which participants are truly 'forced' to participate in the intervention and attempt to recruit givers of PIF by other means. Finally, demand characteristics may have also played a role in our giver results. To prevent this, we encouraged honesty and maintained anonymity via online anonymous surveys. We also emphasized that not everyone would necessarily benefit from this activity; however, it is still possible that demand played some role in study results.

Another limitation of this study is the lack of ideal control groups. For the receivers, facial expression coders did their best to code faces from individuals who were unaffected by the intervention (e.g. those who were not near a kindness interaction, individuals who were

encountered after the activity was complete), and most control data were recorded after the intervention was over. However, there may still have been some spillover effects as compared to if data had been collected on a random day when no PIF activities were happening. In the future, raters who are blind to hypotheses should walk around before and after the intervention and code natural facial expressions, and, ideally, receivers would be video recorded so blinded raters could more accurately rate expressions. For givers, baseline control comparison data were collected ahead of time (one week pre-PIF); however, a comparison group of participants doing pre-post mood assessments before a walk around campus would also be useful. Because of the lack of a control group, results may be due to alternative explanations. For example, givers may have received a mood boost due to the novelty of walking around campus with their friends and participating in an activity other than sitting in a lecture hall. We should note here, however, that givers had participated in eight other positive psychology interventions over the course of the semester, including others that involved outdoor group activities. PIF was one of the last activities they participated in; therefore, it is unlikely that these findings are due to a uniqueness-related mood boost. Unfortunately, due to the nature of this activity (e.g. as a classroom-based intervention over a single brief time period) and the desire to keep the interactions natural, it was not possible to remedy these specific concerns.

Although PIF aims to create a chain of good deeds, this also could not be perfectly tested due to constraints of the study design. There was a low survey self-report response rate (under 30%), partially due to our desire to not alter the altruistic nature and flow of the interaction. Individuals were not pressured to visit the website, and given that university samples are already bombarded with survey requests, the low response rate was not surprising. This did hinder our ability to adequately assess whether individuals completed a good deed at a later point in time. It is possible that individuals who completed the survey benefitted the most from the intervention, although we attempted to minimize this issue by incentivizing people to take the survey with the possibility of winning a small prize (e.g. gift certificates). Of the recipients who responded to the online survey, almost 40% reported paying a good deed forward at the time of the survey (up to 48 h post-intervention), and nearly all respondents reported that they intended to complete a good deed (54.2% of the sample said they would *definitely* PIF, and the mean for likelihood of doing it in the future was 6.35 on a seven-point likelihood scale). This may provide one explanation for why we did not see large self-reported mood differences between people who had already paid it forward at the time of the survey and people who had not yet done so.

The people who had not yet paid it forward may have already been planning and envisioning the good deeds they would do, which may have increased their PA even though they had yet to take action. Furthermore, recipients of the intervention already had high levels of PA, so a ceiling effect may have been present. Because of the nature of the study, brief and short survey items were necessary, including some that were not previously validated in this format (although all items had been used in previous scales and adjectives hung well together based on a factor analysis of the items).

Because this study is the first of its kind, there are many directions for future research to take. Although both the givers and receivers experienced benefits from the PIF activity, our study did not address why these benefits occurred and for how long. Future research should examine the psychological processes that lead to these outcomes, the specific types of ‘good deed’ activities responsible for the found results, the duration of the effects, and whether specific types of people will benefit most (or not benefit) from this activity.

Overall, our brief PIF activity was successful, providing benefits to both the givers and receivers of the intervention, regardless of individual differences in demographic variables or baseline traits. Individuals reported qualitatively that it was ‘fun,’ ‘inspirational,’ ‘mood lifting,’ and ‘life changing.’ Furthermore, technology is making it easier to promote and complete PIF activities through mobile apps designed to promote acts of kindness and track good deeds as they are spread forward (i.e. Ripil; Mobileaze LLC, 2014). With mobile apps such as these, it may become easier to test the ‘ultimate’ PIF intervention, which includes the ability to track whether the good deeds are paid forward and how far the chain of kindness reaches. Given that this activity was inexpensive to execute, lasted less than two hours, was easy to implement, and was broadly beneficial, future researchers and interventionists should encourage individuals to continue to use this type of activity for positive emotion enhancement.

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