

**Doing Good When You Don't Want To:
An Experience Sampling Study Examining Autonomy and Compassionate Action**

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Abstract

There is broad support in the literature that people experience enhanced wellbeing after performing prosocial behaviours, such as acts of compassion: doing good makes you feel good (Alden & Trew, 2013; Layous et al., 2017; Mongrain, Chin, & Shapira, 2011; Weinstein & Ryan, 2010). Less well-established, however, are the boundary conditions for this finding: under what circumstances do people fail to *feel* good despite *doing* good? Autonomy, one of the central pillars of Self-Determination Theory (SDT, Ryan & Deci, 2000), presents as a prime candidate to elucidate this question. The present study uses an experience sampling methodology to explore how autonomy predicts whether people feel better or worse after helping others. Results from the time-lagged linear mixed model indicate that doing good when you want to (internally motivated) predicted subsequent positive mood, however, doing good when you do not want to (externally pressured), instead predicted subsequent negative mood.

Dedication

This thesis is dedicated to my father, Lanny Rootenberg, a true innocent, who would have been immeasurably proud.

Acknowledgements

My wonderful wife, Cally Rootenberg, for helping so much and my children, Eddie and Lyla, for helping so little, I love you all.

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What Happens When You Do Good When You Don't Want To?:

An Experience Sampling Study Examining Autonomy and Compassionate Action

Introduction

There is a growing literature on prosocial behaviour and its effects not only for its recipients but also the effect on the actor, the person who performs the prosocial behaviour. It has already been well-documented that prosocial behaviour increases wellbeing for the actor and conversely that those experiencing wellbeing are more likely to perform prosocial behaviour (Alden & Trew, 2013; Buchanan & Bardi, 2010; Chancellor et al., 2017; Hui et al., 2020; Layous et al., 2017; Mongrain, Chin, & Shapira, 2011; Nelson et al., 2015; O'Connell, O'Shea & Gallagher, 2016; Trew and Alden, 2015; Weinstein & Ryan, 2010). These findings have held across many operationalizations including volunteer work (Freeman, 1997), donating money (Frey & Meier, 2004), and donating blood (Piliavin & Callero, 1991). Moreover, some studies have used experimental designs to establish causal relationships with certain helping behaviours and the helper's wellbeing. Spending money on others (prosocial purchasing) has been shown to have a higher impact on wellbeing than purchasing a similarly priced item for oneself (Aknin, Barrington-Leigh, et al., 2013; Aknin, Broesch, Hamlin, & Van de Vondervoort, 2015; Aknin, Dunn, Sandstrom, & Norton, 2013; Aknin, Flerackers, & Hamlin, 2014; Anik et al., 2013; Whillans et al., 2016). And more broadly, acts of kindness in general have been shown to moderately improve wellbeing (Mongrain, Chin, & Shapira, 2011).

Less well-established in the literature are how individual differences of the prosocial behaviour affect the consequences for the actor. For example, to what extent does helping someone because you want to, versus out of sense of obligation, affect how it makes you feel? The present study aims to use an experience sampling method to elucidate this gap in the

research by exploring how the motivational components of Self-Determination Theory (SDT), and autonomy in particular, affect the outcomes of prosocial behaviour for the actor.

Moreover this study focuses on compassionate actions, which are a subset of acts of kindness differentiated by being undertaken with compassionate motivation: the desire to alleviate another's suffering. While acts of kindness in general can be taken for many reasons, compassionate actions are those in which one is confronted with another's suffering and feels compelled to reduce that suffering. Also important to clarify is the distinction between empathy, wherein one merely senses or imagines how someone else is feeling, and compassion, which additionally involves the motivational aspect of the desire to alleviate suffering.

While much research has focused on the effects of the particular type of compassionate action, less studied are the individual differences that influence how the behaviour occurred. In this study we explore the difference between eagerly and volitionally helping others versus helping others begrudgingly or due to external pressures. While both kinds of helping fall within the purview of prosocial behaviour, one can readily imagine how having just helped someone eagerly feels different from having reluctantly helped someone. This study aims to elucidate this difference by having participants report on compassionate behaviours that they have performed naturalistically and indicate the extent to which they felt that those actions were freely chosen versus externally pressured. SDT provides an excellent theoretical lens through which to explore this finding as *autonomy*, one of its central pillars, is well-defined and theorized to be a central component of wellbeing.

Why We Help: Models of Helping Behaviour

Evolutionary Models

As Darwin suggested in the *Descent of Man*, “when two tribes...came into competition, if (other circumstances being equal) the one tribe included a great number of courageous, *sympathetic* and faithful members, who were always ready to warn each other of danger, to aid and defend each other, this tribe would succeed better and conquer the other.” (Darwin, 1871, emphasis added). Evolutionary models suggest that tribes that collaborate are more likely to survive. Moreover, selection pressure ensured that. Selection pressures help establish internal systems for encouraging collaboration (Goetz et al., 2010) and these emotional systems, while initially honed to encourage parental caretaker expanded to lesser degrees to encompass other kin and non-kin (Gilbert, 2015).

Evolutionary models distinguish between a behaviour’s proximate causes, the contextually local factors that motivate a behaviour—for compassion, the desire to alleviate another’s suffering—and its ultimate causes, the evolutionarily significant factors which shaped the behaviour to increase an organism’s fitness—the tendency for those who exhibit compassion to more successfully propagate their genes to future generations. Importantly, the ultimate causes did not necessarily evolve to be available to conscious awareness, so while kin altruism posits that one is more likely to help their child due to genetic propagation, it means only that we have evolved tendencies to act in those ways, not that we sense that our behaviour is motivated by those reasons (Wilson, 2015).

One such theory is *kin altruism* which involves kindness to our genetic relatives, especially offspring (Hamilton, 1964; Richardson, 2015, Vlerick, 2020). This theory is predicated on the fact that our genes are present not only in ourselves but are proportionally

represented in our family members (e.g. 50% in our children and siblings, 25% in our cousins). While a gene may be selfish (Dawkins, 1976) this provides room for non-selfish behaviour at the organism-level, whereby helping one's children, a gene is indirectly helping a copy of itself. This theory predicts that we would sooner help our children over our siblings, and our siblings over our cousins. Moreover Gilbert (2009, 2020) puts forward the idea that compassion for non-relatives is an evolved adaptation that extended the pre-existing evolved behavioural and biological framework to others beyond our immediate family, a generalization of nurturant care.

Mutualism or co-operation is kindness to our communities, especially people who are members of groups with which we identify (Harcourt & Waal, 1992; Boesch et al., 2006). Mutualism is the tendency to collaborate with and be kind to fellow group members and it underpins kindness that is motivated by a sense of loyalty or community (Curry et al., 2018). This theory predicts that we are more likely to help those with whom we share a common goal, this can be a more tangible goal, like willingness to form hunting groups to find food, or more indirectly, like the tendency for one to be more likely to help those from their own social group, tribe, or ingroup. In line with this theory, compassionate behaviour is more readily initiated towards members of one's community than those outside of it (Tajfel, 1970; Erlandsson, 2018).

Reciprocal altruism (Trivers, 1971; Segerstrale, 2016) is kindness to people who we are likely to interact with again. This underlies a kind of tit-for-tat helping wherein you do a favour for someone now because they might be able to return a favour at a later time. This theory helps explain psychological mechanisms for many common behaviours in humans such as: noticing when others are in need of help, feeling a desire to cooperate with others, expressing appropriate gratitude for received help, noticing when favours are returned and similarly detecting exploitation by noticing when favours are not return or when one's help is exploited (Curry et al.,

2018) This theory predicts that helping behaviour will be particularly common among those with whom we interact, or expect to interact with, in the future, or who have demonstrated a track-record of reciprocity. Reciprocal altruism predicts the extent to which one would go to help a close friend who is struggling gravely is far greater than that to which we would go to help those with whom we rarely interact. Noteworthy, however, is that reciprocal altruism when enacted *consciously* for the goal of reciprocity fails to meet most common definitions of altruism or compassionate actions, but reciprocal altruism is an ultimate cause, not necessarily a proximate one. Therefore it need not operate consciously with aim to seek reciprocation, but instead merely observes that we tend to be more willing to help those who have helped us in the past or who could in the future.

Competitive altruism (Maynard Smith & Price, 1973; Piliavin & Charng, 1990) is kindness to others when it improves our status because it has the capacity to impress others or attract mates. This theory predicts that we will be more likely to help others when we are in a position to do so publicly or receive social credit for having helped. As Curry et al. (2018) point out, because these theories posit ultimate evolutionary causes for the effect of helping others on our adaptive fitness, it follows that we should have motivational systems that encourage helping behaviour by making such behaviour pleasurable or otherwise be experienced as enhancing our wellbeing.

Social Exchange Theory

This is a sociological, psychological, and economic theory that posits that the interactions between people, including compassionate actions, are the result of implicit cost-benefit analysis by those involved. Inspired by Skinner's behaviourism, this theory suggests simply that when deciding whether to help another, a person will determine what benefits they are likely to accrue,

immediately and in the future, from the interaction based on past experience (e.g. positive feelings, recognition) and weigh it against the costs of the interaction (e.g. social cost of helping, danger involved). In economic and game-theoretic terms, this strategy is called a minimax strategy, wherein an agent tries to minimize costs and maximize benefits (Homans, 1974; Cropanzano et al., 2016). While this may seem calculating, or selfish, all volitional behaviours that humans carry out have a motivational component; even the purest altruistic act retains some sense of fulfilling a motivational desire of the actor. This theory differs from the most modern psychological literature, in which compassion is understood to have a motivational component, a desire to reduce another's suffering, so even if a behaviour fulfills this psychological need for the actor, it is still by the most common definition considered to be compassionate, this motivation being the central feature of the compassion.

Batson's Empathy-Altruism Hypothesis

The empathy-altruism hypothesis posits that the primary motivating factor of helping behaviour is *empathic concern*, a term that broadly refers to "other-oriented emotion elicited by and congruent with the perceived welfare of someone in need," a larger category in which compassion would be a part (Batson, 1991). Batson suggests that only if empathic concern is low or lacking will people be motivated by the secondary motivation of cost-benefit analysis in deciding to help another, more in accordance with social exchange theory. This contrasts with social exchange theory in that it proposes that empathy is not present *until* the helper benefits more than loses from the helping behaviour. The two central components of empathic concern are the ability to perceive that another is in need and a valuing of the other's welfare. Empathic concern then leads to altruistic motivation (i.e. a desire to help), once this motivation is in place,

cost-benefit thinking helps determine which course of action is taken, whether that be helping directly, indirectly, or ultimately choosing not to help.

Negative-State Relief Model

In contrast to Batson's other-oriented model, Cialdini's model is egoistic (Baumann, Cialdini, & Kenrick, 1981). Under this model, a) an individual witnesses a circumstance in which others are in need b) this causes them to feel negative emotions c) which in turn spurs them to act to alleviate these negative emotions. Importantly, this model claims that the primary motivating factor is the egoistic concern of managing one's own distress. One of the useful explanatory factors of this model is that it outlines two paths with which one can alleviate their negative feelings, either by engaging in the helping behaviour or alternatively through avoidance of the circumstance, which similarly reduces personal distress (Baumann, Cialdini, & Kenrick, 1981). In this model alleviating the distress of another person is intimately linked with alleviating one's own respondent distress, we help others feel better to help ourselves feel better.

Neurochemical Basis of Helping

Particular neurochemicals have been shown to be essential in enacting compassionate behaviour. Dopamine bolsters compassion, like many intrinsically rewarding behaviours, by acting within the mesolimbic pathway, sometimes termed 'reward pathway'. Through this pathway, dopamine establishes thresholds for behaviours, determining if a particular behaviour is enacted, and reinforcement for behaviours, determining if the behaviour will be internally rewarded (Inagaki, 2018). Oxytocin also plays a role in compassion and has been implicated in bonding, especially between mother and child, pair-bonding, and in-group bonding. Oxytocin has also been shown to more generally increase the salience of social stimuli (Zak, Stanton & Ahmadi, 2007). The neurochemical factors provide some insight into both the motivational

components of compassionate actions, or why they enact compassionate behaviours, as well as those behaviours then trigger the ‘warm glow’, or why people report feeling good after helping others. The pathways that underlie both innate and learned compassionate behaviours can be similarly found in many non-human primates (de Waal, 2019).

Neurostructural Basis of Helping

Brain regions implicated in compassion have also been discovered. Functional magnetic resonance imaging (fMRI) using BOLD imaging, where blood oxygen level is taken to be a proxy for activity, to determine areas of brain that are active when subjects are exposed to images, videos, or stories to produce a compassionate response. The brain regions that show activity during compassion include the anterior cingulate cortex (involved in nociception and empathy), amygdala (involved in threat detection), and medial prefrontal cortex (mPFC, involved in social processing and negative emotion), which are all implicated in pain response as well as the ventral tegmental area/substantia nigra/ventromedial striatum (VTA/SN/VS, involved in dopamine reward circuitry) and temporal parietal cortex (involved in theory of mind and moral judgment) which are both regions implicated when subjects are primed to experience feelings of love (Goetz, Keltner, & Simon-Thomas, 2011). Another particular area of the cerebral cortex known as the right supramarginal gyrus has also been shown to be instrumental for compassion; it allows people to overcome their own emotional experience to be able to experience the emotional states of others (Silani et al., 2013). General sympathetic nervous system response can also be modulated by compassion (Inagaki & Eisenberger, 2016) and mirror neuron systems have been implicated as potentially important for experiencing the state of others (Gallese et al., 1996, Rizzolatti & Craighero, 2004). Moreover, in a study reviewing the literature of the neurostructural underpinning of psychopathy, amygdala was found to be the region with

most consistent impairment relative to controls and most directly tied to deficits in experienced empathy and compassion when responding to stimuli of the suffering of others (Blair, 2013).

The view of compassion offered by the neurochemical and neurostructural lenses is unsurprisingly complex, given the complexity of compassion itself. Neurochemically, dopamine and oxytocin are highlighted in the felt sense of compassion and the enacting of compassionate behaviours, but undoubtedly such intricate experiences cannot be reduced to these two neurotransmitters alone. Neurostructurally, we can draw rough lines between the component of compassion and certain structures: the amygdala, ACC, and mPFC, seem highlighted in perceiving negative emotion, while TPC and supramarginal gyrus seem particularly important for processing the state of others, while finally the VTA/SN/VS system helps to reward taking the compassionate action itself.

Self-Determination Theory (SDT)

Self-Determination Theory, proposed by Deci and Ryan, posits three central pillars to intrinsic motivation: autonomy, competence, and relatedness. Autonomy is the desire to be a causal agent in one's own life and to act in a manner that is aligned with one's integrated self. Competence is the desire to determine and control an outcome. Relatedness is the desire to interact with, connected to, and care for others (Ryan & Deci, 2000; 2018). Some more recent developments also suggest a potential fourth psychological need: beneficence, the desire to give to others (Hui & Kogan, 2018; Martela & Ryan, 2016; 2020)

Self-determination theory explains motivation as a state, from a moment-to-moment basis. SDT conceptualizes autonomy by differentiating between an internal motivation and external motivation. Internal motivation generates behaviour that is done for its own sake, while external motivation generates behaviour that is done in order to achieve a valued goal (Ryan &

Deci, 2000). Behaviours vary in how autonomous, self-motivated or volitional they are along a spectrum of volition. On one end, autonomous motivation is experienced as emanating from or congruent with one's self, or having an internal perceived locus of causality (deCharms, 1968; Ryan & Connell, 1989); they reflect one's values or interests i.e. when one feels like they acted by it was their choice. On the other end: controlled motivation, experienced as emanating from self-imposed pressures (e.g. shame or pride) or from external contingencies or controls, arises from a desire to maintain self-esteem, please others, or obey demands among other reasons, they have an externally perceived locus of causality.

Autonomy has been demonstrated to be a mechanism through which people derive benefits from prosocial behaviours (Nelson et al., 2015). While on the other hand, reduced autonomy could undermine benefits of prosocial behaviour directly (i.e. simply due to less autonomy itself) but reducing autonomy also undermines the other two psychological needs of SDT as well. Competence is reduced because the behaviour is not seen as originating in the self (Deci & Ryan, 1985b; Nix, Ryan, Manly, & Deci, 1999) and it therefore makes it more difficult to mentally ascribe the outcomes of the behaviour to one's own capacities and skills. Prosocial behaviour in general tends to have the effect of increasing self-efficacy and competence over time (Alessandri et al., 2009). Relatedness is also reduced because the behaviour cannot be attributed to genuine caring etc. but instead external contingencies. In fact, in cases where autonomy is low, the person may be acting against the self for the benefit of the other, a case where the outcome might sacrifice relatedness rather than increase it. In this case, an act of kindness might be enacted more out of a sense of duty or obligation than of compassion. Beneficence is a proposed fourth need within SDT. While less universal than the other needs, many people appear to demonstrate a similar pattern of enhanced wellbeing when this need is

satisfied and reduced wellbeing when it is left unsatisfied (Hui & Kogan, 2018) This seems concordant with evolutionary models that suggest compassion is ‘built-in.’

The work of Hui & Kogan, (2018, 2019) tested two competing theories: a deprivation model, where people with the lowest trait autonomy benefit the most from prosocial behaviour (the thinking going that by acting in an atypically prosocial manner they accrue particular benefit from the novel behaviour) versus a sensitization model, where those with highest trait autonomy benefit the most from prosocial behaviour (the thinking going that those who already tend to act prosocially are acutely attuned to its benefits and might be able to gain more from prosocial action). Their work ended up supporting the deprivation model, suggesting that people who are lower in trait autonomy benefit the most from prosocial behaviour such as compassionate actions. These results also demonstrates the central role that autonomy in particular plays in accruing benefit from helping others.

Wellbeing and Prosocial Behaviour

The positive psychology movement brought renewed focus on improving psychological wellbeing by increasing positive mood in addition to decreases in negative mood. As the literature has developed, many interventions have been created and tested to determine their impacts on psychological wellbeing (Hui et al., 2020; Inagai & Orehek, 2017; Seligman 2005; Sergeant & Mongrain, 2011; Shapira & Mongrain, 2010).

Experimental studies performed so far have compared groups of subjects who are told to perform an act of kindness compared to control subjects who either did not perform an act for another or instead performed an act for themselves. While these studies, being experiments, are methodologically superior to the correlational studies insofar as they are best able to make causal claims about behaviours and outcomes, their limitation is that the acts of kindness are being

prompted or externally proscribed and therefore give limited insight into prosocial behaviour as it occurs naturalistically (i.e. “in the wild”). From the perspective of SDT, experimental studies of this kind are problematic since the psychological benefits of prosocial behaviours are, according to SDT, due in part to enacting the behaviour because of internal motivation. Therefore, while these kinds of experiments might help us determine the outcome of being instructed to perform a kind act, they do not necessarily provide insight into the outcome of kind acts as they occur in everyday life. While the study comprising the present thesis is not an experiment, it provides insight into the moment-to-moment outcomes of compassionate actions as they occur in day-to-day life.

The experience sampling method is a longitudinal data collection method originally developed by Larson & Csikszentmihalyi (1983), that prompts participants to respond to data collection questions in real-time at various points throughout their day-to-day lives. This method is easy to administer due to the ubiquity of cell phones and also has the distinct advantage of providing data that is far more ecologically valid than laboratory studies since experiences are sampled by participants in the course of their normal lives, and not in an artificial environment. The aim of the study is to tease apart the effects of mood and compassionate action as they occur naturalistically, a process that experience sampling lends itself well to.

Overview and Current Study

While much previous research has established that it broadly ‘feels good to do good’, (Alden & Trew, 2013; Buchanan & Bardi, 2010; Chancellor et al., 2017; Hui et al., 2020; Lalous et al., 2017; Mongrain, Chin, & Shapira, 2011; Nelson et al., 2015; O’Connell, O’Shea & Gallagher, 2016; Trew and Alden, 2015; Weinstein & Ryan, 2010) few experiments have (1) explored how motivation influences the felt impact of doing good and (2) examined the effect of

these actions in the context of day-to-day life. The present study aims to follow people over the course of two weeks to capture their naturalistic experiences of taking compassionate actions while simultaneously measuring their wellbeing and its fluctuations before and after these actions.

Baseline data, which consisted of demographic and personality variables were collected through an online website, called *ProjectHOPE4U*. Participants then submitted experience sampling data over the course of two weeks, consisting of wellbeing variables and compassionate actions through a cellphone application we designed, called the *Compassion App*. Throughout a two week period participants went about their day and received prompts on their cell phone twice a day to report their mood ([see appendix] with questions adapted from the Positive And Negative Affect Schedule [PANAS], Watson, Clark, Tellegen, 1988; Thompson, 2007) and also indicate if they performed a compassionate action in the past half day (as part of the Compassionate Action Questionnaire [see appendix], including how volitional or externally pressured the compassionate action was). Participants' mood and compassionate actions were then analyzed to a) replicate previous research indicating that compassionate actions predict higher wellbeing and that higher wellbeing predicts more compassionate actions and b) to determine the extent to which the autonomy with which a compassionate action is taken affects these associations.

Hypotheses

- 1) Compassionate action will predict subsequent positive mood.
- 2) Positive mood will predict subsequent compassionate action.
- 3) More *autonomous* compassionate actions will differentially predict subsequent positive mood.

Method

Participants

There were 85 participants in this study who participated in the experience sampling. They were a subset of 320 participants who completed an online baseline questionnaire. They were aged 18 to 35 years ($M = 20.5$ years, $SD = 3.5$). They were primarily female (78%), the majority was single (76%) with the remaining (34%) being in relationships. The sample was ethnically varied, with 15% identifying as Asian, 11% White, 5% each Black, East Indian, and Middle Eastern, 4% Mixed, and 2% Hispanic.

Procedure

This study was reviewed and approved by the Office of Research Ethics at York University and participants provided informed consent to participate in the study. Participants were recruited from a convenience sample of students attending an introductory undergraduate psychology course at York University in June 2018. Participants were entered into a draw to win one of four \$200 Amazon gift cards in partial compensation for their participation. The first phase of the study involved completing a web-based battery of self-report questionnaires which collected demographic information and measured trait variables at baseline. The second (and primary) phase of study involved downloading the cellphone app, named the *Compassion App* which we created for the two-week experience sampling portion of the study, described below.

Measures and Materials

Qualtrics was used to provide a web-based questionnaire to collect baseline data and demographic information from the study participants. At the end of the Qualtrics questionnaire a

unique link was generated for each participant to download the *Compassion App* onto their phones for the experience sampling portion of the study.

The *Compassion App* was developed using MetricWire, a platform that can be used to quickly create data collection and survey apps for iPhone and Android. The app was used to implement experience sampling, a procedure where participants were prompted and presented with the questionnaires at prespecified timepoints throughout their day. The *Compassion App* triggered push notifications on participants' cell phones at pre-specified times of the day and prompted the participants with questions about their mood state and whether they had performed compassionate actions in the previous interval of time (see Appendix) This app was used to push notifications to participants on their phones to complete surveys twice a day (at noon and 7:00 pm), every day for two weeks. All the measures for the experience sampling were administered solely through the app.

Compassionate Action Questionnaire. We developed the Compassionate Action Questionnaire (see Appendix) for this study in order to determine whether a compassionate action occurred, how closely the compassionate action matches current theories of compassion (Gilbert 2020), and the extent to which the motivation for the compassionate action was autonomous versus controlled as per Self-Determination Theory. This 11-item questionnaire was developed to be quick and easy to complete through the *Compassion App*, which would prompt the participants to complete it twice a day. The present study analyzes the data from items 1 (whether a compassionate action occurred) and items 10 and 11 (the extent to which the action felt autonomous versus controlled) and are explained more in depth below. Items 2-9 asked for details about the compassionate action such as their relationship to the recipient, and additional Yes or No questions about their intentions, actions, and results of the compassionate action.

Compassionate Action. The first item was used to determine if a compassionate action was performed in the past half of the day “Were you able to make a difference to someone during the past half of the day?” When participants indicated that they had performed a compassionate action the app would proceed through items 2-11 to determine more information about the compassionate action. If no compassionate action was taken, the app would halt the Compassionate Action Questionnaire and proceed to the wellbeing measures.

Autonomous and Controlled Motivation. The following item was used to assess the degree of autonomy in the act of compassion performed in the previous half day. “To what extent was your compassionate behaviour freely chosen?” (item 10, indicated on a 1 to 5-point Likert scale) while “To what extent did you feel externally pressured to act compassionately? (item 11, indicated on a 1 to 5-point Likert scale) was used to determine how controlled the compassionate action was perceived by the participant. These two items were adapted from Basic Psychological Need Satisfaction Scale (Deci & Ryan, 2000; Gagné, 2003) to provide a quick-to-administer face-valid assessment of felt autonomy of their compassionate action in order to minimize burden on the participants and decrease attrition. While these are single items and therefore lack some of the robustness of a multi-item scale, the items showed good discriminant validity with each other $r(1130) = -.23, p = 0.01$. While the negative correlation provides evidence of discriminant validity, the low magnitude of the correlation indicates that the items should be considered separately (rather than be combined into a composite measure).

Positive and Negative Affect Schedule (PANAS; Watson, Clark, Tellegen, 1988; Thompson, 2007). The PANAS is a 10-item self-report Likert scale containing five items each for positive and negative mood, for example “Indicate the extent to which you feel happy” from 1 (Not at All) to 5 (Extremely). The psychometric properties of the PANAS have been tested in a

non-clinical general population to have high reliability, with a Cronbach's α of .89 and .85 for the positive and negative affect scales respectively (Crawford & Henry, 2004) and in our data the Cronbach's α of the scale was found to be .91 for both of its scales. The items are all highly face valid. The PANAS has also demonstrated convergent validity with other mood scales and strong item validity with positive and negative mood items strongly loading on their respective factors through a principal component analysis (Crawford & Henry, 2004). The exact version of the PANAS that was adapted for experience sampling was the international-PANAS-short form (I-PANAS-SF, Thompson, 2007).

Analysis

Analysis was performed using JASP and R using the nlme (Linear and Nonlinear Mixed Effects Model) package. Experience sampling is an observational and longitudinal data-collection method, which by virtue of having data on participants at multiple time points is able to use mixed-models time-lagged analysis. This makes the method ideal to address the question of what kinds of moods and actions precede others. The method is adapted from Snippe et al. (2017) and Raposa et al. (2016) to examine the effects of mood and behaviour at time t from preceding mood and behaviour at time $t-1$. For example, if a participant reports high positive mood in the evening (for this example, time t) we can look at the previous time point at noon (time $t - 1$) to see if a compassionate action preceded the mood. By applying this technique, it becomes possible to explore whether states or actions at previous time points (time $t - 1$) predict those at the next time point (time t). These types of analyses are susceptible to a type of confounding called autocorrelation, which is the tendency for the same measurement taken at different time points to correlate with itself. For example, if a person is observed to be happy after performing a compassionate action it might not be that the behaviour led to the happiness

but instead that people who are happier in general tend to perform more compassionate behaviours and report higher happiness. Autocorrelation was controlled for through the use of a linear mixed model estimated using REML criterion in which DV = predictor controlling for DV_{t-1} to determine the fixed effects of the predictor while accounting for the random effects within and between the participants.

Results

Three-hundred twenty students completed the first phase of the study, which involved completing a web-based battery of self-report questionnaires. These baseline measures collected demographic information and measured trait variables. A subset of participants ($N = 85$) downloaded the cellphone app (named the *Compassion App*) and participated in the second phase of the study, which involved the two-week experience sampling procedure. The 85 participants completed the mobile app surveys 1132 times ($M = 13.5$ times/participant, $Median = 13$ times) over the two-week period. Most participants completed the surveys about half of the time, response rates at particular time points peaked at 66% early in the study and decreased to 41% by the end of the two week period, this level of attrition is common for app-based experience sampling procedures. Participants reported performing a total of 319 compassionate actions over the sampling period (equating to 33% of time). Friends and relatives constituted the majority of recipients of the compassionate actions: friend (33%), relative (31%), partner (15%), stranger (15%), peer/co-worker (15%), child (6%), and neighbour (6%).¹

Correlations

Simple correlations were run on five variables averaged over the two-week sampling period (see Appendix): (1) compassionate action, (2) autonomous motivation (average extent

¹ (note multiple categories could be chosen per recipient so the total exceeds 100%):

compassionate actions were freely chosen), (3) controlled motivation (average extent compassionate actions were externally pressured), (4) positive mood (average positive affect), and (5) negative mood (average negative affect).

The correlations (see Appendix, Table 1) indicate that the Compassion Action Questionnaire items used to assess the extent to which a compassionate action was taken freely (autonomous motivation) was negatively correlated with the item assessing where it was externally pressured (controlled motivation) $r(1130) = -.23, p = 0.01$, as expected. This negative correlation provides good discriminant validity for these items while the low magnitude of the correlation indicates that the items should be considered separately (rather than be combined into a composite measure).

Performing more compassionate actions was correlated with higher positive affect $r(1130) = .23, p = 0.02$ demonstrating that people who performed more compassionate actions tended to report higher positive mood. However, performing compassionate actions with highly controlled motivation was correlated with higher negative affect, demonstrating that people who felt externally pressured to act compassionately tended report more negative mood.

Multilevel Analysis

Linear mixed models were used to explore the longitudinal data using time-lagged variables while also accounting for the effects of autocorrelation (see Appendix, Table 2). The first model uses the within person reports (up to twice a day) of compassionate action to predict affect over the next half-day. The results of this analysis indicated that performing a compassionate action predicted higher subsequent positive mood ($b = 0.24, 95\% \text{ CI } [0.12, 0.35], t(686) = 3.97, \beta = 0.06, p < 0.001$). Performing a compassionate action did not, however, predict changes in negative mood ($b = -0.06, 95\% \text{ CI } [-0.19, 0.08], t(639) = -0.84, \beta = 0.07, p = 0.399$).

The second model uses affect to predict the likelihood of performing a compassionate action. The results of this analysis indicated that positive mood did not predict frequency of enacting compassionate actions ($b = 0.02$, 95% CI [-0.03, 0.06], $t(680) = 0.75$, $\beta = 0.02$, $p = 0.453$) nor did negative mood ($b = 0.003$, 95% CI [-0.04, 0.03], $t(620) = -0.17$, $\beta = 0.02$, $p = 0.866$). Therefore being in a positive or negative mood did not predict subsequent actions of compassion.

The next set of analyses examined the contextual factors surrounding the compassionate action. More specifically, the degree to which the compassionate action was freely chosen was entered as a predictor of positive and negative affect. The more freely chosen the compassionate action was, the more it predicted subsequent positive mood ($b = 0.15$, 95% CI [0.03, 0.28], $t(143) = 2.39$, $\beta = 0.14$, $p = .020$). The extent to which the compassionate action was freely chosen was not found to predict subsequent negative mood ($b = -0.09$, 95% CI [-0.22, 0.03], $t(133) = -1.52$, $\beta = -0.11$, $p = 0.131$).

Conversely, and in line with the more general finding of the correlation matrix, feeling externally pressured into a compassionate action predicted future negative mood ($b = 0.11$, 95% CI [0.02, 0.21], $t(134) = 2.30$, $\beta = 0.10$, $p = 0.031$). Feeling externally pressured into a compassionate action did not, however, predict any change in future positive mood ($b = -0.07$, 95% CI [-0.16, 0.03], $t(145) = -1.45$, $\beta = -0.07$, $p = 0.149$).

Over the course of two weeks, participants reported acting compassionately 33% of the time. When they did so, they experienced greater positive mood over the next measurement period (half day). Contrary to the hypothesis, acting compassionately did not decrease negative mood. The unique finding of this study was that freely chosen compassionate action led to greater improvements in positive mood. If you do something good because you want to, you feel

good because of it. Externally pressured (sometime called, “controlled”) compassionate action actually led to greater *negative* mood over the next measurement period. If you do something good but you did not want to, then the impact on your wellbeing reverses and you instead feel worse for helping.

Discussion

The results of the present study demonstrate that taking compassionate actions predicted greater positive mood during next half of the day, (they did not, however predict any changes in subsequent negative mood). This finding aligns with randomized controlled trials (RCTs) that demonstrate a causal link between prosocial behaviours and positive mood (Aknin, Barrington-Leigh, et al., 2013; Aknin, Broesch, Hamlin, & Van de Vondervoort, 2015; Aknin, Dunn, Sandstrom, & Norton, 2013; Aknin, Fleerackers, & Hamlin, 2014; Anik et al., 2013; Whillans et al., 2016). The present study explores compassionate actions as they occur naturalistically, whereas the RCTs all randomize some individuals to conditions where they are instructed to perform compassionate actions and compares their wellbeing to controls who performed a non-prosocial task. While our non-experimental design is unable to establish a causal connection between compassionate actions and greater subsequent wellbeing, the fact that compassionate actions predicts subsequent wellbeing is suggestive that compassionate actions taken naturalistically in the course of day-to-day life could plausibly have the same effect.

The psychological literature continually demonstrates a positive association between compassionate actions and wellbeing, a finding that is robust across many different operationalizations of both compassionate action and wellbeing (Mascaro et al., 2020). Moreover, they have been shown to be mutually causal: when people perform compassionate actions they feel good and when people feel good they perform compassionate actions (Alden &

Trew, 2013; Buchanan & Bardi, 2010; Chancellor et al., 2017; Hui et al., 2020; Layous et al., 2017; Mongrain, Chin, & Shapira, 2011; Nelson et al., 2015; O’Connell, O’Shea & Gallagher, 2016; Trew and Alden, 2015; Weinstein & Ryan, 2010). Still relatively nascent is the literature on the nuance, caveats, and boundary conditions of these findings: under what circumstances do the effects occur and under what circumstances do they not? What type of compassionate action has an effect and on what type of wellbeing? This study explores compassionate actions through the lens of self-determination theory to provide caveats to which types of motivation for compassionate actions yields benefits to wellbeing.

The present study also demonstrates that more autonomously enacted compassionate actions differentially predicted subsequent wellbeing than less autonomously enacted compassionate actions. More specifically when compassionate actions felt freely chosen they predicted greater subsequent positive mood.

The findings of this research suggest that compassionate actions performed volitionally were predictive of future positive affect. That is, when actions were freely chosen, participants later reported higher positive mood, a warm glow from the good deed. Conversely, when participants performed compassionate actions that were compelled by circumstance, feeling as though they were externally pressured, they later experienced no increase in positive mood and instead reported increased negative mood. Anecdotally, it is easy to imagine how helping another person reluctantly, begrudgingly, or out of a sense of obligation or duty could result in frustration or resentment rather than unilaterally bolster wellbeing (Reyniers & Bhalla 2013).

Self-determination theory’s psychological need of autonomy proved to be an essential component for predicting the mood that follows compassionate actions. SDT would posit that the increase in positive mood following volitional compassionate actions is in part a consequence of

fulfilling autonomy, one of its three central pillars. Autonomy is seen as a universal and innate psychological need, so taking actions that feel autonomous fulfill this need and therefore lead to enhanced wellbeing (Ryan & Deci, 2000; 2018).

The finding that externally pressured compassionate actions predicted future negative mood can similarly be understood through the theoretical framework of SDT. When their compassionate actions were not perceived to be volitional, the ensuing negative mood can be understood to result from the stifling of their autonomy: the actions were taken *despite* the person's preference, not *because* of them. Moreover, the SDT's two other pillars may similarly be undermined. Fewer volitional actions are less likely to be seen as competence-building, since one feels as if one is acting against one's interests rather than demonstrating one's abilities. Similarly, when enacted reluctantly, compassionate actions could undermine a sense of relatedness instead of enhancing it, breeding resentment instead of connection (Ryan & Deci, 2000; 2018). Reluctant compassionate actions still, however, fulfil the proposed fourth psychological need of beneficence. Despite this, a reluctant compassionate action may tend to stifle autonomy more than it enhances beneficence, resulting in a net negative effect on mood (Hui & Kogan, 2018).

Some limitations of the study are inherent to the study design. For example, while this study replicated previous findings that compassionate actions boost wellbeing (ref) it failed to detect a statistically significant result that the converse is true: that those in a positive mood tend to do more compassionate actions. This may in part be due to time elapsed between prompts given the manner reporting: compassionate actions were reported retrospectively ("Were you able to make a difference to someone during the past half of the day?") while wellbeing was reported in the moment ("Indicate the extent to which you feel happy"). Compassionate actions

done more recently are more likely to be recalled, allowing for a tighter link between a remembered compassionate action and present mood, whereas if a compassionate action was taken too early in the time window, it may be less likely to be recalled at the next time of reporting. Follow-up studies could prompt participants more than twice a day to minimize how the time elapsed between responses.

Another limitation is simply that our experience sampling app prompted responses only twice a day, meaning many hours may elapse between a compassionate action and a mood state. It is likely that the boost felt by compassionate actions are more pronounced shortly following the action and that a person's mood state slowly returns to their baseline, sometimes termed the hedonic treadmill (Frederick, S., & Loewenstein, G., 1999; de Lima et al., 2018). On one hand, the subsequent mood predicted by autonomous compassionate actions likely varies even more than our study demonstrated, the magnitude of change is likely larger, while on the other hand, the fact that subsequent mood states were predicted with such long intervals means that the mood changes are fairly enduring.

While our study focused on how SDT's psychological need of autonomy differentially predicts subsequent wellbeing, future research could explore the connection between compassion action and SDT's two other pillars: competence and relatedness. Successfully performed compassionate actions could also enhance the psychological need for competence, by making the actor feel as though their actions were effective and had an impact. The psychological need for relatedness, could plausibly be indirectly affected by the autonomy of the compassionate action: feeling externally pressured to perform a compassionate action could undermine how related one feels, leading to resentment instead of a deeper connection. Future research could explore both of these psychological needs to see how they interact. Yet still

another pathway through which compassionate actions can be seen to enhance wellbeing is through SDT's more newly proposed fourth need: beneficence, the desire to give to others (Hui & Kogan, 2018; Martela & Ryan, 2016; 2020). One can feel that their needs are adequately addressed: having sufficient autonomy, competence, and relatedness, but still feel a need to give to others, and compassionate actions can be seen as a behaviour that helps embody fulfilment of that need. Despite looking solely into autonomy and not the other psychological needs of SDT, autonomy proved able to predict subsequent wellbeing outcomes.

The differential results seen for freely chosen compassionate actions (predicting subsequent positive mood) and externally pressured compassionate actions (predicting subsequent negative mood) also help differentiate naturalistic compassionate actions, those that occur of their own accord "in the wild," and prescribed compassionate actions, those that occur in randomized controlled trials or other study designs. Helping another person because you felt that you wanted to is not a perfect analogue for helping someone because you've been told to. This study suggests that the positive psychological benefits of helping others may diminish or reverse when the same behaviour is compelled instead of volitional. Randomized controlled trials (RCTs) like those that compare spending money on another versus oneself, come with the caveat that they compare behaviours that are prescribed by the researcher, not initiated by the participant. And while some studies provide choice in their design (Dunn & Aknin, 2008), that choice is still constrained. Our research therefore suggests that naturalistically initiated compassionate actions could plausibly result in larger benefits to one's wellbeing that can be found in research designs where participants are prescribed to take a certain behaviour.

Moreover, prescriptions for behaviour are commonly made based on basic research, especially for research that falls under the umbrella of "positive psychology." The descriptive:

“compassionate actions leads to higher wellbeing” is regularly transmuted into the prescriptive: “people should take more compassionate actions.” Falling in line with SDT, the gap between these two statements is that enacting a behaviour because you chose to do so does not have the same impact as enacting a behaviour because you were told to or because you feel that you must. This research helps highlight the caution needed in too readily jumping to prescriptions of behaviour.

Data collected on the relationship of the compassionate actor and the recipient and indicated most recipients were family and friends. Future research could explore how particular relationships pull for more autonomous versus controlled interactions. Depending on the relationship dynamic, being close to the recipient could make acting compassionately feel more naturally autonomous, for example an innate willingness to help one’s own child, or more externally pressured, for example helping one’s parents out of a sense of duty. While on the other hand, helping strangers is likely to be more autonomous as norms dictate that people are less responsible for those who they do not know. These dynamics could be important to research in future studies.

The result that externally pressured compassionate actions predict greater negative wellbeing instead of the more general trend that compassionate actions lead to positive wellbeing could also prove to be relevant for the growing literature on both compassion fatigue and caregiver burnout. Helping others at the expense of oneself by continually taking compassionate actions out of a sense of duty or obligation could erode one’s autonomy according to SDT and lead to worse wellbeing outcomes over time. Our research provides a useful corrective that helping others is not in itself sufficient to bolster one’s wellbeing and factors of how autonomous someone’s helping is plays a role in predicting how they will later feel.

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Appendices

Measures

Compassionate Action Questionnaire (CAQ)

- 1) Were you able to make a difference to someone during the past half of the day? [Y/N]
- 2) The person you were compassionate towards was your: [relationship] (e.g. sibling, friend, stranger etc.)
- 3) Was this person a dependent of yours? [Y/N]
- 4) I know how to help other people when they are distressed. [Y/N]
- 5) I focused on what was likely to be helpful to them. [Y/N]
- 6) I came up with helpful ways for them to cope with their distress. [Y/N]
- 7) I took the action to help them. [Y/N]
- 8) I expressed feelings of support and encouragement towards them. [Y/N]
- 9) Was your helping well-received by them? [Y/N]
- 10) To what extent was your compassionate behaviour freely chosen?
Not at all (1) (2) (3) (4) (5) Extremely
- 11) To what extent did you feel externally pressured to act compassionately?
Not at all (1) (2) (3) (4) (5) Extremely

International-Positive And Negative Affect Schedule (I-PANAS-SF, adapted for experience sampling)

Indicate the extent to which you feel safe	Not at all (1) (2) (3) (4) (5) Extremely
Indicate the extent to which you feel ashamed	Not at all (1) (2) (3) (4) (5) Extremely
Indicate the extent to which you feel happy	Not at all (1) (2) (3) (4) (5) Extremely
Indicate the extent to which you feel determined	Not at all (1) (2) (3) (4) (5) Extremely
Indicate the extent to which you feel content	Not at all (1) (2) (3) (4) (5) Extremely
Indicate the extent to which you feel hostile	Not at all (1) (2) (3) (4) (5) Extremely
Indicate the extent to which you feel inspired	Not at all (1) (2) (3) (4) (5) Extremely
Indicate the extent to which you feel alert	Not at all (1) (2) (3) (4) (5) Extremely
Indicate the extent to which you feel upset	Not at all (1) (2) (3) (4) (5) Extremely
Indicate the extent to which you feel nervous	Not at all (1) (2) (3) (4) (5) Extremely
Indicate the extent to which you feel afraid	Not at all (1) (2) (3) (4) (5) Extremely
Indicate the extent to which you feel active	Not at all (1) (2) (3) (4) (5) Extremely
Indicate the extent to which you feel secure	Not at all (1) (2) (3) (4) (5) Extremely
Indicate the extent to which you feel attentive	Not at all (1) (2) (3) (4) (5) Extremely

(PANAS; Watson, Clark, Tellegen, 1988; Thompson, 2007)

Table 1. Correlation matrix of compassionate actions (CAs) and average affect

<i>Measures</i>	1	2	3	4	5
1. Proportion reporting CA	—				
2. Extent CAs Autonomous	0.15	—			
3. Extent CAs Controlled	-0.10	0.23*	—		
4. Positive Affect (mean)	0.23*	0.18	0.05	—	
5. Negative Affect (mean)	-0.08	-0.03	0.27*	0.07	—
Mean	33%	4.39	1.91	3.09	1.72
SD	25%	0.74	1.06	0.63	0.67

* $p < .05$, ** $p < .01$, CAs measured by Compassionate Actions Questionnaire, Affect measured by I-PANAS-SF adapted for experience sampling, $N = 1132$

Table 2. Linear Mixed Model Results

Model 1. Predictors	Positive Affect			Negative Affect		
	<i>b</i>	<i>SE</i>	<i>p</i>	<i>b</i>	<i>SE</i>	<i>p</i>
Compassionate Action (t-1)	0.24	0.06	<.001*	-0.06	0.07	0.399
Autonomous (freely chosen) (t-1)	0.15	0.06	0.020*	-0.09	0.06	0.131
Controlled (externally pressured) (t-1)	-0.07	0.05	0.149	0.11	0.05	0.031*

Model 2. Predictors	Compassionate Action		
	<i>b</i>	<i>SE</i>	<i>p</i>
Positive Affect (t-1)	0.02	0.02	0.453
Negative Affect (t-1)	0.003	0.02	0.866

[(t-1) indicated the preceding time]