

## **Gratitude and Compassion**

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In L.F. Barrett, J.M. Haviland-Jones, & M. Lewis (Eds.)

*Handbook of emotion, 4th Ed* (pp. 835-846). New York: Guilford Press.

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Gratitude and compassion stand as some of the best exemplars of affective states tied to sociality. Unlike many other emotions, their evocation and intensity require interaction with another. The other need not be human, of course, as individuals can feel grateful to a divine entity or compassion for an animal in pain. Such others, however, must be perceived as sentient (or at least usually so). This close tie to social interaction marks these emotions as somewhat special in terms of their functionality, as at base they primarily function to build social capital and wellbeing over the long run (Bartlett & DeSteno, 2006; DeSteno, 2009; Valdesolo & DeSteno, 2011).

Although many dilemmas faced in social life might be framed as decisions between selfish and selfless behaviors (e.g., choosing to help another at some cost to oneself), most may also be understood as a tradeoff between immediate and long-term gain. For example, refusing to repay a debt to someone might leave one with more financial or hedonic rewards in the moment, but long-term, it bodes ill for the development or continuation of a relationship that would likely offer greater rewards aggregated over time. Accordingly, many social dilemmas fit within an intertemporal choice framework (DeSteno, 2009). As its name implies, intertemporal choice refers to a situation where decisions hold different consequences as time unfolds. Combine this framework with the fact that the mind tends to overly discount the value of future rewards, and one readily recognizes the fact that humans possess something of a built-in bias for immediate gratification (Ainslie, 1975).

Within the realm of social interaction, gratitude and compassion appear to motivate decisions and behaviors meant to build resources, and thus wellbeing, for the long-term. That is, they increase the probability that individuals will act in ways that tend to increase the strength

and stability of interpersonal relationships and wellbeing over time, even though such acts require immediate costs to oneself in terms of effort, time, or money. Of import, the benefits of these emotions likely derive not only from their influence on an experiencer's choices, but also from the impact their expression has on others witnessing it. That is, the expression of these emotions may serve as markers to others of an individual's motive to behave in a manner meant to benefit relationship development (e.g., Williams & Bartlett, 2014). One, gratitude, functions to do so by nudging individuals to pay back benefits that have been given to them by others, while simultaneously suggesting to observers that grateful individuals are worthwhile relationship partners. The other, compassion, often motivates the initial impulse to offer assistance in the first place. Together, they get and keep the wheels of social exchange greased. In what follows, we examine each state individually.

### **Gratitude**

Gratitude is a positive emotion one feels with the receipt of a gift from another person or entity (i.e., a higher power). The gift can be tangible in nature or intangible—like help in a time of need—but must be perceived by the recipient as positive, intentional, and beneficial, for gratitude to result (McCullough, Kilpatrick, Emmons, & Larson, 2001). Phenomenologically, gratitude, unlike indebtedness, is experienced as a positive state, but one that is differentiable both cognitively and behaviorally from a more general feeling of positive affect (Bartlett & DeSteno, 2006; Emmons & McCullough, 2003; Watkins, 2007). As noted above, a primary purpose of gratitude is to build long-term wellbeing through directly or indirectly enhancing the value placed on decisions and behaviors that maximize virtue and its associated increases in social capital. Here, we will first review gratitude's role in shaping relationships, and then examine its benefits for personal wellbeing.

## **Benefits for Relationships**

**Helping.** Much of the recent literature has considered how gratitude acts to build and maintain relationships. It helps people accept short-term costs (i.e., spending time or money to help someone else) in exchange for long-term gains (i.e., building a strong relationship one can rely on in the future). In particular, gratitude seems to promote helping behavior, which likely bolsters feelings of trust within a relationship that subsequently strengthen cooperation. In support of this notion, Bartlett and DeSteno (2006) conducted a series of experiments that induced gratitude by confronting participants with a problem and then having them receive the assistance of another to fix it. They found that grateful individuals were not only more willing to agree to help their benefactor or a complete stranger subsequently, but also devoted more effort to doing so than did individuals who were experiencing a neutral affective state. Of import, this effect of gratitude on helping clearly diverged from that of a more general positive state. Individuals who were induced to experience happiness as opposed to gratitude did not engage in any increased helping behavior. Additionally, Bartlett and DeSteno (2006) ruled out the possibility that increased helping derived from simple awareness of norms for reciprocity or “paying-it-forward” by using a paradigm to correct for affective misattribution (cf. Schwarz & Clore, 1996). When individuals feeling grateful were reminded to whom those feelings applied, increased efforts to aid the stranger disappeared. Binding the feeling of gratitude to its source prevented its use as an informational cue to acquiesce to the requests of aid of another.

Attesting to the link of gratitude and prosocial helping, several other researchers have reported similar findings. For example, grateful individuals reported increased motives to give back to others (Algoe & Haidt, 2009), and expressions of gratitude by one person motivated receivers of that expression to work harder to assist him or her (Grant & Gino, 2010). Thus, it

appears that gratitude can serve both (a) to motivate people to reciprocate helping—which, over time, could potentially inspire a cycle of mutual give-and-take that would strengthen the relationship—as well as (b) to “pay it forward”—using gratitude toward one individual to inspire prosociality in the general social sphere. These provisions of assistance, although requiring an initial cost in terms of hedonic, temporal, or physical resources, function to foster social capital, which will be of future benefit.

**Forming relationships.** For individuals to receive the benefits associated with social relationships, they must first meet the challenge of forming a bond with others. Here, gratitude has clearly been shown to play a supportive role. For example, work by Algoe, Haidt and Gable (2008) examined the ways in which gratitude influenced the relationships between new members of a sorority and their assigned “big sisters.” After new “little sisters” initially joined the sorority, big sisters would give them anonymous gifts for a week. The gratitude that little sisters felt during that first week predicted their feelings of relationship quality not only at that time, but also one month later. In addition, little sisters’ gratitude also predicted how their big sisters viewed the relationship. Stronger expressions of gratitude by gift recipients (i.e., little sisters) corresponded to more positive views of the relationships by their benefactors (i.e., big sisters). Thus, for both the benefactor and recipient, gratitude seemed to play a role in building a strong relationship—likely through inspiring a reciprocal relationship that would continue to grow.

In a similar vein, feelings of gratitude toward another stand as a primary predictor of intentions and desires to spend more time with a previously unknown benefactor in the future—a sign of a desire to attempt to construct a relationship from a single instance of gratitude toward a stranger (Bartlett, Condon, Cruz, Baumann, & DeSteno, 2012).

**Maintaining and strengthening relationships.** Once relationships have been formed, gratitude has also been shown to aid their maintenance. Participants instructed to think about a time when they were grateful to someone reported a motivation to repay this other, indicating a desire to maintain and continue the relationship (Algoe & Haidt, 2009). Other empirical findings demonstrated that expressing gratitude in relationships was associated with increasing relationship strength (Lambert, Clark, Durtschi, Fincham, & Graham, 2010). After controlling for variables including relationship length and relationship satisfaction, higher levels of gratitude expression significantly predicted higher levels of perceived relationship durability with regard to friendships and romantic relationships both immediately and after a six week lag. In addition, Lambert et al. (2010) confirmed that when controlling for relationship strength at outset, the act of expressing gratitude to a friend twice a week for three weeks significantly elevated the expressers' assessments of relationship quality at the end of this period.

In a reciprocal manner, receiving and experiencing gratitude within romantic relationships conveys important benefits as well (Gordon, Impett, Kogan, Oveis, & Keltner, 2012). Here, individuals who reported feeling more appreciated by their partners also reported feeling more appreciation for their partners. This effect occurred both at an overarching level, as well as in more micro, time-lagged situations. For example, feelings of appreciation and gratefulness on a given day were significantly associated with corresponding feelings on the next day. Moreover, attesting to the power of appearing grateful, gratitude expressed by one's partner predicted feelings of relationship commitment the next day. Finally, with regard to its impact on relationship stability, individuals who felt more grateful toward their partners at the start of the study were more likely to still be in the relationship nine months later, as compared to those with lower levels of gratefulness at baseline.

Other studies have also found relationships between gratitude and positive relationship outcomes. For example, gratitude levels on one day were found to predict increases in reported relationship connection and satisfaction on the next day (Algoe, Gable, & Maisel, 2010). Expressions of gratitude led people to feel more comfortable talking about concerns they may have for the relationship—an important way to make sure concerns do not go unaddressed and result in the deterioration of the relationship—and also led them to perceive their partner in a more positive light (Lambert & Fincham, 2011). For partners in long-term marriages, an individual's felt gratitude and expressed gratitude positively covaried with his or her feelings of marital satisfaction (Gordon, Arnett, & Smith, 2011). Furthermore, felt gratitude (but not expressed gratitude) also predicted the spouse's reports of marital satisfaction (Gordon, Arnett, & Smith, 2011). Finally, higher levels of gratitude for one's partner assessed over a one week period predicted increases in relationship commitment nine months later (Joel, Gordon, Impett, MacDonald, & Keltner, 2013).

Perceived responsiveness—acting in ways that show understanding, acceptance, and consideration of the other person's needs and thus evoke feelings of gratitude—also plays a central role in positive relationship outcomes. For example, Gordon and colleagues (Gordon et al., 2012) found that increased feelings of appreciation for one's partner on a given day strongly predicted increases in responsiveness to the partner on the next day. Employing a slightly different paradigm with a different sample, Gordon et al. (2012) also had third-party observers rate participants' responsiveness to their partners by watching a videotape of the couple interacting; here again, more appreciative participants were seen as being more responsive and committed to their partners and the relationship than those who were less appreciative. In a similar vein, Algoe and colleagues found that the intensity of expressions of gratitude witnessed

during a moment of exchange predicted improvements in the quality of a relationship six months later (Algoe, Fredrickson, & Gable, 2013). Kubacka, Finkenauer, Rusbult, and Keijsers (2011) likewise found responsiveness to be an important component of the gratitude experience such that it suggests a cyclical relationship for couples: Person A feels grateful for something and then acts to maintain the relationship (i.e., working in some way to promote relationship cohesion), which is then noticed by Person B, who feels Person A is acting in a responsive manner, which then causes Person B to feel grateful to Person A, followed by Person B then continuing the cycle. Thus it appears that gratitude and perceived responsiveness are linked, with gratitude functioning to motivate behavioral responses that build and maintain relationships.

**Promoting social inclusion.** Gratitude works at times to inspire not only relationship formation and maintenance, but also general social network development, spreading the effects of relationship building to larger social contexts by influencing social inclusion and cooperation. In the sorority study mentioned previously (Algoe et al., 2008), gratitude felt toward a particular sorority sister during one week predicted how integrated individuals felt within the sorority house as a whole at a later point, thus demonstrating that particular instances of gratitude can have far-reaching effects. Additionally, work by Bartlett and colleagues (2012) revealed that grateful individuals strove to include their previous benefactors in social situations in which they were being excluded. Perhaps more interesting was the fact that grateful individuals were willing to accept a financial cost to bring about this inclusion, thereby lending support to the idea that gratitude serves to promote social inclusion even at the cost of individual reward. Similarly, in a separate study, gratitude enhanced preferences for financial decisions that benefited communal interests as opposed to immediate profit accumulation (DeSteno, Bartlett, Baumann, Williams, & Dickens, 2010). That is, feelings of gratitude mediated decisions that favored the equal sharing

of profits through cooperation than the asymmetric accumulation of profits for one individual at the cost of another.

Using more macro levels of social networks, Froh and colleagues found that gratitude directly and indirectly predicted social integration, which then, itself, functioned to increase subsequent experiences of gratitude (Froh, Bono, & Emmons, 2010). A similar finding within the context of a medical support group showed that women diagnosed with breast cancer who both expressed their emotions and also were likely to respond to situations in a grateful manner reported an increase in perceived social support, as compared to women who did not express their emotions or respond to help in a grateful manner (Algoe & Stanton, 2012).

### **Benefits for General Wellbeing**

Gratitude has been examined both as a trait (i.e., a grateful disposition) and a state. Although not substantively different from the state classification, the notion of a trait classification can be best understood in this case as reflecting a tendency to experience gratitude more frequently due to an increased readiness to bring reciprocity-relevant cognitions to bear on events of daily life (cf. Barrett, 2012). Attesting to the benefits of gratitude, much research has documented positive correlations between a grateful disposition and aspects of general wellbeing (e.g., Emmons & Kneezel, 2005; McCullough, Emmons, & Tsang, 2002; McCullough, Tsang, & Emmons, 2004; for a comprehensive review, see Wood & Froh, 2010). More specifically, a tendency to experience gratitude has been found to positively covary with life satisfaction (Wood, Joseph, & Maltby, 2008), psychological wellbeing (Wood, Joseph, & Maltby, 2009), and a sense of “coherence” (a feeling that “life is manageable, meaningful and comprehensible;” Lambert, Graham, Fincham, & Stillman, 2009, p. 462). Moreover, in studies investigating gratitude’s relation to health outcomes, evidence has linked more experiences of gratitude to

fewer depressive symptoms (Krause, 2007; Lambert, Fincham, & Stillman, 2012), lower aggression (DeWall, Lambert, Pond, Kashdan, & Fincham, 2012), better physical health (Hill, Allemand, & Roberts, 2013), and even better sleep (Wood, Joseph, Lloyd, & Atkins, 2008).

Although a majority of these health-relevant findings are of a correlational nature, experimental evidence demonstrates that gratitude can be cultivated and produce benefits over time. These experiments usually involve “gratitude interventions” in which participants are randomly assigned to complete gratitude exercises (e.g., completing a diary entry to reflect on an event that made them feel grateful) as a way to foster this state in their daily lives. The results of such interventions have been examined in several populations, including school children (Froh, Kashdan, Ozimkowski & Miller, 2009; Froh, Sefick, & Emmons, 2008), people experiencing depression (Mongrain & Anselmo-Matthews, 2012; Sergeant & Mongrain, 2011), and those with physical illness (e.g., neuromuscular disease, Emmons & McCullough, 2003). In all cases, individuals completing gratitude exercises generally demonstrate increased wellbeing, happiness, and life satisfaction as soon as one or two weeks following the start of the intervention. Of import, these beneficial changes reflected increases not only from pre-intervention levels of wellbeing, but also from extant levels of wellbeing among control group members (i.e., members of the same sample who were not assigned to complete gratitude exercises) (e.g., Emmons & McCullough, 2003; Froh, Sefick, & Emmons, 2008). Accordingly, it seems that experiencing gratitude frequently aids individuals in achieving self-improvement goals.

A relatively unique line of research concerns gratitude’s effects on materialism and financial decision-making. It appears that gratitude is related to decreased materialism (Polak & McCullough, 2006). Lambert, Fincham, Stillman, and Dean (2009) found that this relationship was mediated by life satisfaction. Feelings of gratitude led people to report higher satisfaction

with life, which then led to reduced materialism (as compared to a condition that induced feelings of envy). In terms of financial decision-making, inducing gratitude in individuals made them opt for delayed, larger rewards rather than immediate, smaller rewards, helping them overcome the human propensity to engage in temporal discounting (DeSteno, Li, Dickens, & Lerner, 2014). Here again we can see that a primary mechanism underlying gratitude's effects involves nudging people to forgo actions that—although bringing short-term gain—tend to inhibit the accumulation of long-term benefit.

### **Compassion**

Scholars have long proposed that compassion, like gratitude, is a sentiment that stands at the foundation of morality and virtue (Darwin 1879/2004; Goetz, Keltner, & Simon-Thomas, 2010; Nussbaum, 1996; Smith 1759/2009). Emerging scientific evidence has begun to echo this claim by demonstrating the role of compassion in promoting prosocial behavior, cooperative relationships, and physical and psychological wellbeing. Although compassion, like gratitude, is sometimes conceived of as a dispositional trait, recent findings stemming from both examinations of meditation practice and subtle environmental nudging provide evidence that compassion is itself quite variable within individuals and thus amenable to being manipulated or trained as a skill.

Historically, the term *compassion* has been used interchangeably with terms such as *empathy*, *empathic concern*, *sympathy*, and *pity* (e.g., Batson, 1991, 2009; Wispé, 1986). Yet many authors now differentiate *compassion* from *empathy*. Empathy typically refers to processes that allow an individual to understand another person's mental state, either through perspective-taking (sometimes called "cognitive empathy", "theory of mind", "mental state attribution", or "mentalizing") or through emotional contagion (sometimes called "affective empathy", or

“experience sharing”) (Zaki & Ochsner, 2012). Compassion can be differentiated from empathy based on the motivations that underlie one’s resonance with another’s mental state. We adopt the definition offered by Goetz and colleagues (Goetz et al., 2010), who define compassion as an other-oriented emotional state that arises in response to another’s suffering and motivates one to act in a prosocial manner to alleviate another’s suffering. In short, whereas compassion includes a motivational component to relieve another’s suffering, empathy typically refers to processes that merely provide access to the content or experience of another’s state.

Unlike the case with gratitude, a large, historical body of research has demonstrated that compassion promotes helping behavior aimed to alleviate another’s suffering. This work, usually employing the term *empathic concern* as opposed to compassion, comprised much of the social psychological literature on helping behavior in the late twentieth century and has received considerable attention in other reviews (Batson, 1991, 2011; Eisenberg & Miller, 1987). We do not review that work here, but note that compassion functions as an affective state that increases the probability of costly helping independent of other factors that increase helping, such as social recognition (Batson, 1991, 2011; Goetz et al., 2010). Instead, we focus on recent findings that provide additional insight into the role that compassion plays in promoting short-term costs in favor of long-term gain with respect to social systems, relationships, and psychological wellbeing.

### **Compassion and Stable Social Systems**

As noted, a fundamental problem of human social living concerns the development of cooperative social relationships and communities – a task that often proves difficult because individuals must forgo short-term benefits for the self in favor of long-term benefits for the

greater good. Compassion appears to function as an emotional experience that promotes the attainment of cooperative social relationships by supporting the development of emerging relationships and, thereby, the growth in one's social network.

Indeed, the impact of compassionate motives has been demonstrated to predict the development of novel relationships. Crocker and colleagues have studied the experiences of first-semester college freshman who have been randomly assigned a roommate and demonstrated that people who care about the wellbeing of others (i.e., those motivated by "compassionate goals") are more likely to satisfy their own and others' needs compared with those who are motivated by self-interest (i.e., "self-image goals") (see Crocker & Canevello, 2012 for review). Whereas pursuing self-esteem can have various short- and long-term costs, including a reduced sense of relatedness and increased anxiety and depression, caring for the wellbeing of others functions to indirectly promote one's own wellbeing through the building of social capital (Crocker & Canevello, 2008). Based on longitudinal data that tracked college freshman over their first semester, Crocker and Canevello found that those who maintained compassionate goals, compared with those who prioritized self-image goals, provided more support to others in the context of new relationships. Furthermore, those individuals who simultaneously endorsed high compassionate goals and low self-image goals reported receiving greater social support and greater interpersonal trust among friends and significant others. Thus, compassionate dispositions appeared to support the development of emerging relationships. These findings also suggest a positive impact of compassion on overall wellbeing: compassionate goals predicted downstream psychological wellbeing as indicated by self-reported feelings of trust, closeness, and reduced loneliness and interpersonal conflict (Crocker & Canevello, 2008).

The effects of compassion on the development of cooperative relationships may also extend to larger groups beyond dyadic relationships. For example, emerging empirical evidence supports the notion that cooperative groups accumulate the largest amounts of resources over time compared with groups that engage in punitive action. Using simulated economic exchanges, Dreber and colleagues confirmed that groups that refrain from punitive action reap greater communal gains compared with groups characterized by punitive behavior (Dreber, Rand, Fudenberg, & Nowak, 2008). Cooperation, rather than punishment, promotes a flourishing community. It is therefore of great value to identify the factors that might promote cooperation despite uncertainty about potential losses of resources in the short-run. In this vein, researchers have taken interest in the potential of compassion as a moral force that can extend prosocial behavior and forgiveness toward those who have committed social violations or transgressions.

Initial investigation in this realm has produced findings indicating that compassion can in fact promote a reduction in punishment directed at individuals who commit a transgression, even in cases where the transgression occurs against a third party and no forgiveness is sought (Condon & DeSteno, 2011). Using an orchestrated scenario, Condon and DeSteno had participants witness a confederate (i.e., an actor) cheat on a task to win money. Participants later had the opportunity to punish the transgressor by deciding the amount of hot sauce he would be forced to consume (cf. Lieberman, Solomon, Greenberg & McGregor, 1999). Some participants were also exposed to the intense sadness of a nearby female confederate. As expected, the experience of compassion in response to the female confederate's state mediated a reduction in the amount of hot sauce administered to the transgressor. Compassion may therefore be an effective mechanism for reducing escalations of violence. Although unpunished transgressions could prove costly, the avoidance of aggressive action can result in less psychological stress and

greater hedonic wellbeing in the long-run (Bushman, 2002; Carlsmith, Wilson, & Gilbert, 2008), suggesting that compassionate action even toward transgressors may prove worthwhile. An emerging question concerns the manner in which compassion promotes cooperative behavior in contexts that involve such moral violations. The motivation to reduce suffering would likely lead individuals to endorse policies and values that protect the rights of others (Goetz et al., 2010), thus it is likely that compassion would motivate an individual to engage in action to correct the actions of a transgressor with the ultimate aim to reduce collective suffering, albeit in a non-violent manner that minimizes the transgressor's suffering. This interpretation remains speculative, however, and awaits empirical investigation. In sum, compassion supports the development of novel relationships and communal interest, in part by nudging people to forego short-term benefits for the self and by attenuating impulses to engage in third-party punishment.

### **Compassion and Individual Wellbeing**

Various researchers have suggested that compassion may serve as a nourishing, replenishing experience that can contribute to one's personal wellbeing (e.g., Klimecki & Singer, 2012). This is in stark contrast with the notion that people can become overburdened by "compassion fatigue" when providing care for others, such as in healthcare settings or among people who take on the role of a primary caregiver for a family member. Yet several authors have distinguished compassion from empathic distress or empathy fatigue by suggesting that compassion moves beyond the simulation of another's pain and includes feelings of concern and love for those who suffer (Condon & Barrett, 2013; Klimecki & Singer, 2012). In line with this suggestion, several scholars have provided evidence that compassion might indeed promote psychological and physical wellbeing to individuals, as opposed solely to larger social groups.

Not surprisingly, the impact of compassionate goals compared with self-image goals—as reviewed above—extends to one’s personal wellbeing (Crocker, Canevello, Breines, & Flynn, 2010). As previously noted, Crocker and colleagues examined the effect of compassionate goals in college freshman on experiences of anxiety, dysphoria, and distress throughout their first semester. Compassionate goals predicted social support given and received, but interestingly, social support given to others uniquely predicted participants’ own changes in distress from the beginning to the end of the semester. Thus caring for the wellbeing of others over time appears to benefit an individual’s own psychological wellbeing.

Similar effects extend to physiological outcomes as well. Individual differences in self-reported compassion have been found to moderate the effect of social support on reactions to a stress-inducing public speech task (Cosley, McCoy, Saslow, & Epel, 2010). Specifically, high dispositional compassion was associated with reduced blood pressure, reduced cortisol, and higher high-frequency heart rate variability, suggesting reduced sympathetic and increased parasympathetic activity during a stress-inducing public speech (Cosley et al., 2010). Recent experimental work has also confirmed that manipulating compassionate goals can reduce stress reactivity to a stress-inducing public speech task (Abelson et al., 2014). Specifically, individuals who thought about ways to help others while in a job interview setting experienced less hypothalamic-pituitary adrenal (HPA) axis reactivity, which acts as a primary contributor to the negative impacts of stress on health. Thus, compassion could play a fundamental role in promoting psychological and physical wellbeing in response to stress.

Similar findings have emerged with respect to caregiving behavior. Brown and colleagues have demonstrated across differing samples that giving support and providing care for others can contribute to one’s own health and psychological wellbeing (Brown, Brown, House,

& Smith, 2008; Brown, Nesse, Vinokur, & Smith, 2003; Brown et al., 2009). Large-scale prospective survey research of individuals over the age of 65 has demonstrated that giving instrumental support (i.e., help with work, tasks, etc.) and emotional support (i.e., offering love and care for one's spouse) reliably predicted reduced mortality risk over a 5-year period, even after controlling for relevant factors such as health, income, education, socioeconomic status, personality factors, social contact and support received (Brown et al., 2003). Data from the same sample also confirmed that, among participants who recently lost a spouse, self-reported compassion-related helping behavior was associated with decreased depressive symptoms (Brown et al., 2008). Data from a separate sample revealed that caregiving for a spouse predicted reduced risk of mortality (Brown et al., 2009). Similarly, survey research has shown that volunteering rates among people who adopt positive views of others predict lower rates of mortality and psychological distress even when exposed to high levels of stress (Poulin, 2014). Although much research has documented the negative effects of a caregiving role, this newer body of work has shown that compassion-based caregiving can increase self-reported feelings of self-worth, meaning in life, a strengthening in one's relationships, feelings of uplift or elevation, and a reduction in anxiety and depression (see Schulz & Monin, 2012 for a review).

These benefits of compassion-related caregiving are consistent with other findings showing the impact of prosocial action on one's own feeling of happiness. In a recent field experiment, Dunn, Aknin, and Norton (2008) demonstrated that participants who were randomly assigned to spend the cash they were endowed with on other people reported greater levels of happiness compared to participants who were randomly assigned to spend similar amounts of money on themselves. Of import, this effect has been replicated across numerous cultures (Aknin et al., 2013). Such findings are also consistent with neuroimaging evidence suggesting that

charitable and cooperative behavior is experienced as rewarding (Moll et al., 2006; Rilling et al., 2002). Although these findings do not specifically focus on compassion, they suggest that other-oriented costly behavior of the type associated with compassion can promote subjective experiences of wellbeing.

### **Modulating Compassion**

Numerous factors have been documented that decrease compassionate responding to another's suffering, including outgroup membership (Stürmer, Snyder, & Omoto, 2005), the presence of nonresponsive bystanders in a social context (Darley & Latané, 1968), heightened time pressure (Darley & Batson, 1973), higher socioeconomic status (Piff, Kraus, Côté, Cheng, & Keltner, 2010; Stellar, Manzo, Kraus, & Keltner, 2012) and an increased number of people suffering (Cameron & Payne, 2011). These factors all decrease the likelihood that one will respond in a prosocial manner to those in need. Yet emerging evidence is beginning to identify factors that increase compassion as well, including Buddhist-inspired meditation programs and subtle situational cues.

Much of the scientific activity on meditation has focused on the personal health and psychological benefits of meditation, such as decreased anxiety and depression (Hölzel et al., 2011) and enhanced cognitive performance (e.g., Slagter, Lutz, Greischar, Nieuwenhuis, & Davidson, 2009). Recently scientists extended the meditation-based literature to the interpersonal domain by examining the role of meditation in promoting helping and cooperation. A handful of initial studies provided compelling evidence that different types of meditation increase prosocial and compassionate responses to another's suffering. Fredrickson and colleagues (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Kok et al., 2013) have demonstrated that short-term training in loving-kindness meditation (LKM) increases daily experiences of positive emotions

throughout training and self-reported social resources measured at post-training (e.g., greater self-reported social connection). More specifically, they showed that participants completing LKM, compared with those assigned to a wait-list control, reported increased positive emotion, which accounted for increases in a variety of personal resources, including self-reported positive relations with others and self-reported social connection (Fredrickson et al., 2008; Kok et al., 2013).

Several independent groups have demonstrated that compassion-based meditation – a technique similar to, but distinct from LKM – increases empathic responses to others’ suffering (Klimecki, Leiberg, Ricard, & Singer, 2014; Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008; Mascaro, Rilling, Negi, & Raison, 2013). Of import, this increased empathic response has been shown to be predictive of subsequent prosocial acts. As one example, loving-kindness and compassion-based training have been shown to increase economic generosity in computer-based transactions (Leiberg, Klimecki, & Singer, 2011; Weng et al., 2013). In an effort to link meditation to compassionate responses to the suffering of others directly, work by Condon and colleagues has confirmed that just a few weeks of training in either compassion- or mindfulness-based meditation significantly enhances the likelihood that individuals will act to relieve the pain of others, even within the context of bystander situation in which others are ignoring the suffering (Condon, Desbordes, Miller, & DeSteno, 2013; Lim, Condon & DeSteno, 2014).

A variety of non-meditation based techniques may also prove effective for increasing compassion. Experimental research indicates that increases in feelings of similarity (Valdesolo & DeSteno, 2011) and security (Mikulincer, Shaver, Gillath, & Nitzberg, 2005) enhance compassion and helping behavior. In both lines of research, subtle cues were sufficient to increase feelings of compassion and downstream helping behavior. With respect to similarity, a

simple measure of motor synchrony resulted in magnified feelings of similarity to a stranger, which subsequently mediated the experience of compassion for the stranger's plight and behaviors meant to assist him (Valdesolo & DeSteno, 2011). Mikulincer and colleagues likewise demonstrated that subtle manipulations of felt security increase compassionate responding to the others' suffering (Mikulincer et al., 2005). Participants in these studies viewed subliminal primes of the names of secure attachment figures (e.g., the name a person who has provided care and responsiveness in times of need, such as the participant's mother, a close friend or other relationship partner) and later reported greater willingness to help a woman in need, compared with participants who viewed subliminal primes of neutral content.

Interventions that incorporate these factors may stand as potential targets for interventions that do not require protracted efforts involving meditation-based training. As the field matures, it will be noteworthy to examine possible contextual factors that predict the degree to which meditation increases compassionate outcomes (e.g., social context, practice settings) and individual susceptibility to compassion-based enhancements via meditation training. At present, however, it is interesting to note a potential common element that may tie some of these relatively nascent findings together. The goal of many meditative techniques is to foster a state of equanimity – a state in which the social categories typically used to separate people are broken down (Desbordes et al., in press). Such a state, by definition, increases the similarity seen between individuals. Accordingly, the ability of subtle similarity manipulation to increase compassion may represent an efficient “hack” to achieve similar benefits that come from more chronic training of the mind. This view is supported by work showing that inductions of compassion enhance feelings of similarity to others (Oveis, Horberg, & Keltner, 2010), thereby suggesting a possible reciprocal interaction between the relevant mechanisms. A sense of

increased similarity to another individual, of course, stands as a marker that this individual is likely to be more willing to repay the favor by providing subsequent aid in the future (de Waal, 2008).

### **Conclusion**

As the preceding review makes abundantly clear, gratitude and compassion share several commonalities. Both are intrinsically linked with building social relationships. Both motivate behaviors that, although costly in the moment, in terms of social, financial, temporal, or hedonic resources, typically lead to opportunities for greater accumulation of similar rewards when aggregated over time. As such, these emotions enhance wellbeing by nudging individuals to behave virtuously (DeSteno, 2009). For all their similarities, however, they do constitute unique states that also address distinct challenges. Gratitude primarily functions to motivate behaviors likely to maintain relationships (e.g., repayment of debts, offering of social support to previous benefactors). Although it has been shown that gratitude can result in pay-it-forward behavior to strangers, such acts likely stem from a misattribution of the feeling state to others and thus represent a highly beneficial spandrel as opposed to a central functional outcome (cf. Bartlett & DeSteno, 2006). A unique aspect of compassion, on the other hand, is its ability to motivate supportive behavior and diminish aggressive behavior in the absence of any pre-existing relationship. Thus, compassion and gratitude may work together to build social capital, with compassion motivating the initial impulse to be a benefactor to a new individual and gratitude motivating subsequent repayments meant to continue the exchange.

## References

- Abelson, J. L., Erickson, T. M., Mayer, S. E., Crocker, J., Briggs, H., Lopez-Duran, N. L., & Liberzon, I. (2014). Brief cognitive intervention can modulate neuroendocrine stress responses to the Trier Social Stress Test: buffering effects of a compassionate goal orientation. *Psychoneuroendocrinology, 44*, 60–70.
- Ainslie, G. (1975). Specious reward: A behavioral theory of impulsiveness. *Psychological Bulletin, 82*, 463-496.
- Aknin, L. B., Barrington-Leigh, C. P., Dunn, E. W., Helliwell, J. F., Burns, J., Biswas-Diener, R., ... Norton, M. I. (2013). Prosocial spending and well-being: cross-cultural evidence for a psychological universal. *Journal of Personality and Social Psychology, 104*, 635–652.
- Algoe, S. B., Fredrickson, B. L., & Gable, S. L. (2013). The social functions of the emotion of gratitude via expression. *Emotion, 13*, 605-609.
- Algoe, S. B., Gable, S. L., & Maisel, N. C. (2010). It's the little things: Everyday gratitude as a booster shot for romantic relationships. *Personal Relationships, 17*, 217-233.
- Algoe, S. B., & Haidt, J. (2009). Witnessing excellence in action: The 'other-praising' emotions of elevation, gratitude, and admiration. *The Journal of Positive Psychology, 4*, 105-127.
- Algoe, S. B., Haidt, J., & Gable, S. L. (2008). Beyond reciprocity: Gratitude and relationships in everyday life. *Emotion, 8*, 425-429.
- Algoe, S. B., & Stanton, A. L. (2012). Gratitude when it is needed most: Social functions of gratitude in women with metastatic breast cancer. *Emotion, 12*, 163-168.
- Barrett, L.F. (2012). Emotions are real. *Emotion, 12*, 413-429.

- Bartlett, M. Y., Condon, P., Cruz, J., Baumann, J., & DeSteno, D. (2012). Gratitude: Prompting behaviours that build relationships. *Cognition and Emotion, 26*, 2-13.
- Bartlett, M. Y., & DeSteno, D. (2006). Gratitude and prosocial behavior: Helping when it costs you. *Psychological Science, 17*, 319-325.
- Batson, C.D. (1991). *The altruism question: Toward a social-psychological answer*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Batson, C.D. (2009). These things called empathy: Eight related but distinct phenomena. In J. Decety & W. Ickes (Eds.), *The social neuroscience of empathy* (pp. 3-15). Cambridge, MA: MIT Press.
- Batson, C.D. (2011). *Altruism in humans*. New York, NY: Oxford University Press.
- Brown, S. L., Brown, R. M., House, J. S., & Smith, D. M. (2008). Coping with spousal loss: potential buffering effects of self-reported helping behavior. *Personality & Social Psychology Bulletin, 34*, 849–861.
- Brown, S. L., Nesse, R. M., Vinokur, A. D., & Smith, D. M. (2003). Providing social support may be more beneficial than receiving It: Results from a prospective study of mortality. *Psychological Science, 14*, 320–327.
- Brown, S. L., Smith, D. M., Schulz, R., Kabeto, M. U., Ubel, P. A., Poulin, M., ... Langa, K. M. (2009). Caregiving behavior is associated with decreased mortality risk. *Psychological Science, 20*, 488–494.
- Bushman, B.J. (2002). Does venting anger feed or extinguish the flame? Catharsis, rumination, distraction, anger, and aggressive responding. *Personality and Social Psychology Bulletin, 28*, 724-731.

- Cameron, C. D., & Payne, B. K. (2011). Escaping affect: How motivated emotion regulation creates insensitivity to mass suffering. *Journal of Personality and Social Psychology*, *100*, 1–15.
- Carlsmith, K.M., Wilson, T.D., & Gilbert, D.T. (2008). The paradoxical consequences of revenge. *Journal of Personality and Social Psychology*, *95*, 1316-1324.
- Condon, P., & Barrett, L.F. (2013). Conceptualizing and experiencing compassion. *Emotion*, *13*, 817-821.
- Condon, P., Desbordes, G., Miller, W. B., & DeSteno, D. (2013). Meditation increases compassionate responses to suffering. *Psychological Science*, *24*, 2125–2127.
- Condon, P., & DeSteno, D. (2011). Compassion for one reduces punishment for another. *Journal of Experimental Social Psychology*, *47*, 698–701.
- Cosley, B. J., McCoy, S. K., Saslow, L. R., & Epel, E. S. (2010). Is compassion for others stress buffering? Consequences of compassion and social support for physiological reactivity to stress. *Journal of Experimental Social Psychology*, *46*, 816–823.
- Crocker, J., & Canevello, A. (2008). Creating and undermining social support in communal relationships: the role of compassionate and self-image goals. *Journal of Personality and Social Psychology*, *95*, 555–575.
- Crocker, J., Canevello, A., Breines, J. G., & Flynn, H. (2010). Interpersonal goals and change in anxiety and dysphoria in first-semester college students. *Journal of Personality and Social Psychology*, *98*, 1009–1024.
- Darley, J., & Batson, C. (1973). From Jerusalem to Jericho: A study of situational and dispositional variables in helping behavior. *Journal of Personality and Social Psychology*, *27*, 100–108.

- Darley, J., & Latané, B. (1968). Bystander intervention in emergencies: Diffusion of responsibility. *Journal of Personality and Social Psychology*, *8*, 377–383.
- Darwin, C. (2004). *The descent of man*. New York, NY: Penguin Classics. (Original work published 1875)
- Debordés, G., Gard, T., Hoge, E.A., Hölzel, B., Kerr, C.E., Lazar, S.W., Olendzki, A., & Vago, D.R. (in press). Moving beyond mindfulness: Defining equanimity as an outcome measure in meditation and contemplative research. *Mindfulness*.
- DeSteno, D. (2009). Social emotions and intertemporal choice: “Hot” mechanisms for building social and economic capital. *Current Directions in Psychological Science*, *18*, 280-284.
- DeSteno, D., Bartlett, M. Y., Baumann, J., Williams, L. A., & Dickens, L. (2010). Gratitude as moral sentiment: Emotion-guided cooperation in economic exchange. *Emotion*, *10*, 289-293.
- DeSteno, Li, Dickens, & Lerner (2014). Gratitude: A Tool for reducing economic impatience. *Psychological Science*, *25*, 1262-1267.
- de Waal, F. B. M. (2008). Putting the altruism back into altruism: The evolution of empathy. *Annual Review of Psychology*, *59*, 279-300.
- DeWall, C., Lambert, N. M., Pond, R. R., Kashdan, T. B., & Fincham, F. D. (2012). A grateful heart is a nonviolent heart: Cross-sectional, experience sampling, longitudinal, and experimental evidence. *Social Psychological and Personality Science*, *3*, 232-240.
- Dreber, A., Rand, D. G., Fudenberg, D., & Nowak, M. A. (2008). Winners don't punish. *Nature*, *452*, 348–351.
- Eisenberg, N., & Miller, P. A. (1987). The relation of empathy to prosocial and related behaviors. *Psychological Bulletin*, *101*, 91–119.

- Emmons, R. A., & Kneezel, T. T. (2005). Giving Thanks: Spiritual and Religious Correlates of Gratitude. *Journal of Psychology and Christianity, 24*, 140-148.
- Emmons, R. A., & McCullough, M. E. (2003). Counting blessings versus burdens: An experimental investigation of gratitude and subjective well-being in daily life. *Journal of Personality and Social Psychology, 84*, 377-389.
- Fredrickson, B. L., Cohn, M. A., Coffey, K. A., Pek, J., & Finkel, S. M. (2008). Open hearts build lives: positive emotions, induced through loving-kindness meditation, build consequential personal resources. *Journal of Personality and Social Psychology, 95*, 1045–1062.
- Froh, J. J., Bono, G., & Emmons, R. (2010). Being grateful is beyond good manners: Gratitude and motivation to contribute to society among early adolescents. *Motivation and Emotion, 34*, 144-157.
- Froh, J. J., Kashdan, T. B., Ozimkowski, K. M., & Miller, N. (2009). Who benefits the most from a gratitude intervention in children and adolescents? Examining positive affect as a moderator. *The Journal of Positive Psychology, 4*, 408-422.
- Froh, J. J., Sefick, W. J., & Emmons, R. A. (2008). Counting blessings in early adolescents: An experimental study of gratitude and subjective well-being. *Journal of School Psychology, 46*, 213-233.
- Goetz, J. L., Keltner, D., & Simon-Thomas, E. (2010). Compassion: an evolutionary analysis and empirical review. *Psychological Bulletin, 136*, 351–374.
- Gordon, C. L., Arnette, R. M., & Smith, R. E. (2011). Have you thanked your spouse today? Felt and expressed gratitude among married couples. *Personality and Individual Differences, 50*, 339-343.

- Gordon, A. M., Impett, E. A., Kogan, A., Oveis, C., & Keltner, D. (2012). To have and to hold: Gratitude promotes relationship maintenance in intimate bonds. *Journal of Personality and Social Psychology, 103*, 257-274.
- Grant, A. M., & Gino, F. (2010). A little thanks goes a long way: Explaining why gratitude expressions motivate prosocial behavior. *Journal of Personality and Social Psychology, 98*, 946-955.
- Hill, P. L., Allemand, M., & Roberts, B. W. (2013). Examining the pathways between gratitude and self-rated physical health across adulthood. *Personality and Individual Differences, 54*, 92-96.
- Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science, 6*, 537–559.
- Joel, S., Gordon, A. M., Impett, E. A., MacDonald, G., & Keltner, D. (2013). The things you do for me: Perceptions of a romantic partner's investments promote gratitude and commitment. *Personality and Social Psychology Bulletin, 39*, 1333-1345.
- Klimecki, O.M., & Singer, T. (2012). Empathic distress fatigue rather than compassion fatigue? Integrating findings from empathy research in psychology and social neuroscience. In B. Oakley, A. Knafo, G. Madhavan, & D.S. Wilson (Eds.), *Pathological altruism* (pp. 368-383). New York, NY: Oxford University Press.
- Klimecki, O. M., Leiberg, S., Ricard, M., & Singer, T. (2014). Differential pattern of functional brain plasticity after compassion and empathy training. *Social Cognitive and Affective Neuroscience, 9*, 873–879.

- Kok, B. E., Coffey, K. A, Cohn, M. A, Catalino, L. I., Vacharkulksemsuk, T., Algoe, S. B., ... Fredrickson, B. L. (2013). How positive emotions build physical health: perceived positive social connections account for the upward spiral between positive emotions and vagal tone. *Psychological Science, 24*, 1123–1132.
- Krause, N. (2007). Self-expression and depressive symptoms in late life. *Research on Aging, 29*, 187-206.
- Kubacka, K. E., Finkenauer, C., Rusbult, C. E., & Keijsers, L. (2011). Maintaining close relationships: Gratitude as a motivator and a detector of maintenance behavior. *Personality and Social Psychology Bulletin, 37*, 1362-1375.
- Lambert, N. M., Clark, M. S., Durtschi, J., Fincham, F. D., & Graham, S. M. (2010). Benefits of expressing gratitude: Expressing gratitude to a partner changes one's view of the relationship. *Psychological Science, 21*, 574-580.
- Lambert, N. M., & Fincham, F. D. (2011). Expressing gratitude to a partner leads to more relationship maintenance behavior. *Emotion, 11*, 52-60.
- Lambert, N. M., Fincham, F. D., & Stillman, T. F. (2012). Gratitude and depressive symptoms: The role of positive reframing and positive emotion. *Cognition and Emotion, 26*, 615-633.
- Lambert, N. M., Fincham, F. D., Stillman, T. F., & Dean, L. (2009). More gratitude, less materialism: The mediating role of life satisfaction. *The Journal of Positive Psychology, 4*, 32-42.
- Lambert, N. M., Graham, S. M., Fincham, F. D., & Stillman, T. F. (2009). A changed perspective: How gratitude can affect sense of coherence through positive reframing. *The Journal of Positive Psychology, 4*, 461-470.

- Lambert, N. M., Gwinn, A. M., Baumeister, R. F., Fincham, F. D., Gable, S. L., Strachman, A., & Washburn, I. J. (2013). A boost of positive affect: The perks of sharing positive experiences and grateful experiences. *Journal of Social and Personal Relationships, 30*, 24-43.
- Leiberg, S., Klimecki, O., & Singer, T. (2011). Short-term compassion training increases prosocial behavior in a newly developed prosocial game. *PloS One, 6*, e17798.
- Lieberman, J.D., Solomon, S., Greenberg, J., & McGregor, H.A. (1999). A hot new way to measure aggression: Hot sauce allocation. *Aggressive Behavior, 25*, 331-348.
- Lim, D., Condon, P., & DeSteno, D. (2014). Mindfulness and compassion: An examination of mechanism and scalability. *Manuscript submitted for publication*.
- Lutz, A., Brefczynski-Lewis, J., Johnstone, T., & Davidson, R. J. (2008). Regulation of the neural circuitry of emotion by compassion meditation: effects of meditative expertise. *PloS One, 3*, e1897.
- Mascaro, J. S., Rilling, J. K., Tenzin Negi, L., & Raison, C. L. (2013). Compassion meditation enhances empathic accuracy and related neural activity. *Social Cognitive and Affective Neuroscience, 8*, 48-55.
- McCullough, M. E., Emmons, R. A., & Tsang, J. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology, 82*, 112-127.
- McCullough, M. E., Kilpatrick, S. D., Emmons, R. A., & Larson, D. B. (2001). Is gratitude a moral affect? *Psychological Bulletin, 127*, 249-266.
- McCullough, M. E., Tsang, J., & Emmons, R. A. (2004). Gratitude in intermediate affective terrain: Links of grateful moods to individual differences and daily emotional experience. *Journal of Personality and Social Psychology, 86*, 295-309.

- Mikulincer, M., Shaver, P. R., Gillath, O., & Nitzberg, R. A. (2005). Attachment, caregiving, and altruism: boosting attachment security increases compassion and helping. *Journal of Personality and Social Psychology, 89*, 817-839.
- Moll, J., Krueger, F., Zahn, R., Pardini, M., de Oliveira-Souza, R., & Grafman. (2006). Human fronto-mesolimbic networks guide decisions about charitable donation. *Proceedings of the National Academy of Sciences, 103*, 15623–15628.
- Mongrain, M., & Anselmo-Matthews, T. (2012). Do positive psychology exercises work? A replication of Seligman et al. (2005). *Journal of Clinical Psychology, 68*, 382-389.
- Nussbaum, M.C. (1996). Compassion: The basic social emotion. *Social Philosophy & Policy, 13*, 27-58.
- Oveis, C., Horberg, E. J., & Keltner, D. (2010). Compassion, pride, and social intuitions of self-other similarity. *Journal of Personality and Social Psychology, 98*, 618-630.
- Piff, P. K., Kraus, M. W., Côté, S., Cheng, B. H., & Keltner, D. (2010). Having less, giving more: the influence of social class on prosocial behavior. *Journal of Personality and Social Psychology, 99*(5), 771–784.
- Polak, E. L., & McCullough, M. E. (2006). Is gratitude an alternative to materialism? *Journal of Happiness Studies, 7*, 343-360.
- Poulin, M. J. (2014). Volunteering predicts health among those who value others: two national studies. *Health Psychology, 33*, 120–129.
- Rilling, J., Gutman, D., Zeh, T., Pagnoni, G., Berns, G., & Kilts, C. (2002). A neural basis for social cooperation. *Neuron, 35*, 395–405.
- Sergeant, S., & Mongrain, M. (2011). Are positive psychology exercises helpful for people with depressive personality styles? *The Journal of Positive Psychology, 6*, 260-272.

- Slagter, H. A., Lutz, A., Greischar, L. L., Nieuwenhuis, S., & Davidson, R. J. (2009). Theta phase synchrony and conscious target perception: impact of intensive mental training. *Journal of Cognitive Neuroscience, 21*, 1536–1549.
- Smith, A. (2009). *The theory of moral sentiments*. New York, NY: Penguin Classics. (Original work published 1759)
- Stellar, J. E., Manzo, V. M., Kraus, M. W., & Keltner, D. (2012). Class and compassion: Socioeconomic factors predict responses to suffering. *Emotion, 12*, 449–459.
- Stürmer, S., Snyder, M., & Omoto, A. M. (2005). Prosocial emotions and helping: the moderating role of group membership. *Journal of Personality and Social Psychology, 88*, 532–546.
- Valdesolo, P., & Desteno, D. (2011). Synchrony and the social tuning of compassion. *Emotion, 11*, 262–266.
- Watkins, P. C. (2007). Gratitude. In R. Baumeister & K. Vohs (Eds.), *Encyclopedia of Social Psychology*. Thousand Oaks, CA: Sage.
- Weng, H. Y., Fox, A. S., Shackman, A. J., Stodola, D. E., Caldwell, J. Z. K., Olson, M. C., ... Davidson, R. J. (2013). Compassion training alters altruism and neural responses to suffering. *Psychological Science, 24*, 1171–1180.
- Williams, L. A., & Bartlett, M. Y. (in press). Warm thanks: Gratitude expression facilitates social affiliation in new relationships via perceived warmth. *Emotion*.
- Wispé, L. (1986). The distinction between sympathy and empathy: To call forth a concept, a word is needed. *Journal of Personality and Social Psychology, 50*, 314–321.
- Wood, A. M., Froh, J. J., & Geraghty, A. W. A. (2010). Gratitude and well-being: A review and theoretical integration. *Clinical Psychology Review, 30*(7), 890-905.

- Wood, A. M., Joseph, S., Lloyd, J., & Atkins, S. (2009). Gratitude influences sleep through the mechanism of pre-sleep cognitions. *Journal of Psychosomatic Research, 66*, 43-48.
- Wood, A. M., Joseph, S., & Maltby, J. (2009). Gratitude predicts psychological well-being above the Big Five facets. *Personality and Individual Differences, 46*, 443-447.
- Wood, A. M., Joseph, S., & Maltby, J. (2008). Gratitude uniquely predicts satisfaction with life: Incremental validity above the domains and facets of the five factor model. *Personality and Individual Differences, 45*, 49-54.
- Zaki, J., & Ochsner, K. (2012). The neuroscience of empathy: Progress, pitfalls and promise. *Nature Neuroscience, 15*, 675–680.