Emotion
2008, Vol. 8, No. 2, 281–290

1528-3542/08/$12.00 DOI: 10.1037/1528-3542.8.2.281

A Social–Cognitive Model of Trait and State Levels of Gratitude

Alex M. Wood
University of Warwick

John Maltby
University of Leicester

Neil Stewart
University of Warwick

P. Alex Linley
Centre for Applied Positive Psychology

Stephen Joseph
University of Nottingham

Three studies tested a new model of gratitude, which specified the generative mechanisms linking individual differences (trait gratitude) and objective situations with the amount of gratitude people experience after receiving aid (state gratitude). In Study 1, all participants ($N = 253$) read identical vignettes describing a situation in which they received help. People higher in trait gratitude made more positive beneficial appraisals (seeing the help as more valuable, more costly to provide, and more altruistically intended), which fully mediated the relationship between trait and state levels of gratitude. Study 2 ($N = 113$) replicated the findings using a daily process study in which participants reported on real events each day for up to14 days. In Study 3, participants ($N = 200$) read vignettes experimentally manipulating objective situations to be either high or low in benefit. Benefit appraisals were shown to have a causal effect on state gratitude and to mediate the relationship between different prosocial situations and state gratitude. The 3 studies demonstrate the critical role of benefit appraisals in linking state gratitude with trait gratitude and the objective situation.

Keywords: gratitude, personality, social–cognitive, attribution, positive psychology, emotion, trait, state, well-being

Throughout history, philosophical and theological discussions have viewed gratitude as fundamental to understanding people, their relationships, and the operation of society (Emmons & Crumpler, 2000). In contemporary society, gratitude still seems to play an important role, with most people reporting feeling gratitude very frequently (McCullough, Emmons, & Tsang, 2002). However, it is only recently that psychological research has begun systematically to study gratitude (McCullough, Kilpatrick, Emmons, & Larson, 2001), possibly in part because of the traditional neglect of positive emotions in psychology (see Linley, Joseph, Harrington, & Wood, 2006).

Emotions can be conceptualized on state and trait levels (Rosenberg, 1998). At the state level, emotions involve temporary affects or longer duration moods, which may have associated thought and action tendencies. At the trait level, emotions are characterized by individual differences in the average frequency with which affects and moods are experienced in daily life. The study of gratitude has almost exclusively focused on one or another of these levels, and there is little knowledge about how trait and state levels of gratitude interact (McCullough, Tsang, & Emmons, 2004).

Trait gratitude has been shown to have unique associations with other prosocial traits (e.g., McCullough et al., 2002; Wood, Joseph, & Linley, 2007a; Wood, Maltby, Stewart, & Joseph, in press) and to be a causal predictor of well-being (Emmons & McCullough, 2003; Lyubomirsky, Sheldon, & Schkade, 2005; Seligman, Steen, Park, & Peterson, 2005). State gratitude is an affect that occurs after a person has been helped and that motivates the reciprocation of aid (Bartlett & DeSteno, 2006; McCullough et al., 2001; Tsang, 2006). Using a daily process methodology, McCullough et al. (2004) have shown that higher trait levels of gratitude are related to more frequent and intense experiences of state gratitude in daily life. However, the mechanisms that explain why trait gratitude is related to state gratitude have not yet been demonstrated. If two people receive help in an identical situation, it is intuitive that the person higher in trait gratitude would feel more state gratitude. There is currently no explanation of why this might occur.

We propose a model in which characteristic interpretive biases in appraising prosocial situations mediate the relationship between trait and state levels of gratitude. First, we suggest that after a person is helped, he or she makes several attributions about the nature of the aid, and the attributions naturally group together to form a benefit appraisal. Second, we suggest that the benefit

Alex M. Wood and Neil Stewart, Department of Psychology, University of Warwick, Coventry, England; John Maltby, School of Psychology, University of Leicester, Leicester, England; P. Alex Linley, Centre for Applied Positive Psychology, Coventry, England; Stephen Joseph, School of Sociology and Social Policy, University of Nottingham, Nottingham, England.

This research was supported in part by a University of Warwick Research Fellowship awarded to Alex M. Wood.

Correspondence concerning this article should be addressed to Alex M. Wood, Department of Psychology, University of Warwick, Coventry CV4 7AL, England. E-mail: alex.wood@warwick.ac.uk

appraisals cause the experience of state gratitude. Third, we suggest that characteristic interpretive biases lead people higher in trait gratitude to make more positive benefit appraisals. Fourth, we suggest that more positive benefit appraisals explain why trait and state levels of gratitude are linked. This model is presented in Figure 1.

Two previous studies have suggested which attributions may compose a benefit appraisal. Tesser, Gatewood, and Driver (1968) gave participants three vignettes detailing a hypothetical situation in which they were given help by another person. The vignettes were manipulated to provide low, medium, or high perceptions of (a) the value of the help, (b) how much it cost the benefactor to provide the help, and (c) to what extent the benefactor genuinely wanted to help them (as opposed to having ulterior motives). Participants rated their attributions of the situation in terms of value, cost, and genuine helpfulness and indicated how they would feel on a composite variable of gratitude and indebtedness. Manipulating the vignettes led to different attributions, suggesting that these attributions are in part caused by the objective situation. Complex interactions were seen between the manipulations, in which manipulating one appraisal affected perceptions of other appraisals (e.g., manipulating value additionally led to higher perceptions of genuine helpfulness, and manipulating genuine helpfulness additionally led to higher perceptions of value). This suggests that these appraisals are not independent, but perhaps operate as part of a wider benefit appraisal. Manipulating perceptions of value, cost, and genuine helpfulness caused increases in gratitude and indebtedness, and perceptions of these variables jointly accounted for between 52% and 64% of the variance in the gratitude–indebtedness variable.

The Tesser et al. (1968) study should be treated with caution as gratitude and indebtedness have since been shown to be distinct emotions, with different causes and associated action tendencies (Watkins, Scheer, Ovnicek, & Kolts, 2006). However, confidence in the findings is increased by Lane and Anderson (1976), who demonstrated similar findings through a similar methodology by manipulating value and the benefactor's good intentions. Taken together, these two studies present evidence for which attributions may combine to form a benefit appraisal. They also provide support for our model's predictions that benefit appraisals are in part caused by situational factors and that benefit appraisals cause state gratitude (see Figure 1).

If benefit appraisals are the proximal causal agents of state gratitude, then these appraisals are the likely mechanism with which to explain the relationship between trait and state levels of gratitude. We expect trait gratitude to be related to characteristic interpretive biases in benefit appraisals. Essentially, we suggest that people who feel a lot of gratitude in life have specific appraisal tendencies that lead them to characteristically appraise the benefits of help-giving situations more positively than less grateful people.

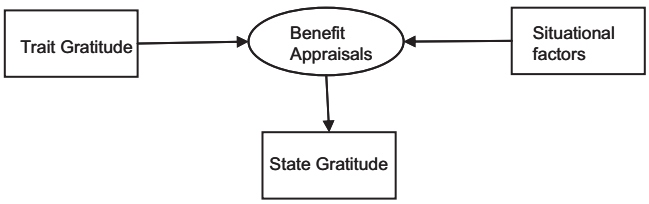

Figure 1. A theoretical model of trait and state levels of gratitude.

Previous research has suggested that people process information about others in a way that is consistent with their own self-identity (Bargh, Lombardi, & Higgins, 1988; Markus, 1977). For example, high masculinity is associated with a bias in information processing that emphasizes the masculine characteristics of others (Markus, Smith, & Moreland, 1985), even when the other people's behavior is irrelevant to the issue of masculinity (Higgins & Brendl, 1995). We suggest that a similar process occurs in which grateful people have specific appraisal tendencies leading to gratitude-relevant interpretations of the behavior of other people. Specifically, we suggest that grateful people make distinct benefit appraisals, perceiving the help they receive as more costly to the benefactor, more genuinely intended to help them (rather than ulteriorly motivated), and more valuable. Broadly, this would also be consistent with the large body of work showing that there are distinct attributional biases associated with depression (e.g., Bodner & Mikulincer, 1998), and emotions more generally (Beck, 1976). The aim of the current studies was to test whether more positive benefit appraisals represent distinct attributional biases of grateful people and whether these biases are the mechanism explaining why grateful people feel more gratitude in social situations. These predictions lead to the model presented in Figure 1. This model is fundamentally social–cognitive in nature (cf. Bandura, 1999; Cervone, 2004) as it integrates social situations, individual differences, and the mediating cognitive mechanisms.

Three studies are presented that test this social–cognitive model of gratitude. In Study 1, identical vignettes were presented to participants to test whether, when faced with the same situation, people higher in trait gratitude appraise the situation as more beneficial and whether benefit appraisals mediate the relationship between trait and state levels of gratitude. Study 2 replicates the first study using a daily process methodology, in which people reported on real events that happened over a 2-week period. This methodology also revealed the extent to which state gratitude was determined by situational factors relative to stable individual differences. In Study 3, benefit appraisals were directly manipulated to see whether benefit appraisals are affected by objective situation and whether benefit appraisals have a causal effect on state gratitude. Together, these three studies provide a full test of the model in Figure 1.

Study 1

Introduction

Study 1 used structural equation modeling to test the social–cognitive model of gratitude. Benefit appraisal was defined as a latent variable, with the attributions of cost, value, and genuine helpfulness as indicators. The core test of Study 1 focused on whether benefit appraisals mediated the relationship between trait and state levels of gratitude.

Method

Participants

Two hundred fifty-three undergraduates (214 women and 39 men) at a British university participated in return for course credit.

Several alternate options for course credit were available for students who did not want to participate. Participants' ages ranged from 18 to 38 ($M = 19.53$, $SD = 2.62$), with 94% aged between 18 and 21. Participants were predominantly of a White (78%) or Indian (10.3%) ethnic background.

Design and Procedure

Each participant filled out the same questionnaire. This questionnaire contained three vignettes, each of which was followed by five questions. Each of the vignettes detailed a situation in which the participant had been helped by another person. The topics of the vignettes were being assisted with coursework, requesting and receiving a job reference, and being assisted by another customer in a supermarket (see the Appendix for a sample vignette). The situations described were designed to be ambiguous and not to suggest any particular attribution.

Participants were asked to imagine that they were being helped in the way the vignette had described. They were then asked to answer the five questions that followed presentation of the vignette on individual 6-point scales:

1. "How much benefit do you think that the person expected to get in return for helping you?" (1 = *no benefit,* 6 = *a lot of benefit*). This item was reverse coded and measured the extent to which participants believed that their benefactor did not expect to gain anything from providing the help, which we termed *selflessness*.

2. "How much was this person motivated by a sincere desire to help you?" (1 = *not at all motivated,* 6 = *totally motivated*). This assessed perceptions of the benefactor's genuine helpfulness.

3. "How much did it cost the person to help you (in terms of time, effort, financial cost etc.)?" (1 = *nothing,* 6 = *a great deal*). This assessed perceived cost.

4. "How valuable do you think that this person's help was to you?" (1 = *not at all valuable,* 6 = *extremely valuable*). This assessed perceived value.

5. "How much gratitude would you feel toward this person?" (1 = *no gratitude,* 6 = *a very lot of gratitude*). This assessed state gratitude.

Each of the responses to these five questions were averaged over the three vignettes, so each participant had one score for each of the study variables. The selflessness question showed a very poor pattern of correlations with all of the other variables and was omitted from subsequent analysis.

Participants also completed the Gratitude Questionnaire–6 (GQ-6; McCullough et al., 2002) as a measure of trait gratitude. The GQ-6 is a six-item self-report inventory rated on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Two items are reverse scored, and potential scores range from 6 to 42, with higher scores representing higher levels of trait gratitude. Items measure how frequently people feel gratitude (e.g., "Long amounts of time can go by before I feel grateful to something or someone" [reverse coded]), the intensity of the gratitude felt (e.g., "I feel thankful for what I have received in life"), and the range of events or people that elicit gratitude (e.g., "I feel grateful to a wide variety of people"). Good internal consistency has previously been shown ($\alpha = .82$), and the GQ-6 consists of a robust one-factor solution (McCullough et al., 2002). The order of the presentation of the GQ-6 was counterbalanced, so participants received the GQ-6 either before or after the presentation of the vignettes.

Results

Covariance structural equation modeling (SEM) was performed using AMOS (Arbuckle, 2006). Model fit was tested with the chi-square test, the comparative fit index (CFI), and the standardized root-mean-square residual (SRMR). On the basis of their Monte Carlo analysis, Hu and Bentler (1999) suggested that good fit is indicated when the CFI is greater than .95, SRMR is greater than .08, and the least sum of Type I and Type II errors is present when using a combinational rule of CFI greater than .95 and SRMR greater than .09. Full correlation–covariance tables and descriptive statistics for each study are available from Alex M. Wood.

The SEM model was designed to test whether benefit appraisals mediated the relationship between trait and state levels of gratitude. The basic model is presented in Figure 2 and showed an excellent fit, $\chi^2(4, N = 253) = 6.90$, CFI = .99, SRMR = .03.

To test mediation, we used Baron and Kenny's (1986) three steps and Sobel's (1982) test. Baron and Kenny's first step requires the predictor to be related to the outcome. An standard univariate regression analysis showed that trait gratitude predicted state gratitude ($\beta = 0.23$, $p < .001$). The second and third steps were tested with the SEM model in Figure 2. This model shows that the predictor (trait gratitude) is related to the mediator (benefit appraisal). The model also shows that the mediator (benefit appraisal) is related to the outcome (state gratitude) controlling for the predictor (trait gratitude). This fulfills Baron and Kenny's second step.

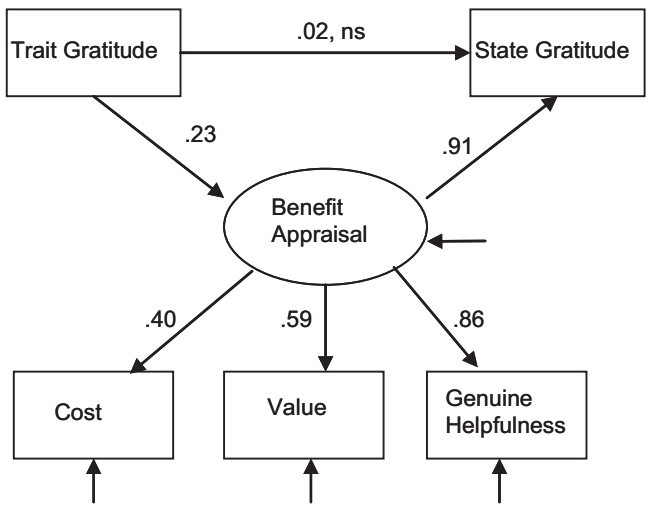

Figure 2. A structural equation model, Study 1. All values are standardized. All paths except those marked *ns* were significant at $p < .001$. Model fit: $\chi^2(4, N = 253) = 6.09$, CFI = .99, SRMR = .03.

The model further shows that controlling for the benefit appraisals substantially reduced the relationship between trait and state levels of gratitude (from $\beta = 0.23$, $p < .001$, to $\beta = 0.02$, $p = .65$). Sobel's (1982) test shows whether this reduction in beta is statistically significant. This test is mathematically equivalent to testing the significance of the mediated pathway from trait gratitude to state gratitude through benefit appraisals (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). The Sobel test was significant ($z = 3.60$, $p < .001$), indicating that mediation had occurred. To test whether mediation was complete, we compared the model in Figure 2 with a second model in which there was no direct path from trait to state gratitude. The fit of the second model was excellent, $\chi^2(5, N = 253) = 7.09$, CFI = .99, SRMR = .03, and not significantly worse than the basic model in Figure 2 ($\Delta\chi^2 = .19$; $\Delta df = 1$; $p = .66$). Thus, on the basis of parsimony the second model is to be preferred, and full mediation was indicated. The demonstration of full mediation completes Baron and Kenny's (1986) third step.

Discussion

Study 1 presented preliminary support for the social–cognitive model of gratitude. Cost, value, and genuine helpfulness were shown to be good indicators of a latent benefit appraisals construct. When measured without error, the benefit appraisals that people made explained 83% of the variance in state gratitude. When faced with identical hypothetical situations, people higher in trait gratitude made more positive benefit appraisals and believed that they would feel more state gratitude. Benefit appraisals fully mediated the relationship between trait and state levels of gratitude.

Study 2

Introduction

Although widely used, the vignette approach described above suffers from some limitations, which we addressed in Study 2. The validity of vignette studies rests on the assumption that participants are both able to imagine the situation described and have sufficient knowledge to accurately assess how they would think and feel in the given situation. Research into affective forecasting has shown that people are not always able to predict how they will feel in future situations (Gilbert, Lieberman, Morewedge, & Wilson, 2004; Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). It is therefore possible that Study 1 assessed only people's perceptions regarding the appraisals they would make and the amount of gratitude they would feel rather than the level of these variable they would actually experience in real life.

To rule out the possibility that we were assessing only perceptions of gratitude rather than actual appraisals, in Study 2 we used a daily process methodology (Bolger, Davis, & Rafaeli, 2003), in which people reported on real events that had recently occurred. Each day for 15 days, participants were asked to record a real instance in which they had been helped during that day. They then rated the help in terms of cost, value, and genuine helpfulness and rated the amount of gratitude they had felt when the event occurred. A daily process methodology also enabled the estimation of the proportion of the variance in state gratitude that was due to within-person (situational) variability and the proportion of variance that was due to between-person (individual difference) variability (Nezlek, 2001). This will demonstrate whether most of the variance in state gratitude is situational variability (which may be partially predicted from benefit appraisals) or whether most of the variance is between-person variability (which may be partially predicted by personality). The results were analyzed with multilevel data techniques, which permitted the examination of the interactions between trait gratitude and the daily experience of benefit appraisals and state gratitude (Luke, 2004; see also McCullough et al., 2004).

Method

Participants

One hundred thirteen (85 women and 28 men) first-year undergraduates from a major British university participated in the study as part of training in research methods. Students were not penalized if they chose not to participate in the study. Ages ranged between 18 and 26 years ($M = 18.68$, $SD = 1.23$). Participants were predominantly of a White (84.1%) or Chinese (5.3%) ethnic origin.

Design and Procedure

The study used a diary methodology in which participants were asked to complete a questionnaire each day for 15 days. Diary studies allow people to report on real events that have happened to them, within a time frame that limits retrospective bias. Given the high response burden on participants, it is particularly important to ensure compliance, particularly regarding whether people complete the questionnaires on the correct day rather than completing all questionnaires at the end of the study (Bolger et al., 2003). To address this issue, we created an Internet page on the university network. Participants logged onto this page each day using their university e-mail address as an unique identifier. Computers are readily available throughout the campus, and participants could additionally log on remotely using the Internet. The time and date of the daily questionnaire submission was automatically encoded by the server following submission, making false reporting of the time of submission nearly impossible.

Participants were asked to try and complete an entry every day, but were told that if they forgot or were unable to complete a daily entry, then they should continue as normal the next day. The number of days participants completed ranged from 1 to 15 days ($M = 8.92$, $SD = 3.87$). This represents a 59.4% compliance rate, which is comparable with other diary studies in which submission time was collected electronically. For the data techniques used, it was not necessary for all participants to complete the same number of days, so no participant was excluded for low response rate (Nezlek, 2001).

Measures

On the day immediately before the start of the diary study, participants completed the GQ-6 measure of trait gratitude, as in Study 1. On each subsequent day, participants were first asked to provide a paragraph that would "describe one event that occurred today where someone did something for you (e.g., lent you money, given you a lift)." These responses were not coded but rather were

intended to act as a cue for the participants to better remember the event. Participants were then asked the same four questions as in Study 1, designed to measure the state appraisals of cost, value, and genuine helpfulness. They were also asked how much gratitude they had felt when the event had occurred.

Data Analysis

The data have a hierarchical structure in which each of the daily observations are nested within individuals. Multilevel modeling was performed using the HLM 6 software (Raudenbush, Bryk, Cheong, & Congdon, 2004). Multilevel modeling allows the simultaneous modeling of within-person (Level 1) daily models, between-person (Level 2) models of individual differences, and the interactions between the levels (Nezlek, 2001). Conceptually, multilevel modeling computes separate regression intercepts and slopes for each of the participants, on each of the days. The average (between-person estimates) of these intercepts and slopes is estimated and modeled as a function of between-person variables (for a description of the mathematical process, see Luke, 2004). As HLM does not model latent variables, we restricted the analysis to a path model of observed variables.

Results

We first examined what proportion of the variance in state gratitude and the appraisals could be accounted for by (a) within-person (state or situational) determinants and (b) between-person (stable or dispositional) determinants. The interclass correlation coefficient (ICC) was obtained for state gratitude and each of the appraisals by dividing the between-person variance by the sum of the between- and within-person variance. The ICC for state gratitude was .22 (so 22% of the variance in state gratitude is attributable to between-person factors, and 78% of the variance is within-person, situational variability). The ICC was .18 for value, .16 for cost, and .25 for genuine helpfulness. It seems that the vast majority of variance in state gratitude and in the attributions is accounted for by situational factors, with a moderate proportion of variance (between 16% and 25%) accountable to between-person differences.

Path Model

Multilevel modeling was used to test mediation, using the Baron and Kenny (1986) steps and the Sobel (1982) test. The application of these tests to multilevel designs is outlined by Krull and MacKinnon (2001). A multilevel regression showed that trait gratitude predicted daily experiences of state gratitude following help ($b = 0.03$, $SE = .01$, $\beta = 0.12$, $p < .01$), fulfilling Baron and Kenny's first step. Further multilevel regressions were performed to create the path diagram presented in Figure 3.

Trait gratitude led to appraisals of value and genuine helpfulness. Appraisals of value and genuine helpfulness led to state gratitude, controlling for trait gratitude. This fulfills Baron and Kenny's (1986) second step. Controlling for value and genuine helpfulness reduced the relationship between trait and state gratitude from a significant beta of .12 ($p = .03$) to a nonsignificant beta of .02. This fulfills Baron and Kenny's third step and indicated full or very substantial mediation. The Sobel (1982) test indicated that the mediated pathway from trait gratitude to state gratitude through value was significant ($z = 2.12$, $p = .03$), as was the mediated pathway through genuine helpfulness ($z = 2.05$, $p = .04$).

Discussion

Study 2 provided further support for the social–cognitive model of gratitude by fully replicating Study 1 using real events rather than hypothetical scenarios. Additionally, the vast majority of the variance in benefit appraisals was shown to be due to within-person (situational) causes rather than between-person individual differences. It seems that state gratitude is largely determined by situations (and their interpretations), with trait gratitude being a smaller but robust determinant of state (through the mediating mechanism of benefit appraisals). The convergence of the results from Studies 1 and 2 support the use of a vignette methodology for gratitude research.

Study 3

Introduction

Study 1 presented cross-sectional support of the social–cognitive model. Study 2 provided support for the predicted direction of the relationship between trait gratitude and both benefit appraisals and state gratitude, as the measurement of trait gratitude temporally preceded the events on which the appraisals and emotional reaction were based. Study 3 completed the test of the social–cognitive model, through experimental manipulation of the

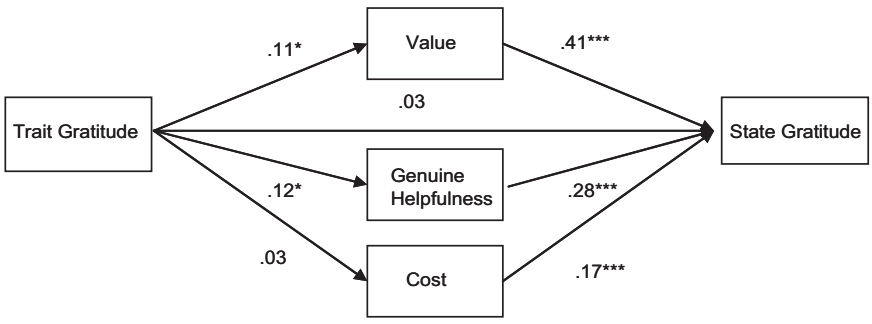

Figure 3. A path diagram based on multilevel modeling, Study 2. * $p < .05$. *** $p < .001$.

objective situation to test whether situations have a causal effect on benefit appraisals and whether benefit appraisals have a causal effect on state gratitude. The latent benefit appraisal was manipulated by presenting two groups of participants with vignettes that were either high or low in each of the factors of cost, value, and genuine helpfulness.

In Study 3, we also aimed to see whether trait gratitude had an unique relationship with the benefit appraisals or whether this relationship was due to a third personality variable. Gratitude has been shown to correlate moderately with the Big Five personality traits (McCullough et al., 2001), which appear to represent personality at the highest level of abstraction (Costa & McCrae, 1995; Goldberg, 1993; McCrae & Costa, 1999). The Big Five traits of extraversion and agreeableness both represent outgoing and prosocial tendencies (Costa & McCrae, 1995), which could be the real explanation of why grateful people make positive benefit appraisals after they have been helped. Alternatively, the appraisals of grateful people may lie in trait positive or negative affect, given the effects of mood on cognition (see Eich, Kihlstrom, Bower, Niedenthal, & Forgas, 2000). If this were the case, then the relationship between gratitude and state appraisals should not exist independently of the Big Five traits of extraversion, which includes trait positive affect, or neuroticism, which includes trait negative affect (Costa & McCrae, 1995). In Study 3, we administered the Big Five Inventory (John & Srivastava, 1999) alongside the measure of trait gratitude with the purpose of assessing whether trait gratitude was related to state gratitude and benefit appraisals above and beyond the effect of other broad personality variables.

Method

Participants

Two hundred participants (102 men and 98 women) were recruited from a local college of further education. Participants were between 18 and 59 years old ($M = 32.52$, $SD = 9.79$) and were predominantly White (63%), Indian (5%), or Black Caribbean (7%).

Design and Procedure

Participants were randomly assigned to one of two groups. Both groups completed a questionnaire packet and read six vignettes. The vignettes that the participants received differed by group. We used a unifactorial design in which participants received vignettes either high or low in each of the factors of cost, value, and genuine helpfulness. Manipulating these factors together produced the largest possible difference between groups. A multifactorial design was not viable, as each of the factors were shown in the first two studies to be indicators of the same latent construct, and the theoretical interest is in the causal effect of the latent construct and not in the unique effects of its constituent factors. Additionally, Tesser et al. (1968) showed that manipulating one factor (e.g., value) leads to changes in another factor (e.g., genuine helpfulness), suggesting that a multifactorial design would be confounded.

In Group 0, each of the vignettes detailed a situation with objectively low benefit, and in Group 1 each of the vignettes detailed a situation with objectively high benefit. All of the vignettes followed the same form. Both groups received the same first sentence describing a general hypothetical situation in which the participants were helped. The second sentence manipulated value (Group 0 = low, Group 1 = high). Both groups received the same third sentence, which was simply a filler sentence. The fourth sentence manipulated genuine helpfulness (Group 0 = low, Group 1 = high), and the fifth sentence manipulated cost (Group 0 = low, Group 1 = high). An example of the vignettes given to both groups is presented in the Appendix. In essence, participants in Group 0 received six vignettes that each described a situation low in objective benefit (operationalized as low in value, cost, and genuine helpfulness) and participants in Group 1 received six vignettes that each described a situation high in objective benefit (operationalized as high in value, cost, and genuine helpfulness). Any difference between the groups should be directly attributable to the objective value of the situation described.

Measures

Measures from Study 2. All participants completed the GQ-6 (McCullough et al., 2002) and following presentation of the vignettes answered the same questions on benefit appraisals and state gratitude as in Study 2.

Big Five. The Big Five Inventory (BFI; John & Srivastava, 1999) was used to measure the traits of neuroticism, agreeableness, extraversion, openness, and conscientiousness. The 44-item BFI has between 8 and 10 items for each trait, and for each trait Cronbach's alpha and test–retest reliability have been shown to range from .79 to .90 (John & Srivastava, 1999). The BFI also has very high convergent validity with other measures of the Big Five. Correcting for unreliability, each of the subscales correlates with the corresponding scales of the other widely used measures at between .83 and .99 (mean $r = .94$).

Results

Experimental Analysis

We tested (a) whether the situational manipulation had increased state gratitude, (b) whether the manipulation had successfully increased benefit appraisals, and (c) whether the manipulation had led to increased state gratitude because of increased benefit appraisals. Essentially, Step A represents a test of the experimental effect of the independent variable (between-group manipulation of the objective benefit of the situation) on the dependent variable (state gratitude), Step B represents a manipulation check, and Step C represents a test of whether the experimental effect was due to the intended manipulation. Conceptually, this test is equivalent to testing whether benefit appraisals mediate the relationship between the objective situation and state gratitude.

The group variable was dummy coded 0 (*low benefit*) or 1 (*high benefit*). A standard univariate regression analysis showed that the manipulation had increased state gratitude ($\beta = 0.53$, $p < .001$), fulfilling Baron and Kenny's (1986) first step of mediation. The second part of the analysis is presented in the structural equation model in Figure 4a. The fit of this model was excellent, $\chi^2(4, N = 200) = 3.2$, CFI = .99, SRMR = .01.

The group manipulation led to higher levels of benefit appraisals, showing that the manipulation was successful. While control-

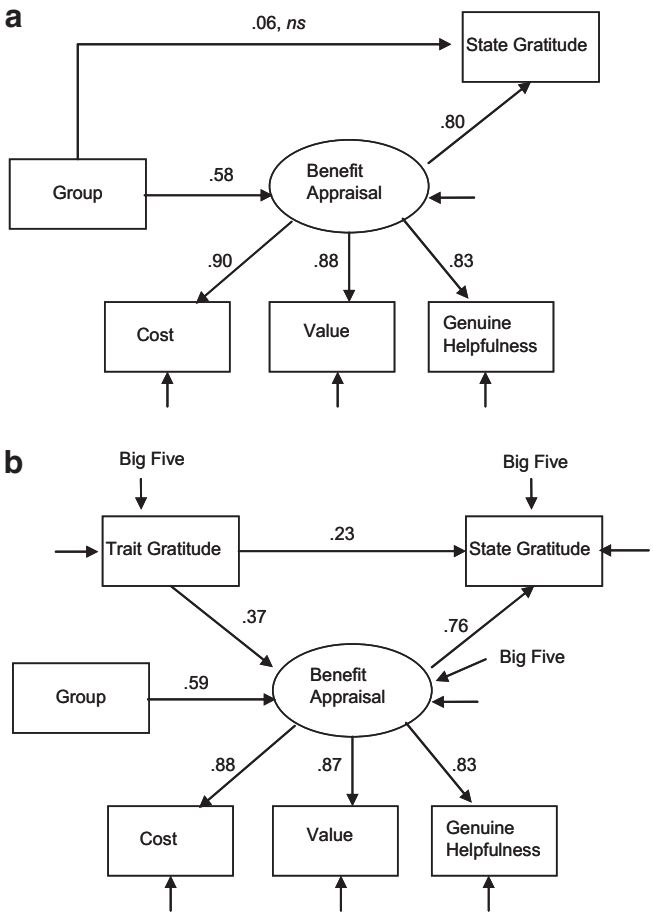

Figure 4. Two structural equation models, Study 3. All values are standardized. All paths except those marked *ns* were significant at $p < .001$. Model 4a fit: $\chi^2(4, N = 200) = 3.23$, CFI = .99, SRMR = .01; Model 4b fit: $\chi^2(23, N = 200) = 44.5$, CFI = .98, SRMR = .04.

ling for the group manipulation, benefit appraisals led to state gratitude. This fulfills Baron and Kenny's (1986) second step. The model further shows that controlling for benefit appraisals substantially reduced the relationship between the group manipulation and state gratitude (from $\beta = 0.53$, $p < .001$, to $\beta = -0.06$, $p = .32$). This reduction in beta was statistically significant ($z = 6.87$, $p < .001$) according to Sobel's (1982) test. To test whether mediation was complete, we compared the model in Figure 4a with a second model in which there was no direct path from the group manipulation to state gratitude. The fit of the second model was excellent, $\chi^2(5, N = 200) = 4.2$, CFI = .99, SRMR = .01, and not significantly worse than the basic model in Figure 4a ($\Delta\chi^2 = 1.0$; $\Delta df = 1$; $p = .32$). Thus, on the basis of parsimony the second model is to be preferred, and full mediation was indicated. The demonstration of full mediation completes Baron and Kenny's third step.

Moderation

We tested whether trait gratitude moderated the relationship between the group manipulation and state gratitude or the benefit appraisals. Moderation would occur, for example, if people lower (or higher) in trait gratitude were more susceptible to the effect of the situational manipulation. Moderation was not predicted by the model, but would invalidate the mediational findings if present. Using the procedures described by Aiken and West (1991), four multiple regressions were performed to sequentially test whether different levels of trait gratitude (the moderator) changed the magnitude of the relationship between the manipulation (the predictor) and the outcome variables of state gratitude, cost appraisals, genuine helpfulness appraisals, and value appraisals. In each of these analyses, the outcome was regressed on the predictor (which was effects coded), the moderator (which was standardized), and an interaction variable formed by multiplying the predictor and the moderator. In each of the tests, the interaction variable was not significant (largest $\beta = -0.04$, $t = -.670$, $p = .50$). Additionally, removing the interaction variable from the multiple regression lead to nonsignificant decreases in R^2 (largest $\Delta R^2 = .001$, $\Delta F = 0.45$, $p = .50$). These analysis indicated that moderation had not occurred.

Testing the Full Model

We tested whether benefit appraisals still mediated the relationship between trait and state levels of gratitude with the effects of the Big Five covaried. Gratitude was significantly correlated with extraversion ($r = .35$, $p < .001$), agreeableness ($r = .49$, $p < .001$), and neuroticism ($r = -.18$, $p = .01$), showing the importance of covarying these variables. We first conducted a standard univariate multiple regression, regressing state gratitude on trait gratitude and each of the Big Five. With the effects of the Big Five controlled, trait gratitude still predicted state gratitude ($\beta = 0.47$, $p < .001$), fulfilling Baron and Kenny's (1986) first step. The remaining steps were tested with the full model presented in Figure 4b. Each of the Big Five were included as observed variables, and paths from each of the Big Five led to trait gratitude, state gratitude, and benefit appraisals. As such, all of the results in Figure 4b are independent of the effect of the Big Five. The fit of this model was very good, $\chi^2(23, N = 200) = 44.53$, CFI = .98, SRMR = .04.

As shown in Figure 4b, trait gratitude was related to benefit appraisals. With trait gratitude controlled, benefit appraisals were still related to state gratitude. This fulfills Baron and Kenny's (1986) second step. Controlling for benefit appraisals substantially reduced the relationship between trait and state levels of gratitude (from $\beta = 0.47$, $p < .001$, to $\beta = 0.23$, $p = .32$), a reduction in beta that Sobel's (1982) test showed was statistically significant ($z = 5.30$, $p < .001$). This indicated substantial or complete mediation. Demonstrating partial mediation completes Baron and Kenny's third step. To test whether mediation was complete, we compared the model in Figure 4b with a second model in which there was no direct path from trait to state gratitude. The fit of the second model was good, $\chi^2(24, N = 200) = 64.85$, CFI = .95, SRMR = .04, but was significantly worse than the basic model in Figure 4b ($\Delta\chi^2 = 20.32$, $\Delta df = 1$, $p < .001$). It was concluded that mediation was substantial but not complete. To test whether the use of the Big Five as covariates substantially changed the results, all analysis was repeated without including the Big Five. Each of Baron and Kenny's steps were still met, Sobel's test remained significant, and the betas reported in Figure 4b changed by a

maximum of .08. It appears that including the Big Five as covariates did not substantially change the model.

General Discussion

Three studies provided support for the social–cognitive model of gratitude in Figure 1. Studies 1 and 3 showed that following help, people's appraisals of cost, value, and genuine helpfulness combined to form a latent benefit appraisal variable. In each of the studies, trait gratitude was robustly associated with benefit appraisals, and in Study 3 this relationship was shown to be distinct from the Big Five personality traits. In each study, benefit appraisals were shown to substantially or completely mediate the relationship between trait and state levels of gratitude. This suggests that benefit appraisals are the generative mechanism that explains why grateful people feel more gratitude after they receive aid. Study 2 shows that this finding is method invariant, occurring both after people considered hypothetical vignettes and after real events that occurred over a 2-week period. Finally, Study 3 showed that experimentally manipulating the objective benefit of the situation caused changes in state gratitude as the result of altered benefit appraisals. Together, the three studies provided full support for the social–cognitive model in Figure 1, in which individual differences in trait gratitude and situational factors lead to benefit appraisals, and benefit appraisals lead to the experience of state gratitude.

Study 2 indicated the relative importance of situational factors and individual differences in determining state gratitude. Over 14 days, 78% of the variance in daily reports of state gratitude was due to unique, within-person, situational variability on the individual days. Accordingly, 22% was due to stable, between-person, individual differences in the experience of state gratitude. These findings explain the magnitude of the effects seen across the three studies (cf. Luke, 2004; Nezlek, 2001). If most of the variance in state gratitude is situational, then appraisals should be the primary predictor of state gratitude, in that they capture both the objective situation and the individuals' perceptions of the objective situation. This is the pattern that was seen over the three studies, with benefit appraisals accounting for a very substantial amount of the variance in state gratitude (between 64% and 83% when measured without error). In a related vein, the situational manipulation had a large effect on state gratitude ($r = .53$).

If a small but reliable amount of variance in state gratitude is due to between-person differences, then individual differences in gratitude should be a small but robust predictor of benefit appraisals and consequently of state gratitude. Across the three studies, trait gratitude was seen to be a small to moderate predictor of benefit appraisals and state gratitude. These findings add detail to the model in Figure 1, suggesting the relative importance of the variables. The most variance is accounted for by the situation and benefit appraisals, with individual differences playing a small but important role by exerting a characteristic bias over the appraisal of the situation. This relative importance is consistent with recent findings in the debate regarding the relative importance of personality and situation in determining behavior (Fleeson, 2004). Personality traits are now seen to be only a small predictor of behavior at any given moment, but they exert a subtle effect on behavior, which when averaged across days reliably distinguishes the person from others (Fleeson, 2001).

The results supported a mediational but not a moderational model of gratitude. This is an important distinction (Baron & Kenny, 1986). Each study showed that benefit appraisals mediated trait and state levels of gratitude. Mediation suggests that benefit appraisals are why grateful people experience more state gratitude following help. Mediation is based on the assumption of linear relationships between the variables (where, e.g., gratitude is equally as strongly related to benefit appraisals irrespective of whether a person has high, medium, or low gratitude). Study 3 ruled trait gratitude out as a moderator between the objective situation and state gratitude. Moderation would occur if trait gratitude had a different relationship with benefit appraisals and state gratitude was dependent on the objective situation. It was possible, for example, that people high in trait gratitude only saw situations as more beneficial when the situation was low in objective benefit, but when the situation was high in objective benefit everyone made the same benefit appraisals irrespective of their levels of trait gratitude. Study 3 ruled out this possibility and showed that gratitude leads to a positive bias in appraising benefit and experiencing state gratitude irrespective of the objective situation.

In Studies 1 and 3, the appraisals of cost, value, and genuine helpfulness were shown to form a robust latent variable. These variables appear to co-occur in a constellation. Future research is needed to investigate exactly what this constellation represents. Cost, value, and genuine helpfulness could be independent appraisals that naturally group together, lower order indicators of a superordinate appraisal, or part of a gratitude schema. It is unlikely that the variables are independent appraisals, as Tesser et al. (1968) showed that manipulating one of the appraisals (e.g., value) led to changes in another appraisal (e.g., genuine helpfulness). It is not, however, clear whether the constellation of variables meets a definition of a schema, which would exist in only some people, involve individual difference in availability, and have unique perceptual, memory, and interpretive effects that would apply to a variety of perceptual and cognitive measures.[1] Such a question has applied significance for the increasingly prevalent clinical interventions to increase gratitude (e.g., Seligman et al., 2005). The existence and malleability of a grateful schema would be an important consideration in therapeutically increasing gratitude. Potentially, such research could lead to a new schema-focused therapy for increasing gratitude, with associated well-being benefits. Such an approach would have to be evaluated alongside the current successful approach of "counting your blessings" (Emmons & McCullough, 2003).

The studies had a number of limitations. Principally, they relied on self-report of gratitude, and future research may consider using direct behavioral measures of gratitude (cf. Tsang, 2006). However, McCullough et al. (2002) provided strong support for the use of self-report measures of gratitude, showing that the GQ-6 is correlated with peer reports and that the measure is not confounded by social desirability. Although benefit appraisals substantially mediated trait and state levels of gratitude in Study 3, unlike the other studies mediation was not complete. Although partial mediation is the norm rather than the exception in personality psychol-

[1] We gratefully acknowledge Piotr Winkielman, University of California, San Diego, for making this observation (personal communication, October 20, 2007).

ogy research (Baron & Kenny, 1986), this does raise the question of what other appraisals could mediate trait and state levels of gratitude. Another plausible appraisal regards the successfulness of the help (e.g., if a friend attempts to help but failure still ensues).

Research into trait gratitude is just beginning, and there is vast scope for future study. Future research will likely focus on whether grateful people are more likely to help others, whether they have better social relationships, and the mechanisms by which trait gratitude is related to better well-being (see McCullough et al., 2002, 2001; Wood, Joseph, & Linley, 2007b). From a social–cognitive point of view (Bandura, 1999), it will be important to consider these questions within a framework whereby individuals interact with their environments.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions.* Newbury Park, CA: Sage.

Arbuckle, J. L. (2006). *Amos 7.0 user guide.* Spring House, PA: Amos Development.

Bandura, A. (1999). Social cognitive theory of personality. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 154–196). New York: Guilford Press.

Bargh, J. A., Lombardi, W. J., & Higgins, E. (1988). Automaticity of chronically accessible constructs in person × situation effects on person perception: It's just a matter of time. *Journal of Personality and Social Psychology, 55,* 599–605.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51,* 1173–1182.

Bartlett, M. Y., & DeSteno, D. (2006). Gratitude and prosocial behavior: Helping when it costs you. *Psychological Science, 17,* 319–325.

Beck, A. T. (1976). *Cognitive therapy and the emotional disorders.* Oxford, England: International Universities Press.

Bodner, E., & Mikulincer, M. (1998). Learned helplessness and the occurrence of depressive-like and paranoid-like responses: The role of attentional focus. *Journal of Personality and Social Psychology, 74,* 1010–1023.

Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology, 54,* 579–616.

Cervone, D. (2004). The architecture of personality. *Psychological Review, 111,* 183–204.

Costa, P. T., & McCrae, R. R. (1995). Domains and facets: Hierarchical personality assessment using the revised NEO personality inventory. *Journal of Personality Assessment, 64,* 21–50.

Eich, E., Kihlstrom, J. F., Bower, G. H., Niedenthal, P. M., & Forgas, J. P. (2000). *Cognition and emotion.* New York: Oxford University Press.

Emmons, R. A., & Crumpler, C. A. (2000). Gratitude as a human strength: Appraising the evidence. *Journal of Social and Clinical Psychology, 19,* 56–69.

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.

Fleeson, W. (2001). Toward a structure- and process-integrated view of personality: Traits as density distributions of states. *Journal of Personality and Social Psychology, 80,* 1011–1027.

Fleeson, W. (2004). Moving personality beyond the person-situation debate: The challenge and the opportunity of within-person variability. *Current Directions in Psychological Science, 13,* 83–87.

Gilbert, D. T., Lieberman, M. D., Morewedge, C. K., & Wilson, T. D. (2004). The peculiar longevity of things not so bad. *Psychological Science, 15,* 14–19.

Gilbert, D. T., Pinel, E. C., Wilson, T. D., Blumberg, S. J., & Wheatley, T. P. (1998). Immune neglect: A source of durability bias in affective forecasting. *Journal of Personality and Social Psychology, 75,* 617–638.

Goldberg, L. R. (1993). The structure of phenotypic personality traits. *American Psychologist, 48,* 26–34.

Higgins, E., & Brendl, C. (1995). Accessibility and applicability: Some "activation rules" influencing judgment. *Journal of Experimental Social Psychology, 31,* 218–243.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6,* 1–55.

John, O. P., & Srivastava, S. (1999). The big five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 102–138). New York: Guilford Press.

Krull, J. L., & MacKinnon, D. P. (2001). Multilevel modeling of individual and group level mediated effects. *Multivariate Behavioral Research, 36,* 249–277.

Lane, J., & Anderson, N. H. (1976). Integration of intention and outcome in moral judgment. *Memory & Cognition, 4,* 1–5.

Linley, P. A., Joseph, S., Harrington, S., & Wood, A. M. (2006). Positive psychology: Past, present, and (possible) future. *Journal of Positive Psychology, 1,* 3–16.

Luke, D. A. (2004). *Multilevel modeling.* Thousand Oaks, CA: Sage.

Lyubomirsky, S., Sheldon, K. M., & Schkade, D. (2005). Pursuing happiness: The architecture of sustainable change. *Review of General Psychology, 9,* 111–131.

MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7,* 83–104.

Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology, 35,* 63–78.

Markus, H., Smith, J., & Moreland, R. L. (1985). Role of the self-concept in the perception of others. *Journal of Personality and Social Psychology, 49,* 1494–1512.

McCrae, R. R., & Costa, P. T. (1999). A five-factor theory of personality. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 139–154). New York: Guilford Press.

McCullough, M. E., Emmons, R. A., & Tsang, J. A. (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.-A., & 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.

Nezlek, J. B. (2001). Multilevel random coefficient analyses of event- and interval-contingent data in social and personality psychology research. *Personality and Social Psychology Bulletin, 27,* 771–785.

Raudenbush, S., Bryk, A., Cheong, Y. F., & Congdon, R. (2004). *HLM 6: Hierarchical linear and nonlinear modeling* [Computer software]. Lincolnwood, IL: Scientific Software International.

Rosenberg, E. L. (1998). Levels of analysis and the organization of affect. *Review of General Psychology, 2,* 247–270.

Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress: Empirical validation of interventions. *American Psychologist, 60,* 410–421.

Sobel, M. E. (1982). Asymptotic intervals for indirect effects in structural equations models. In S. Leinhart (Ed.), *Sociological methodology 1982* (pp. 290–312). San Francisco: Jossey-Bass.

Tesser, A., Gatewood, R., & Driver, M. (1968). Some determinants of gratitude. *Journal of Personality and Social Psychology, 9,* 233–236.

Tsang, J.-A. (2006). Gratitude and prosocial behaviour: An experimental test of gratitude. *Cognition & Emotion, 20,* 138–148.

Watkins, P. C., Scheer, J., Ovnicek, M., & Kolts, R. (2006). The debt of gratitude: Dissociating gratitude and indebtedness. *Cognition & Emotion, 20,* 217–241.

Wood, A. M., Joseph, S., & Linley, P. A. (2007a). Coping style as a psychological resource of grateful people. *Journal of Social and Clinical Psychology, 26,* 1108–1125.

Wood, A. M., Joseph, S., & Linley, P. A. (2007b). Gratitude: The parent of all virtues. *Psychologist, 20,* 18–21.

Wood, A. M., Maltby, J., Stewart, N., & Joseph, S. (i2008). Conceptualizing gratitude and appreciation as a unitary personality trait. *Personality and Individual Differences, 44,* 619–630.

Appendix

Sample Vignettes

Study 1

You are queuing at a supermarket till and are late in meeting someone. Noticing that you appear to be in a hurry the person in front of you let you go first. You realize that this person is on your course, and although you do not know them personally you have seen them around the department. You accept the person's offer and leave the store faster than you would have otherwise. You meet the person you had arranged to without being late.

Study 3

High-Benefit Version

You receive an unexpectedly high bill. You do not have the money to pay the bill and will get into a lot of trouble when the company contacts a debt collection agency. You receive a visit from your aunt, and tell her about your situation. She later phones you and offers to pay the bill. Your aunt is a generous woman and she genuinely wants to help you. Your aunt relies on her state pension and paying the bill will represent a considerable amount of money to her.

Low-Benefit Version

You receive an unexpectedly high bill. You can afford to pay the bill with the money in your bank account without much of a problem. Your receive a visit from your aunt, and tell her about your situation. She later phones you and offers to pay the bill. She does not really care about helping you, but rather wants to raise your family's opinion of her, and will no doubt remind them of it for some time to come. Your aunt is very rich and the cost of the bill will seem like a very small amount of money to her.

Received July 5, 2006
Revision received November 1, 2007
Accepted November 12, 2007 ■