Do Yourself a Favor: We Help Our Future Selves for the Same Reasons We Help Others

Citation

Burum, Bethany Anne. 2014. Do Yourself a Favor: We Help Our Future Selves for the Same Reasons We Help Others. Doctoral dissertation, Harvard University.

Permanent link

http://nrs.harvard.edu/urn-3:HUL.InstRepos:12274598

Terms of Use

Share Your Story

Do Yourself a Favor: We Help Our Future Selves for the Same Reasons We Help Others

A dissertation presented

by

Bethany Anne Burum

to

The Department of Psychology

in partial fulfillment of the requirements

for the degree of Doctor of Philosophy

in the subject of

Psychology

Harvard University

Cambridge, Massachusetts

May 2014

Dissertation Adviser: Professor Daniel Gilbert   Bethany Anne Burum

Do Yourself a Favor: We Help Our Future Selves for the Same Reasons We Help Others

ABSTRACT

As humans we have a remarkable capacity to sacrifice for the future, and an equally remarkable capacity to shortchange it, leaving our future selves to pay the price. The research in this dissertation suggests that sacrifice for the future (*patience)* may be governed by the same rules that govern sacrifice for others (*altruism*). Studies found that (1) patience was positively correlated with altruism, and (2) patience was positively correlated with empathic accuracy, a measure that predicted altruism. A third set of studies found that (3) a pervasive influence on altruism—group membership—also influenced patience. Participants who expected to switch groups in the future felt less connected to their future selves and left more than twice as much unpleasant work to the future. This research provides converging support for the hypothesis that common factors promote altruism and patience, suggesting that we may be able to draw on the decades of research studying kindness toward others to promote a little more kindness toward our future selves.

TABLE OF CONTENTS

DO YOURSELF A FAVOR:

PATIENCE AS INTERTEMPORAL ALTRUISM

We are the only animals who imagine things we can't see (Dennett, 1996; Gilbert, 2006; Roberts, 2002; Suddendorf & Corballis, 2007). We don't need a passport and a plane ticket to picture the Éiffel Tower, only a prefrontal cortex (Addis, Pan, Vu, Laiser, & Schacter, 2009; Buckner, Andrews-Hanna, & Schacter, 2008). Our ability to simulate the not-here, not-now means that we can forecast what may happen in the future and experience a preview of what that future may feel like (Anderson & Phelps, 2001; Breitner et al., 2001; Gilbert, 2006; Gilbert & Wilson, 2007; Kavanagh, Andrade, & May, 2005; Phelps et al., 2001). We don't have to spend a weekend painting our walls pink and orange before deciding whether we like them that way; we can picture the combination and wince right now.

Our unique capacity to imagine the future sets up our unique capacity to sacrifice for it. We are the only animals who, in situations our genes could never have foreseen, accept costs now for payoffs much later. Other primates wait only a few minutes for a larger reward (Beran & Evans, 2009; Stevens, Hallinan, & Hauser, 2005). Yet we routinely study to pass a test tomorrow, exercise to fit into a wedding dress in a few months, and save to retire to Hawaii in thirty years.

Despite our capacity to sacrifice for the future, we often foresee what will make us happy and fail to do it anyway. It is just as human to party the night before a midterm, sleep in instead of hitting the gym, and buy a new convertible instead of saving—leaving our future selves to pay the price of failure, last-minute dress alterations, and a lackluster retirement. Americans have saddled their future selves with more than $856 billion in credit card debt (Federal Reserve Aggregate Revolving Consumer Debt Survey, 2014), and although workers typically save

1

something for retirement, most don't save enough (Bernheim et al.*,* 2000; Li, 1996; Munnell, Webb, & Golub-Sass, 2007; Retirement Confidence Survey, 2013).

Our impatience is quantifiable: when people choose between receiving smaller amounts of money now and larger amounts in the future, they tend to choose smaller immediate rewards (called *discounting* future rewards; e.g. Frederick, Loewenstein, & O'Donoghue, 2002; Kirby & Marakovic, 1996). Further, the closer the delay period is to *right now*, the more it costs people to wait (e.g. people need to be paid a lot to wait a month, but not that much more to wait two months; Kirby & Marakovic, 1996; Laibson, 1997; Laibson, Repetto, & Tobacman, 1998**;** Zauberman, Kim, Maikoc, & Bettman, 2009). This indicates that the impatience people display in these decisions cannot fully be explained by rational concerns that change linearly with time, such as the certainty of getting the reward (Kirby & Marakovic, 1996; Chapman, 1996; Frederick, Loewenstein, & O'Donoghue, 2002; Laibson, 1997; O'Donoghue & Rabin, 1999). Rather, this impatience reflects a tendency to shortchange the future in service of what happens now.

Future Me Is More Like You

Why do we so often prioritize the present over the future? One possibility is that when we imagine something happening to us in the future, it feels like it's happening to someone else (Parfit, 1971, 1984; Schelling, 1984). We typically keep more for ourselves when dividing resources with other people (Camerer, 2003; Diekmann, Samuels, Ross, & Bazerman, 1997). If the future self is another 'other,' we would also expect to keep more for our present selves when dividing resources with our future selves.

New research confirms that we think about our future selves in much the same way that we think about other people. When people imagine their future selves (but not their present

selves) they adopt the visual perspective of an external observer, rather than imagining events in the first person (Pronin & Ross, 2006). People make the same decisions for their future selves as for others, which are distinct from the decisions they make for their present selves (Pronin, Olivola, & Kennedy, 2008). They also make behavioral attributions for their future selves that are more like those that they make for others than those that they make for their present selves (Nussbaum, Trope, & Liberman, 2003; Pronin & Ross, 2006; Wakslak, Nussbaum, Liberman, & Trope, 2008).

These behavioral results converge with research in cognitive neuroscience. Neuroimaging research has shown that cortical midline structures, including the mesial prefrontal cortex (mPFC) and the rostral anterior cingulate (rACC), are more active when people are thinking about themselves ('Do I like hip hop?') than when they are thinking about other people ('Does Roy like hip-hop?') (Amodio & Frith, 2006; Craik et al., 1999; Heatherton et al., 2006; Kelley et al., 2002; Moran, Macrae, Heatherton, Wyland, & Kelley, 2006; Northoff & Bermpohl, 2004; Northoff et al., 2006). Likewise the vmPFC and rACC are more active when people are thinking about their *present selves* ('Do I like hip hop?') than when they are thinking about their *future selves* ('Will I like hip hop?'; Ersner-Hershfield, Wimmer, & Knutson, 2009; Mitchell, Schirmer, Ames, & Gilbert, 2010). The larger the difference in activation in these regions for present relative to future selves, the less willing people are to forego small benefits in the present ($1 today) to obtain larger benefits in the future ($5 next month).

Common Factors Affect Helping Future Me and You

If we think about our future selves in much the same way that we think about other people, the factors that influence sacrifice for others may also influence sacrifice for the future. Several studies support this possibility.

3

We tend to sacrifice more for others if we feel connected and similar to them (Aknin, Sandstrom, Dunn, & Norton, 2011; Aron, Aron, Tudor, & Nelson, 1991; Cialdini, Brown, Lewis, Luce, & Neuberg, 1997; Galak, Small, & Stephen, 2010; Krebs, 1975). Likewise, people who feel more similar to their future selves have lower discount rates and more financial assets, including greater savings and lower debt (Ersner-Hershfield et al., 2009). People also discount rewards more when the delay period for the reward is a period during which they expect to their identity to change (Bartels & Rips, 2010). Further, telling college seniors that they will be very different after they graduate leads more of them to choose a small immediate reward instead of waiting a year for a larger one (Bartels & Urminsky, 2011).

We also sacrifice more for others if we attend to specific individuals (e.g. Jenni & Loewenstein, 1997; Kogut & Ritov, 2005; Loewenstein, Small & Strand, 2006). Likewise, people who interact with aged versions of themselves in virtual reality are more interested in saving for retirement than those who interact with current versions of themselves or aged versions of someone else (Ersner-Hershfield et al., 2011).

Finally, a sense of social responsibility can promote sacrifice for others to whom we feel connected (Nadler, Romek, & Shapira-Friedman, 1979; Willis & Goethais, 1973). Likewise, people who feel connected to their future selves save more for retirement if they see a message appealing to the social responsibility they have to their future selves than if they see a message appealing to their self-interest (Bryan & Hershfield, 2012).

Patience as Intertemporal Altruism

In short, new research in psychology, behavioral economics, and cognitive neuroscience implies that (1) we regard our future selves as other people, and (2) our connection to our future selves influences how we make the decisions that will ultimately affect their well-being. Taken

together, this research suggests that the basic rules that govern our treatment of others may govern our treatment of our future selves. In other words, the same factors that influence sacrifice for others (*altruism*) may influence sacrifice for the future (*patience*).

This hypothesis suggests a new place to look for the causes of impatience. Decades of research have shed light on the causes of our unkindness to others; if common factors promote altruism and patience, we may be able draw on this research to explain and ameliorate unkindness toward our future selves. Specifically, we may be able to take factors that we know affect altruism, and find that they affect patience.

The Present Research

This dissertation will test the hypothesis that common factors promote altruism and patience. Studies will test whether (1) patience is positively correlated with altruism, and (2) patience is positively correlated with empathic accuracy, a factor that predicts altruism. A third set of studies will test whether (3) a pervasive influence on altruism—group membership—also influences patience.

STUDY SET 1:

IS PATIENCE CORRELATED WITH ALTRUISM?

If common factors promote altruism and patience, we would expect patience to be positively correlated with altruism. Studies 1a and 1b tested this hypothesis by asking participants to make two sets of hypothetical choices: (1) choices between receiving a smaller amount of money immediately or a larger amount after a delay (the measure of *patience*), and (2) choices between receiving a smaller amount of money immediately or giving a larger amount to another participant (the measure of *altruism*). I predicted that the amount of money required to compel participants to wait for a larger payoff would be positively correlated with the amount of money required to compel them to give money to someone else—that those whose patience cost less would also put a lower price on altruism.

Study 1a

Participants

250 participants completed an online survey advertised in the 'volunteers' section of Craigslist. 67 were run by advertising on the Boston Craigslist website, 15 by advertising in Austin, 31 by advertising in San Francisco, 61 by advertising in Chicago, 48 by advertising in Philadelphia, and 28 by advertising in Atlanta. Participants were at least 18 years of age; the survey did not ask for specific demographic information.

Measures and Procedure

I measured participants' patience and altruism through two sets of hypothetical decisions (in counterbalanced order). To measure patience, I used a hypothetical version of a discounting task. Specifically, I asked participants to imagine that they were in an experiment and were given two options: receiving a certain amount of money now, or receiving a certain amount of

money in the future (See Appendix A for instructions). Participants then indicated which option they would choose in 26 different questions, with the current amount remaining constant, but the future amount increasing by $2 each question. The measure of patience was the minimum amount of money required to compel participants to choose the future amount.

To measure altruism, I designed an analogue of the patience questions. This set of questions also asked participants to imagine that they were in an experiment, but this time they were to imagine that there was another participant in another room and that they had to choose between receiving a certain amount of money now, or asking the experimenter to give a certain amount to the other participant (see Appendix B for instructions). Participants answered 26 questions, with the current amount remaining constant, but the amount for the other participant going up by $2 for each decision. The measure of altruism was the minimum amount of money required to compel participants to choose to give money to the other participant.

I collected responses from five different versions of this survey, altering the parameters of the questions slightly in different versions in an attempt to increase the percentage of participants who switched to the patient and altruistic response somewhere within the available range (if participants never switched from impatience to patience, I could not calculate a precise value for the cost of their patience, and likewise for altruism). To maximize response rates, I posted each version of the survey in a different city.

The first version of the survey asked participants to choose between receiving $5 now or $7+ in one month, and between receiving $5 now or giving $7+ to the next participant. In the subsequent four surveys I made the following changes: (1) I made the delay for the patience questions one year instead of one month, (2) I made the first patience question a choice between receiving $5 immediately or receiving $5 in a month (instead of $7), and the first altruism

7

decision a choice between receiving $5 or giving $5 to the other participant (instead of $7), (3) I made the impatient amount $8 for the patience questions (instead of $5), and (4) I changed the participants' amount to $2 for the altruism questions (instead of $5).

Results

I used meta-analysis to combine the results from the five survey versions (Lipsey & Wilson, 2001) because the N for most of the individual survey versions was quite low. Meta-analyzing the results across surveys, altruism and patience were positively correlated. This correlation held both when I included just those participants (40%) who provided a cost for both patience and altruism by switching to the patient and altruistic decision somewhere within the available range, $N = 94$, $r = .428$, $p < .01$, and when I analyzed a larger percentage of the data (90%) by assigning reasonable values to those who did not switch (i.e. by assigning the first possible value to those who were altruistic or patient at the first opportunity and the last possible value to those who were never patient or were never altruistic), $N = 225$; $r = .265$, $p < .01$. (Analyses excluded the 25 participants who did not answer all of the altruism or patience questions.)

Discussion

Study1a found that patience was positively correlated with altruism; participants more willing to wait for their money were also more willing to give money away. This is consistent with the hypothesis that common factors promote altruism and patience. However, because the decisions were hypothetical it is plausible that patience and altruism were correlated because participants who wanted to appear to do the 'right' thing indicated that they would wait patiently to get more money and also give up money so that a larger benefit could go to another. To help rule out this explanation, study 1b added a measure of how motivated participants are to present

8

themselves in a favorable light (Crowne & Marlowe, 1960). By using Amazon Mechanical Turk, study 1b was also able to replicate the results of study 1a using a single survey with more power.

Study 1b

Participants

100 participants were recruited through Amazon Mechanical Turk. Participation was limited to American workers who were at least 18 years of age (43% female; $M_{Age} = 38.25$ years, $SD_{Age} = 12.86$ years, range: 21-70 years).

Measures and Procedure

Participants answered the altruism and patience questions used in study 1a (order counterbalanced). For patience, the choice was always between receiving $5 immediately or a certain amount in one month. The delayed amount began at $5 and went up by $2 per question for a series of 26 questions to reach $55 dollars.

For altruism, the choice was always between receiving $5 immediately or giving a certain amount to the other participant. The amount for the other participant started at $5 and went up by $2 per question for a series of 26 questions to reach $55.

After answering these questions, participants completed the Marlowe-Crowne Social Desirability Scale. This scale measures how motivated participants are to present themselves in a favorable light by asking a series of true or false questions for which the likely honest answer is socially undesirable (e.g. *I never hesitate to go out of my way to help someone in trouble*; Crowne & Marlowe, 1960). (See Appendix C for the full scale.) Participants also completed a few demographic questions.

Results

     Patience and altruism. As in study 1a, the measure of patience was the minimum amount of money required to compel participants to wait, and the measure of altruism was the minimum amount of money required to compel them to give money to the other participant. Patience was positively correlated with altruism, both when I included just those participants (46%) who provided a cost for both patience and altruism by switching to the patient and altruistic decision somewhere within the available range, $N = 45$, $r = .519$, $p < .001$, and when I analyzed a larger percentage of the data (97%) by assigning reasonable values to those who did not switch (i.e.by assigning the first possible value to those who were altruistic or patient at the first opportunity and the last possible value to those who were never patient or were never altruistic), $N = 97$, $r = .205$, $p = .044$. (Analyses excluded the 3 participants who did not answer all of the altruism or patience questions.)

     Social desirability. Social desirability scores were not correlated with patience or altruism. This held both when I included just participants who switched at some point to the patient and altruistic decision, patience $r = -.058$, $p = .573$; altruism $r = .182$, $p = .222$, and when I analyzed a larger percentage of the data by assigning reasonable values to those who did not switch, patience $r = -.037$, $p = .716$; altruism $r = .095$, $p = .350$.

Discussion

     Study 1b replicated the positive correlation between patience and altruism found in study 1a, and demonstrated that this correlation was independent of participants' motivation to present themselves in a desirable light.

Discussion of Study Set 1

Two studies found that participants who were more altruistic were also more patient. This correlation is consistent with the hypothesis that common factors promote altruism and patience. For instance, participants who tend to feel more connected to others may have felt more motivated to forgo money in order to give more to another participant and to their future selves.

However, there are many alternative explanations. One possibility is that people who are virtuous in one way tend to be virtuous in other ways. Neither altruism nor patience was correlated with participants' motivation to present themselves in a favorable light; however, people who are genuinely more patient may also be genuinely more altruistic, not because of a special connection between altruism and patience, but because virtues cluster together (e.g. due to commonalities in parenting and culture, values, genetics). Research showing that altruism and patience are more correlated with one another than they are with other virtues, such as honesty, would help rule out this alternative.

Additionally, these studies used very similar questions to measure patience and altruism. This helped remove other sources of variance, but it also increased the probability that spurious factors (e.g. a motivation to pick answers with larger numbers in them) would create a positive correlation. Research using measures of patience and altruism that are more different from one another could rule out this alternative.[1]

---

[1] Although there are multiple reasons to predict a positive correlation between patience and altruism, there are also good reasons to predict a *negative* correlation. Maximizing personal financial gain likely requires both the patience to wait now for greater returns later, and the selfishness to keep as much as possible for oneself. Likewise, the more one gives away to others now, the less one has to enjoy later. Thus, individual differences in how much people prioritize maximizing their own financial gain might have produced a negative correlation between altruism and patience if this had been a dominant influence on participants' decisions.

In light of these and other alternative explanations, studies 1a and 1b would make a stronger case in combination with other research suggesting that common factors promote altruism and patience.

Decades of research have shown that empathy increases altruism (e.g. Batson, 1990; Batson, Fultz, & Schoenrade, 1987; Caprara, Alessandri, & Eisenberg, 2012; Edele, Dziobek, & Isabel, 2013). In turn, people feel more empathy for other people if they think about their mental states, including their emotional states (Batson et al., 1997). If the factors that promote altruism promote patience, we may also expect those who think more about others' emotional states to be more patient.

A common measure that focuses on thinking about others' emotional states is the Reading the Mind in the Eyes Task (RMET), a test of empathic accuracy that asks respondents to guess people's emotional states from pictures of their eye regions. Although some research suggests that empathic accuracy increases kindness toward others (e.g. Simpson, Ickes, & Blackstone, 1995; Verhofstadt, Buysse, Ickes, Davis, & Devoldre, 2008), I could not locate any research that directly examined the relationship between RMET scores or other similar measures of empathic accuracy and altruism. For this reason, study 2a established that empathic accuracy as measured by the RMET is positively correlated with altruism. Studies 2b and 2c then tested whether patience is positively correlated with empathic accuracy. In addition, study 2c added a measure of connection with one's future self to test weather this measure would mediate the relationship between patience and empathic accuracy.

Study 2a

Participants

300 participants (recruited from Amazon Mechanical Turk) completed this study (pretesting suggested that this study required a large sample size). Participation was limited to

American workers who were at least 18 years of age (49% female, M_{Age} = 36.16 years, SD_{Age} = 11.69 years, range: 20 to 75 years).

Measures and Procedures

This study measured empathic accuracy using the "Reading the Mind in the Eyes" Test (RMET). Originally developed by Baron-Cohen, Jolliffe, Mortimore, and Robertson (1997), this test shows a series of 37 photos of people's eye regions, all expressing different emotions, and participants choose the emotion that the picture is expressing out of four possible choices. Scores on the RMET are inversely correlated with scores on the Autism Spectrum Quotient (AQ), and convey subtle individual differences in social sensitivity (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). A higher score indicates higher empathic accuracy. (See Appendix D.)

Participants completed the RMET and the measure of altruism used in studies 1a and 1b (order counterbalanced). They also completed the Social Desirability Scale and answered a few demographic questions.

Results

RMET scores and altruism. Scores on the RMET were negatively correlated with the amount of money required to compel participants to be altruistic. This correlation held both when I included just those participants (51%) who provided a cost for altruism by switching to the altruistic decision somewhere within the available range, N =152, r = -.233, p = .004, and when I analyzed a larger percentage of the data (92%) by assigning reasonable values to those who did not switch (i.e.by assigning the first possible value to those who were altruistic at the first opportunity and the last possible value to those who were never altruistic), N = 275, r = -.117, p = .052. (Analyses excluded the 25 participants who provided inconsistent answers to the

altruism questions.) Thus, participants with higher empathic accuracy scores were also more altruistic.

Social desirability. Social desirability scores were positively correlated with RMET scores, $N = 300$, $r = .150$, $p = .009$. Social desirability scores were also marginally negatively correlated with the amount of money required to compel participants to be altruistic when I included just those participants (51%) who switched to the altruistic decision, $N = 153$, $r = -.147$, $p = .069$, although not when I assigned reasonable values to those who did not switch, $N = 275$, $r = .064$, $p = .293$. Thus, participants with higher social desirability scores had higher empathic accuracy and were marginally more altruistic.

I entered RMET scores and social desirability scores into a regression model whose dependent variable was altruism. The analysis revealed that both RMET scores, $\beta = .234$, $p = .001$, and social desirability scores, $\beta = .170$, $p = .017$, remained significant predictors of altruism, showing that RMET scores predicted altruism independent of social desirability scores.

Discussion

Study 2a found that empathic accuracy was positively correlated with altruism, independent of participants' motivation to present themselves in a favorable light. If the factors that promote altruism also promote patience, empathic accuracy should also predict participants' patience. Study 2b tested this hypothesis.

<div align="center">

Study 2b

</div>

Participants

96 Harvard undergraduates and summer school students participated in a lab study. I excluded two participants for not following directions, six for being strongly suspicious of elements of the study, and three because they had noticeably limited English. This left 85

participants for analysis (69% female, M_{Age} = 19.82 years, SD_{Age} = 2.45 years, range: 16 – 27

years). Participants were recruited through the Harvard Psychology Department and

compensated with $5 or study pool credit.

Measures and Procedure

This study measured patience using a standard intertemporal choice task (a *discounting*

task). This task, like the measure of patience in studies 1a and 1b, measured participants'

preferences for smaller immediate compared to larger delayed rewards (task adapted from Kirby

& Marakovic, 1996). Participants made 48 hypothetical choices between a smaller immediate

reward ($10) and a larger delayed reward (order of all questions randomized). The larger reward

values ranged from $12 to $26 in $2 increments, and the delay periods were 1, 7, 30, 60, 180,

and 365 days. (See Appendix E for intertemporal choice task instructions.)

The measure of patience was the participant's *discount rate*. Discount rates were

calculated using the following hyperbolic model (Kirby, Petry, & Bikel, 1999; Mazur, 1987; for

more specific information on how to calculate discount rates, see Kirby, 2000):

$$V = \frac{A}{1 + kD}$$

In this model, V is the value of the immediate reward, A is the value of the delayed

reward, D is the amount of delay (in days), and k is the discount rate. The larger the discount

rate, the more impatient participants' choices were.

Discount rates predict patience in multiple domains. Alcoholics, cigarette smokers,

heroin addicts, and other drug users have higher discount rates than control participants (Bickel

& Johnson, 2003; Vuchinich & Simpson, 1998), and lower discount rates predict lower BMI and

risk for obesity, higher rates of exercise, and greater use of preventative health services (e.g**.** Bradford, 2010; Chabris et al., 2008; Ikeda, 2009; Weller, Cook, Avsar, & Cox, 2008). Researchers have found similar patterns in participants' discount rates when using real rewards (Kirby, 1997; Kirby & Marakovic, 1996) and hypothetical rewards (Green, Fristoe, & Myerson, 1994; Locey, Jones, & Rachlin, 2011).

Participants completed the intertemporal choice task and the RMET at a computer in a lab room.[2] They then completed the Social Desirability Scale and answered some demographic questions.

Results

Discount rates and RMET scores. Discount rates were negatively correlated with RMET scores, $N = 79$, $r = -.225$, $p = .046$. (Analyses excluded the 6 participants who did not answer all of the questions.) Thus, more patient participants had higher empathic accuracy.

Response times. Response times for the discounting task and the RMET were positively correlated, $N = 64$, $r = .562$, $p < .001$. (Due to a computer error RMET response times were not collected for 16 participants.) However, discount rates were not correlated with response times on the discounting task, $N = 84$, $r = -.021$, $p = .852$, and RMET scores were not correlated with response times on the RMET, $N = 64$, $r = -.014$, $p = .915$. Likewise, discount rates were not correlated with response time on the RMET, $N = 63$, $r = -.055$, $p = .671$, and RMET scores were not correlated with response times on the discounting task, $N = 80$, $r = -.060$, $p = .596$. Thus, the

---

[2] The measures in this study were included with a separate study that had a separate hypothesis. As a result, after completing the intertemporal choice task, but before completing the discounting task, participants had two other experiences. First, participants encountered a confederate posing as a student who asked participants to answer as many questions on a questionnaire as they were willing to complete. Second, participants had their height measured. After this, participants returned to the lab room where they had previously completed the intertemporal choice task and completed the RMET.

correlation between RMET scores and discounting scores was independent of the amount of time participants spent on these tasks.

Social desirability. Social desirability scores did not correlate with discount rates, $N = 83$, $r = .012$, $p = .916$, or RMET scores, $N = 81$, $r = -.096$ $p = .394$. Thus, participants' discount rates and RMET scores were independent of their social desirability scores.

Discussion

Study 2b found that patience was positively correlated with empathic accuracy, a measure that predicted altruism in study 2a. These results are consistent with the hypothesis that common factors promote altruism and patience. Our future selves do not provide us with literal facial expressions to decipher like those on the RMET, but higher empathic accuracy may reflect a more general tendency to think about others' emotional states (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). Those who tend to think more about others' emotional states may be more engaged during a test of empathic accuracy, or get more practice reading other people's emotions in everyday life. In turn, the tendency to think about others' emotional states may lead people to think more about their future selves' emotional states, increasing patience.

When people think more about their future selves' emotional states they may consequently feel more connected to their future selves. Given that people who feel more connected to their future selves are more patient (Bartels & Rips, 2010; Bartels & Urminsky, 2011; Ersner-Hershfield et al., 2009), empathic accuracy may increase patience in part by increasing people's connection to their future selves.

Study 2c tested this hypothesis by including a measure of participants' connection to their future selves. This study also added a measure of mood to test whether participants' mood could explain the correlation between patience and empathic accuracy.

Study 2c

Participants

114 Harvard undergraduates and community members participated in a lab study. Eight participants were excluded for failing to follow directions, and an additional eight for figuring out the study's hypothesis. This left 98 participants for analysis (48% females, M_{Age} = 27.88 years, SD_{Age} = 13.20 years, range: 17 – 65 years). Participants were recruited through the Harvard Psychology Department and the Decision Science Laboratory, and compensated with $5 or study pool credit.

Measures and Procedure

Participants completed the RMET, intertemporal choice task, and Social Desirability Scale from study 2b. They also completed two additional scales.

The first was the Future Self Connection Questionnaire, which I created to measure how connected participants felt with their future selves. For the first 10 questions, participants imagined themselves ten years in the future and rated how similar and connected they felt to this future self. I averaged these ten questions to obtain a *connection score* (α = .773). For the remaining six questions, participants imagined developing chronic back pain in ten years. Five questions then asked participants to rate how much compassion and sympathy they felt towards this future self with back pain, and I averaged these five questions into a *compassion score* (α = .914). An additional *back pain concern score* question asked participants to rate the extent to which they were concerned about the possibly of developing back pain in the future. (See Appendix F for the questionnaire.)

Participants also completed the Positive and Negative Affect Schedule (PANAS), a widely used measure of mood with high internal consistency, and high discriminate and

convergent validity (Watson, Clark, & Tellegen, 1988). Participants rated the extent to which they were experiencing each of sixteen specific mood states at the current moment (I shortened the original 20-item PANAS to the 16 most useful items). I averaged the ratings for the ten positive items to calculate participants' positive affect score (α = .909), and averaged the ratings for the six negative items to calculate participants' negative affect score (α = .839). (See Appendix G for the full scale used in this study.)

Participants completed all questionnaires and then answered some demographic questions.[3]

Results

Discount rates and RMET scores. Discount rates were negatively correlated with RMET scores, N = 97, r = -.354, p < .001, demonstrating that participants with higher empathic accuracy were also more patient. (Analysis excluded the 1 participant who did not answer all of the discounting questions.)

Future self connection. Participants' connection to their future selves was negatively correlated with their discount rates, N = 97, r = -.236, p = .020, and positively correlated with their RMET scores, N = 98, r = .265, p = .008. Thus, the more connection participants felt with their future selves, the higher their patience and empathic accuracy (see Table 1 for the correlations between these variables).

Participants' compassion for a hypothetic future self who developed back pain was not correlated with their discount rates, N = 97, r = -.004, p = .971, or their RMET scores, N = 98, r

---

[3] The measures in this study were included with a separate study that had a separate hypothesis. As a result, before completing any of the measures in this study participants first summarized a paragraph that contained either an example of altruism or an example of honesty. This manipulation had no effect on discounting scores, RMET scores, or, in a separate study, on altruism.

= .069, *p* = .499. Likewise, participants' concern about developing back pain was not correlated with their discount rates, *N* = 98, *r* = .059, *p* = .567, or their RMET scores, *N* = 98, *r* = -.158, *p* = .121

Table 1. Correlations in study 2c between discount rates, RMET scores, and future self (FS) connection scores. Lower discount rates reflect higher patience.

	Discount Rates	RMET Scores	FS Connection
Discount Rates	—	-.354**	-.236*
RMET Scores	—	—	.265**
FS Connection	—	—	—

* *p* < .05; ** *p* < .01

Future self connection mediated the relationship between RMET scores and discount rates. I predicted that participants' connection to their future selves would partially mediate the relationship between empathic accuracy and patience. Conceptually consistent with this, (a) RMET scores predicted discount rates, (b) RMET scores predicted future self connection scores, and (c) future self connection scores predicted discount rates.

The Sobel test is the most commonly used means of testing the significance of a mediation analysis (Sobel, 1982). However, the Sobel test has recently been called into question because it requires the assumption that the sampling distribution of the mediation effect is normal, when in fact it tends to be asymmetric, with nonzero skewness and kurtosis (Bollen & Stine, 1990; Stone & Sobel, 1990). As an alternative, bootstrapping approaches are becoming

increasingly popular, both because they are nonparametric tests that do not assume normality, and because they tend to have the highest power and the best Type I error control (Hayes, 2009). Bootstrapping generates an empirical representation of the sampling distribution of the mediation effect by taking repeated subsamples from the data (with replacement) and treating each subsample as a representation of the population in miniature.

I used the Preacher and Hayes bootstrapping method (Hayes, 2013) to test whether future self connection scores significantly mediated the relationship between RMET scores and discount rates (using the PROCESS SPSS Macro that Hayes made publically available). This method provides a 95% confidence interval (CI) for the mediation effect, which was significant, 95% CI [-1.63, -0.50].

RMET scores mediated the relationship between future self connection and discount rates. When I entered future self connection scores and RMET scores into a regression model whose dependent variable was discount rates, I noticed that RMET scores ($\beta = -.314$) remained a stronger predictor of discount rates than future self connection scores ($\beta = -.153$). For this reason, I tested the hypothesis that empathic accuracy partially mediated the relationship between participants' connection with their future selves and their discount rates. A bootstrapping analysis (Hayes, 2013) revealed that the mediation effect was significant, 95% CI [-1.63, -0.50].

Social desirability. Social desirability scores were not correlated with RMET scores, $N = 98$, $r = -.079$, $p = .439$, discount rates, $N = 97$, $r = .125$, $p = .224$, future self connection scores, $N = 98$, $r = .100$, $p = .327$, future self compassion scores, $N = 98$, $r = .010$, $p = .922$, or concern about developing back pain, $N = 98$, $r = -.112$, $p = .271$.

Mood. Participants' negative affect scores were negatively correlated with their RMET

scores, $N = 98$, $r = -.331$, $p = .001$, and future self connection scores, $N = 98$, $r = -.200$, $p = .044$. Positive affect scores were not correlated with RMET scores, $N = 98$, $r = -0.31$, $p = .763$, but were positively correlated with future self connection scores, $N = 98$, $r = .299$, $p = .003$. Neither negative affect scores, $N = 97$, $r = .159$, $p = .121$, nor positive affect scores, $N = 97$, $r = -.036$, $p = .729$, were correlated with discount rates.

I entered RMET scores, negative affect scores, and positive affect scores into a regression model whose dependent variable was discount rates. Analyses revealed that RMET scores remained a significant predictor of discount rates, $\beta = -.340$, $p = .001$, whereas negative affect scores, $\beta = .049$, $p = .637$, and positive affect scores, $\beta = -.049$, $p = .612$, did not.

I also entered future self connection scores, negative affect scores, and positive affect scores into a regression model whose dependent variable was discount rates. Analyses revealed that future self connection scores remained a significant predictor of discount rates, $\beta = -.220$, p $= .044$, whereas negative affect scores, $\beta = .113$, $p = .276$, and positive affect scores, $\beta = .023$, p $= .829$, did not.

Finally, I entered future self connection scores, negative affect scores, and positive affect scores into a regression model whose dependent variable was RMET scores. Analyses revealed that future self connection scores remained a significant predictor of RMET scores, $\beta = .234$, $p = .024$, as did negative affect scores, $\beta = -.280$, $p = .005$, but not positive affect scores, $\beta = -.088$, $p = .379$.

Thus, participants who were in a better mood had higher empathic accuracy and felt more connected with their future selves, but mood did not relate to patience and could not account for the relationship between patience and empathic accuracy, the relationship between patience and participants' connection with their future selves, or the relationship between empathic accuracy

and participants' connection with their future selves.

Discussion

Study 2c replicated the positive correlation between empathic accuracy and patience shown in study 2b, and demonstrated that this correlation was independent of participants' mood. In addition, participants' connection with their future selves partially mediated the relationship between empathic accuracy and patience, and empathic accuracy partially mediated the relationship between participants' connection with their future selves and patience.

<div align="center">

Discussion of Study Set 2

</div>

The results of these studies supported the hypothesis that common factors promote altruism and patience. Participants who had higher empathic accuracy were more altruistic and more patient, and empathic accuracy and patience were both positively correlated with participants' connection to their future selves. This joins past research (Bartels & Rips, 2010; Bartels & Urminsky, 2011; Ersner-Hershfield et al., 2009) to provide converging evidence that people are more patient when they feel more connected to their future selves. It also demonstrates a novel relationship between attunement to others' emotions and connection to one's future selves.

Empathic Accuracy May Promote Altruism and Patience

Higher empathic accuracy may reflect a greater tendency to think about the emotional states of others, including one's future selves. People who tend to think more about their future selves' emotional states may be more patient when making intertemporal decisions because they think more about how they will feel if they receive money in the future. They may also develop a habit of prioritizing the future because they often consider how their future selves will feel.

People who think more about their future selves' emotional states may consequently feel

<div align="center">

24

</div>

more connected to their future selves, which may encourage them to be more patient (i.e. thinking more about their future selves' emotional states → greater connection to their future selves → greater patience). Consistent with this possibility, study 2c found that participants' connection to their future selves partially mediated the relationship between empathic accuracy and patience.

In addition, participants who feel more connected to their future selves may consequently think more about their future selves' emotional states, which may encourage them to be more patient (i.e. greater connection to their future selves → thinking more about their future selves' emotional states → greater patience). Consistent with this possibility, study 2c also found that empathic accuracy partially mediated the relationship between participants' connection to their future selves and patience.

Alternative Explanations

Mediation analyses do not reveal anything definitive about causal relationships. Additional measures helped to rule out some of the more obvious and uninteresting explanations for the correlation between patience and empathic accuracy: the time participants spent on the tasks, their mood, and their motivation to present themselves in a favorable light. However, other alternatives remain. For instance, patience and empathic accuracy could be correlated because all virtues tend to be correlated (as discussed for patience and altruism). Alternatively, impatience may decrease people's tendency to develop empathic skills. The payoffs associated with thinking about other people's emotions may be fairly long-term (e.g. building strong relationships, developing the ability to handle social situations); perhaps impatient people put less energy into developing these skills.

Given the alternative explanations that confound correlations, I turned to experiments.

Specifically, I manipulated a pervasive determinant of altruism, and tested its effect on patience.

STUDY SET 3:

DOES GROUP MEMBERSHIP AFFECT PATIENCE?

One of the most pervasive determinants of altruism is group membership. Children and adults across cultures are kinder to members of their in-groups than to members of their out-groups. Merely categorizing people into arbitrary groups causes them to express more favorable evaluations of in-group members (e.g. Doise et al., 1972; Rabbie & Horowitz, 1969), allocate more resources to in-group members (e.g. Hertel & Kerr, 2001; Jetten, Spears, & Manstead, 1992; Mullen, Brown, & Smith, 1992; Tajfel, Billig, Bundy, & Flament, 1971), cooperate more with in-group members (e.g. Kramer & Brewer, 1984; Simpson, 2006), and sacrifice more money for in-group members (Yamagishi & Mifune, 2008). When placed in competitive groups, people favor in-group members even more strongly (Sherif et. al., 1962; Blake & Mouton, 1962), empathizing less with out-group members and taking pleasure in their misfortunes (e.g. Cikara, Botvinik, & Fiske, 2011; Cikara, Bruneau, & Saxe, 2011).

The strength and robustness of in-group favoritism makes it a promising test case for the hypothesis that common factors promote altruism and patience. If this hypothesis is correct, participants should be less patient when they expect their future selves to be members of a different group.

Two studies tested this hypothesis. Participants in these studies were randomly assigned to a team arguing for one of two positions in a legal dispute. After reading about and discussing the dispute, half learned that they would switch teams and argue for the opposing position when they returned in a week for the second part of the study. Participants then decided how much of an unpleasant task they would complete immediately and how much they would leave to complete when they returned.

I predicted that participants who expected to switch teams would leave more of the unpleasant task to the second part of the study than participants who expected to remain on the same team. I also predicted that participants who expected to switch teams would feel less connected to their future selves, and that this would partially mediate the effect of switching teams on the amount of the unpleasant task that they left.

Study 3a

Participants

53 undergraduates from Harvard University were recruited through the Harvard Study Pool. One participant was omitted for not finishing the study, one for having a large number of suspicions about the purpose of the study, and one for being confused about the study instructions. This left 50 participants for analysis (66% female; M_{Age} = 19.92 years; SD_{Age} = 1.69; range: 18-25 years). (2 participants did not list their age.) Participation took two hours, divided into two parts, and participants were compensated with $20 or course credit at the end of the second part.

Measures and Procedure

Harvard undergraduates arrived at the laboratory for a two-part study in which the two sessions were to be separated by about a week. Throughout both sessions, the experimenter read from a script to standardize the procedure (see Appendix H).

Session 1. During session 1, participants read about a complex legal dispute between a biological mother and an adoptive mother who were both seeking custody of the same infant (a fictional dispute created for this experiment; see Appendix I). Participants were told that there were several other participants in the lab that day, and that all of them had been assigned to one of two 'legal teams,' either the prosecution or the defense. Each team, they were told, would act

as an advocate for one of the mothers. During session 1 the teams would develop arguments on a particular mother's behalf, and during session 2 the teams would have a debate.

Participants were also told that during session 1 they would join their two other teammates in a chat room and spend about 30 minutes discussing the facts of the case and developing their arguments. In reality, there were no other participants in the lab; to camouflage this, participants were told that the other participants had arrived at slightly different times to avoid face-to-face communication that could bias the online conversation.

Once participants finished reading the case materials, they began the online chat with their two fictional teammates using Google Chat (gchat). The experimenter sat in a separate room and played the role of the two fictional teammates by using two separate email accounts. The two fictional teammates and the real participant answered preset questions in a set order, with the real participant always responding last so that he or she would always see the same text from the other teammates. (See Appendix J for gchat scripts.)

After the chat was complete, participants were told that the first part of the study was finished. Critically, participants in the *stay condition* were told that when they returned for the debate the following week they would remain on the same team, whereas participants in the *switch condition* were told that, due to some cancelations, when they returned in a week they would switch teams and debate for the opposite side of the case, against their teammates from the first session. Before completing any other tasks, participants completed the PANAS to capture the mood that they were in after being told whether or not they were going to switch teams.

Participants were then told that they would spend the remaining 40 minutes of the time slot participating in an unrelated study about pattern recognition. For this study they were asked

to complete eleven pages of an incredibly dull and time consuming task (the *unpleasant task*) that required them to find four-letter animal names in lines of letters (see Appendix K). Before beginning the unpleasant task, participants completed a few practice questions so that they would have the opportunity to discover how truly tedious it was. They then received a folder containing the full eleven pages and were asked to decide how much of the task they wanted to complete right then, and how much they wanted to leave to complete when they returned for the second session. Participants were told that there was enough time in both sessions to allow them to divide the task any way they wished (including doing all of the task in the first session or leaving all of the task to the second session). To avoid demand effects, the experimenter left the room while participants divided the task.

Once participants had divided the unpleasant task, they worked on the pages that they had decided to complete during the first session. About five minutes before the study was scheduled to finish, participants filled out a questionnaire that asked them about the legal dispute and debate, the unpleasant task, and their feelings toward their future selves in a week (e.g. *How connected do you feel to yourself a week from now*; see Appendix L).

Session 2. It was important to verify that participants expected to return for the second session and complete the pages that they had left for that time. However, I did not need to collect any more data during session 2. Thus, when participants returned for the second session they were informed that the study was complete, debriefed, and paid or credited.

Results

Manipulation checks. Participants assigned to the prosecution and those assigned to the defense were equally invested in their teams. Prosecution and defense participants were equally invested in winning the case, $t(48) = 0.85$, $p = .400$ (prosecution $M = 4.68$, $SD = 1.22$; defense M

= 4.36, *SD* = 1.44), were equally convinced that the team they had been on in session 1 had the more valid case, *t*(48) = -0.61, *p* = .547 (prosecution *M* = 4.84, *SD* = 1.57; defense *M* = 5.12, *SD* = 1.69), felt equally competitive with the other team, *t*(48) = 1.12, *p* = .269 (prosecution *M* = 4.52, *SD* = 1.42; defense *M* = 4.72, *SD* = 1.65), were equally confident that their team would win the debate in session 2, *t*(48) = -0.67, *p* = .507 (prosecution *M* = 4.92, *SD* = 1.12; defense *M* = 5.16, *SD* = 1.41), liked their teammates from session 1 equally, *t*(48) = 0.77, *p* = .445 (prosecution *M* = 5.80, *SD* = 1.12; defense *M* = 5.56, *SD* = 1.08), and felt equally connected to their teammates, *t*(48) = 1.39, *p* = .171 (prosecution *M* = 5.08, *SD* = 1.58; defense *M* = 4.48, *SD* = 1.48).

I collapsed across assignment to the prosecution or defense to look at the effect of switching teams. Participants in the switch condition (*M* = 4.72, *SD* = 1.28) were less confident than were participants in the stay condition (*M* = 5.36, *SD* = 1.19) that their position from session 1 was the valid case (*t*(48) = 2.07, p = .044), but participants in the switch condition (*M* = 4.72, *SD* = 5.36) also felt marginally less confident than did participants in the stay condition (*M* = 5.36, *SD* = 4.72) that they would win the debate in session 2 (*t*(48) = 1.84, *p* = .072).

Participants in the switch and stay conditions were equally invested in winning the case, *t*(48) = -0.64, *p* = .529 (switch *M* = 4.64, *SD* = 1.22; stay *M* = 4.40, *SD* = 1.44), and felt equally competitive with the other team, *t*(48) = -0.80, *p* = .431 (switch *M* = 4.64, *SD* = 1.75; stay *M* = 4.24, *SD* = 1.81). Participants in the switch and stay conditions were also equally attached to their teammates, feeling equally connected to their teammates, *t*(48) = 1.30, *p* = .200 (switch *M* = 4.64, *SD* = 1.67; stay *M* = 4.92, *SD* = 1.44), and liking them equally, *t*(48) = 0.64, *p* = .527 (switch *M* = 5.48, *SD* = 1.12; stay *M* = 5.88, *SD* = 1.05). However, participants in the switch condition were less happy about the team they were going to be on when they returned for

session 2, $t(48) = 2.43$, $p = .019$ (switch $M = 4.12$, $SD = 1.72$; stay $M = 5.12$, $SD = 1.13$), suggesting that participants preferred to remain on the same team.

Participants in the switch and stay conditions did not differ in how much they enjoyed the unpleasant task, $t(48) = 0.23$, $p = .823$, (switch $M = 2.96$, $SD = 1.84$; stay $M = 3.08$, $SD = 1.94$), or in how much they wanted it to stop, $t(47) = -0.59$, $p = .530$ (switch $M = 4.88$, $SD = 1.94$; stay $M = 4.54$, $SD = 2.11$). (1 participant did not answer the question about how much they wanted the task to stop.)

Returning for session 2. All but one participant (98%) returned for the second session. This indicates that participants expected to return for the second session and complete the pages that they had left for that time.

Effect of switching teams on patience. I predicted that participants who expected to switch teams would leave more of the unpleasant task to the second session than those who expected to stay on the same team. As predicted, an independent samples t-test revealed that participants in the switch condition left more pages of the unpleasant task to the second session ($M = 5.16$, $SD = 2.82$) than did participants in the stay condition ($M = 2.12$, $SD = 3.06$), $t(48) = 3.65$, $p = .001$, $d = 1.03$ (see Figure 1). The effect size for this analysis exceeded Cohen's (1988) convention for a large effect ($d = 0.80$).

There are two striking features of this effect. First, the effect is very large, with participants in the switch condition leaving more than twice as many pages to the second session. Second, participants in the stay condition were very patient, completing an average of 8.88 out of 11 pages in the first session. This study does not include a baseline measure of how patient participants would have been if were they not assigned to a team, but group membership may have pushed participants in opposite directions: participants in the stay condition may have been

more patient because their future selves were in-group members, whereas participants in the switch condition may have been *less* patient because their future selves were out-group members.
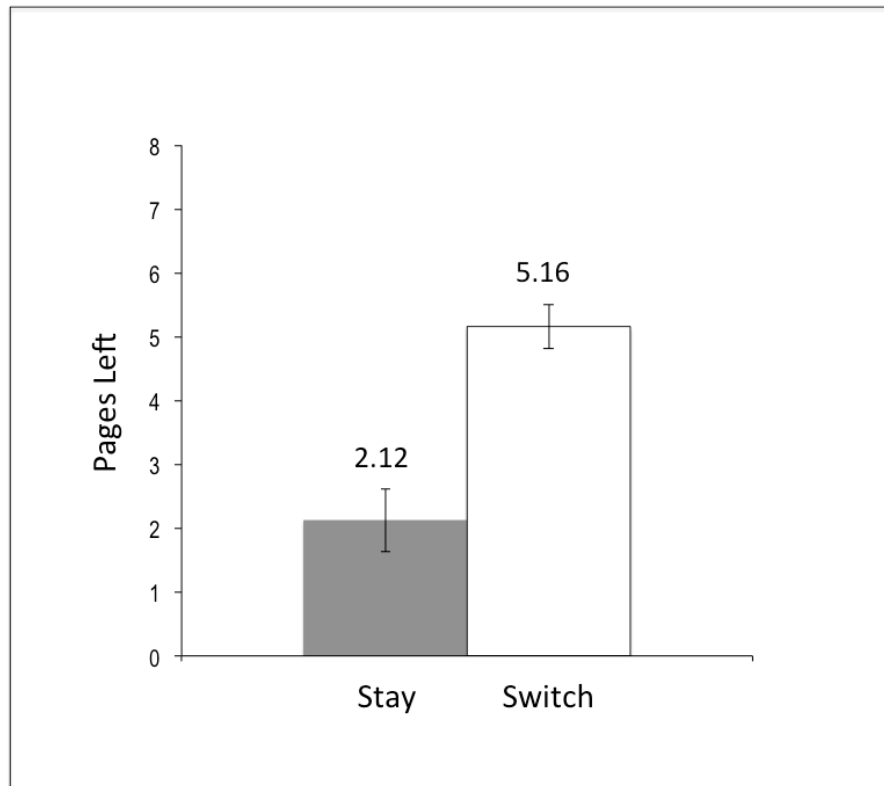
Figure 1. Pages of the unpleasant task that participants left to the second session in experiment 1. Error bars reflect the standard error around each mean.

Assignment to the prosecution or defense. I ran an analysis of variance (ANOVA) to test whether the effect of switching teams interacted with the team to which participants were assigned (prosecution or defense). This analysis revealed a main effect switching teams on the number of pages of the unpleasant task that participants left to the second session, $F(1, 46) = 12.90$, $p = .001$. However, there was no main effect of team (prosecution or defense), $F(1, 46) = 1.21$, $p = .277$, and no interaction between switching teams and team, $F(1, 46) = 0.37$, $p = .546$. Given this, all analyses collapsed across the team to which participants were assigned.

Participant sex. I also ran an ANOVA to test whether the effect of switching teams

interacted with participant sex. This analysis revealed a main effect switching teams on the number of pages of the unpleasant task that participants left to the second session, $F(1, 46) = 12.40$, $p = .001$. However, there was no main effect of participant sex, $F(1, 46) = 0.56$, $p = .458$, and no interaction between participant sex and switching teams, $F(1, 46) = 0.08$, $p = .786$. Given this, all analyses collapsed across participant sex.

Mediation by future self connection. I predicted that participants who expected to switch teams would feel less connected to their future selves in a week, and that this would partially mediate the effect of switching teams on the amount of the unpleasant task that they left to the second session. As predicted, participants in the switch condition ($M = 3.56$, $SD = 1.33$) felt significantly less connected to their future selves than did participants in the stay condition ($M = 4.88$, $SD = 1.42$), $t(48) = 3.39$, $p = .001$. Participants in the switch condition ($M = 4.12$, $SD = 1.36$) also felt significantly less similar to their future selves than did participants in the stay condition ($M = 5.20$, $SD = 1.53$), $t(48) = 2.64$, $p = .011$. Finally, participants in the switch condition liked their future selves significantly less ($M = 4.48$, $SD = 1.39$) than did participants in the stay condition ($M = 5.84$, $SD = 0.94$), $t(48) = 4.05$, $p < .001$.

These three questions were intercorrelated: how connected participants felt to their future selves was positively correlated with how much they liked their future selves, $r(48) = .675$, $p < .001$, and how similar they felt to their future selves, $r(48) = .595$, $p < .001$. Likewise, how similar participants felt to their future selves was positively correlated with how much they liked their future selves, $r(48) = .584$, $p < .001$. Given these strong intercorrelations, I averaged the three questions into a future self connection score ($\alpha = .827$). Participants in the switch condition ($M = 4.05$, $SD = 1.15$) had lower future self connection scores than did participants in the stay condition ($M = 5.31$, $SD = 1.08$), $t(48) = 3.99$, $p < .001$.

Future self connection scores were negatively correlated with the number of pages of the unpleasant task that participants left to the second session, $N = 50$, $r = -.394$, $p = .005$. (Number of pages left was negatively correlated with connection, $N = 50$, $r = -.393$, $p = .005$, and liking, $N = 50$, $r = -.388$, $p = .005$, and marginally negatively correlated with similarity, $N = 50$, $r = -.247$, $p = .084$.)

Thus, analyses revealed that (a) expecting to switch teams increased the amount of the unpleasant task that participants left to the second session, (b) expecting to switch teams decreased participants' connection to their future selves, and (c) the less connected participants felt to their future selves, the more of the unpleasant task they left to the second session. This is consistent with the hypothesis that participants who expected to switch teams left more of the unpleasant task to the second session in part because they felt less connected to their future selves.

However, a bootstrapping analysis (Hayes, 2013) revealed that future self connection scores did not significantly mediate the effect of switching teams on the number of pages of the unpleasant task that participants left to the second session, although the CI approached significance, 95% CI [-0.14, 1.80]. This may be because mediation analyses often require relatively large sample sizes to be significant; the sample in this study provided adequate power to detect the large main effects of switching teams, but is insufficient to detect most mediation effects (Fritz & MacKinnon, 2007).
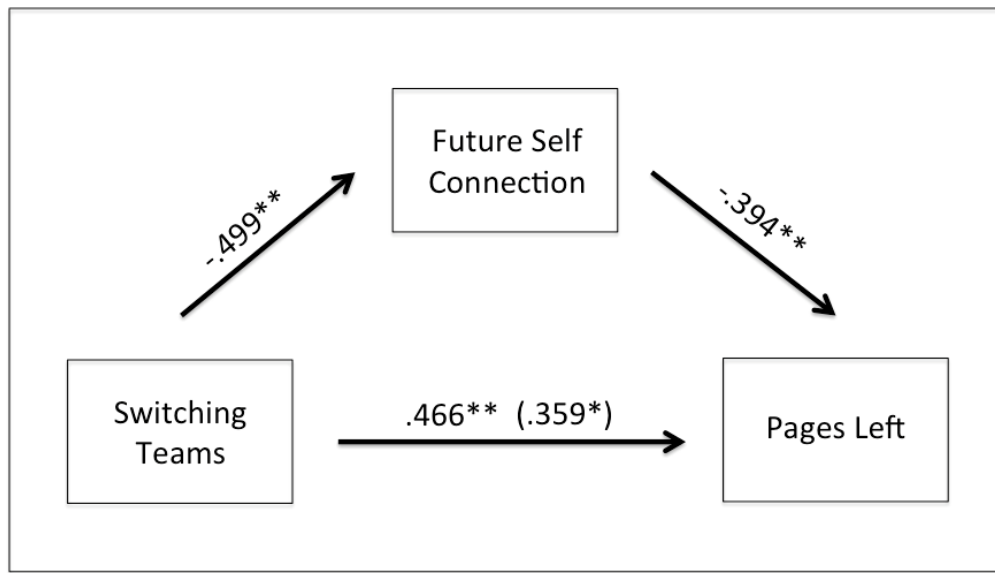
Figure 2. Standardized regression coefficients for the relationships between switching teams, future self connection scores, and pages of the unpleasant task left to the second session in experiment 1 (the coefficient for the effect of switching teams on pages left controlling for future self connection scores is in parentheses). The mediation effect did not reach statistical significance, 95% CI [-0.14, 1.80].

Mood in session 1. Switching teams had no effect on either positive affect scores, $t(46) = 0.30$, $p = .746$, or negative affect scores, $t(46) = 1.15$, $p = .258$, and neither positive affect scores, $r(46) = -.112$, $p = .447$, nor negative affect scores, $r(46) = .177$, $p = .229$, were correlated with the number of pages of the unpleasant task that participants left to the second session. (These analyses excluded 2 participants who did not complete all of the PANAS.)

Discussion

Participants who expected to switch teams when they returned for the second part of a legal debate left more than twice as much unpleasant work for their future selves to complete when they returned. Participants in the switch condition also felt less connected to their future selves, felt less similar to their future selves, and liked their future selves less, and participants' feelings toward their future selves predicted the amount of the unpleasant task that they left to

the second session.

These results suggest that participants in the switch condition left more of the unpleasant task to the future because they felt less connected to their future selves. However, one plausible alternative explanation (the *bad mood now hypothesis*) is that participants in the switch condition were less happy at the end of session 1, and this made them averse to doing the unpleasant task at that time. In other words, they may have left more of the unpleasant task for their future selves to do simply because of how they felt, and not because of how they felt about their future selves.

It is not difficult to imagine that participants would feel demoralized if they prepared to advocate for one position and then learned that they would have to switch teams and advocate for the opposite position, against their own teammates. Participants in the switch condition did not report being in a worse mood than participants in the stay condition, and participants' mood did not predict the amount of the unpleasant task that they left to the second session. However, these null effects do not definitively rule out the bad mood now hypothesis; it is possible that participants in the switch condition did feel less happy in a way that their self-reports failed to reflect. Study 3b added a manipulation to address this possibility.

A second alternative explanation for study 3a's results (the *bad mood later hypothesis*) is that participants in the switch condition left more of the unpleasant task for the second session because they expected to feel so unhappy when they returned that they did not think the unpleasant task could make them feel much worse. Study 3b addressed this possibility by including a question that asked participants how they expected to feel when they returned for the second session.

Study 3b

Study 3b added a manipulation to rule out the bad mood now hypothesis. As in study 3a,

participants expected to either switch teams or stay on the same team. However, half of the participants thought that they were dividing the unpleasant task with their future selves (as in study 3a), whereas the other half thought that they were dividing the unpleasant task with another participant. The logic was that if participants who expect to switch teams are simply unhappy and therefore averse to doing the unpleasant task, it should not matter whether the remainder of the task falls to their future selves or to another participant. On the other hand, if participants who expect to switch teams leave more of the unpleasant task because they feel less connected to their future selves, they should do less of the unpleasant task only when the remainder will fall to their future selves, and not when the remainder will fall to another participant.

Study 3b also addressed the bad mood later hypothesis by including a question that asked participants how they expected to feel when they returned for the second session.[4]

Participants

59 undergraduates from Harvard University were recruited through the Harvard Study Pool. Four participants were omitted because they were suspicious of the study's premises, and one because she had participated in the prior version of the study (study 3a). This left 54 participants for analysis (51% female; M_{Age} = 20.02 years, SD = 1.80 years, range = 18 to 25 years). Participation took two and a half hours, divided into two parts, and participants were compensated with $25 or course credit. Due to changes in Harvard Study Pool protocol, participants were partially compensated at end of part 1 and received the rest of their compensation at the end of part 2, instead of receiving full compensation at the end of the second

---

[4] Including a question that asked participants how they expected to feel in the second session also allowed me to determine whether participants in the switch condition left more of the unpleasant task because they expected to feel *better* when they returned (e.g. because of the novelty of arguing for a new team), although this hypothesis was less likely than the reverse given that participants preferred to remain on the same team.

part (as in study 3a).

Measures and Procedure

The procedure for study 3b was identical to that for study 3a, except for the way that participants divided the unpleasant task. Half of participants divided the unpleasant task under exactly the same conditions as in study 3a, dividing the eleven pages of the unpleasant task between their current selves and their future selves (the *self-finisher condition*). The other half of participants instead divided the unpleasant task between their current selves and another participant (the *other-finisher condition*).

When it was time to divide the task, participants in the other-finisher condition were told that the experimenter was helping a graduate student pilot a pattern recognition task. Participants were told that there were eleven pages left of the task, and that all eleven pages needed to be completed by the end of the day. Critically, they were also told that one more participant was coming in later that day who would finish any of the eleven pages that were left undone. (Participants were given no other information about this other participant, who in reality did not exist.) Participants were told that they had enough time to complete all eleven pages, and were given the option to do as much or as little of the unpleasant task as they wished. After completing a few practice questions, participants decided how many pages of the unpleasant task they wanted to complete by putting the rest of the pages in a folder for the next participant.

Study 3b also added a question that asked participants how they expected to feel when they returned for the second session. This question was added to the questionnaire that all participants completed at the end of the study.

Results

Manipulation checks. Participants assigned to the prosecution and those assigned to the

defense were equally invested in their teams. Prosecution and defense participants were equally invested in winning the case, $t(52) = -1.15$, $p = .255$ (prosecution $M = 4.30$, $SD = 1.61$; defense $M = 4.74$, $SD = 1.20$), were equally convinced that the team they had argued for in session 1 had the more valid case, $t(52) = 0.34$, $p = .738$ (prosecution $M = 5.41$, $SD = 1.55$; defense $M = 5.26$, $SD = 1.68$), felt equally competitive with the other team, $t(52) = -1.04$, $p = .302$ (prosecution $M = 4.33$, $SD = 1.73$; defense $M = 4.79$, $SD = 1.47$), were equally confident that their team would win, $t(52) = -1.00$, $p = .318$ (prosecution $M = 4.59$, $SD = 1.47$; defense $M = 5.00$, $SD = 1.49$), liked their teammates from session 1 equally, $t(52) = 0.69$, $p = .493$ (prosecution $M = 5.67$, $SD = 1.21$; defense $M = 5.44$, $SD = 1.16$), and felt equally connected to their teammates, $t(52) = 0.188$, $p = .852$ (prosecution $M = 4.81$, $SD = 1.36$; defense $M = 4.74$, $SD = 1.53$).

I collapsed across assignment to the prosecution or defense to look at the effect of switching teams. Participants in the switch condition ($M = 4.21$, $SD = 1.22$) and participants in the stay condition ($M = 4.85$, $SD = 1.55$) were equally invested in winning the case, $t(52) = 1.65$, $p = .104$, and were equally likely to think that their session 1 team had the more valid case, $t(52) = -1.14$, $p = .261$ (switch $M = 5.57$, $SD = 1.45$; stay $M = 5.08$, $SD = 1.74$). Participants in the switch and stay conditions were equally attached to their teammates, feeling equally connection to their teammates, $t(52) = 1.10$, p $= .277$ (switch $M = 4.57$, $SD = 1.50$; stay $M = 5.00$, $SD = 1.36$), and liking them equally, $t(52) = 0.82$, $p = .416$ (switch $M = 5.43$, $SD = 1.20$; stay $M = 5.69$, $SD = 1.16$).

Participants in the switch condition were less confident that they would win when they returned, $t(52) = 4.65$, $p < .001$ (switch $M = 4.00$, $SD = 1.44$; stay $M = 5.59$, $SD = 1.05$), and less competitive with the other team, $t(52) = 2.61$, $p = .012$ (switch $M = 4.04$, $SD = 1.57$; stay $M = 5.11$, $SD = 1.48$). Participants in the switch condition were also less excited to return, $t(52) =$

3.76, $p < .001$ (switch $M = 3.86$, $SD = 1.41$; stay $M = 5.19$, $SD = 1.27$), and less happy about the team they would be on when they returned, $t(52) = 3.67$, $p = .001$ (switch $M = 3.93$, $SD = 1.74$; stay $M = 5.54$, $SD = 1.36$), suggesting that participants preferred to remain on the same team.

Participants in the switch and stay conditions did not differ in how much they enjoyed the unpleasant task, $t(52) = 1.06$, $p = .953$ (switch $M = 3.82$, $SD = 1.77$; stay $M = 3.85$, $SD = 1.94$), or in how much they wanted it to stop, $t(52) = .768$, $p = .446$ (switch $M = 3.61$, $SD = 1.85$; stay $M = 4.00$, $SD = 1.94$).

Returning for session 2. 5 participants (17%) failed to return for the second session. These participants participated near the end of the semester, during finals period. The participants who failed to return for the second session were no more likely to be in the switch than the stay condition, $N = 25$, $\chi^2(1) = 0.22$, $p = .641$, and were no more likely to be in the self-finisher than the other-finisher conditions, $\chi^2(1) = 1.36$, $p = .243$). Thus, there is no reason to be concerned that participants in certain conditions were less likely to expect to return for the second session.

Effects of the manipulations on patience. I predicted that participants who expected to switch teams would leave more of the unpleasant task to their future selves, but not to another participant. Thus, I predicted an interaction between the effect of switching teams on the amount of the unpleasant task that participants completed and whether participants divided the task with their future selves or another participant. An ANOVA testing this interaction revealed a main effect of switching teams on the number of pages of the unpleasant task that participants left in the folder, $F(1, 51) = 10.44$, $p = .002$, a main effect of the recipient of the pages in the folder (future self or other), $F(1, 51) = 23.92$, $p < .001$, and a significant interaction between the two, $F(1, 51) = 8.38$, $p = .006$ (see Figure 3).

Simple effects analyses revealed that the results from the self-finisher condition strongly replicated the results of study 3a. Participants who expected to switch teams ($M = 0.71$, $SD = 1.44$) left more pages of the unpleasant task to their future selves than did participants who expected to remain on the same team ($M = 4.93$, $SD = 2.34$), $t(27) = -5.79$, $p < .001$. This effect size was again large, Cohen's $d = 2.17$.

Critically, results from the other-finisher condition demonstrated that switching teams had no effect on the number of pages of the unpleasant task that participants left to another participant ($N = 25$, $M = 6.08$, $SD = 2.87$ for stay, $M = 6.31$, $SD = 3.28$ for switch), $t(24) = -0.19$, $p = .850$. Although participants in the other-finisher condition tended to leave about half of the unpleasant task, there was significant variation (average $SD = 3.02$ pages). Thus, switching teams did not fail to influence participants in the other-finisher condition because these participants felt uniformly compelled (e.g. by a dominant social norm) to leave half of the unpleasant task to the other participant.

Replicating the results of study 3a, participants in the self-finisher condition who expected to stay on the same team were very patient, completing an average of 10.29 out of 11 pages in the first session. It was only when participants in the self-finisher condition expected to switch teams that they left about half of the unpleasant task to their future selves (completing 6.07 out of 11 pages), leaving about the same amount of the task to the future as participants in the other-finisher conditions left to another participant (the number of pages that participants in the self-finisher and other-finisher conditions completed in session 1 did not differ when participants expected to switch teams, $t(26) = -1.29$, $p = .209$).
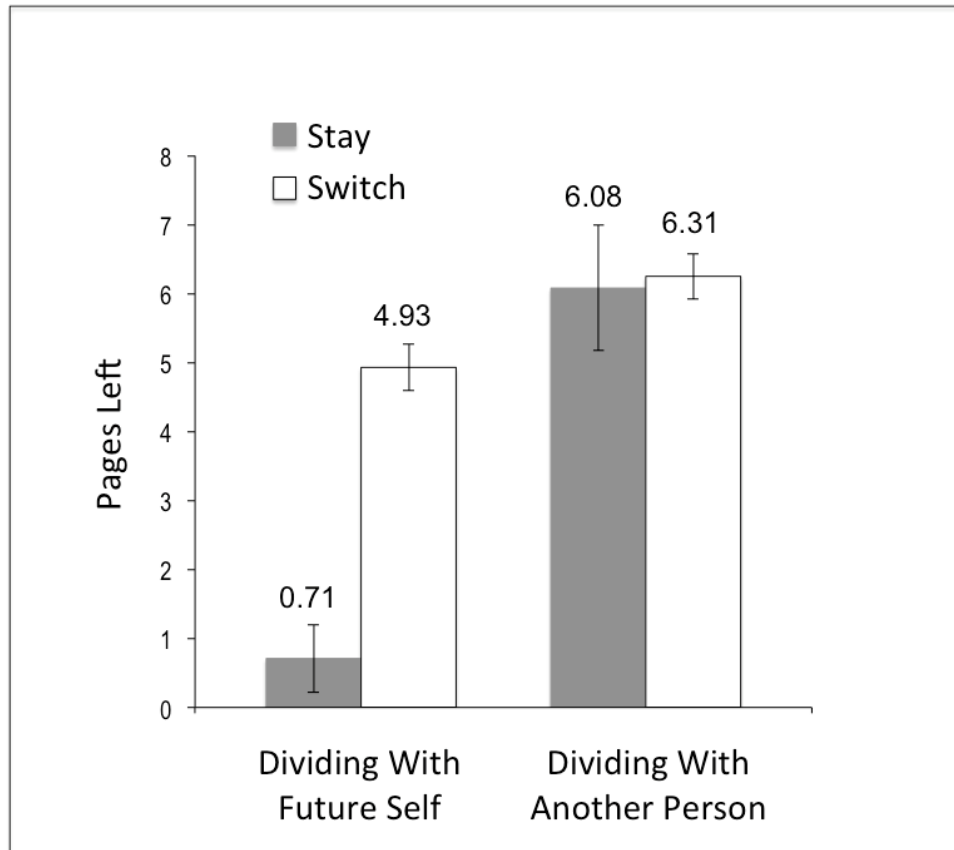
Figure 3. Pages of the unpleasant task that participants left to either the second session or another participant in experiment 2. Error bars reflect the standard error around each mean.

Assignment to the prosecution or defense. I ran an ANOVA to test whether the two primary manipulations interacted with the team to which participants were assigned (prosecution or defense). This analysis revealed a main effect of switching teams on the number of pages of the unpleasant task that participants left in the folder, $F(1, 47) = 9.48$, $p = .003$, a main effect of the recipient of the pages in the folder (future self or other), $F(1, 47) = 23.55$, $p < .001$, and a significant interaction between the two, $F(1, 47) = 8.46$, $p = .006$. However, there was no main effect of team (prosecution or defense), $F(1, 47) = 0.36$, $p = .553$, and no interaction between team and any of the other variables, $F(1, 47) = 0.18$, $p = .674$ for the interaction with switching teams, $F(1, 47) = 2.19$, $p = .146$ for the interaction with recipient, and $F(1, 47) = 0.001$, $p = .961$

43

for the three-way interaction. Given this, all analyses collapsed across the team to which participants were assigned.

Participant sex. I also ran an ANOVA to test whether the effect of switching teams interacted with participant sex. This analysis revealed a main effect of switching teams on the number of pages of the unpleasant task that participants left in the folder, $F(1, 47) = 9.26$, $p = .004$, a main effect of the recipient of the pages in the folder (future self or other), $F(1, 47) = 22.07$, $p < .001$, and a significant interaction between the two, $F(1, 47) = 7.63$, $p = .008$. However, there was no main effect of sex, $F(1, 47) = 0.197$, $p = .822$, and no interaction between sex and any other variable, $F(1, 47) = 0.01$, $p = .926$ for the interaction with switching teams, $F(1, 47) = 1.16$, $p = .286$ for the interaction with recipient, and $F(1, 47) = 0.41$, $p = .810$ for the three-way interaction. Given this, all analyses collapsed across participant sex.

Mediation by future self connection. I predicted that participants in the self-finisher condition who expected to switch teams would feel less connected to their future selves in a week, and that this would partially mediate the effect of switching teams on the amount of the unpleasant task that participants left to the future (all of the analyses in this section are for participants in the self-finisher condition because there was no effect of switching teams in the other-finisher condition). As predicted, participants in the switch condition felt significantly less similar to their future selves ($M = 3.40$, $SD = 1.40$) than did participants in the stay condition ($M = 5.14$, $SD = 1.56$), $t(27) = 3.20$, $p = .003$. Participants in the switch condition liked their future selves significantly less ($M = 3.88$, $SD = 1.82$) than did participants in the stay condition ($M = 6.14$, $SD = 0.77$), $t(27) = 4.45$, $p < .001$. Participants in the switch condition ($M = 3.40$, $SD = 1.40$) also trended toward feeling less connected to their future selves than did participants in the stay condition ($M = 4.43$, $SD = 1.87$), $t(27) = 1.68$, $p = .104$. (These analyses have smaller

sample sizes than those in study 3a, which could explain why the effect of switching teams on participants' connection to their future selves did not reach significance in this study.)

These three questions were intercorrelated: how similar participants felt to their future selves was positively correlated with how much they liked their future selves, $N = 29$, $r = .570$, $p = .001$, and how connected they felt to their future selves, $N = 29$, $r = .713$, $p < .001$. Likewise, how connected participants felt to their future selves was marginally positively correlated with how much they liked their future selves, $N = 29$, $r = .319$, $p = .091$.[5] Given these intercorrelations, I averaged the three questions into a future self connection score ($\alpha = .765$). Participants in the switch condition had significantly lower future self connection scores ($M = 3.58$, $SD = 1.16$) than did participants in the stay condition ($M = 5.24$, $SD = 1.11$), $t(27) = 3.92$, $p = .001$.

Future self connection scores were negatively correlated with the number of pages of the unpleasant task that participants left to the second session, $N = 29$, $r = -.620$, $p < .001$. (Number of pages left was negatively correlated with similarity, $N = 29$, $r = -.397$, $p = .033$, liking, $N = 29$, $r = -.719$, $p < .001$, and connection, $N = 29$, $r = -.620$, $p <. 001$.)

Thus, analyses revealed that (a) expecting to switch teams increased the amount of the unpleasant task that participants left to the second session, (b) expecting to switch teams decreased participants' connection to their future selves, and (c) the less connected participants felt to their future selves, the more of the unpleasant task they left to the second session. This is consistent with the hypothesis that participants who expected to switch teams left more of the unpleasant task to the second session in part because they felt less connected to their future

---

[5]All three questions were highly intercorrelated when analyzing the entire data set ($r = .617$, $p < .001$ for similarity with liking, $r = .736$, $p < .001$ for similarity with connection, $r = .401$, $p = .002$ for liking with connection, $N = 55$ for all).

selves. Further supporting this hypothesis, a bootstrapping analysis (Hayes, 2013) revealed that participants' connection with their future selves significantly mediated the effect of switching teams on the amount of the unpleasant task that they left to the second session, 95% CI [.018, 3.13].

Participants' connection with their future selves only partially mediated the effect of switching teams; I entered switching teams and future self connection scores into a regression model in which pages left was the dependent variable, and the effect of switching teams remained significant, $\beta = .582$, $t(26) = 2.47$, $p = .001$.
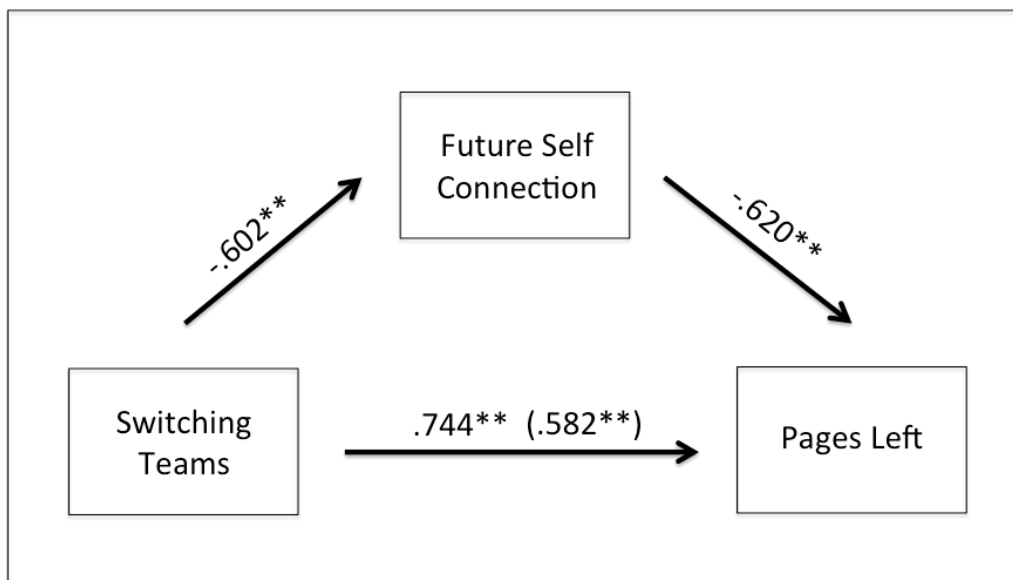
Figure 4. Standardized regression coefficients for the relationships between switching teams, future self connection scores, and pages of the unpleasant task left to the second session in experiment 2 (the coefficient for the effect of switching teams on pages left controlling for future self connection is in parentheses). The mediation effect was significant, 95% CI [.018, 3.13].

Mood in session 1. Switching teams had no effect on either positive affect scores, $t(26) = -0.32$, $p = .754$, or negative affect scores, $t(26) = 0.16$, $p = .872$ for participants in the self

finisher condition (all of the analyses in this section are for participants in the self-finisher condition because there was no effect of switching teams in the other-finisher condition that mood could explain). In addition, positive affect scores, $N = 28$, $r = -.019$, $p = .925$ were uncorrelated with the number of pages of the unpleasant task that the participants left to the second session, although negative affect scores were marginally positively correlated with number of pages left, $N = 28$, $r = .353$, $p = .066$. In light of this marginal correlation, I entered negative affect scores as a covariate in an ANCOVA testing the effect of switching teams on the number of pages of the unpleasant task that participants left to the second session. Results revealed that the effect of switching teams remained highly significant when controlling for negative affect, $F(25) = 37.12$, $p < .001$.

Expected mood in session 2. Study 3b added a question that asked participants how they expected to feel when they returned for the second session (all of the analyses in this section are for participants in the self-finisher condition because there was no effect of switching teams in the other-finisher condition that anticipated mood could explain). Participants in the switch condition ($M = 4.47$, $SD = 1.60$) did not anticipate feeling any differently from participants in the stay condition ($M = 5.14$, $SD = 1.29$) when they returned, $t(26) = 1.25$, $p = .223$. However, participants' anticipated mood in the second session was marginally negatively correlated with the number of pages they left to the second session, $N = 29$, $r = -.350$, $p = .063$. In light of this marginal correlation, I entered participants' anticipated mood as a covariate in an ANCOVA testing the effect of switching teams on the number of pages of the unpleasant task that participants left to the second session. Results revealed that the effect of switching teams remained highly significant when controlling for participants' anticipated mood, $F(26) = 29.22$, $p < .001$.

47

Discussion

Study 3b robustly replicated the results of study 3a. Participants in the self-finisher condition who expected to switch teams left more unpleasant work to complete when they returned for the second session in a week. Participants in the switch condition also felt less connected to their future selves in a week, which in this study significantly mediated the effect of switching teams on the amount of unpleasant work that participants left to the second session.

Results from study 3b also demonstrated that switching teams had no impact on the amount of unpleasant work that participants left to another participant, nor on how participants expected to feel when they returned for the second session. Taken together, these results suggest that switching teams decreased patience by changing how participants felt about their future selves, and not by changing how they felt or expected to feel about completing the unpleasant task.

Discussion of Study Set 3

Two studies found that participants were less patient if they expected to switch teams in the future. In study 3a, participants who expected to switch teams when they returned for the second part of a legal debate in a week left more than twice as much unpleasant work to complete when they returned than did participants who expected to remain on the same team (Cohen's $d = 1.03$). In study 3b, participants who expected to switch teams left more than five times as much unpleasant work to their future selves (Cohen's $d = 2.17$).

Participants who expected to switch teams in a week also felt less connected to their future selves in a week, felt less similar to their future selves, and liked their future selves less. In turn, participants who felt less connected to their future selves (as indicated by connection, similarity, and liking) left more of the unpleasant task to the future, and this significantly

48

mediated the effect of switching teams in study 3b. These results suggest that switching teams may have decreased patience in part through changing how participants felt about their future selves. Participants who felt less connected to their future selves may have cared less about how they would feel when they returned for the second session. Or they may have been less likely to think about their future selves at all.

Ruling Out the Bad Mood Now Hypothesis

Importantly, results did not support the alternative hypothesis that participants in the switch condition were less patient because they were less happy at the end of session 1, and consequently averse to doing the unpleasant task at that time. Participants rated their mood directly after learning whether they would switch teams, which was directly before they divided the unpleasant task. Switching teams had no effect on participants' self-reported mood, and participants' mood did not predict the amount of the unpleasant task that they left to the future.

Study 3b also addressed this alternative experimentally. This study added a condition in which participants divided the unpleasant task between their current selves and another participant, rather than between their current selves and their future selves. Results showed that changing groups did not affect the amount of work that participants left to another participant; it only increased the amount of work that they left to their future selves. This indicates that participants in the switch condition were not more averse to completing the unpleasant task during session 1, they were less motivated to spare their future selves unpleasant work.

Ruling Out the Bad Mood Later Hypothesis

Another alternative hypothesis is that participants in the switch condition expected to feel so unhappy during session 2 that they did not think the unpleasant task could make them feel much worse. Study 3b found that switching teams had no effect on how participants expected to

feel when they returned for the second session. However, it is possible that participants in the switch condition did expect to feel differently in a way that my question failed to detect. An additional test of this alternative would be to ask participants to divide a *pleasant* task between their present and future selves (e.g. eating chocolate), rather than an unpleasant one. If participants in the switch condition expect to feel worse when they return for the second session, and if these expectations mediate their decisions about how to apportion tasks, then they should leave *more* of a pleasant task for their future selves. On the other hand, if (as I expect) participants in the switch condition feel less connected to their future selves, and this mediates their decisions about how to apportion tasks, then participants in the switch condition should leave *less* of the pleasant task for their future selves.

Groups Change Many Things

Taken together, the results of these two studies suggest that participants who expected to switch teams left more unpleasant work to the future in part because they felt less connected to their future selves. However, participants' feelings toward their future selves did not account for the full effect of switching teams on patience in either study. This is not surprising, particularly considering the large sizes of the effects. Group membership influences how people treat others through multiple means (e.g. Cikara, Bruneau, & Saxe, 2011; Doise et al., 1972; Hertel & Kerr, 2001; Mullen, Brown, & Smith, 1992; Simpson, 2006; Tajfel, Billig, Bundy, & Flament, 1971; Yamagishi & Mifune, 2008); it may influence patience through multiple means as well.

For instance, people often have more favorable implicit attitudes toward in-groups than out-groups, and these attitudes can impact behavior toward members of these groups (e.g. Greenwald & Banaji, 1995; Greenwald, McGhee, Schwartz, 1998; Greenwald, Poehlman, Uhlmann, & Banaji, 2009; Heiphetz, Spelke, & Banaji, 2013; Hofman, Gawronski,

Gschwendner, Le, & Schmitt, 2005; McConnell & Leibold, 2001; Turner & Crisp, 2010; van Ravenzwaaij, van der Maas, & Wagenmakers, 2011; Wilson, Lindsey, & Schooler, 2000). Participants may have had less favorable implicit attitudes toward their future selves, and therefore have been less patient, when they expected to leave their in-group and join the out-group.

You're Still Me, I Just Don't Like You Anymore

It is novel that these studies changed how participant felt toward their future selves without suggesting that their future selves would be fundamentally different from their present selves. Past studies have found a relationship between participants' connection or similarity to their future selves and patience, but have confounded connection or similarity with the degree to which participants expect their fundamental traits to change (e.g. Bartels & Urminsky, 2011, told participants that their 'core identity and traits were very likely/unlikely to change over the coming year,' see also Ersner-Hershfield et al., 2009; Bartels & Rips, 2010). The present studies avoided this confound. The manipulation in these studies only entailed assigning participants to switch legal teams in a court case—nothing about the manipulation suggested that participants' traits would change any more if they switched teams than if they stayed on the same team.

To my knowledge, these are the first studies to demonstrate that a factor that affects altruism can also affect patience without leading participants to believe that they will be fundamentally different in the future. These were also the first studies to manipulate how much participants liked their future selves, suggesting that a wider range of feelings toward others can be directed toward our future selves.

A Common Influence on Patience and Altruism

The present studies demonstrate that a pervasive determinant of altruism—group

51

membership—can also affect patience. However, they do not show that the same manipulation of group membership affects both altruism and patience; this would require an additional study using the same paradigm to demonstrate that participants leave less unpleasant work to other participants who are in their group, compared to those in the out-group.

Past research has shown that group membership influences a form of altruism that is very similar to the measure of patience used in the present studies (e.g. Yamagishi & Mifune, 2008). Further, the present studies employed a manipulation of group membership that is likely to promote particularly strong in-group favoritism (Blake & Mouton, 1962; Cikara, Botvinik, & Fiske, 2011; Sherif et. al., 1962). This, combined with the robustness of in-group favoritism across decades of psychological research (e.g. Cikara, Bruneau, & Saxe, 2011; Doise et al., 1972; Hertel & Kerr, 2001; Jetten, Spears & Manstead, 1992; Kramer & Brewer, 1984; Mullen, Brown & Smith, 1992; Rabbie & Horowitz, 1969; Simpson, 2006; Tajfel, Billig, Bundy, & Flament, 1971; Yamagishi & Mifune, 2008), gives me confidence that my manipulation of group membership would affect how participants treat others in the same way that it affected how they treated their future selves.

However, should my manipulation fail to influence altruism, it would still be plausible that it influenced patience through the same means (e.g. feelings of connection and liking) that other manipulations of group membership influence altruism. Past research suggests that almost any division into groups can impact how we treat others (e.g. Doise et al., 1972; Hertel & Kerr, 200 Tajfel, Billig, Bundy, & Flament, 1971), but that doesn't mean that every division has an equally strong impact on how we treat everyone. If a given manipulation of group membership impacts patience but not altruism, it may be because it influences connection with our future selves more strongly than it influences connection with others.

52

GENERAL DISCUSSION

We shape our lives by deciding when we will—and won't—sacrifice for the future. Today we choose whether to save or spend, run or sit, stay true or cheat; tomorrow we find ourselves wealthy or poor, healthy or fit, loved or despised. Three sets of studies suggest that sacrifice for the future may be governed by the same rules that govern sacrifice for others. These studies found that patience was correlated with altruism and with empathic accuracy, a factor that predicted altruism. Further, a major influence on altruism—group membership—also influenced patience. Participants left more than twice as much unpleasant work to the future if they expected to switch groups, an effect that was mediated by participants' connection to their future selves.

These results suggest that group membership may exert as powerful an influence on how we treat our future selves as it does on how we treat others. One of the most pervasive determinants of whether we help others is whether they are in our group (e.g. Hertel & Kerr, 2001; Tajfel, Billig, Bundy, & Flament, 1971; Yamagishi & Mifune, 20008). We are often attached to the groups that we're in (Brewer, 1999; Milonov, 2009; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987); and yet, as we age, our group memberships naturally change— from liberal college student to investment banker, swinging single to married-with mortgage, hardworking New Yorker to retired Floridian—and we find ourselves belonging to groups that we once regarded as alien. The present studies suggest that we connect with our future selves less, and therefore are less patient, when we expect to leave our current group and become a member of a new one.

The change from in-group member to out-group member in the present studies was only a week away. This implies that our connection to our future selves may wax and wane with

53

relative ease, influencing not only our long-term decisions, but also those whose consequences come next Tuesday. Our future selves may become alien sooner than we think.

When Does Self Become Other?

When does 'me now' become 'me in the future'? Previous studies have shown that we feel distinct from selves a year away (Bartels & Rips, 2010; Bartels & Urminsky, 2011; Ersner-Hershfield et al., 2009); the present research shows that we feel distinct from selves a week away. Future studies may find that the divide is sooner still. Perhaps there is something special about going to sleep and then waking up to a new morning that makes us represent our future selves tomorrow as distinct from the selves we are today. Perhaps we can feel separate from who we will become in a few hours, or a few minutes. Or perhaps the change in context that we expect to experience is as important as the time that will pass; we may not distinguish between our present self and our five-minutes-in-the-future self if in five minutes we will still be sitting in the same chair listening to the same lecture; but we may feel distinct from that self if in five minutes we will have left our chair to get up on stage. If the point in time when we start representing our future selves as distinct from our present selves corresponds to a sharp decrease in patience, this will be further evidence that we are often impatient because we view future benefits as going to someone else.

Why Do We Shortchange Our Future Selves?

If, as the present research suggests, we view our future selves like others, there are many reasons that this may lead us to shortchange them. As things move farther from the here and now in time or social distance, we tend to represent them with less vivid concrete detail (Maglio, Trope, & Liberman, 2013; Trope & Liberman, 2003; van Boven, Kane, & McGraw, 2010). This implies that, just as with others (Liviatan, Trope, & Liberman, 2008; Maglio, Trope, &

Liberman, 2013), we are less likely to focus on the internal experiences that our future selves may have because they are psychologically distant (we don't represent the joy of receiving $10 in a month as vividly as the joy of receiving $10, or maybe even $20, now; Pronin, Olivola, and Kennedy, 2008; Pronin & Ross, 2006).[6]

Additionally, because the present self is not just a concept but a lived experience (e.g. James, 1890), we have firsthand experiences in the present that are more intense than imagining the experiences of our future selves or others;[7] as horrible as it feels to imagine being stabbed in the eye, it feels worse still to experience it directly. For this reason, if kindness to others or our future selves is at odds with temptations in the here and now, it can be a tough battle for altruism or patience to win.[8]

Finally, the studies in this dissertation demonstrate that representing our future selves as distinct from our present selves allows for our feelings toward our future selves to impact how

---

[6]Another interesting piece of research suggesting that temporal and social distance may have analogous effects on patience and altruism is the finding that the amount of money a person is willing to forgo in order to give money to another person decreases as a hyperbolic function of the perceived social distance between them, just as the amount of money people are willing to forgo now to receive more money in the future decreases as a hyperbolic function of the amount of delay (Jones & Rachlin, 2006; Rachlin & Jones, 2008).

[7]Although they may not be as intense as direct experience, we do have emotional reactions to imagining both future experiences and other people's experiences, even using the same parts of our brain to simulate these experiences (Anderson & Phelps, 2001; Avenanti et al., 2006; Breitner, Aharon, Kahneman, Dale, & Shizgal, 2001; Gilbert, 2006; Gilbert & Wilson, 2007; Kavanagh, Andrade, & May, 2005; Kosslyn et al., 1999; McGuire, Shah, & Murray, 1993; Phelps et al., 2001; Singer et al., 2004; Wicker et al., 2003). These emotional reactions may be the reason we do sometimes overcome present temptations to be altruistic or patient.

[8]This may be the reason that we are often less patient when a temptation is literally right in front of us (cake on the table, stilettos in the window, cigarette in our friend's hand) than we are when making a tradeoff between a consequence that we imagine happening relatively soon, and a consequence that we imagine happening relatively less soon ($5 at the end of the experiment or $10 later), even relative to short-term rewards delayed by only a few minutes (McClure, Ericson, Laibson, Loewenstein, & Cohen, 2007; Rosati, Stevens, Hare, & Hauser, 2007).

we treat them, just as our feelings toward others impact how we treat others (Batson, 1990; Batson, Fultz, & Schoenrade, 1987; Caprara, Alessandri, & Eisenberg, 2012; Cialdini et al., 1997). For instance, study set 3 suggests that we are less patient when we like our future selves less. Other manipulations of how much we like our future selves may have a similar influence, sometimes to paradoxical effect. We may like our future selves less if we expect them to look back upon us with disapproval (Eastwick & Finkel, 2009; chapter 6 of Kenny, 1994), and yet we often disapprove of ourselves precisely because we have made impatient decisions. If we are more impatient the more we dislike our future selves, anticipating that we will disapprove of our impatient decisions may *increase* our tendency to make those decisions.

Likewise, we tend to like fortunate people more than unfortunate people (Godfrey & Lowe, 1975; Lerner & Miller, 1978; Olsen, Dunham, Dweck, Spelke & Banaji, 2009; Pryor, Reeder, & Monroe, 2012). If we like our future selves less when we expect them to be unfortunate, this may lead us to help them less *precisely because* they need our help more.

The present research suggests that how we feel about our future selves can have a strong influence on how we treat them. We often sacrifice for others because of the emotion we feel when we think about them (e.g. Aron, Aron, Tudor, & Nelson, 1991; Cialdini, Brown, Lewis, Luce, & Neuberg, 1997; Batson et al., 1997); perhaps we are also patient because of the emotion we feel when we think about the future.[9]

---

[9]The struggle to be patient is often framed as a battle between a system that responds to immediate emotional experience (e.g. 'I want that marshmallow now!' often termed the *hot system*) and a cognitive, emotionally neutral system that responds to abstract goals ('I want to maximize the number of marshmallows I receive,' often termed the *cold system*; Loewenstein, 1996; Loewenstein, Weber, Hsee, & Welch, 2001; Metcalfe & Mitschel, 1999; Mischel et al., 1989). However, the present research suggests that sometimes patience may come not from cooler reason but from feeling more emotion in favor of the patient decision. It may even be that a big part of what our fatigable 'willpower' (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muravan & Baumeister, 2000) does is marshal emotional ammunition for our long-term goals by

Conclusions

The research in this dissertation provides converging support for the hypothesis that common factors promote altruism and patience. This suggests the value of testing the hypothesis more broadly. We know a lot about what increases kindness toward others; much of this may apply to what increases kindness toward our future selves. By drawing on the decades of research investigating altruism, we may be able to learn important ways to ameliorate impatience. We may also be able to better understand how we think about our future selves, and why it can be so hard to be nice to them.

---

reminding us of values we hold dear or conjuring evocative representations of how our decisions will affect our future selves.

REFERENCES

Addis, D.R., Pan, L., Vu, M.A., Laiser, N., & Schacter, D.L. (2009) Constructive episodic simulation of the future and past: Distinct subsystems of a core brain network mediate imaging and remembering. Neuropsychologia, 11, 2222-2238.

Amodio, D.M. & Frith, C. D. (2006). Meeting of minds: The medial frontal cortex and social cognition. Nature Reviews Neuroscience, 7(4), 268-277.

Anderson, A. K. & Phelps, E. A. (2001). Lesions of the Human Amygdala impair enhanced perception of emotionally salient events. *Nature, 411*(6835), 305-9.

Aron, A., Aron, E. N., Tudor, M., & Nelson, G. (1991). Close relationships as including other in the self. *Journal of Personality and Social Psychology, 60*(2), 241-253.

Avenanti, A., Paluello, L. M., Bufalari, I., & Aglioti, S. M. (2006). Stimulus-driven modulation of motor-evoked potentials during observation of others' pain. *Neuroimage, 32*(1), 316-324.

Baron-Cohen, S., Jolliffe, T., Mortimore, C., & Robertson, M. (1997). Another advanced test of theory of mind: Evidence from very high functioning adults with autism orAsperger Syndrome. *Journal of Child Psychology and Psychiatry, 38*(7), 813-822.

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The 'Reading the mind in the eyes' Test revised version: A study with normal adults, and adults with Asperger syndrome or high-functioning autism. *Journal of Child Psychology and Psychiatry, 42*(2), 241-251.

Bartels, D. M., & Rips, L. J. (2010). Psychological connectedness and intertemporal choice. *Journal of Experimental Psychology: General, 139*(1), 49-69.

Bartels, D. M., & Urminsky, O. (2011). On intertemporal selfishness: How the perceived instability of identity underlies impatient consumption. *Journal of Consumer Research, 38*(1), 182-198.

Batson, C. D. (1990). How social an animal? The human capacity for caring. *American Psychologist, 45*(3), 336-346.

Batson, C. D., Fultz, J., & Schoenrade, P. A. (1987). Distress and empathy: Two qualitatively distinct vicarious emotions with different motivational consequences. *Journal of Personality, 55*(1), 19-39.

Batson, C. D., Sager, K., Garst, E., Kang, M., Rubchinsky, K., & Dawson, K. (1997). Is empathy-induced helping due to self-other merging? *Journal of Personality and Social Psychology, 73*(3), 495-509.

Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology, 74,* 1252-1265.

Beran, M. J. & Evans, T.A. (2009). Delay of gratification by chimpanzees (Pan troglodytes) in working and waiting situations. *Behavioral Processes, 80*(2), 177-181.

Bernheim, B.D., Forni, L., Gokhale, J., & Kotlikoff, L.J. (2000). How much should Americans be saving for retirement? *American Economic Review, 90*(2), 288-292.

Bickel, W. K. & Johnson, M. W. (2003). Delay discounting: A fundamental behavioral process of drug dependence. In G. Loewenstein, D. Read, R. Baumeister, G. Loewenstein, D. Read, R. Baumeister (Eds.). *Time and decision: Economic and psychological perspectives on intertemporal choice* (pp. 419-440). New York: Russell Sage Foundation.

Blake, R. E. & Mouton, J. S. (1962). Overevaluation of own group's product in ingroup competition. *The Journal of Abnormal Social Psychology, 64(3),* 237-238.

Bollen, K. A. & Stine, R. (1990). Direct and indirect effects: Classical and bootstrap estimates of variability. *Sociological Methodology, 20,* 115–140.

Bradford, W. D. (2010). The association between individual time preferences and health maintenance habits. *Medical Decision Making, 30*(1), 99-112.

Brewer, M. B. (1999). The psychology of prejudice: Ingroup love or outgroup hate? Special Issue: Prejudice and intergroup relations: Paper in honor of Gordon W. Allport's centennial, *Journal of Social Issues, 55*(3), 429-444.

Bryan, C. J., & Hershfield, H. E. (2012). You owe it to yourself: Boosting retirement saving with a responsibility-based appeal. *Journal of Experimental Psychology: General, 141*(3), 429-432.

Buckner, R. L., Andrews-Hanna, J. R., & Schacter, D. L. (2008). The brain's default network: Anatomy, function and relevance to disease. *Annals of the New York Academy of Sciences, 1124,* 1-38.

Camerer, C. F. (2003). Behavioral studies of strategic thinking in games. *Trends in Cognitive Sciences, 7*(5), 225-231.

Caprara, G., Alessandri, N., & Eisenberg. N. (2012). Prosociality: the contribution of traits, values, and self-efficacy beliefs. *Journal of Personality and Social Psychology, 102,* 1289–1303.

Chabris, C. F., Laibson, D., Morris, C. L., Schuldt, J. P., & Dmitry, T. (2008). Individual laboratory-measured discount rates predict field *behavior. Journal of Risk and Uncertainty, 37*(2-3), 327-269.

Chapman, G. B. (1996). Temporal discounting and utility for health and money. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 22,* 771-791.

Cialdini, R. B., Brown, S. L., Lewis, B.P., Luce, C., & Neuberg, S. L. (1997). Reinterpreting the empathy-altruism relationship: When one into one equals oneness. *Journal of Personality and Social Psychology, 73*(3), 481-494.

Cikara, M., Botvinick, M. M., & Fiske, S. T. (2011). Us versus them: Social identity shapes neural responses to intergroup competition and harm. *Psychological Science, 22,* 306-313.

Cikara, M., Bruneau, E. G., & Saxe, R. R. (2011). Us and them: Intergroup failures of empathy. *Current Directions in Psychological Science, 20*(3), 149-153.

Craik, F. I. M., Moroz, T. M., Moscovitch, M., Struss, D. T., Winocur, G., Tulving, E., & Kapur, S. (1999). In search of self: A positron emission tomography study. *Psychological Science, 10*(1), 26-34.

Crowne, D. P. & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 24*(4), 349-354.

Dennett, D. (1996). *Kinds of Minds: Toward An Understanding Of Consciousness.* New York: Basic Books.

Diekmann, K. A., Samuels, S. M., Ross, L., & Bazerman, M. H. (1997). Self-interest and fairness in problems of resource allocation: Allocators versus recipients. *Journal of Personality and Social Psychology 72*(5), 1061-1074.

Doise, W., Csepeli, G., Dann, H. D., Gouge, C., Larsen, K., & Ostell, A. (1972). An experimental investigation into the formation of intergroup representations. *European Journal of Social Psychology, 2*(2), 202-204.

Eastwick, P. W., & Finkel, E. J. (2009). Reciprocity of Liking. In H. T. Reis & S. Sprecher (Eds.), *Encyclopedia of Human Relationships* (pp. 1333–1336). Thousand Oaks: Sage Publications.

Edele, A., Dziobek, I., & Keller, M. (2013). Explaining altruistic sharing in the dictator game: The role of affective empathy, cognitive empathy, and justice sensitivity. *Learning and Individual Differences, 24,* 96-102.

Ersner-Hershfield, H., Garton, M., Ballard, K., Samanez-Larkin, G. R., & Knutson, B. (2009). Don't stop thinking about tomorrow: Individual differences in future self continuity account for saving. *Judgment and Decision Making, 4*(4), 280-286.

Ersner-Hershfield, H., Goldstein, D., Sharpe, W., Fox, J., Yeykelis, L., Carstensen, L., & Bailenson, J. N. (2011). Increasing saving behavior through age-progressed renderings of the future self. *Journal of Marketing Research, 48,* S23-S37.

Ersner-Hershfield, H., Wimmer, G., & Knutson, B. (2009). Saving for the future self: Neural measures of future self-continuity predict temporal discounting. *Social Cognitive And Affective Neuroscience, 4*(1), 85-92.

Federal Reserve Aggregate Revolving Consumer Debt Survey (2014). *Board of Governors of the Federal Reserve System.* Retrieved from http://www.federalreserve.gov/releases/g19/hist/cc_hist_sa_levels_html.

Frederick, S., Loewenstein, G. & O'Donoghue, T. (2002). Time discounting and time preference: A critical review. *Journal of Economic Literature, 40,* 351-401.

Fritz, M. S. & MacKinnon, D. P. (2007). Required sample size to detect the mediation effect. *Psychological Science, 18*(3), 233-239.

Gawronski, B., Hofmann, W., & Wilbur, C. (2006). Are "implicit" attitude unconscious? *Consciousness & Cognition, 15,* 485-499.

Gilbert, D. T. (2006). *Stumbling on Happiness.* New York: Alfred A. Knopf.

Gilbert, D. T. & Wilson, T. D. (2007). Prospection: Experiencing the future. *Science, 317,* 1351 1354.

Godfrey, B. & Lowe, C. (1975). Devaluation of innocent victims: An attribution analysis within the just world paradigm. *Journal of Personality and Social Psychology, 31,* 944–951.

Green, L., Fristoe, N., & Myerson, J. (1994). Temporal discounting and preference reversals in choice between delayed outcomes. *Psychonomic Bulletin & Review, 1*(3), 386-289.

Greenwald, A. G. & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self esteem, and stereotypes. *Psychological Review, 102,* 4-27.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. K. L. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal ofPersonality and Social Psychology, 74,* 1464-1480.

Greenwald, A. G., Poehlman, T. A., Uhlmann, E. L., Banaji, M.R. (2009). Understanding and using the implicit association test: III. Meta-analysis of predictive validity. *Journal of Personality and Social Psychology, 97*(1), 17-41.

Breitner, H. C., Aharon, I., Kahneman, D., Dale, A., & Shizgal, P. (2001) Functional Imaging of Neural Responses to Expectancy and Experience of Monetary Gains and Losses, *Neuron, 30*(2), 619-639.

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76(4),* 408–420.

Hayes, A. F. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach.* New York: Guilford.

Heatherton, T. F., Wyland, C. L., Macrae, C. N., Demos, K. E., Denny, B. T., & Kelley, W. M. (2006). Medial prefrontal activity differentiates self from close others. *Social and Affective Neuroscience, 1*(1), 18-25.

Heiphetz, L., Spelke, E.S., & Banaji, M.R. (2013). Patterns of implicit and explicit attitudes in children and attitudes in children and adults: Tests in the domain of religion. *Journal of Experimental Psychology: General, 142*(3), 864-879.

Hertel, G., & Kerr, N. L. (2001). Priming in-group favoritism: The impact of normative scripts in the minimal group paradigm. *Journal of Experimental Social Psychology, 37*(4), 316 324.

Hofmann, W., Gawronski, B., Gschwendner, T., Huy, L. A., & Schmitt, M. (2005). Meta Analysis on the Correlation Between the Implicit Association Test and Explicit Self Report Measures. *Personality and Social Psychology Bulletin, 31*(10), 1369-1385.

Ikeda, S. (2009). Time discounting and obesity. *The Japanese Journal of Psychonomic Science, 28(*1), 156-159.

James, W. (1890). *The principles of psychology (Vol. 1).* London: Macmillan.

Jenni, K. & Loewenstein, G. (1997); Explaining the 'Identifiable Victim Effect.' *Journal of Risk and Uncertainty, 14,* 235-257.

Jones, B. & Rachlin, H. (2006). Social Discounting. *Psychological Science, 17*(4), 283-286.

Kavanagh, D. J., Andrade, J. & May, J. (2005). Imaginary relish and exquisite torture: The elaborated intrusion theory of desire. *Psychological Review, 112*(2), 446-467.

Kelley, W. M., Macrae, C. N., Wyland, C. L., Caglar, S. S., Inati, S. S., & Heatherton, T. F. (2002). Finding the self?: An event-related fMRI study. *Journal of Cognitive Neuroscience, 14*(5), 785-794.

Kenny, D. A. (1994). *Interpersonal perception: A social relations analysis.* New York: Guilford.

Kirby, K. N. (1997). Bidding on the future: Evidence against normative discounting of delayed rewards. *Journal of Experimental Psychology: General, 126*(1), 54-70.

Kirby, K. N., & Maraković, N. N. (1996). Delay-discounting probabilistic rewards: Rates decrease as amounts increase. *Psychonomic Bulletin & Review, 3*(1), 100-104.

Kirby, K.N. (2000). Instructions for inferring discount rates from choices between immediate and delayed rewards. *Unpublished manuscript.*

Kogut, T. & Ritov, I. (2005). The 'identified victim' effect: An identified group, or just a single individual? *Journal of Behavioral Decision Making, 18*(3), 157-167.

Kosslyn, S. M., Pascual-Leone, A., Felician, O., Camposano, S., Kennan, J. P., Thompson, W. L., Ganis, G., Sukei, E., & Alpert, N. M. (1999). The role of area 17 in visual imagery: convergent evidence from PET and rTMS, *Science, 284,* 167-170.

Kramer, R. M. & Brewer, M. B. (1984). Effects of group identity on resource use in a simulated commons dilemma. In: J. M. Levine & R. L. Moreland (Eds.) *Small groups* (pp. 119-132). New York: Psychology Press.

Krebs, D. (1975). Empathy and altruism. *Journal of Personality and Social Psychology, 32*(6), 1134-1146.

Laibson, D. (1997). Golden Eggs and Hyperbolic Discounting. *The Quarterly Journal of Economics, 112*(2), 443-478.

Laibson, D. I., Repetto, A., & Tobacman, J. (1998). Self-control and saving for retirement. *Brookings Papers on Economic Activity,* 91-196.

Lerner, M. J., & Miller, D. T. (1978). Just world research and the attribution process: Looking back and ahead. *Psychological Bulletin, 85*(5), 1030–1051

Lipsey, M. W. & Wilson, D. (2001). *Practical meta-analysis.* Thousand Oaks: Sage publications.

Liviatan, I., Trope, Y., & Liberman, N. (2008). Interpersonal similarity as a social distance dimension: Implications for perceptions of others' actions. *Journal of Experimental Social Psychology, 44,* 1256-1269.

Locey, M. L., Jones, B.A., & Rahclin, H. (2011). Real and hypothetical rewards in self control and social discounting. *Judgment and Decision Making, 6*(6), 522-564.

Loewenstein, G. Small, D.A. & Strand, J. (2006). Statistical, identifiable, and iconic victims. *Behavioral Public Finance,* 32-46.

Loewenstein, G.F., Weber, E.U., Hsee, C.K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin, 127*(3), 267-286.

Maglio, S.J., Trope, Y., & Liberman, N. (2013). The common currency of psychological distance. *Current Directions in Psychological Science 22*(4), 278-282.

McClure, S.M., Ericson, K.M., Laibson, D.I., Loewenstein, G., & Cohen, J.D. (2007). Time discounting for primary rewards. *Journal of Neuroscience, 27*(21), 5796 5804.

McGuire, P. K., Shah, G. M., & Murray, R. M. (1993). Increased blood flow to broca's area during auditory hallucinations in Schizophrenia. *Lancet, 342*(8873), 703-706.

Metcalfe, J., & Mischel, W. (1999). A hot/cool-system analysis of delay of gratification: The dynamics of willpower. *Psychological Review, 106*(1), 3–19.

Mitchell, J. P., Schirmer, J., Ames, D. L., & Gilbert, D. T. (2011). Medial prefrontal cortex predicts intertemporal choice. *Journal of Cognitive Neuroscience, 23*(4), 857-866.

Moran, J. M., Macrae, C. N., Heatherton, T. F., Wyland, C. L., & Kelley, W. M. (2006). Neuroanatomical evidence for distinct cognitive and affective components of self. *Journal of cognitive neuroscience, 18(9),* 1586-1594.

Mullen, B., Brown, R., & Smith, C. (1992). Ingroup bias as a function of salience, relevance, and status: An integration. *European Journal of Social Psychology, 22*(2), 103-122.

Munnell, A. H., Webb, A., Delorme, L. & Golub-Sass, F. (2012). National retirement risk index: How much longer do we need to work? *Center for Retirement Research of Boston College, 12*(12), 1-6.

Muravan, M. & Baumeister, R.F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*(2), 247-259.

Nadler, A., Romek, E., & Shapira-Friedman, A. (1979). Giving in the kibbutz: Pro-social behavior of city and kibbutz children as affected by social responsibility and social pressure. *Journal of Cross-Cultural Psychology, 10*(1), 57-72.

Northoff, G. & Bermpohl, F. (2004). Cortical midline structures and the self. *Trends in Cognitive Sciences, 8*(3), 102-107.

Northoff, G. J, Heinzel, A.; de Greck, M., Bermpohl, F., Dobrowolny, H., Panksepp, J. (2006). Self-referential processing in our brain—a meta-analysis of imaging studies on the self. *Neuroimage, 31,* 440-457.

Nussbaum, S., Trope, Y., & Liberman, N. (2003). Creeping dispositionism: The temporal dynamics of behavior prediction. *Journal of Personality and Social Psychology, 84*(3), 485-497.

O'Donoghue, T. & Rabin, M. (1999). Doing it now or later. *The American Economic Review, 89*(1), 103-124.

Olson, K. R., Dunham, Y., Dweck, C. S., Spelke, E. S., & Banaji, M. R. (2008). Judgments of the lucky across development and culture. *Journal of Personality and Social Psychology, 94*(5), 757-776.

Parfit, D. (1971). Personal identity. *Philosophical Review, 80*(1), 3-27.

Parfit, D. (1984). *Reasons and Persons.* Oxford: Oxford University Press.

Phelps et al., 2001: Activation of the left amygdala to a cognitive representation of fear. *Nature Neuroscience 4,* 437-441.

Pronin, E., & Ross, L. (2006). Temporal differences in trait self-ascription: When the self is seen as an other. *Journal of Personality and Social Psychology, 90*(2), 197-209.

Pronin, E., Olivola, C. Y., & Kennedy, K. A. (2008). Doing unto future selves as you would do unto others: Psychological distance and decision making. *Personality and Social Psychology Bulletin, 34*(2), 224-236.

Pryor, J.B., Reeder, G.D., & Monroe, A.E. (2012). The infection of bad company: Stigma by association. *Journal of Personality and Social Psychology, 102*(2), 224-241.

Rabbie, J. M., & Horwitz, M. (1969). Arousal of ingroup-outgroup bias by a chance win or loss. *Journal of Personality and Social Psychology, 13*(3), 269-277.

Rachlin, H. & Jones, B. (2008). Social discounting and delayed discounting. *Journal of Behavioral Decision Making, 21*(1), 29-43.

Retirement Confidence Survey. (2013). Employee Benefit Research Institute. Retrieved from http://www.ebri.org/publications/ib/index.cfm?fa=ibDisp&content_id=5175.

Roberts, W. A. (2002). Are animals stuck in time? *Psychological Bulletin, 128*(3), 473-489.

Rosati, A. G., Stevens, J. R., Hare, B., & Hauser, M. D. (2007). The evolutionary origins of human patience. Temporal preferences in chimpanzees, bonobos, and human adults. *Current Biology 17*(19), 1663-1668.

Schelling, T. T. (1984). Self-command in practice, in policy, and in a theory of rational choice. *The American Economic Review, 74*(2), 1-11.

Sherif, M., Harvey, O.J., White, B.J., Hood, W., & Sherif, C.W. (1961). *Intergroup Conflict and Cooperation: The Robbers Cave Experiment.* Norman: The University Book Exchange.

Simpson, B. (2006). Social identity and cooperation in social dilemmas. *Rationality and Society, 18*(4), 443-470.

Simpson, J. A., Ickes, W., & Blackstone, T. (1995). When the head protects the heart: Empathic accuracy in dating relationships. *Journal of Personality and Social Psychology, 69*(4), 629.

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology 13*, 290–312.

Stevens, J. R., Hallinan, E.V., & Hauser, M.D. (2005). The ecology and evolution of patience in two New World monkeys. *Biology Letters, 1*(2), 223-226.

Stone, C. E. & Sobel, M. E. (1990). The robustness of estimates of total indirect effects on covariance structure models estimated by maximum likelihood. *Psychometrika, 55*(2), 337-352.

Suddendorf, T., & Corballis, M.C. (2007) The evolution of foresight: What is mental time travel and is it unique to humans? *Behavioral and Brain Sciences, 30,* 299-351.

Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behaviour. *European Journal of Social Psychology, 1*(2), 149-178.

Trope, Y. & Liberman, N. (2003). Temporal construal. *Psychological Review, 110*(3), 403-421.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the Social Group: A self-categorization Theory*. New York: Blackwell.

Turner, R. N. & Crisp, R. J. (2010). Imagining intergroup contact reduces implicit prejudice. *British Journal of Social Psychology, 49*(1), 129-142.

van Boven, L., Kane, J., McGraw, A.P., & Dale, J. (2010). Feeling close: Emotional intensity reduces perceived psychological distance. *Journal of Personality and Social Psychology, 98*(6), 872-885.

van Ravenzwaaij, D., van der Maas, H. L. J., & Wagenmakers, E-J. (2011). Does the Name Race Implicit Association Test Measure Racial Prejudice. *Experimental Psychology, 58*(4), 271-277.

Verhofstadt, L.L., Buysse, A., Ickes, W., Davis, M., & Devoldre, I. (2008). Support provision in marriage: The role of emotional linkage and empathic accuracy. *Emotion, 8,* 792-802.

Vuchinich, R.E., & Simpson, C.A. (1998). Hyperbolic temporal discounting in social drinkers and problem drinkers. *Experimental and Clinical Psychopharmacology, 6,* 292-305.

Wakslak, C. J., Nussbaum, S., Liberman, N., & Trope, Y. (2008). Representations of the self in the near and distant future. *Journal of Personality and Social Psychology, 95*(4), 757-773.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070.

Weller, R. E., Cook, E. W. III, Avsar, K. B., & Cox, J. E. (2008). Obese women show greater delay discounting than healthy-weight women. *Appetite, 51*(3), 562-569.

Wicker, B., Keysers, C., Plailly, J., Royet, J. P., Gallese, V., & Rizzolatti, G. (2003). Both of us disgusted in my insula: The common neural basis of seeing and feeling disgust. *Neuron, 40*(3), 655-664.

Willis, J. A. & Goethais, G. R. (1973). Social responsibility and threat to behavioral freedom as determinants of altruistic behavior. *Journal of Personality, 41*(3), 376-384.

Yamagishi, T., & Mifune, N. (2008). Does shared group membership promote altruism?: Fear, greed, and reputation. *Rationality And Society, 20*(1), 5-30.

Zauberman, G., Kim, B. K., Maikoc, S., & Bettman, J. (2009). Time discounting and discounting time. *Journal of Marketing Research, 46,* 543-556.

APPENDICES

Appendix A

Instructions for the Measure of Patience in Studies 1a and 1b

Imagine that you are participating in a study of decision-making at a well-known university. You are seated alone in a room.

Imagine the researcher comes into your room and tells you that you can choose between two options:

- Option A: The researcher will give you $5 right now.

- Option B: The researcher will send you a different amount of money one month from now.

Imagine that the researcher really will do what he says. For each of the amounts below, please indicate which option you would choose in each case.

Appendix B

Instructions for the Measure of Altruism in Studies 1a, 1b, and 2a

Imagine that you and another person are participating in a study of decision-making at a well-known university. You and the other person arrived separately, have not seen each other, and are seated in separate rooms. When the study is over you will leave by separate doors and neither of you will ever learn the other's identity.

Imagine the researcher comes into your room and tells you that you can choose between two options:

- Option A: The researcher will give you $5 right now.

- Option B: The researcher will give the other person a different amount right now.

Imagine that the researcher really will do what he says. For each of the amounts below, please indicate which option you would choose in each case.

Marlowe-Crowne Social Desirability Scale

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to your personally. It's best to go with your first judgment and not spend too long mulling over any one question.

1. Before voting I thoroughly investigate the qualifications of all the candidates.

2. I never hesitate to go out of my way to help someone in trouble.

3. It is sometimes hard for me to go on with my work if I am not encouraged.

4. I have never intensely disliked anyone.

5. On occasions I have had doubts about my ability to succeed in life.

6. I sometimes feel resentful when I don't get my way.

7. I am always careful about my manner of dress.

8. My table manners at home are as good as when I eat out in a restaurant.

9. If I could get into a movie without paying and be sure I was not seen I would probably do it.

10. On a few occasions, I have given up something because I thought too little of my ability.

11. I like to gossip at times.

12. There have been times when I felt like rebelling against people in authority even though I knew they were right.

13. No matter who I'm talking to, I'm always a good listener.

14. I can remember "playing sick" to get out of something.

15. There have been occasions when I have taken advantage of someone.

16. I'm always willing to admit it when I make a mistake.

17. I always try to practice what I preach.

18. I don't find it particularly difficult to get along with loudmouthed, obnoxious people.

19. I sometimes try to get even rather than forgive and forget.

20. When I don't know something I don't mind at all admitting it.

21. I am always courteous, even to people who are disagreeable.

22. At times I have really insisted on having things my own way.

23. There have been occasions when I felt like smashing things.

24. I would never think of letting someone else be punished for my wrongdoings.

25. I never resent being asked to return a favor.

26. I have never been irked when people expressed ideas very different from my own.

27. I never make a long trip without checking the safety of my car.

28. There have been times when I was quite jealous of the good fortune of others.

29. I have almost never felt the urge to tell someone off.

30. I am sometimes irritated by people who ask favors of me.

31. I have never felt that I was punished without cause.

32. I sometimes think when people have a misfortune they only got what they deserved.

33. I have never deliberately said something that hurt someone's feelings.

Reading the Mind in the Eyes Test (RMET)

Instructions

You will see a series of photographs of eyes. For each set of eyes, choose which word best describes what the person in the picture is thinking or feeling. Choose the word by pressing the key with the number that corresponds to the number for the word on the screen. You may feel that more than one word is applicable but please choose just one word, the word which you consider to be most suitable. Before making your choice, make sure that you have read all 4 words. You should try to do the task as quickly as possible but you will not be timed. The questions will begin in a moment.

Example Trial

1: Jealous
2: Arrogant
3: Panicked
4: Hateful

Appendix E

Instructions for the Intertemporal Choice Task from Studies 2b and 2c

For this task, you will be asked a series of questions about whether you would prefer to receive $10 now, or a different amount of money at a point of time in the future. The future amount and point of time for the second choice will vary depending on the question. For each of these questions, please imagine that you are given the choice between receiving $10 right away from the experimenter, or receiving the other amount in a check that arrives at the designated time. Assume that there is no doubt about whether you will receive the amount of money you choose at the corresponding time.

Appendix F

Future Self Questionnaire from Study 2c

Imagine who you will be in 10 years. Imagine yourself and your life as vividly as possible. What will you be doing? What will you look like? Where will you live? Who will your friends be? Will you be married? Divorced? Really picture who you will be and what you will do on a typical day.

Once you have vividly imagined who you will be in ten years, please answer the following questions:

[Connectedness Subscore.]

1. How connected do you feel to the person that you will be in 10 years?

1	2	3	4	5	6	7
Not at all						Extremely

2. How similar will you be in 10 years, relative to who you are now?

1	2	3	4	5	6	7
Not at all						Extremely

3. How much affection do you feel for the person you will be in 10 years?

1	2	3	4	5	6	7
Not at all						Extremely

4. How much do you like the person you will be in 10 years?

1	2	3	4	5	6	7
Not at all						Extremely

5. How much do you care for the well being of the person you will be in 10 years?

1	2	3	4	5	6	7
Not at all						Extremely

6. How different will you be in 10 years, relative to who you are now? *

1	2	3	4	5	6	7
Not at all						Extremely

7. How alienated do you feel from the person you will be in 10 years? *

1	2	3	4	5	6	7
Not at all						Extremely

8. To what degree will you like the same things in 10 years that you like now?

1	2	3	4	5	6	7
Not at all						Extremely

9. To what degree will you be the same person in 10 years that you are now?

1	2	3	4	5	6	7
Not at all						Extremely

10. How much do you prefer yourself now to the person you will be in 10 years? *

1	2	3	4	5	6	7
Not at all						Extremely

Now imagine that in 10 years, you develop back problems. Your back begins to hurt every day when you get out of bed. You feel sharp pain when you move in certain ways or exert yourself. Sometimes, you feel mild pain in your back all day. You visit several doctors, but none can offer a permanent solution. They explain the back pain like yours can develop as a result of aging, and often there is no cure. You take over-the-counter pain killers on particularly bad days, but they only help a little, and you realize that chronic back pain is something you will just have to live with.

[Concern Subscore]

11. How concerned are you about the possibility of developing chronic back pain in 10 years?

1	2	3	4	5	6	7
Not at all						Extremely

[Compassion subscore

12. How sympathetic do you feel toward this future you?

1	2	3	4	5	6	7
Not at all						Extremely

13. How compassionate do you feel toward this future you?

1	2	3	4	5	6	7
Not at all						Extremely

14. How warm do you feel toward this future you?

1	2	3	4	5	6	7
Not at all						Extremely

15. How tender do you feel toward this future you?

    1   2   3   4   5   6   7
Not at all   Extremely

16. How moved do you feel when you think about this future you?

    1   2   3   4   5   6   7
Not at all   Extremely

*Indicates an item that was reverse-scored

Adapted PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate answer under the word to indicate to what extent you feel this way **right now**, that is, at the present moment.

Good

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

Interested

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

Distressed

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

Excited

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

Upset

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

Competitive

1	2	3	4	5
very slightly	a little	moderately	quite a bit	extremely

or not at all

Engaged

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

Hostile

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

Enthusiastic

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

Irritable

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

Alert

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

Happy

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

Nervous

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

Determined

	1	2	3	4	5
	very slightly or not at all	a little	moderately	quite a bit	extremely

Attentive

	1	2	3	4	5
	very slightly or not at all	a little	moderately	quite a bit	extremely

Active

	1	2	3	4	5
	very slightly or not at all	a little	moderately	quite a bit	extremely

Appendix H

Script from Studies 3a and 3b

Hi and thank you for coming to participate in our experiment! I just wanted to let you know that in order to standardize the procedure for all participants, I am going to be reading you the instructions as we go along.

OK we're ready to get started. Just so that you know, because this is a two-part study you will receive credit or payment when you come back next week, at the end of part 2.

In today's study we are looking at how people collaborate online. To do this we are grouping participants into teams and asking them to debate one side of a civil court case involving custody rights. Some participants are assigned to the defense team, and some are assigned to the prosecution team. Today, you and two other participants have been assigned to the [defense/prosecution] team. Because we are focused on online communication, we arranged it so that each of you arrives at a slightly different time than the others in order to avoid any kind of contact that might bias the online conversation. After reading about the case, the three of you will work together in an online chat to discuss your side of the debate against the [prosecution/defense], which we will hold when you return for the second session.

Please read through the materials (show them the materials, already on the desk) *about your case and the position you will take as a member of the [prosecution/defense]. Once you are finished reading the materials just open the door and let me know. Because of how many participants are in this experiment, each of you has been assigned a specific researcher to make the process run more smoothly. I am your assigned researcher so if you ever have any questions please ask me.*

Do you have any questions about this? Okay, let me know when you finish, It shouldn't
take more than 10 minutes.

Okay, now that you have familiarized yourself with the case materials, I will sign you into
a group chat via gchat with the members of your group so that you can discuss them online.

In order to standardize the format of the conversation, we have assigned roles to the
members of your group. Participant 1 will give their opinion about question one, followed by
participant 2, and then you will respond third with your opinion regarding that question, and the
same response order goes for question 2 and so on. Does this make sense? Participant 1 will to
initiate the chat, which should start in a moment. Please do not type anything in the chat box
until Participants 1 and 2 are finished with their responses. And make sure to let the other
participants know when you're done with your answer. It's important for the chats to have a
consistent format, so please follow this structure when you discuss the case with your teammates.

Do you have any questions? Good! When you have finished discussing the questions just
open the door and let me know. Again, please remember that the gchat transcripts are going to
be analyzed so make sure that you follow the format and only talk about material related to the
case.

I will be in the hall so feel free to open the door if you have any questions during the
group discussion.

Stay Condition

All set? Great! That's all for this first study today. When you return next week, you will
be joining your other teammates to debate on behalf of the [prosecution/defense], against the
team arguing for the [defense/prosecution.] Do you have any questions about this?

Switch Condition (Memorize this Section)

All set? Great! That's all for this first study today. Because of some cancellations, when you return next week you will actually be switching to the [prosecution/defense] team since we need to even out the numbers in the debate. **So instead of arguing for the [prosecution/defense], when you return next week you'll be a member of the opposite team, arguing against the two team members you worked with today, with the members of the [defense/prosecution].** *Do you have any questions about this?*

Everyone

Now we are going to start the second, unrelated study. We often like to bundle studies together because it saves people the inconvenience of coming in for only a short time.

This second study is from a colleague who is interested in pattern recognition. For this task, you need to find all of the animal names embedded in lines of letters. For example (show them the example on the packet).

Give them the PANAS form and the first page with the practice problems.

Please fill out the questionnaire first and then do the practice problems to get the hang of the task and let me know when you are finished.

All set? Thanks! The task is just like that all the way through. There's time for this task both this session and next session, so you can divide it up between sessions however you want. Whatever you don't do now, you'll do next week after you debate for the [prosecution/defense]. **So just think about how many pages you want to leave for yourself to do next week after the debate, and put them in this folder so that I can add them to your paperwork for next session.** *I have to go check on something, but I'll be back in a minute to collect your part 2 folder.*

Leave and let them divide it up

Thanks! You can start working on the pages you've allocated for this session and come find me in the hall when you're done.

Leave and wait for the participant to finish.

Great! You're almost done with part 1. We just need you to fill out a few questionnaires. Just fill these out in order, and open the door when you are done.

For the Switch Condition

When filling out the questionnaire please keep in mind that you will be on the other team next week, rather than the team you were on today.

Everyone

Thanks! That's all for part 1. Don't forget that you'll receive your payment or credit after completing part 2. I look forward to seeing you next week.

Debriefing Questions

1. Do you have any thoughts about what we might be looking for in this study?

2. What did you think of the court case?

3. What did you think of your teammates?

4. Did you suspect that your teammates weren't actually other participants?

5. What did you think of the pattern recognition task?

6. Was your decision about how much of the pattern recognition task to do influenced at all by concerns about finishing the study in time?

7. Did you believe me when I said you have enough time to finish it all today?

Case Materials from Studies 3a and 3b

Case Summary and Instructions

Mr. and Mrs. Donovan claim to be the rightful parents of Sally Washington. Janet Washington gave birth to Sally 5 months ago and has raised the child with her husband Richard. In June Sally became ill with symptoms that suggested she might have a genetic disorder that makes children allergic to a wide variety of foods. Concerned for her health, the Washington's brought Sally to the hospital for genetic testing. Although the tests revealed that Sally was perfectly healthy, they also indicated that she was not the Washington's biological child.

Sally had been conceived through in vitro fertilization (IVF), a process by which an egg is fertilized by sperm outside of the body and then implanted in the patient's uterus. IVF is a major treatment for infertility when other methods of assisted reproduction technology have failed. The only way that Mrs. Washington could have given birth to someone else's biological child is if there was a mix-up between her embryos and the embryos of another women who was using IVF to become pregnant.

After the hospital investigated the matter, they found out that there had indeed been a rare mix up between the fertilized eggs of Mrs. Washington and another patient at the hospital, Mrs. Donovan. When the Donovan's were informed that Sally was actually their biological child, they had their attorney file a lawsuit to gain primary custody of Sally. The Washington's attorney responded and the case is set for trial.

Your job as a member of the Donovan [Washington] Legal Team is to come up with a set of arguments for why Mr. and Mrs. Donovan [Mr. and Mrs. Washington] deserve to

have custody of Sally. On the next page there are statements from Mrs. Donovan as well as from Mrs. Washington.

As you read through the statements please keep these 4 questions in mind:

1) What are the strongest arguments in favor of your case?

2) What are the weakest aspects of your case and how would you defend them against attack from the defense?

3) What are the strongest arguments for the defense and how could you attack them?

4) What are the weakest arguments for the defense, and how could you attack them?

Once you read through the statements, you will discuss these questions with two other participants who are also members of the Donovan [Washington] Legal Team.

Statement from Kerry Donovan

My name is Kerry Donovan. I am 39 years old and co-own a computer software company with my husband Arthur. We live in New York City. When I was in my mid-30s Arthur and I decided we were ready to have a child. We tried for months but it was very hard for us to conceive, so we went to a fertility clinic for assistance. It turned out that I was infertile and the clinic suggested we try in vitro fertilization. On the third round I became pregnant. I was overwhelmed with joy. It was our dream come true. Tragically, I miscarried several months later. As difficult as it was to get through emotionally, my husband and I still deeply wanted a child. The doctors said we still had a good chance, and we were planning another round, but before we had a chance I started to go through menopause. At that point the doctors told us that I could probably not ever have a child of my own.

Then a little over a year later, the hospital contacted us to let us know that we did have a child! There had been a mix-up and my eggs had been given to someone else. I couldn't believe

that my baby was out there somewhere. All I could think was that I wanted her to come home as soon as possible. Being told I couldn't have a child was bad, but not nearly as bad as finding out that I do have a child but can't hold her, or love her, or raise her. I saw a picture of her, and she looks exactly like Arthur—his green eyes and red hair, his round face. It is so clear that she is *our* baby. I've cried every day since getting this news.

It is just so horrible that the Washingtons had to go through a pregnancy thinking that the child was theirs when it wasn't. Mrs. Washington was an accidental surrogate and the hospital has done irreparable harm to her and her husband. We really feel awful for them and hope they sue the hospital for all the pain and suffering they caused with their mistake. But it was their mistake, not ours. It's not right that my husband and I should be forced to pay for their error with our child's life!

My husband and I are Sally's real parents. Thankfully, Sally is still very young, and for her to come live with us will not be a difficult transition for her. She should be able to grow up with her real parents. We hope the Washingtons will try again and have her own child. But Sally is the only child I will ever have. And more than that, she is my daughter. I can't live knowing that someone else is raising my baby.

Statement from Janet Washington

My name is Janet Washington. I'm 30 years old, and until recently worked as an interior designer in New York City. Having a child is a dream I've always had. My husband Richard and I always planned to start a family, and a few years ago decided the time was right and began trying. After a year of trying to have a baby and unsuccessful attempts using ovulation stimulation shots, Richard and I decided to use IVF to have a child. It took a few tries, but when I found out that the IVF was a success and that I was finally pregnant, it was one of the happiest

moments of my life. I was going to be a mother! From then on that was the most important thing in my life.

My pregnancy was by no means an easy one. I had several serious medical complications while pregnant with Sally and had to give up my job in order to focus on my health. However, when I held her for the first time and looked into her beautiful eyes, I knew that all of the sacrifices had been worth it.

Sally is my little miracle, and I would do anything to keep her healthy and safe. Over the last five months, I've bonded with her in a way I can't describe. My entire life is organized around her—her sleeping, her nursing, her walk time and playtime. I love taking her to see my parents, who have fallen in love with her too. She's brought so much to our whole family.

It is impossible for a mother to express the profound love she has for her child. I love her with all my heart and could never give her away. I understand that Mrs. Donovan wants to have a child, but before June, she did not even know Sally existed. Richard and I have raised and cared for Sally since she was born. Sally is a member of our family.

While Sally may not be biologically related to us, she is still our baby. Sally came from inside of me; she kicked in my belly and nurses from my breast. It is love and care that makes a mother, not genes. Mrs. Donovan doesn't have the same bond with Sally that I do. She hasn't raised Sally since birth. A mistake made by the hospital should not allow the Donovans to take away our child. I beg that the Donovans reconsider their decision to sue for custody of Sally.

Gchat Scripts from Studies 3a and 3b

P1 = Fictional Participant 1

P2 = Fictional Participant 2

P3 = Participant

Prosecution Script

P1: okay so my experimenter just left and he told me to go first. I guess we are supposed to go through the questions one at a time and discuss them. Lets see, the first question is to talk about the strongest arguments in favor of our case. I think the fact that Kerry and her husband have a right to raise their biological child is a key point for our side. She shouldn't have this right taken away. To live knowing that their child is out there somewhere being raised by other people…I can't imagine how horrible that would be. What do you think? (participant 2 goes next right? Haha)

P2: Yeah, I go now ☺ I agree with those points. Also, I think it is important to consider how young Sally is and how this works in our favor. Sally probably isn't making real memories yet, so having her live with our client and her husband wouldn't be detrimental to her mental health. This kinda falls in line with your point about it being the parents right to raise their biological child…except it is also Sally's right to grow up in her own family. Does that make sense? Oh, and on top of that, our client can't get pregnant anymore and therefore this is her only chance to have a baby that is related to her, Can you think of any other ideas?

P3: (they say what they think is the strongest argument)

P1: Yeah! That totally makes sense, I really like that idea. Lets see, the next question wants us to look at the weakest side of our case and how we would respond to an attack from the other team. I mean, I think we have a pretty strong case haha but I guess the defense could say that because their client gave birth to Sally and raised her that she is more of a 'mom' but I don't think that is really true because their client has been with Sally for such a short period of time. For example a baby sitter can love a child and help raise the child but that doesn't make her the mom, right? (done)

P2: Hah that is a pretty good point about the baby sitter, actually. As for how to respond to the defense's point, I personally believe that the argument you just mentioned (about her being more of a 'mom' because she gave birth / raised Sally for 5 months) is more of a plea for their client's wellbeing than for Sally's. Sally is just a baby and wouldn't really be aware of what is happening or what all of this means, so the emotional struggle is honestly only something affecting the Washingtons. I do feel bad for the Washingtons and believe that they should be compensated by the hospital for the mistake, but that doesn't change the fact that our client is Sally's real mother. Thoughts?

P3: (they respond)

P1: For sure, that's a great point! We are coming up with some great stuff ☺ Lets see… the next question is about what the other side has as their strongest point and how we should attack it. I think the defense is likely to try to get sympathy by bringing up the fact their client has sacrificed a lot for the pregnancy, like giving up her job and dealing with health complications. They will try to pull at heartstrings. Do you agree?

P2: Yeah I agree, the other team is going to bring a lot of emotion to the table. However, we should respond by saying that although it is unfortunate that their client had to make sacrifices for Sally, it shouldn't be a deciding factor in who gets to raise Sally. Also, our client is very sympathetic too. Like what 1 mentioned earlier about how awful it would feel to know you have a child but you are prevented from raising it. The Donovans are fit and loving parents who want to care for their daughter who was unfairly taken from them. And also how unfair it is to Sally. How she would feel learning that her real parents were out there and had wanted to raise her, but were not allowed to. What are your thoughts 3?

P3: (response)

P1: So true, I definitely agree with all that has been said so far. Alright on to the last question, which is what the other side is weakest on and how we could attack it. I think it just comes down to the fact that while it is hard for the Washington's to give up Sally, parents have a right to their biological children if they want to raise them. Our client never agreed to give up Sally. And also Sally's wellbeing matters too! If she can live with her biological parents, then she should do so (providing the transition will not cause damage, which in this case it won't because she is so young). What else?

P2: Right. We could also add that if Sally does stay with the Washington's she will basically be living a lie or would be in for a pretty big surprise if the parents do tell her why she isn't related to them. No kid deserves that kind of identity crisis right? (done)

P3: (response)

P1: yup :D hah should we get our experimenters? Or is there anything else you think we need to discuss?

P2: I think we are good, right? This was fun haha, it was nice talking to all of you! Until next week ☺

P1: We are gonna kick butt! The other side doesn't have a chance ☺

P2: Totally haha. Adios!

Defense Script

P1: okay so my experimenter just left and he told me to go first. I guess we are supposed to go through the questions one at a time and discuss them. Lets see, the first question is to talk about the strongest arguments in favor of our case. I think the whole idea of motherhood being about love vs genes is a big one. When people adopt they are considered the real parents because they are the ones who put time and love into raising the child, right? What do you think? (participant 2 goes next right? Haha)

P2: Yeah I go now ☺. I agree with those points. Also it just feels so wrong for our clients to have to give up their child. I think that the bond they have with Sally is stronger than the one the Donovans claim to have. I mean Janet carried the baby for nine months and then raised her for five more months; that creates a powerful bond. Think of how bonded parents are with their kids by that point? It would be so wrong for her to lose the child now. Also, our client had to give up so much for the pregnancy, that should count for something don't you think?

P3: (they say what they think is the strongest argument)

P1: Yeah! That totally makes sense, I really like that idea. The next question wants us to look at the weakest side of our case and how we would respond to an attack from the other team. I mean, I think we have a pretty strong case haha. I guess the prosecution could still say that it shouldn't make a difference if Sally moves in with the Donovans because she has been with the

92

Washingtons for such a short period of time. That is really the only thing that sticks out to me. Do you have any other ideas?

P2: Yeah very true, the prosecution will probably argue that if Sally were like 6 or something she would have a stronger bond with our clients and so taking her away would be psychologically and emotionally damaging to her. But since she is so little there wouldn't be a big impact. As for how to respond to this, I personally believe that this argument is really just an additional reason that it could be worse to take the child away under other circumstances; it doesn't change what's right in this case. I think the point is that our clients are still the rightful parents; they would be devastated to lose their child. So even if Sally would be 'okay' if she moved, that doesn't mean it's right to take her away. Make sense? what do you think?

P3: (they respond)

P1: For sure, I definitely agree and think they will bring those things up. We are coming up with some great stuff ☺ I think we can move on to the next question now, which is about what the other side has as their strongest point and how we should attack it. I think the prosecution is likely to try to get sympathy by bringing up the fact that their client can not get pregnant anymore and that Sally is her only hope of having a child that is related to her. Our client can technically have another baby, but their client can't. Do you agree?

P2: Yeah I definitely agree. I understand how that must be hard for their client but that doesn't necessarily give her the right to take away Sally from the woman who gave birth to her and raised her. Mrs. Donovan can always adopt. It isn't as though she can never raise a child. What do you think?

P3: (response)

P1: So true, I definitely agree with all that has been said so far. Alright, on to the last question, which is what the other side is weakest on and how we could attack it. I think it just comes down to the fact that our client gave birth to Sally and raised her for all this time and that makes her more of a 'mom' than the prosecution's client, right? I don't really know how else to say it.

P2: Right and also it just seems so inhuman to take a child away from their family! Both of our clients have probably connected so strongly with Sally by now—and she to them. Sally may be young, but I do believe that a deep bond has been formed between her and our clients. The Washingtons had to wake up at all hours to feed her, introducing her to their family, taking her to the doctor, all that stuff creates a bond that the Donovans do not have with Sally. I mean, I really do feel bad for the other woman but our family should win this case, no question. What do you think?

P3: (response)

P1: yup :D hah should we get our experimenters? Or is there anything else you think we need to discuss?

P2: I think we are good, right? This was fun haha, it was nice talking to all of you! Until next week ☺

P1: We are gonna kick butt! The other side doesn't have a chance ☺

P2: Totally haha. Adios!

Unpleasant Task from Studies 3a and 3b

Pattern Recognition Task

Instructions: For each stream of letters, find <u>one four-letter animal word,</u> circle the letters, and write the word you find in each line.

Rules:

- The letters do not have to be next to each other, but the word will <u>read from left to right</u>.

- You can find the same words more than once.

Example:

                                                              Answer:

I M **B** W H Z W **E** M J T O M X V P W Q **A** M B Z Y S M **R** D D V **Bear**

Practice

  I. J X K P F C Z S J H O S R Y M R W J E Q X U V N A B E N P

 II. X G Q Q Z T D I L B I K G O G S P B U D G M I C J R G N K

 III. E B F C M R T P E L L Y Z T M C C W T O A G L E M K S W Z

Words:

- **Bear**
- **Bird**
- **Crow**
- **Deer**
- **Duck**
- **Frog**
- **Goat**
- **Hawk**

- **Lion**
- **Seal**
- **Slug**
- **Swan**
- **Tick**
- **Wolf**
- **Worm**

1. V G C P T Y T Q Q R L O B B E Q Y K X A T W C Y H W R Y L

2. F Z U S N I B S D T L L U M L W C X I A Q Q F E C A J K R

3. N D K Y Y J M R L Y S Z K S U A I I C J L O F K M A W N X

4. O Y D R L I B A X O E N F F S T G H E Q R C E M C F P D N

5. T P J J Y F K D T Z Y C Z X G G S S N T K R P G B O R W B

6. R Z W L B E L K T Z V D C N P A V T E S J N V Z I O N I G

7. C B U J F E K A B L K Z Q R C V O A W U H O T C L D D F T

8. L J S G K L P D Q F F W Z Y V S B E N U B G S F A K I R I

9. V J S X U O A W E F C J I P I T B F L R V R A M R N S L E

10. L R C C W B E B L E R P E H P I O G R T D E D P Q A P R C

11. D B P W J B A S T K T J M P E J A K U O L P C E U D G R P

12. K H J D W E S E W O W U S K A T Y M S O Z E Y P Z D O R V

[Continues with new problems for another 10 pages, reaching 132 total.]

Appendix L

Questionnaire From Studies 3a and 3b

<u>General Questionnaire</u>

What is your year of birth? _____

What is your sex?

        Male   Female   Other/prefer not to say

What is your race/ethnicity?

  White/Caucasian   African American   Hispanic   Asian American
  Native American   Other_____   Prefer not to say

Please check all that apply:

    ___I am a Harvard Undergraduate

    ___I am an Undergraduate at a University other than Harvard

    ___I am a Harvard Summer School Student

How well do you speak English (click one)?

    ___I am a native English speaker

    ___I am not a native English speaker, but I speak English fluently

    ___I am highly proficient in English (I occasionally make minor errors, but comprehend everything I hear/read)

    ___I am moderately proficient in English (I occasionally have trouble understanding something/being understood)

Please take a moment to carefully read through and fill out this short questionnaire

1. **How invested are you in winning the case?**

1	2	3	4	5	6	7
Not at all						Extremely

2. **To what degree do you believe that the side you argued for today actually has the more valid case?**

1	2	3	4	5	6	7
Not at all						Very strongly

3. **How much did you like your teammates today?**

1	2	3	4	5	6	7
Not at all						Extremely

4. **How connected did you feel to your teammates today?**

1	2	3	4	5	6	7
Not at all						Extremely

5. **How happy are you about being on the prosecution/defense when you come back next week?**

1	2	3	4	5	6	7
Not at all						Extremely

6. **How confident do you feel that your side will win next week?**

1	2	3	4	5	6	7
Not at all						Extremely

7. **How excited are you about returning next week to debate against the other team?**

1	2	3	4	5	6	7
Not at all						Extremely

8. **How competitive do you feel with the other team?**

1	2	3	4	5	6	7
Not at all						Extremely

How connected do you feel to yourself a week from now?

1	2	3	4	5	6	7
Not at all						Extremely

How similar do you feel to yourself a week from now?

1	2	3	4	5	6	7
Not at all						Extremely

How much do you like yourself a week from now?

1	2	3	4	5	6	7
Not at all						Extremely

9. **How much did you enjoy the pattern task?**

1	2	3	4	5	6	7
Not at all						Very much

10. **How often did you want to stop while completing the pattern task?**

1	2	3	4	5	6	7
Not at all						Very often

11. **How much time do you think it took you to fill out the pattern task?**

_____ minutes

12. **How much time do you think it will take to finish the task when you return next week?**

_____ minutes