A Representative Experience Sampling Study of Everyday Empathy

by

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A thesis submitted in conformity with the requirements for the degree of Master of Arts, Psychology

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Abstract

Empathy — the ability to understand, share, and care about the emotions of others — has received considerable attention. However, important questions about empathy remain unsettled; including its frequency, whether it’s a choice, and its impacts on prosociality and well-being. The current study advances understanding by investigating empathy outside the lab. Participants were recruited with quota sampling for age, education, income, region, gender, and ethnicity. They completed a baseline survey, then a week of experience sampling where they were prompted 7 times daily and asked whether they experienced or received empathy in the last 15 minutes. This research tests links between trait and state empathy, and clarifies the relationships between empathy and prosocial behavior, and empathy and well-being. One emerging theme was the importance of positive empathy. This study provides a novel description of empathy in everyday life, and an indication of the utility of experience sampling for understanding empathy in context.

Keywords: Empathy; Prosocial; Subjective Well-being; Experience Sampling
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Introduction

In 2015, a humanitarian crisis shook the world as persecution, conflict and violence, displaced refugees on a scale not seen since World War II (United Nations General Assembly, 2015, p. 1). According to that year’s United Nations High Commissioner Report for Refugees, 63.5 million men, women, and children were forced to flee from their homes in desperate attempts to seek safety. Despite the scale of the crisis, however, it was not until a photo of a young boy named Alan put a human face on the conflict that calls to action began to truly gain traction in western nations. The horror of the rising death count was largely ignored by the global community, until the sight of this 10-year old boy drowned on the beach, triggered a sense of empathy that resulted in a short-lived but significant surge of donations and support (Slovic, Västfjäll, Erlandsson, & Gregory, 2017).

Defining Empathy

Empathy is the capacity to share and understand the emotions of another person. Though some disagreement about the definition exists (for a review see Cuff, Brown, Taylor, & Howat, 2014), empathy is generally thought to consist of three distinct, yet related concepts: the capacity to share the emotions of another, the cognitive ability to perspective take and imagine oneself in another’s shoes, and a feeling of compassion or empathic concern for another’s welfare (Decety & Jackson, 2004). Following this tradition, we define empathy in the current study as consisting of a cognitive component known as perspective taking, an affective component known as emotion sharing, and a motivational component known as compassion. Many researchers view empathy as a critical piece of human psychology (Baron-Cohen, 2011; De Waal, 2008). It has been said that empathy allows for interpersonal communication and understanding, facilitates parental care, and drives prosocial altruistic behaviour (Decety, 2011).

The Contested Value of Empathy

Despite this importance, and conceptions of empathy as automatic (De Waal & Preston, 2017), people have been shown to avoid it in a laboratory setting (Cameron et al., 2019). In addition, longitudinal studies of trait empathy have shown declines over time (Chopik, O’Brien, & Konrath, 2017). This has prompted many concerns among scientists and non-scientists alike. For
example, as President Barack Obama raised concerns about an ‘empathy deficit’ and suggested it may be an even greater threat than its fiscal counterpart (Obama, B., 2006), while the economic and social theorist Jeremy Rifkin argues that we are a world in crisis that must race to become an ‘empathic civilization’ (Rifkin, 2009).

Indeed, there is evidence that empathy may promote altruism (Batson, 2011; Brethel-Haurwitz et al., 2018). On the other hand, the limits and potential drawbacks of empathy have been discussed by psychologists and philosophers alike (eg. Bloom, 2017; Prinz, 2011). These critics have pointed out that empathy is biased and innumerate and thus far from a reliable guide to prosocial and moral behaviour. While there is encouraging evidence of a link between empathy and helping behaviour, empathy and compassion are not always beneficial (Klimecki, 2019). Investigating empathy and prosocial in daily life may help us understand conditions where empathy does or does not promote helping behaviour, clarifying the relationship between them.

The link between subjective well-being and empathy is similarly uncertain. Some researchers have reported evidence that individuals high in empathy have higher psychological well-being (Konrath & Grynberg, 2016), while other studies suggest that repeatedly engaging with the emotional experiences of others can lead to negative outcomes such as fatigue, burnout, and even vicarious trauma in caregivers (Burtson & Stichler, 2010). In addition, a review on the relation between empathy and subclinical symptoms of depression reported that empathic distress was associated with depression, but empathic concern was not (Schreiter, Pijnenborg, & aan het Rot, 2013). Schreiter et al. (2013) also specifically called for more ecologically valid measures of empathy. Ecological validity is one strength of the experience sampling approach (Mehl & Tamilin, 2012).

**State of the Research**

This call for ecological validity highlights the fact that much of the research done on empathy has been performed in a lab setting, meaning its generalizability to the real world is unknown. Furthermore, it means we have yet to answer basic questions such as whether experiencing empathy makes the empathizer more likely to help other people. We don’t know whether receiving empathy is associated with increased well-being, and whether it makes you more likely to empathize or help others in turn. In addition, we don’t yet know basic descriptive facts about
empathy such as how often we have opportunities to empathize, how often we empathize when given the opportunity, and what form this empathy takes in terms of different purported components—or dimensions—of empathy discussed in the literature; including emotion sharing, perspective taking, and compassion. Settling the discussion about whether empathy should be reserved for emotion sharing or should be used as an umbrella term encompassing these dimensions is a necessary step before we can progress in our discussions of whether empathy is predictive of a given outcome. In addition, it is still a matter of debate whether empathy is experienced as voluntary or occurs automatically. Furthermore, when empathy takes place, it remains to be determined whether the proposed components of empathy operate independently or interact in daily life as some researchers (e.g. Zaki & Ochsner, 2012) propose.

Considerable research has explored how self-report and task-based measures of empathy predict important psychological outcomes. We know—for example—that reduced cognitive empathy is associated with autism spectrum disorder, while deficits in emotional empathy correlate with psychopathy (Lockwood, Bird, Bridge, & Viding, 2013). While this body of work is impressive, studies have shown that experience sampling methods can uncover relationships that global retrospective self-reports miss (Shiffman, Stone, & Hufford, 2008). There has also been much research on the underlying neural networks that are associated with different aspects of empathy (for reviews see Shamay-Tsoory & Lamm, 2018; Singer & Lamm, 2009). However, these studies are not able to address whether these components interact or occur separately in everyday life (Zaki & Ochsner, 2012). Experience sampling methods could examine this question while employing a more ecologically valid measure of empathy.

Experience sampling methods have previously been usefully applied to examine outcomes related to empathy. For example, one study (Grühn, Rebucal, Diehl, Lumley, & Labouvie-Vief, 2008) examined how trait empathy is related to relationship satisfaction in everyday life. Another study (Morelli, Rameson, & Lieberman, 2014) looked at how neural correlates of empathy generated in the lab predict prosocial behaviour in everyday life, while a third study (Meng et al., 2013) examined trait empathy measures and daily well-being in older adults. These examples and others like them still measure empathy in the lab, few studies have applied experience sampling to understand how empathy itself is experienced in daily life.
While most of the research on empathy has been conducted in the lab, there have been some exceptions. One of the few studies that measured empathy itself in daily life looked at how empathy can fluctuate as a result of daily events and affect (Nezlek, Feist, Wilson, & Plesko, 2001), this important study focused on emotional empathy alone and was limited to a single assessment a day. A more recent study (Toomey & Rudolph, 2018) adapted items from the empathic concern and perspective taking subscales of the Interpersonal Reactivity Index and provided evidence that empathy in daily life mediated the link between affective arousal and emotional labour in the workplace. Another study explored empathic ability and expression in the classroom, highlighting the importance of examining empathy in context by showing that social network analysis could explain differences in daily expressions of empathy that individual ability measures of empathy collected in the lab would not predict (Roerig, Van Wesel, Evers, & Krabbendam, 2015). In addition, one interesting study showed that compassion in everyday life is predictive of feelings of both eudaimonia and prosocial behaviour in a way that empathy measures collected in the lab were not (Runyan et al., 2019). Though experience sampling research on empathy is still in early stages, these selected studies demonstrate the utility of this methodology.

**Unanswered Questions**

Despite the progress made thus far, it is clear there are important unanswered questions. The current study will address these questions by examining empathy in everyday life with experience sampling. This allows us to measure empathy and prosocial behaviour across a range of real-life emotions and social contexts, avoiding some of the limitations of previous empathy research that have been identified (Morelli, Rameson, & Lieberman, 2014). First, we turn to a historical review of the empathy literature to understand the background motivating the current study.
Chapter 1
Literature Review

Review of Empathy

1.1 Historical Review

"Taught by time, my heart has learned to glow for other’s good, and melt for other’s woe”

- Homer, 8th Century BCE

As Ebbinghaus once said of Psychology itself, empathy has a long history, but a short past. The theme is present in Aristotle and Plato’s debate about the rightful place of poetry in society, though Aristotle uses the word pity (Grigoriou, 2018). In the 17th century, philosophers discussed the benefits and problems associated with sympathy, which shared much in common with the modern definition of empathy, especially the empathic concern or compassion component. David Hume argued that the basis of our moral foundations lay in our sentiments and ‘sympathy’ was a major driver of our concern for other people. He described sympathy as the process whereby the “minds of men” became “mirrors to one another” (Knapska & Meyza, 2018, p. 1). Adam Smith also argued for the importance of ‘sympathy’ as a social glue, a term that has since been applied to empathy by modern authors (Rifkin, 2009). Similarly, Charles Darwin felt ‘sympathy’ was a foundational social instinct (Jahoda, 2005).

In 1873, Robert Vischer coined the term Einfühlung to describe the way that people “feel-into” or project themselves onto a given piece of art. Theodor Lipps, a student of Wundt, applied this concept to Psychology to describe how we understand that other people have selves, what we would today think of as theory of mind or perspective taking. He saw this term as very similar to the concept of sympathy discussed above. Edward Titchener had a different idea of the meaning of Einfühlung, and he became the first Psychologist to use the term “empathy” as a process of humanizing or feeling ourselves into objects and other people (Nowak, 2011). Since Titchener’s time, empathy has been extensively investigated and discussed in psychology (Allison, Baron-Cohen, Wheelwright, Stone, & Muncer, 2011), neuroscience (Decety & Lamm, 2006),
philosophy (Zahavi, 2010), and animal behaviour (De Waal & Preston, 2017). Though both important and interesting, a full review of the philosophical development of empathy is beyond the scope of this paper (see Wispé, L., 1991), so we will focus on the history of research on empathy in psychology.

The picture of empathy emerging from this research is a complex one, with empathy being associated with different outcomes depending on its definition. This suggests a need for a descriptive account of how empathy, and its proposed components correlate and interact – or not – in daily life. We will next examine how various researchers have attempted to measure empathy in order to understand what questions about empathy remain to be addressed.

1.2 Measuring Empathy

1.2.1 Self-report measures

In psychology, two early approaches to understanding empathy emerged. One followed a cognitive role-taking approach to the concept (Dymond, 1949) and another thought of empathy as a vicarious emotional response (Stotland, 1969). One of the first formal attempts at developing an empathy scale was by Hogan (1969). Defining empathy as “the intellectual or imaginative apprehension of another's condition or state of mind,” he followed Dymond’s (1949) lead and employed a cognitive focused formulation that is similar to what we call perspective taking in the current study. Hogan also explicitly linked empathy with morality, describing those with an empathic disposition as having an increased capacity to take the “moral point of view” (Hogan, 1969, p. 307). Later investigations of this 64-question scale suggested it may load onto several factors, rather than being unidimensional (Johnson, Cheek, & Smither, 1983). This theme of multidimensionality would appear again in the literature.

Another questionnaire was developed in 1972 called the Questionnaire Measure for Emotional Empathy that followed Stotland’s (1969) approach, capturing the emotional — but not cognitive — aspects of empathy (Mehrabian & Epstein, 1972). A review of both Hogan’s empathy scale and the Questionnaire Measure for Emotional Empathy stated that, while both showed reasonable validity, they appeared to be measuring different aspects of empathy (Chlopan, McCain, Carbonell, & Hagen, 1985). Thus, even early in the study of empathy there was a
recognition of cognitive and emotional components, and an attempt to understand how these dimensions related to one another.

A later conception of empathy encompassed both cognitive and emotional dimensions with a scale called the Interpersonal Reactivity Index. This scale adopted a multidimensional approach that would prove to be heavily influential (Davis, M.H., 1983). The Interpersonal Reactivity Index consists of four subscales: perspective taking, fantasy, empathic concern, and personal distress. Empathic concern denotes a tendency to feel concern or compassion for other people. Personal distress describes a tendency to feel stressed, nervous, or overwhelmed in the presence of others suffering. Perspective taking refers to the ability to put yourself in the shoes of another and understand their point of view. The fantasy scale taps the tendency to become caught up in stories and imaginatively identify with the characters. This scale has been used in many subsequent studies and will be used as a trait measure of empathy in the current study.

A number of other scales have been developed since the Interpersonal Reactivity Index; such as the Basic Empathy Scale (Jolliffe & Farrington, 2006), the Questionnaire for Cognitive and Affective Empathy (Reniers, Corcoran, Drake, Shryane, & Völlm, 2011), and the Toronto Empathy Questionnaire (Spreng, Mckinnon, Mar, & Levine, 2009), among others. Many of these scales have good psychometric properties but are not included in the current study due to space constraints. Future research is required to determine how various empathy scales relate to one another, and which scale or combination of scales, is most predictive of empathy in everyday life.

Another measure in this domain is the Empathy Quotient (Wheelwright & Baron-Cohen, 2004), which is a 40-item questionnaire that can measure empathy in the general public that can also be used in a clinical context to assess the level of social impairment in disorders like autism. An analysis of this scale suggested it is a valid measure of empathy, and that empathy could be measured along a single dimension (Allison et al., 2011). However, a unidimensional conception fails to explain, for example, how individuals with autism spectrum disorder (ASD) and psychopathology can both suffer from empathy deficits but in such different ways.

Along with the Interpersonal Reactivity Index the current study employs another recently developed scale intended to capture emotion sharing and behavioural contagion aspects of
empathy: the Empathy Index (Jordan, Amir, & Bloom, 2016). This scale will be administered to provide trait measures of how inclined someone is to feel similar emotions (empathy subscale) or physiological sensations (behavioural contagion subscale) to the ones that they observe. Using these two scales in conjunction should provide a good overview of the trait empathy profile of our sample at the global, retrospective report level.

This brief review of scales that have been developed to measure empathy serves dual purposes. First, it provides support from the literature for examining empathy as a multidimensional construct. It also provides the reader with an introduction to how empathy at the trait level will be measured in the current study with self-report. That is, we will obtain scores for individuals on the following dimensions of empathy: personal distress, empathic concern, fantasy, and perspective taking from the Interpersonal Reactivity Index (Davis, 1983); along with emotion sharing, and behavioural contagion from the Empathy Index (Jordan et al., 2016). We will also be asking participants to what extent they agree with the statement “I am an empathetic person” (SITES: Konrath, Meier, & Bushman, 2018) and to what extent they believe empathy is malleable (Schumann, Zaki, & Dweck, 2014). These trait measures of empathy will be asked in Part One of the current study.

1.2.2 Behavioural measures

Along with self-report measures of empathy, several task-based or behavioural measures have been developed. In this section we will briefly describe these measures, with a focus on the Empathy Selection Task (Cameron et al., 2019), which is also administered at baseline in the current study.

There have been many attempts at operationalizing empathy with a behaviour-based approach. These include the comic strip task, the picture story stimuli, and the kid’s empathetic development scale (Neumann, D.L., et al., 2015) as well as the reading the mind in the eyes test, and the false belief task (Yang, Khalifa, & Völlm, 2017), to name a few. These tasks often require participants to perform a behaviour or make a judgement based on limited information. For example, the reading the mind in the eyes task requires participants to infer the emotional states of other people based on an image of the area around the eyes alone, while the comic strip task requires participants to make inferences about the beliefs and intentions of characters in a
comic strip. Likewise, the picture story stimuli and Kids Empathetic Development Scale (Reid et al., 2012) require children to interpret pictures of varying social complexity. The false belief task requires a child to understand that a character’s behaviour will be guided by a false belief that their doll is where they left it (for a review see Neumann et al., 2015). These tasks generally focus children’s theory of mind, which corresponds most with the cognitive or perspective taking component of empathy. However, some researchers have provided evidence that emotional information in a speaker’s voice can influence children’s expectations as indexed by their gaze patterns, which involves affective perspective taking (Khu, Chambers, & Graham, 2018).

Another task-based approach is the empathy selection task (Cameron, D., et al., 2019). The empathy selection task (EST) was modeled after previous effort avoidance tasks. The task itself involves repeatedly choosing from one of two presented decks. Participants see a photo of an individual, and then are instructed on what to do next by the card they choose. The instructions differ depending on the deck, where one deck instructs participants to empathize and describe what the person is feeling, and the other instructs them to describe the appearance of the person. This task is also administered at baseline in the current study.

Across a series of studies with the Empathy Selection Task, researchers have found that participants consistently avoided empathy when given a choice, selecting the empathy deck only about 35% of the time. They performed a meta-analysis and found a robust empathy avoidance effect (g = -.67) across 10 studies (Cameron et al., 2019, p. 9). Empathy avoidance was observed for positive experiences and when there was no emotional or material costs associated with empathizing. By adapting behavioural economic approaches, the authors also created an empathy discounting task and calculated that, on average, participants required 39 cents more in compensation to choose from the empathy than the describe deck. While intriguing, the results run counter to notions of empathy as involuntary (De Waal & Preston, 2017), suggesting instead that individuals might be differentially motivated to empathize across different situations (Weisz & Zaki, 2018). However, like the bulk of research on empathy, work with the Empathy Selection Task was done in the confines of an artificial lab setting, meaning the applicability of this work to the real world is unknown.
The current study will address these limitations by studying empathy outside the lab, in everyday life. It will address the question of whether empathy is automatic or not by determining how often people empathize when given the opportunity, and by asking participants to report the extent to which empathizing or not empathizing felt like it was voluntary: something they decided.

This brief review of self-report and behavioural measures of empathy illustrates two important points for the current study. First, we have not yet settled on a precise definition of empathy. Second, it is not yet clear whether empathy is a choice or is automatic. We will next discuss research on how empathy correlates with important psychological outcomes to underscore the need to learn two other important facts about empathy: how it connects with prosocial behaviour and subjective well-being. To put the question more broadly, we want to know if empathy appears to act as a positive or negative force for individuals and society in the course of everyday life. Attempts at resolving these questions have thus far been inconclusive.

### 1.3 Outcomes associated with empathy

#### 1.3.1 Prosocial Behaviour

Several empathy researchers have made strong claims about its link to prosocial behaviour. For example, Batson proposes a link between empathy and altruism (Batson, 2019; Batson, 2011; Batson et al., 1991) and Baron-Cohen suggested at the other end of the continuum that human evil can be seen as being identical with having “zero degrees” of empathy (Baron-Cohen, 2011). The literature linking prosocial behaviour and empathy is considerable (for reviews see Davis, Schroeder, & Graziano, 2015; Eisenberg & Miller, 1987).

However, cognitive empathy can also be employed for narcissistic exploitation (Wai & Tiliopoulos, 2012). Furthermore, critics have pointed out that empathy may not always lead to prosocial or moral behaviour. For example, Bloom has argued that empathy is biased and innumerate, and can just as easily be used to manipulate people as it can to drive moral behaviour (Bloom, 2017).
Much of this debate hinges on authors employing different definitions of empathy. For Bloom, empathy refers to feeling the (often negative) emotions of others, while other researchers use the term as an umbrella concept encompassing cognitive, emotional, and motivational dimensions. The current study will help resolve this debate by examining the correlation of emotion sharing, perspective taking, and compassion in daily life. Furthermore, it will test whether empathy predicts prosocial behavior in daily life both at the time of empathizing and at time 2. With this design, we can also examine whether being the target of empathy leads to increased prosocial behaviour, an issue which has received little study to date.

1.3.2 Subjective Wellbeing

Much like the relationship with prosocial behaviour, the relationship between subjective wellbeing and empathy is not entirely understood. It is clear that very low levels of empathy are associated with mental health issues. For example, reduced emotional empathy is implicated in Narcissistic Personality Disorder, Antisocial Personality Disorder, and Psychopathy (Konrath & Grynberg, 2016), while reduced cognitive empathy is linked to Autism Spectrum Disorder (Sucksmith, Allison, Baron-Cohen, Chakrabarti, & Hoekstra, 2013) and Asperger Syndrome (Dziobek et al., 2008). On the other hand, a review of studies with Major Depressive Disorder patients suggests that an unusually high degree of empathy related distress is associated with depressive symptoms. Children with the genetic disorder known as Williams Syndrome show high emotional reactivity but low perspective taking ability, which often results in social isolation (Konrath & Grynberg, 2013). Thus, it seems that both high and low empathy can be associated with issues in clinical populations.

In non-clinical populations, there is evidence that higher empathy is associated with lower stress, anxiety, and depression (Konrath & Brown, 2012). There has been research linking perceived empathy (Cramer & Jowett, 2010) and empathic accuracy (Howland & Rafaeli, 2010) to wellbeing and satisfaction in relationships. On the other hand, empathic distress brought on by emotion sharing has been associated with reduced wellbeing (Schreiter, Pijnenborg, & Aan Het Rot, 2013). Research suggests one aspect of trait empathy (personal distress) is positively associated with burnout, while empathic concern is negatively associated with burnout among caregivers (von Harscher, Desmarais, Dollinger, Grossman, & Aldana, 2018). Thus, this brief
review illustrates that the relationship between empathy and subjective well-being is complex and not yet fully understood. Describing the phenomenon in everyday life with a representative sample of the general population is an important step towards this understanding.
Chapter 2
Empathy in Everyday Life

The Current Study

2.1 Participants and Procedure

Participants were recruited and assessed in compliance with the University of Toronto Research Ethics Board guidelines, and materials and procedure were approved prior to data collection. In order to improve the generalizability of our results, we used quota sampling to obtain a sample that was relatively representative of the U.S. population in terms of age, region, ethnicity, education, gender, and income. This step is important as previous research has suggested that empathy may significantly vary with a number of these parameters; including age (Grühn et al., 2008; O’Brien, Konrath, Grühn, & Hagen, 2013), gender (Christov-Moore et al., 2014), region (Bach, Defever, Chopik, & Konrath, 2017), and income (Stellar, Manzo, Kraus, & Keltner, 2012; Varnum, Blais, Hampton, & Brewer, 2015). This recruitment process was done in cooperation with the company Qualtrics utilizing their panel management option (Qualtrics®, 2002; www.qualtrics.com). Authors constructed a demographic survey (Appendix A), which Qualtrics distributed to their panel. Participants who answered this demographic survey were selected by Qualtrics based on quotas derived from U.S. census data. Participants recruited in this way provided an email address in order to be contacted for the purposes of the study. Participants were offered $18 for participating in the study, plus a bonus of $7 if they completed 80% or more of the experience sampling surveys. As per our preregistration, participants answering less than 7 experience sampling surveys were removed prior to analysis. With the agreement of our participants, all data is posted on the open science framework (osf.io/g42yt) along with materials, code, and supplementary materials.

As we wanted a reasonably precise estimate of the number of empathy experiences per day, we planned our sample to be large enough to enter the corridor of stability described in previous research (Schönbrodt & Perugini, 2013), and obtained in some of our own simulations (Figure 1). This work suggested that an N around 250 would yield an acceptably precise estimate of
population parameters. Therefore, we preregistered a sample size around 250 participants or 7,500 observations. In the current thesis, we had to pause collection at a lower N than planned due to time constraints, but we intend to continue collecting until our preregistered goal has been met and present our findings in a future publication. That said, the current study presents data from a total of 4,784 surveys completed in the context of everyday life, along with baseline personality and demographic information, for a reasonably representative sample of 160 U.S. citizens. This experience sampling approach provided additional power as well as some advantages over retrospective self-report measures alone (Shiffman et al., 2008), which are often systematically biased through the use of heuristics (Schwarz, 2012).

In terms of age, our sample was 6% 18-24, 19% 25-34, 24% 35-44, 21% 45-54, 19% 55-64, and 11% over 65. We sourced participants from each region of the United States, with 19% of our sample coming from the Northeast, 20% from the Midwest, 47% from the South, and 14% from the West. In terms of ethnicity our sample was 66% Caucasian, 16% African American, 5% Asian American, 11% Hispanic, and 2% Other. Regarding income, 28% of our sample reported an annual income of less than $25,000, 37% reported between $26,000-$50,000, 27% reported an income of $51,000-$100,000, and 8% reported an income of $101,000 or more. We also had a range of education levels in our sample, with 40% of our sample having a high school education or less, 29% having some college experience, 19% being college graduates, and 11% obtaining a graduate degree. Finally, around 48% of our sample was female, 50% was male, and 1% was non-binary or transgender. Though this sample is under-represented among adults between 18 and 25, over 65, and those making over $100,000 a year, the representativeness of the current sample is a significant improvement from convenience or undergraduate samples employed in much of the literature.

Once recruited, participants were emailed a link to Part One, which was an online baseline survey completed on Qualtrics. Given the inability of researchers to agree on the definition of empathy, we assumed there would be variability in definitions among the general public. For this reason, we provided a glossary of terms for participants at the beginning of the baseline survey. This baseline survey included measures of empathy, a big five measure of personality, and several other individual differences including: religiosity, political orientation, verbal ability, chronotype, and implicit willpower beliefs. For the full list of measures used see Appendix B.
the conclusion of this baseline survey, participants followed instructions to download the “MetricWire” application and create an account on their mobile device (MetricWire®, 2013; www.metricwire.com).

In Part Two, participants were notified 7 times a day over the course of a week to answer a short survey about their recent experiences (Appendix C). A total of 4,784 experience sampling surveys were answered, with each participant answering an average of $M = 29.71$ (SD = 12.81, 95% CI = [27.73, 31.70]). This represents significant variation in number of surveys answered, but number of surveys answered was not significantly associated with any of our daily empathy measures after adjusting for false discovery rate (Table 1).

The final survey on the final day of Part Two re-administered a subset of the trait empathy measures that participants completed at baseline. A total of 114 participants completed this questionnaire. This allowed us to determine whether trait empathy scores, which should remain stable, were manipulated through the course of the experiment. These changes would suggest our attempt to measure empathy in daily life may have inadvertently manipulated empathy, and therefore undermine our estimates of the frequency of empathy in daily life. However, if such changes occur, it would be interesting to note if this change was predicted by beliefs about the malleability of empathy. It would also provide evidence for the hypothesis that empathy levels can be changed, even without—in this case—direct intentions to this end.

2.2 Results

Several interesting results were obtained that help inform our conversation about empathy moving forward. To walk through the results, we will first provide a descriptive account of empathy in everyday life with a discussion of the role of positive empathy. We will then go through our preregistered hypotheses in turn. Finally, we will discuss some exploratory analyses to help provide potential directions for future research. These data highlight the potential for experience sampling methods to advance the study of empathy by embedding it in the social context on which it depends.
2.2.1 Describing Empathy

Of all 4,784 experience sampling surveys, participants reported having experienced an empathy opportunity in the last 15 minutes 20% of the time (M = 0.20, SD = 0.40, 95% CI = [0.19, 0.21]). Some participants answered more surveys than others and are therefore overrepresented in the data. However, in this case taking the mean of each participant mean yields a similar estimate at 22% (M = .22, SD = .22, 95% CI = [0.16, 0.28]), but with considerable variability (SD = .40). In total, there was 969 reported opportunities to empathize, of which participants reported experiencing empathy in some form on 863 occasions. On average, participants empathized on 87% of reported opportunities (M = 0.87, SD = 0.25, 95% CI = [0.83, 0.91]). However, when participants reported not having an empathy opportunity, they were asked if they had observed, read about, or heard about the emotional experiences of another person. Participants responded yes to this question 12% of the time on average (M = 0.12, SD = 0.15, 95% CI = [0.11, 0.13]). By our definition, which was established with the participants, these would constitute missed empathy opportunities. In total, participants missed 391 opportunities to empathize over the course of the week. Therefore, when participants had observed emotional experiences of other people, they empathized 63% of the time overall (95% CI = [0.61, 0.68]), though this number increases to 89% overall (M = .89, SD = .31, 95% CI = [.87, .91]) when we look only at situations where the observed emotions of others was coded as an empathy opportunity by the participants.

The current data suggests that empathy opportunities and empathy itself are common occurrences in daily life for many people. However, there is significant variation, and 14 of our participants reported 0 empathy opportunities throughout the course of the week despite answering 7 surveys or more. We asked about the last 15 minutes within a circumscribed time frame (between 10am and 10pm), over the course of a week, sampling an average of 450 minutes per participant. We captured an average of 6.06 empathy opportunities (M = 6.06, SD = 7.45, 95% CI = [4.95, 7.25]) and 5.4 empathy experiences per participant (M = 5.39, SD = 7.20, 95% CI = [4.28, 6.51]). Therefore, we might roughly estimate that individuals experience 9.6 opportunities to empathize and 8.6 empathy experiences in a typical 12-hour day. Once again, we note considerable between subject variance (Figure 2).
The components of empathy were very highly correlated in everyday life. Looking at all the empathy events reported, we can see that by far the most common experience of empathy involved emotion sharing, perspective taking, and compassion all occurring in the same situation (67%). As noted, some participants answered more surveys than others, so we examined the proportion of each combination of components by participant and calculated means. For each participant’s set of empathy experiences, all three components co-occurred an average 68% of the time, but with significant variation (M = 0.68, SD = 0.34, 95% CI = [0.66, 0.70]). The second most proportionally common combination was compassion and perspective taking (M = 0.11, SD = 0.22, 95% CI = [0.10, 0.12]), and compassion and emotion sharing (M = 0.09, SD = 0.19, 95% CI = [0.08, 0.10]).

We were also curious about how often people feel that others have an opportunity to empathize with them, and how often they actually receive empathy in their daily lives. Overall, of the 4,784 experience sampling surveys answered, participants reported that another person had an opportunity to empathize with them in the last 15 minutes 609 times (M = 0.13, SD = 0.33, 95% CI = [0.12, 0.14]). If we take the mean of our participant means, we once again get a similar estimate (M = 0.14, SD = 0.19, 95% CI = [0.11, 0.17]). As we see, participants report opportunities to receive empathy less frequently than they report opportunities to experience it for others. In fact, 44 participants did not report a single situation where someone had an opportunity to empathize with them (Figure 3). When an opportunity to receive empathy was reported, participants reported that the other person did not emotion share, perspective take, or feel compassion for them on only 58 occasions. This means that participants received empathy on 90% (M = 0.90, SD = 0.29, 95% CI = [0.88, 0.92]) of the reported opportunities. Therefore, participants receive empathy themselves when they present an opportunity, at similar rates to feeling empathy when provided with an opportunity (M = 0.89, SD = 0.31, 95% CI = [0.87, 0.91]). When participants were the target of empathy, we found that emotion sharing, perspective taking, and compassion co-occurred together on 418 out of 609 occasions (69%). The component structure of experiencing and receiving empathy showed considerable overlap in the overall data (Figure 4). Once again, we took the proportion of times emotion sharing, perspective taking, and compassion occurred in each possible combination per participant and calculated means to get estimates where each participant’s data counted equally. On average participants received all three components 57% of the time, but there is substantial variation between participants (M =
The second most common response proportionally when participants report someone had an opportunity to empathize with them is that emotion sharing, perspective taking, and compassion do not occur at all (M = 0.11, SD = 0.22, 95% CI [0.07, 0.15]). Future analysis could explore how this experience of not receiving empathy when providing an opportunity impacts well-being, behaviour, and subsequent empathizing. Emotion sharing and compassion occurred together roughly 10% of occasions (M = 0.10, SD = 0.25, 95% CI = [0.05, 0.15]), while compassion occurred by itself 9% of occasions on average per participant (M = 0.09, SD = 0.23, 95% CI = [0.05, 0.13]). Compared to the structure of empathy experienced per participant, we can see that when receiving empathy, all three components occurring together was less common (Figure 5), but this still comprised the majority of empathy target experiences.

As mentioned, when individuals did have an empathy opportunity, they reported experiencing empathy 89% of the time overall. This strikingly high rate might suggest the behaviour should be considered automatic as some scholars have suggested (De Waal & Preston, 2017), however—participants rated both empathizing (M = 5.62, SD = 1.47, 95% CI = [5.52, 5.72]) and not empathizing (M = 4.77, SD = 1.81, 95% CI = [4.43, 5.11]) as ‘voluntary or something they decided’ using a novel 1-7 scale from not at all voluntary to completely voluntary (see Appendix C). These data support conceptions of empathy as a choice that people may be more or less motivated to engage in across targets and situations (Cameron, Cunningham, Saunders, & Inzlicht, 2018; Weisz & Zaki, 2018). Participant’s reported experience may not tell the whole story however, as the data shows participants are not consciously recognizing empathy opportunities even when they have stated that they observed or heard about the emotional experience of another person. It is also likely that on some number of occasions participants were exposed to the emotional experiences of other people and did not notice at all, and it may be that individuals avoid potentially costly empathy in everyday life by avoiding the conscious recognition of empathy opportunities, which could allow them to avoid distress (Zaki, Wager, Singer, Keysers, & Gazzola, 2016) or effort (Dunn, Inzlicht, & Risko, 2019) and still regard themselves as an empathetic individual.

To get some further insight into this matter, we asked participants that did not empathize when given an opportunity to indicate why this was the case from a list of options. Participants stated
most often that they were busy doing something else, then that they didn’t want to feel pressure to act a certain way, and then that they didn’t have time. This impact of feeling rushed is reminiscent of early findings in the empathy literature of seminary students passing by an injured person on their way to deliver a sermon about the good Samaritan (Darley & Batson, 1973). The least selected options were that it was too emotionally painful, it was too hard, and they didn’t care about the person. These responses could serve as pilot testing for future surveys asking why participants didn’t empathize.

However, even more common than any of these options, participants indicated they did not empathize for other reasons. Several participants stated that they did not empathize because they were not sure how to empathize. Others indicated that the situation did not make sense, seemed illogical, or was not relatable. In several situations, participants reported that they did not empathize because they were continually faced with the “same issue” over and over, and they had “heard it all before”. In other cases, participants reported that they felt disconnected from the person. In one case, a participant did not empathize because it “stressed [them] out just to listen to”, while another “just didn’t feel like it”. Thus, the reasons for not empathizing vary, but the extent to which these reasons drive behaviour rather than provide explanations for behaviour remains to be determined. While aspects of empathy are experienced as voluntary, other aspects—such as whether another’s emotional experience counts as an empathy opportunity or not—appear to happen without conscious control.

This data supports conceptions of empathy as a multidimensional construct (Davis, M., 1983), with distinct components that interact in daily life (Zaki & Ochsner, 2012). On the other hand, it suggests more narrow definitions of empathy; for example those that conceive of empathy as best reserved for emotion sharing (Bloom, 2016) may be misguided. In everyday life, when people report feeling empathy, compassion is the most common of the components that are experienced. Of the 863 empathy experiences in the current data, only 36 (4%) did not involve compassion. Furthermore, peoples ratings of agreement that they are ‘an empathetic person’ (SITES; Konrath, Meier, & Bushman, 2018) are most predictive of the extent to which they feel compassion (b = 0.24, SE = 0.07, t(119) = 3.40, p = .007, r = 0.30, 95% CI = [0.10, 0.37]), while also to a lesser degree predicting the extent of perspective taking (b = 0.26, 95% CI = [0.06, 0.46], SE = 0.10, t(113) = 2.58, p = .04, r = 0.24) and emotion sharing (b = 0.21, 95% CI = [0.06,
0.37], SE = 0.08, t(110) = 2.66, p = .009, r = 0.25). Definition aside, Bloom makes an important point that some manifestations of empathy (personal distress, negative emotion sharing) are less helpful than others (compassion, positive emotion sharing), and empathy should not be promoted blindly. There may be ways of engaging with the emotional experiences of other people that are more skillful and conducive to the health of individuals and societies than others. One important step towards this goal is to obtain descriptive information about empathy in everyday life, as we have attempted to do with the current study and open dataset.

### 2.2.2 Positive Empathy

Though empathy is often discussed in the literature as a reaction to observing negative emotions, pain, or some other form of suffering—researchers have increasingly begun to note the importance of positive empathy (Andreychik & Lewis, 2017; Morelli, Lieberman, & Zaki, 2015; Telle & Pfister, 2016). The current study provides additional support for this idea, showing that in daily life people often empathize with the positive emotional experiences of others. In fact, in the current dataset positive empathy experiences (67%) were more than three times as common as negative empathy experiences (20%), with another substantial portion (13%) being described as mixed.

Overall, the average rated valence of observed emotional experiences coded as empathy opportunities was (M = 5.25, SD = 1.85, 95% CI = [5.13, 5.37]) on a scale ranging from extremely negative (1) to extremely positive (7). The mean of participant valence means is somewhat lower, but still positive (M = 4.83, SD = 1.41, 95% CI = [4.60, 5.06]). These are promising findings, as previous researchers (Batson, 2011) have argued that sharing the positive emotions of others — or empathic joy — may be the key experience linking empathy with altruism or prosocial behaviour. Other researchers have expanded on this point, highlighting the potential for positive empathy in promoting prosocial behaviour (Telle & Pfister, 2016). The current study underscores the promise of this line of research by showing that empathizing with positive experiences is more common than empathizing with negative experiences in the everyday lives of adults. It is interesting to note this prevalence of positive empathy is a finding that was also reported in early research on empathy in children (Strayer, 1980).
The importance of considering both positive and negative emotions when we think about empathy is also underscored by the fact that valence may impact outcomes of interest in unexpected ways. For example, reported valence of observed emotions is a significant predictor of important outcomes like subjective well-being ($b = 0.12, SE = 0.02, t(784) = 6.50, p < .001, r = 0.23, 95\% CI = [0.08, 0.15]$). Given that we are social animals, it is not surprising that the valence of the emotions experienced by the people around us would impact our own emotions. Further exploration of how positive and negative empathy differentially impact well-being and prosocial behaviour in everyday life may prove to be an important direction for future research.

2.2.3 Preregistered Analyses

Though this study is exploratory—meaning many models were tested to obtain potentially important areas for future research—we had several preregistered hypotheses. All p values were adjusting using the false discovery rate procedure with the p.adjust function in the stats package in R (R Core Team, 2019). As required when multilevel modeling for correct interpretation (Kleiman, 2017), trait measures used as predictors were grand mean centered, while repeated measures used as predictors were participant mean centered. We built multilevel models nested within participant and day of survey using glmer or lmer functions in the lme4 package in R (Bates, Maechler, Bolker, & Walker, 2015). When models did not converge the bobyqa optimizer was applied. If the models still would not converge, we dropped nesting within day and nested just within participant. If models would not converge at this point, they would not be interpreted.

2.2.3.1 Empathy and prosocial behaviour

It was expected that some trait measures of empathy, such as empathic concern, would be associated with increased prosocial behaviour in daily life while other aspects of empathy, specifically personal distress, might be associated with social withdrawal and therefore less prosocial behaviour. We tested each trait empathy subscale as a single predictor of reported prosocial behaviour. Contrary to expectations, no significant associations were found between any of our trait empathy measures collected at baseline and prosocial behaviour in daily life (see Table 3).
In our daily life measures however, empathy does appear to be associated with prosocial behaviour (Table 4). This ability of experience sampling measures to uncover associations that global retrospective or trait measures do not capture has previously been noted as an advantage of this methodology (Mehl & Tamlin, 2012; Runyan et al., 2019; Shiffman et al., 2008). In the current study, having an empathy opportunity in the last 15 minutes is predictive of reporting prosocial behaviour in that same time frame \((b = 4.61, \text{SE} = 0.17, \text{z}(4780) = 26.70, p < .001, r = 0.79, \text{Odds Ratios} = 100.72, 95\% \text{ CI} = [71.79, 141.29])\). Empathy opportunities that were flagged as such were more predictive of prosocial behaviour than missed empathy opportunities, though it was interesting to note that these too were associated with increased prosocial behaviour \((b = 1.21, \text{SE} = 0.21, \text{z}(3811) = 5.77, p < .001, r = 0.32, 95\% \text{ Odds Ratios} = 3.37, \text{CI} = [2.23, 5.09])\). Once an empathy opportunity is noticed, actually experiencing empathy is also associated with increased prosocial behaviour \((b = 1.08, \text{SE} = 0.29, \text{z}(964) = 3.74, p = .001, r = 0.29, \text{Odds Ratios} = 2.95, 95\% \text{ CI} = [1.67, 5.19])\).

In terms of the components of empathy in everyday life, prosocial behaviour is most strongly associated with compassion. First, whether or not participants had experienced compassion was associated with increased prosocial behaviour \((b = 1.20, 95\% \text{ CI} = [1.35, 8.20], \text{SE} = 0.46, \text{z}(855) = 2.62, p = .02, r = 0.31, \text{Odds Ratios} = 3.33)\). In addition, higher participant centered ratings of extent of compassion were predictive of increased prosocial behaviour \((b = 0.47, \text{SE} = 0.13, \text{z}(819) = 3.50, p = .002, r = 0.13, \text{Odds Ratios} = 1.60, 95\% \text{ CI} = [1.23, 2.08])\).

While empathy did predict prosocial behaviour, this effect was short-lived, with no significant associations found between empathizing at time 1 and prosocial behaviour at time 2 (Table 5). This echoes a finding that iconic photos triggering empathy only impacted donations for a short time (Slovic et al., 2017). Interestingly, receiving empathy is also associated with prosocial behaviour. When participants reported that another person had an opportunity to empathize with them, they were about 7 times more likely to report a prosocial behaviour \((b = 1.98, \text{SE} = 0.13, \text{z}(4780) = 15.66, \text{Odds Ratios} = 7.27, 95\% \text{ CI} = [5.67, 9.32], p < .001, r = 0.48)\).

The association between prosocial behaviour and empathy was observed despite the fact that the majority of empathy opportunities involved positive emotions. This provides support to the idea that it’s not only people who are suffering that receive help (Telle & Pfister, 2012). Given that...
participants who reported an empathy opportunity were 100 times more likely to report a prosocial behaviour, and the fact that empathy opportunities are often missed, it seems that we should encourage people to notice more of empathy opportunities around them. However, it is important to determine what kind of impact these empathy experiences have on the individuals themselves. One way to explore this question is by looking at the impact on subjective well-being.

2.2.3.2 Empathy and subjective well-being

Another major question of the current study was the connection between empathy and subjective well-being in daily life. Among trait empathy, we found only one significant predictor, and it was in the negative direction. Trait personal distress scores on the Interpersonal Reactivity Index were negatively associated with subjective well-being in everyday life ($b = -0.38, 95\% \text{ CI} = [-0.62, -0.14], \text{SE} = 0.12, t(157) = -3.08, p = .02, r = 0.24$). However, none of the other empathy subscales showed significant associations with subjective well-being (Table 6).

Once again, experience sampling measures of empathy uncovered associations that were not observed using trait measures (see Table 7). Reinforcing the sole significant finding described above, we found that participant centered personal distress during an empathy opportunity in everyday life was negatively predictive of subjective well-being ($b = -0.11, 95\% \text{ CI} = [-0.14, -0.08], \text{SE} = 0.02, t(804) = -6.70, p < .001, r = 0.23$) as was empathy difficulty ($b = -0.12, 95\% \text{ CI} = [-0.17, -0.06], \text{SE} = 0.03, t(694) = -3.84, p < .001, r = 0.14$).

On the other hand, several of the everyday empathy predictors were positively associated with subjective well-being. The occurrence of empathy opportunities was associated with higher ratings of subjective well-being ($b = 0.21, 95\% \text{ CI} = [0.20, 0.21], \text{SE} = 0.03, t(4327) = 6.32, p = 1.8e-09, r = 0.10$). The extent of empathy experienced ($b = 0.15, 95\% \text{ CI} = [0.09, 0.21], \text{SE} = 0.03, t(709) = 4.79, p < .001, r = 0.18$), and the confidence reported during these experiences ($b = 0.24, 95\% \text{ CI} = [0.16, 0.32], \text{SE} = 0.04, t(707) = 5.72, p < .001, r = 0.21$), are both associated with increased subjective well-being. Similarly, the extent of empathy participants themselves received ($b = 0.20, 95\% \text{ CI} = [0.11, 0.29], \text{SE} = 0.05, t(430) = 4.40, p < .001, r = 0.21$) and—as mentioned—the valence of the empathy opportunities reported ($b = 0.12, 95\% \text{ CI} = [0.08, 0.15], \text{SE} = 0.02, t(784) = 6.50, p < .001, r = 0.23$) are positively associated with subjective well-being.
As with prosocial behaviour, we found that the impact of empathy experiences on subjective well-being was relatively short lived. None of our daily empathy predictors were associated with subjective well-being at time 2, after adjusting for the false discovery rate.

Clearly, empathy in everyday life is often associated with increased well-being. However, certain forms—such as personal distress and empathy difficulty—express the opposite association. In addition, when we restrict our analysis to situations where empathy opportunities were reported that were on the negative side of the spectrum, only confidence when empathizing was predictive of subjective well-being (\(b = 0.37, 95\% \text{ CI} = [0.12, 0.62], \text{SE} = 0.13, t(120) = 2.89, p = .026, r = 0.26\)), and this was primarily driven by effects on sense of purpose (\(b = 0.50, 95\% \text{ CI} = [0.23, 0.76], \text{SE} = 0.14, t(114) = 3.63, p = 0.003, r = 0.32\)) rather than happiness (\(b = 0.23, 95\% \text{ CI} = [-0.07, 0.54], \text{SE} = 0.16, t(132) = 1.50, p = .25, r = 0.13\)). Meanwhile, in this limited dataset analysis, difficulty ratings of empathy (\(b = -0.49, 95\% \text{ CI} = [-0.70, -0.29], \text{SE} = 0.11, t(120) = -4.67, p = .0001, r = 0.39\)) and ratings of personal distress (\(b = -0.14, 95\% \text{ CI} = [-0.24, -0.03], \text{SE} = 0.05, t(153) = -2.57, p = .047, r = 0.20\)) remained negatively predictive of well-being, though personal distress was barely significant after adjustment. Further analysis is needed to elucidate the relationship between empathy and well-being in everyday life and explore how it may be mediated by the valence of the emotions observed.

2.2.3.3 Trait empathy and everyday empathy

We examined the relationship between trait measures of different dimensions of empathy and experience-sampling based measures of empathy in daily life by running a series of multilevel models using each trait measure as a single predictor of each daily empathy measure. We took the list of p-values for each trait predictor and adjusted them for false discovery rate. For preregistered hypotheses, adjusted values that were below .05 after this adjustment were considered statistically significant. For the sake of space, not all tests are reported in print here, but tables of t/z scores and adjusted p values for all models tested can be found in supplementary materials (osf.io/g42yt). Significant associations provide some ecological validity for the trait measures of empathy, and some construct validity for our novel measures of empathy in everyday life. However, as with other findings in this study confirmatory follow-up studies are required to solidify these relationships.
The subscales of the Interpersonal Reactivity Index were predictive of aspects of empathy in everyday life in different ways (Table 8). We begin with the empathic concern subscale which contains items such as “I often have tender, concerned feelings for people less fortunate than me” (Davis, M., 1980). This corresponds most closely to our question about compassion in daily life. The Empathic concern subscale was predictive of whether or not participants experienced empathy when given an opportunity ($b = 1.03$, $SE = 0.25$, $z(945) = 4.05$, $p < .001$, Odds Ratios $= 2.80$, $r = 0.27$, 95% CI $= [1.70, 4.61]$). It was predictive of the extent to which participants reported emotion sharing ($b = 0.30$, 95% CI $= [0.08, 0.51]$, $SE = 0.11$, $t(114) = 2.70$, $p = .012$, $r = 0.25$) and compassion ($b = 0.38$, 95% CI $= [0.21, 0.56]$, $SE = 0.09$, $t(129) = 4.32$, $p = .001$, $r = 0.36$) in everyday life. Empathic concern scores were also predictive of participant’s confidence in the accuracy or appropriateness of their compassion ($b = 0.37$, 95% CI $= [0.21, 0.52]$, $SE = 0.08$, $t(101) = 4.64$, $p < .001$, $r = 0.42$) and perspective taking ($b = 0.29$, 95% CI $= [0.11, 0.47]$, $SE = 0.09$, $t(85) = 3.15$, $p = .002$, $r = 0.32$), but not emotion sharing ($b = 0.21$, 95% CI $= [0.01, 0.40]$, $SE = 0.10$, $t(107) = 2.10$, $p = .052$, $r = 0.20$). On the other hand, empathic concern was negatively predictive of difficulty ratings for emotion sharing ($b = -0.59$, 95% CI $= [-0.79, -0.24]$, $SE = 0.14$, $t(110) = -4.06$, $p = .004$, $r = 0.36$), perspective taking ($b = -0.52$, 95% CI $= [-0.87, -0.30]$, $SE = 0.14$, $t(132) = -3.72$, $p < .001$, $r = 0.31$), and compassion ($b = -0.76$, 95% CI $= [-1.03:-0.50]$, $SE = 0.14$, $t(110) = -5.61$, $p < .001$, $r = 0.47$). Empathic concern is thus associated with higher rates of empathy, greater extent of emotion sharing and compassion, and confidence during compassion and perspective taking. At the same time, empathic concern scores were negatively predictive of difficulty ratings for all three proposed components of empathy.

Though not as predictive as empathic concern appears to be, another subscale of the interpersonal reactivity index that is predictive of several everyday empathy variables is the perspective taking scale. This scale is predictive of empathizing ($b = 0.63$, $SE = 0.26$, $z(945) = 2.37$, $p = .04$, $r = 0.17$, Odds Ratios $= 1.87$, 95% CI $= [1.11, 3.13]$), and with extent of perspective taking ($b = 0.32$, 95% CI $= [0.06, 0.57]$, $SE = 0.13$, $t(117) = 2.44$, $p = .04$, $r = 0.22$) and compassion ($b = 0.26$, [0.09, 0.43], $SE = 0.09$, $t(126) = 2.94$, $p = .01$, $r = 0.25$). It was also associated with increased confidence ratings in perspective taking ($b = 0.32$, 95% CI $= [0.15, 0.49]$, $SE = 0.09$, $t(87) = 3.73$, $p = 0.003$, $r = 0.37$), and compassion ($b = 0.28$, 95% CI $= [0.13, 0.43]$, $SE = 0.08$, $t(106) = 3.63$, $p = .003$, $r = 0.33$). Finally, the perspective taking subscale was also associated with lower difficulty ratings of perspective taking ($b = -0.44$, 95% CI $= [-0.72, -
0.17) SE = 0.14, t(111) = -3.13, p = .01, r = 0.29) and emotion sharing (b = -0.33, 95% CI = [-0.61, -0.05], SE = 0.14, t(138) = -2.34, p = .04, r = 0.20) in everyday life.

We also found that the fantasy score was not significantly associated with any of our daily empathy variables after correcting for false discovery rate. The final subscale of the Interpersonal Reactivity Index, the personal distress scale, was predictive of lower ratings of confidence when taking perspective (b = -0.25, 95% CI = [-0.40, -0.09], SE = 0.08, t(96) = -3.14, p = .002, r = 0.31), or feeling compassion (b = -0.20, 95% CI = [-0.34, -0.06], SE = 0.07, t(111) = -2.74, p = .007, r = 0.25). Surprisingly, the personal distress scale was not predictive of personal distress in everyday life (b = 0.14, 95% CI = [-0.12, 0.41], SE = 0.13, t(148) = 1.06, p = .292, r = 0.09).

After correcting for the false discovery rate, the Empathy Index Empathy subscale was not predictive of empathy in daily life. This was also the case with the Behavioural Contagion subscale of the Empathy Index. Similarly, scores on the Empathy Selection Task and the Beliefs About the Malleability of Empathy scale were not predictive of everyday empathy (Table 9).

### 2.2.3.4 Confidence and difficulty of empathy

Previous research completed in the lab with the empathy selection task provides evidence that individuals with higher reported confidence were more likely to empathize when given the choice. Therefore, we predicted increased confidence ratings of the accuracy of emotion sharing, perspective taking, and compassion in everyday life would be associated with increased empathizing in everyday life. Prior research with the empathy selection task has also demonstrated that reported difficulty is negatively associated with empathy, so we predicted a similar relationship in our everyday empathy variables. We found support for both hypotheses (Table 10).

Participant centered confidence ratings were predictive of experiencing emotion sharing (b = 0.50, 95% CI = [0.37, 0.63], SE = 0.07, t(635) = 7.45, p < .001, r = 0.28), perspective taking (b = 0.63, 95% CI = [0.47, 0.78], SE = 0.08, t(635) = 8.09, p < .001, r = 0.31), and compassion (b = 0.54, 95% CI = [0.45, 0.63], SE = 0.05, t(669) = 11.61, p < .001, r = 0.41) to a greater extent. Interestingly, confidence ratings were also predictive of higher ratings of extent of received emotion sharing (b = 0.14, 95% CI = [0.03, 0.25], SE = 0.06, t(281) = 2.46, p = .02, r = 0.14).
perspective taking \((b = 0.23, 95\% \text{ CI} = [0.11, 0.35], \text{ SE} = 0.06, t(265) = 3.83, p = .003, r = 0.23)\), and compassion \((b = 0.26, 95\% \text{ CI} = [0.15, 0.37], \text{ SE} = 0.05, t(282) = 4.74, p < .001, r = 0.27)\). In addition, confidence ratings were negatively associated with empathy difficulty ratings \((b = -0.37, 95\% \text{ CI} = [-0.47, -0.27], \text{ SE} = 0.05, t(708) = -7.34, p < .001, r = 0.27)\) and with personal distress during empathy opportunities in everyday life \((b = -0.23, 95\% \text{ CI} = [-0.41, -0.06], \text{ SE} = 0.09, t(728) = -2.63, p = .01, r = 0.10)\).

For participant centered difficulty ratings, the pattern of findings was essentially the opposite, though only received emotion sharing was associated with difficulty, and this relationship was barely significant \((b = -0.10, 95\% \text{ CI} = [-0.18, -0.01], \text{ SE} = 0.04, t(277) = -2.28, p = .04, r = 0.14)\). Higher empathy difficulty ratings predicted lower extent ratings of emotion sharing \((b = -0.23, 95\% \text{ CI} = [-0.35, -0.11], \text{ SE} = 0.06, t(630) = -3.77, p < .001, r = 0.15)\), perspective taking \((b = -0.21, 95\% \text{ CI} = [-0.28, -0.14], \text{ SE} = 0.04, t(702) = -5.76, p < .001, r = 0.21)\). Higher difficulty ratings were also associated with higher levels of personal distress in everyday life \((b = 0.36, 95\% \text{ CI} = [0.24, 0.48], \text{ SE} = 0.06, t(726) = 5.74, p < .001, r = 0.21)\). It seems that an individual’s sense of confidence and difficulty when empathizing is associated with the extent to which they feel empathy.

### 2.2.3.5 Empathy and Personality

We made several hypotheses about the big five personality measures and empathy in everyday life. Specifically, it was predicted that agreeableness, openness, and extroversion would be positively associated with empathy, while neuroticism would be negatively associated with empathy. We tested each of these dimensions of the big five as a predictor for the extent of empathy experienced, as well as reported levels of confidence and difficulty of empathy. All 9 p-values were adjusted together using the false discovery rate procedure (Table 11).

Agreeableness was associated with higher reported confidence when empathizing \((b = 0.34, 95\% \text{ CI} = [0.14, 0.54], \text{ SE} = 0.10, t(102) = 3.37, p = .009, r = 0.32)\), and with higher ratings of extent of empathy \((b = 0.34, 95\% \text{ CI} = [0.10, 0.57], \text{ SE} = 0.12, t(119) = 2.79, p = .01, r = 0.25)\). It was negatively associated with reports of difficulty \((b = -0.60, 95\% \text{ CI} = [-0.89, -0.31], \text{ SE} = 0.15, t(119) = -4.07, p = .002, r = 0.35)\). Likewise, extroversion predicted higher ratings of empathy
extent \( (b = 0.30, \text{95\% CI} = [0.13, 0.48], \text{SE} = 0.09, t(120) = 3.42, p = .001, r = 0.30) \) and higher ratings of confidence \( (b = 0.35, \text{95\% CI} = [0.20, 0.49], \text{SE} = 0.07, t(106) = 4.71, p < .001, r = 0.42) \). However, it was not associated with difficulty ratings \( (b = -0.15, \text{95\% CI} = [-0.38, 0.08], \text{SE} = 0.12, t(126) = -1.29, p = .201, r = 0.11) \). Neuroticism was slightly associated with ratings of empathy extent \( (b = -0.14, \text{95\% CI} = [-0.28, -0.01], \text{SE} = 0.07, t(127) = -2.05, p = .047, r = 0.18) \) and it was predictive of decreased confidence during empathy \( (b = -0.26, \text{95\% CI} = [-0.37, -0.15], \text{SE} = 0.06, t(114) = -4.52, p < .001, r = 0.39) \), and positively associated with ratings of empathy difficulty \( (b = 0.24, \text{95\% CI} = [0.06, 0.41], \text{SE} = 0.09, t(132) = 2.69, p = .008, r = 0.23) \). Contrary to predictions, openness was not associated with extent ratings of empathy \( (b = 0.09, \text{95\% CI} = [-0.12, 0.30], \text{SE} = 0.11, t(128) = 0.81, p = .418, r = 0.07) \), confidence ratings of empathy \( (b = 0.17, \text{95\% CI} = [-0.01, 0.35], \text{SE} = 0.09, t(113) = 1.87, p = .064, r = 0.17) \), or difficulty ratings of empathy \( (b = -0.16, \text{95\% CI} = [-0.43, 0.10], \text{SE} = 0.14, t(133) = -1.20, p = .232, r = 0.10) \). Therefore, our predictions about personality and empathy were partially supported. We also found unpredicted significant associations between conscientiousness and empathy, which will be discussed further in the exploratory analysis section.

2.2.3.6 Empathy and Gender

Another goal of the current study was to see if we can replicate some of the findings in the empathy literature. One debate in the literature we can address with our data is whether men and women have different levels of empathy. Researchers have reported that women tend to score higher than men on empathy measures (e.g. Lam, Solmeyer, & McHale, 2012). However, some have suggested diverging scores on empathy measures between men and women may be a difference in motivation rather than capacity (Klein & Hodges, 2001). In the current study, we used gender as a single predictor in linear models with each trait empathy score as the dependent variable in turn in a dataset where each participant is represented by a row.

We found some support for the existence of differences between men and women on trait empathy scales. Specifically, women scored higher on the empathic concern subscale \( (b = 0.43, \text{95\% CI} = [0.23, 0.63], \text{SE} = 0.10, t(155) = 4.21, p < .001, r = 0.32) \) and the personal distress subscale \( (b = 0.37, \text{95\% CI} = [0.12, 0.61], \text{SE} = 0.12, t(155) = 2.97, p = .009, r = 0.23) \) of the Interpersonal Reactivity Index. They also scored higher on both measures of the Empathy Index;
including empathy \( (b = 0.43, \, 95\% \text{ CI} = [0.21, \, 0.65], \, SE = 0.11, \, t(155) = 3.81, \, p < .001, \, r = 0.29) \) and behavioural contagion \( (b = 0.48, \, 95\% \text{ CI} = [0.27, \, 0.69], \, SE = 0.11, \, t(155) = 4.46, \, p < .001, \, r = 0.34) \). Finally, women scored higher on the Single Item Trait Empathy scale, agreeing more strongly with the statement “I am an empathetic person” \( (b = 0.42, \, 95\% \text{ CI} = [0.12, \, 0.71], \, SE = 0.15, \, t(155) = 2.80, \, p = .01, \, r = 0.22) \). Interestingly, we found comparatively few significant associations between gender and empathy in everyday life (Table 13). Gender was a significant predictor of the extent of empathy experienced \( (b = 0.36, \, 95\% \text{ CI} = [0.10, \, 0.62], \, SE = 0.13, \, t(122) = 2.67, \, p = .04, \, r = 0.23) \), but this was primarily driven by extent of compassion, while emotion sharing and perspective taking extent were not associated with gender. Finally, gender was also a significant predictor of empathy confidence ratings \( (b = 0.31, \, 95\% \text{ CI} = [0.08, \, 0.54], \, SE = 0.12, \, t(111) = 2.66, \, p = .04, \, r = 0.25) \).

2.2.3.7 Other Preregistered Hypotheses

While some hypotheses outlined above found strong support, others received only limited support from the data. It was predicted that participants will select the empathy option in the empathy selection task around 35% of the time. In the current study, participants selected the empathy option an average of 10 out of 25 times \( (M = 10.13, \, SD = 6.30, \, 95\% \text{ CI} = [9.15, \, 11.10]) \). Therefore, participants in this study selected the empathy option about 40.5% of the time, demonstrating a tendency to avoid empathy, though not as strongly as predicted.

It was also predicted that scores on the Hartford Shipley Index would be negatively associated with empathy. We found limited support for this hypothesis. Scores on the Hartford Shipley Index were negatively associated with reports of empathy opportunities \( (b = -0.06, \, SE = 0.02, \, z(4675) = -2.93, \, p = .02, \, r = -0.02, \, \text{Odds Ratios} = 0.94, \, 95\% \text{ CI} = [0.91, \, 0.98]) \). One unpredicted finding here was that higher scores on the HSI were associated with decreased difficulty ratings of empathy \( (b = -0.07, \, 95\% \text{ CI} = [-0.06, \, -0.08], \, SE = 0.01, \, t(114) = -4.90, \, p < .001, \, r = 0.42) \). However, no other associations were found between scores on the Hartford Shipley Index and trait or daily empathy (Table 14).

We also had several preregistered hypotheses that were not supported by the current data. For example it was hypothesized that higher scores on the single item trait empathy scale (SITES) would be predictive of higher subjective well-being in everyday life, this was not found to be the
Furthermore, it was hypothesized that any observed changes in empathy from baseline to post-test, would be predicted by the beliefs about the malleability of empathy scale. The only change in trait empathy from baseline to post-test was on the SITES where participants rate agreement with the statement “I am an empathetic person.” Compared to the baseline (M = 6.02, SD = 1.0, 95% CI = [5.87, 6.17]), mean scores on the SITES measure were lower at the post-test following experience sampling (M = 5.66, SD = 1.36, 95% CI = [5.41, 5.91]) according to a t-test (t = 3.02, df = 196.86, p-value = 0.003). The squared difference scores of this change were not associated with beliefs about malleability of empathy (b = -0.05, 95% CI = [-0.39, 0.29], SE = 0.17, t(110) = -0.29, p = .776, r = 0.03), so our hypothesis was not supported. The fact that participants, on average, viewed themselves as less empathetic following the experiment was interesting and unexpected.

2.2.4 Exploratory Analyses

The dataset in this study contains 4,784 surveys answered in the context of participants daily lives. The participants comprised a representative sample of 160 U.S. citizens, who also completed a battery of individual difference measures. As such, there is a lot of potential for exploratory analysis to find candidates for future research. In the current study, we performed some analysis beyond our preregistered tests for this purpose. We found some interesting results, which may prove to be strong candidates for future research, but we emphasize the exploratory nature of these analyses.

2.2.4.1 Empathy and Personality Continued

While we preregistered hypotheses about agreeableness, openness, and extroversion, we were also curious about the remaining factors on the big five: conscientiousness and neuroticism. We used these scores as single predictors for the extent of empathy, confidence of empathy, and difficulty of empathy in everyday life. We then corrected these six p-values together with the false discovery rate procedure. This analysis suggested a number of connections between these two factors of the big five and empathy in daily life. While conscientiousness was predictive of increased extent (b = 0.35, 95% CI = [0.15, 0.54], SE = 0.10, t(137) = 3.45, p = .001, r = 0.28) increased confidence (b = 0.37, 95% CI = [0.20, 0.53], SE = 0.08, t(120) = 4.38, p < .001, r =
0.37), and decreased difficulty (b = -0.30, 95% CI = [-0.55, -0.05], SE = 0.13, t(136) = -2.33, p = .025, r = 0.20) of empathy, neuroticism was associated with the opposite. Higher neuroticism scores predicted increased difficulty (b = 0.24, 95% CI = [0.06, 0.41], SE = 0.09, t(132) = 2.69, p = .01, r = 0.23), reduced confidence (b = -0.26, 95% CI = [-0.37, -0.15], SE = 0.06, t(114) = -4.52, p < .001, r = 0.39), and reduced extent (b = -0.14, 95% CI = [-0.28, -0.01], SE = 0.07, t(127) = -2.05, p = .042, r = 0.18) of empathy.

### 2.2.4.2 Demographics of Empathy

Alongside gender, there have been a number of demographic variables discussed in connection with empathy. Among these are socioeconomic status, age, religiosity, and political orientation. In the current study, we tested whether any of these demographic variables were significantly predictive of the extent to which individuals empathize in everyday life. None of socioeconomic status (b = 0.11, 95% CI = [-0.04, 0.26], SE = 0.08, t(119) = 1.45, p = .298, r = 0.13), age (b = -0.03, 95% CI = [-0.13, 0.06], SE = 0.05, t(117) = -0.70, p = .644, r = 0.06), or political orientation (b = -4e-04, 95% CI = [-0.08, 0.08], SE = 0.04, t(126) = -0.009, p = .993, r = 8e-04) were significantly associated with extent of empathy. On the other hand, individuals who rated themselves as more religious reported empathizing to a greater extent in everyday life (b = 0.15, 95% CI = [0.04, 0.26], SE = 0.05, t(118) = 2.74, p = .028, r = 0.24). This was primarily driven by taking perspective to a greater extent (b = 0.24, 95% CI = [0.10, 0.38] SE = 0.07, t(107) = 3.36, p = .005, r = 0.31).

### 2.2.4.3 Compassion and Eudaimonia

In a previous study (Runyan et. al, 2018), authors reported significant within person links between compassion and eudaimonia assessed in daily life with experience sampling. In the current study, we were able to attempt to conceptually replicate these findings. With a sample of 160 U.S. citizens, we tested a multi-level model nested within participant to determine if compassion in everyday life was predictive of within person eudaimonia. In the original article, the authors used the Psychological Well-Being scale (Diener et al., 2010) to assess eudaimonia. They administered the entire 9-item scale at baseline, and adapted versions of the top three loading items during experience sampling surveys.
In the current study, we operationalized eudaimonia by utilizing items similar to the top loading items in the original study. Specifically, in the original study, authors asked participants to what extent they agree with the statement “In the past several hours, I have led a purposeful and meaningful life.” In the current study, we ask participants "At the moment, do you feel that your life has a clear sense of purpose?” In addition, Runyan et al. (2018) asked participants to rate agreement with “In the past several hours, I have actively contributed to the happiness and well-being of others” and “In the past several hours, I have been a good person and living a good life.” In our study, we asked participants to report whether they had done anything in the last 15 minutes to "help, or make another person feel better”. We also ask participants how happy they felt at the moment. Together, these questions likely capture the sense of contributing to the well-being of others and living a good life used in Runyan et. al (2018).

We first attempted to predict eudaimonia with a binomial predictor: whether they felt compassion or not, and this model was not significant (b = 0.18, SE = 0.11, t(799) = 1.60, p = .109, r = 0.06). We tested a multi-level model predicting eudaimonia from the participant-centered extent of compassion reported, nested within participant and survey day. This model was significant (b = 0.12, SE = 0.02, t(678) = 5.29, p < .001, r = 0.20) and the effect remained significant after controlling for personality and demographic data (b = 0.12, SE = 0.02, t(656) = 5.41, p < .001, r = 0.21). Therefore, our data appears to support the findings reported by Runyan et al. (2018).

2.3 Discussion

2.3.1 Implications

2.3.1.1 The construct of empathy

While research in neuroscience (Cox et al., 2012) and social psychology (Jordan, Amir, & Bloom, 2016) has differentiated between different aspects of empathy, it has also been suggested that they interact in daily life (Zaki & Ochsner, 2012). The current study provides empirical support for this interaction, both when experiencing and receiving empathy. By showing that in everyday life emotion sharing, compassion, and perspective taking often co-occur, our data
provides evidence that it makes sense to consider empathy a multidimensional process with interacting components.

### 2.3.1.2 Empathy as a choice

There are diverging perspectives in the literature about whether empathy is a choice or is automatic (Cameron et al., 2019; De Waal & Preston, 2017). Our data suggests that when presented with an opportunity, participants report experiencing empathy at a high rate. They also described both empathizing and not empathizing as voluntary acts. However, it is interesting to note that in many cases participants reported observing or hearing about the emotional experiences of other people but did not code these as empathy opportunities. This is in line with a motivated empathy perspective which suggests that individuals may “actively structure their environments or their minds…to increase or decrease empathy” (Cameron, 2018). In sum, our data suggests that there are aspects of empathy that are voluntary, such as deciding to empathize or not when presented with an opportunity. At the same time, other aspects of empathy—like the coding of opportunities—may occur automatically.

### 2.3.1.3 Importance of opportunity

It is also worth noting that many empirical demonstrations of failures of empathy may involve failures to notice empathy opportunities. For example, Batson’s classic study that participants who empathized with a little girl named Sheri Summers were more inclined to move her up a donor waitlist at the cost of other children (Batson, Klein, Hightberger, & Shaw, 1995). Future studies could explore if we can reverse these effects if we encourage them to empathize, for example, with the other children on the donor list (and their parents) who hear that they have been moved down the list. Furthermore, it is argued that understanding what differentiates empathy opportunities and missed empathy opportunities is an important step for future research.

### 2.3.1.4 Potential of experience sampling

In addition, this study reinforces the value of experience sampling methods that has previously been reported by other researchers (e.g. Runyan et al., 2019; Shiffman et al., 2008) for uncovering associations between psychological constructs in daily life. Specifically, in this study
we showed that while trait measures of empathy were not predictive of prosocial behaviour in daily, empathy experiences assessed in daily life were, especially the occurrence of a reported empathy opportunity, in the presence of which participants were 100 times more likely to report a prosocial behaviour. That said, this impact on helping behaviour may have been either short-lived or situationally bound, as it did not extent to helping behaviour at time two.

Similarly, while only one trait empathy predictor—personal distress—was negatively predictive of subjective well-being, we uncovered several associations between aspects of empathy in everyday life and subjective well-being; both positive and negative. These results suggest that when individuals engage with the emotional experiences of other people, it does impact their well-being. Furthermore, while personal distress and difficulty of empathy were negatively predictive of well-being, empathy opportunities, extent of empathy experienced, empathy confidence, and extent of empathy received were all positively predictive. Future studies investigating how empathy effects outcomes in everyday life would do well to consider including experience sampling in their design.

2.3.1.5 Valence and positive empathy

The data reported here also highlights the importance of considering valence when studying empathy. Not only was empathy for positive emotions more common than expected, valence itself was a significant predictor of subjective well-being. It is clear any discussion of empathy that focuses only on negative emotions is missing part of the story. What is less clear is the cause of the prevalence of empathy for positive emotions compared to negative. Whether it is due to a tendency to empathize preferentially with positive emotions, or the fact that positive emoting is more socially acceptable and therefore perhaps more common in daily life, or for some other reason, will be for future research to determine. The prevalence of positive empathy is a promising finding given the potential for prosocial behaviour it may hold (Telle & Pfister, 2016).

2.3.2 Limitations and Future Research

Along with results reported in this thesis, there may be additional exploratory analyses, hypothesis tests, and conceptual replications possible in the current dataset for a number of research questions. As ever, new studies should do their best to avoid the limitations of those that
came before. In the next section, we have done our best to outline the major limitations of the current study and—where possible—suggest recommendations to mitigate them moving forward.

2.3.2.1 Design and demand

While the current study advances the literature, as with any study there are limitations to the design. As previously discussed, this study was exploratory. Significant findings—especially those in the exploratory analysis section—will need to be replicated in pre-registered confirmatory studies. Other potential limitations include demand introduced from the glossary of terms, which defines empathy as referring to three different, but related feelings: emotion sharing, perspective taking, and compassion. Future studies could explore whether the components of empathy would correlate as strongly in experience sampling surveys if the glossary was not included or empathy was defined differently.

2.3.2.2 Attrition and missing data

Another potential limitation is the fact that not all our participants reported an empathy opportunity. In a minimum of 7 surveys, 14 participants did not once report having an empathy opportunity in the last 15 minutes. Future research could capture everyday empathy data from all of the participants by extending the window of the empathy opportunity question to the last survey answered or asking participants to describe the last empathy opportunity they had. However, this may introduce recall bias, negating one of the major advantages of the experience sampling approach. Alternatively, we could extend the time frame of experience sampling or increase the number of prompts. This too would involve trade-offs as it would entail additional demand on our participants.

The study also suffered from significant issues with attrition, as many of the participants who initially signed up to the study through the demographic survey either did not end up completing the baseline survey or did not participate in experience sampling. Future analysis can test if there any demographic differences between participants who did and did not complete the baseline, and if there are baseline/demographic differences between participants who did and did not
complete experience sampling. If there are no significant differences this could increase our confidence in the quality and representativeness of the data.

Finally, it is worth nothing here that the sample in the current study falls short of our pre-registered N and is unrepresentative in some ways. In particular, individuals making over $100,000 annually, individuals aged 18-25 and individuals aged 65 and over are underrepresented in this sample. The authors are currently collecting data to remedy this particular limitation and will be reporting the completed results in future study. Where results conflict between the current study and the full results, we will defer to the data from the pre-registered sample size.

2.3.2.3 Future research

Despite these limitations, the study sheds light on a number of debates in the literature, supplies a novel descriptive account of empathy in everyday life, and provides many potential directions for future research. The analytic approach employed in this study allowed us to explore relationships in the data between different variables as single predictors. Future research will begin to probe the data in more detail, building larger models to find out what explains most of the variance. Techniques like principal component analysis could be employed to determine whether there is a hidden underlying structure to our daily empathy experiences. It may be possible to describe an empathy profile for individual participants using this structure. Future research can also use this dataset to test other questions of interest and perform conceptual replications of existing studies.

2.4 Conclusion

In conclusion, this study generates descriptive statistics about empathy’s frequency, valence, and experiential structure in everyday life with a representative sample of U.S. citizens. At the same time, it brings relevant data to bear on several debates in the literature. In this study we show that for many people empathy is a common experience, though individuals vary in their tendency to notice opportunities. On average, individuals are exposed to the emotional experiences of other people about as often as they use the bathroom, and flag these as opportunities to empathize about two-thirds of the time. We also demonstrate that—while the scientific literature has often tended to focus on suffering—empathy for positive emotional experiences in daily life is actually
more common. When people experience or receive empathy, it often involves all three components: emotion sharing, perspective taking, and compassion.

Our data suggests that empathy impacts both subjective well-being and prosocial behaviour in everyday life, though this may be missed by studies using trait measures alone. This effect is generally positive but short-lived. The positive impacts of empathy are also influenced by the valence of the experience observed, in that when participants empathize with negative experiences, the effects appear to be less pronounced. However, empathy opportunities predict prosocial acts, even when the experiences are negative.

While both empathizing and not empathizing are experienced as voluntary, opportunities to empathize often go unnoticed. As empathy opportunities predict increased well-being and prosocial behaviour, future research should determine what distinguishes empathy opportunities and missed empathy opportunities and explore whether it is possible to make people more open to the empathy opportunities surrounding them.
References


Appendices

Appendix A

Demographic survey

We would like to ask you a few demographic questions. Your answers will be kept confidential. We will also be asking a few questions to ensure data quality. If you pass these checks, you will be invited to participate in an upcoming study.

Please select 'yes' if you have a phone that runs on Apple (iOS) or Android OS software.

- Yes
- No

Please select 'yes' if you are willing to download an app to complete Part 2 of this study.

- Yes
- No

Please specify your ethnicity.

- Caucasian
- African-American
- Asian-American
- Hispanic
- Other

In which region of the United States do you live?

- Northeast
- Midwest
- South
- West

Click to continue/proceed only after at least five seconds have passed... Thank you.
What is the highest degree or level of school you have completed? If currently enrolled, highest degree received.

- High-school graduate/GED or less
- Some College
- College Graduate
- Graduate degree

What is your age?

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65+

What is your annual income?

- Under $25,000
- $26,000-$50,000
- $51,000-$100,000
- $101,000+

What is your gender?

- Male
- Female
- Other (please specify) ____________________________________________________

Please answer the following question to show you have read and understood this form. This is a study about alcohol use on weekends

- This is a study about personality and relationships
- This is a study about everyday experiences with other people
- This is a study about stress and decision making

Please provide your email so you can be contacted for the purposes of the study.

_________________________________________________________________

Please add any additional comments below
Appendix B
Baseline Survey Measures

At baseline, participants completed the following list of individual difference measures:

1. Participants learned a glossary of definitions and were tested on these definitions (see glossary here: https://osf.io/g42yt/quickfiles)

2. Questions about political orientation and religiosity

3. The Single Item Trait Empathy Scale (Konrath, Meier, & Bushman, 2018)

4. The Big Five Inventory 2 (Soto & John, 2017)

5. The Interpersonal Reactivity Index (Mark Davis, 1980)

6. Empathy Index (Jordan et al., 2016)

7. Shipley-Hartford vocabulary test (Shipley, 1940)

8. Beliefs about Malleability of Empathy Scale (Schumann, Zaki, & Dweck, 2014)

9. Implicit Theories of Willpower (Job, Dweck, & Walton, 2010)

10. Empathy Selection Task (Cameron et al., 2019)

11. Reduced Morningness-Eveningness Questionnaire (Adan & Almirall, 1991)
Appendix C:

Experience sampling survey

Subjects were prompted to respond to this survey 7 times a day for a week. The questions marked with * were only included once a day to reduce demand on participants. Participants were asked a subset of the questions below each time, depending on which options they selected. For example, if they have not had an empathy opportunity in the last fifteen minutes, they skip down to whether they’ve been a target of empathy. If this is also a no, they complete all of the filler questions to match survey length no matter what choices are made. Subjective well-being combines questions 1 and 2. The final survey on the final day of experience sampling re-administered the follow trait empathy measures: perspective taking, empathic concern, fantasy scale (Interpersonal Reactivity Index), empathy scale (Empathy Index) and Single Item Trait Empathy Scale.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer choices</th>
<th>R Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. At the moment, how happy do you feel?</td>
<td>Extremely unhappy (1)</td>
<td>Unhappy (2)</td>
</tr>
<tr>
<td>2. At the moment, do you feel that your life has a clear sense of purpose?</td>
<td>Not at all (1)</td>
<td>(2)</td>
</tr>
<tr>
<td>3. In the last 15 minutes, did you do anything to directly or indirectly help, or make another person feel better? (e.g. by offering comfort, financial support, advice or assistance)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4. In the last 15 minutes, did you have an opportunity to empathize with another person? (eg. an option to share another person’s emotion, see things from their perspective, or feel warmth or kindness)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5. *Explain the situation in one sentence.</td>
<td>Descriptive</td>
<td>explain</td>
</tr>
<tr>
<td>6. *Describe your current situation in one sentence.</td>
<td>Descriptive</td>
<td>describe</td>
</tr>
<tr>
<td>7. How long ago would you estimate this empathy opportunity occurred?</td>
<td>Less than a minute ago</td>
<td>1 minute ago</td>
</tr>
<tr>
<td>8. In relation to this empathy opportunity, what emotion did you observe? (Select)</td>
<td>Happiness</td>
<td>Anger</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>9. Please specify the other emotion you observed.</td>
<td>Descriptive</td>
<td>other_emo</td>
</tr>
<tr>
<td>10. In relation to this empathy opportunity, what emotion did you observe positive or negative?</td>
<td>Extremely negative (1)</td>
<td>Negative (2)</td>
</tr>
<tr>
<td>11. How close are you with the person involved in this empathy opportunity?</td>
<td>Total stranger (1)</td>
<td>(2)</td>
</tr>
<tr>
<td>12. In relation to this empathy opportunity, was the emotional experience you observed positive or negative?</td>
<td>Not at all distressed (1)</td>
<td>(2)</td>
</tr>
<tr>
<td>13. In relation to this empathy opportunity, did you actually experience some form of empathy for the person or people involved at the time?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>14. To what extent was empathizing voluntary: something that you decided?</td>
<td>Not at all voluntary (1)</td>
<td>(2)</td>
</tr>
<tr>
<td>15. To what extent was not empathizing voluntary: something that you decided?</td>
<td>Not at all voluntary (1)</td>
<td>(2)</td>
</tr>
<tr>
<td>16. Why didn't you empathize? (choose all that apply)</td>
<td>I was busy doing something else.</td>
<td>I didn't want to feel pressure to act a certain way (e.g. give money)</td>
</tr>
<tr>
<td>17. For what other reason didn't you empathize? (please specify)</td>
<td>Descriptive</td>
<td>other_no_E</td>
</tr>
<tr>
<td>18. In relation to this empathy opportunity, did you share or feel a similar emotion to one that you observed? (e.g. happiness, sadness, anger, surprise)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>19. How confident are you that this is the emotion they felt?</td>
<td>Not at all confident (1)</td>
<td>(2)</td>
</tr>
<tr>
<td>20. At the time, to what extent did you feel a similar emotion?</td>
<td>Very little (1)</td>
<td>(2)</td>
</tr>
<tr>
<td>21. How difficult was it to share their emotion?</td>
<td>Not at all difficult (1)</td>
<td>(2)</td>
</tr>
<tr>
<td>No.</td>
<td>Question</td>
<td>Response Options</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>22.</td>
<td>In relation to this empathy opportunity, did you put yourself in someone else's shoes or try to see things from their perspective?</td>
<td>Yes</td>
</tr>
<tr>
<td>23.</td>
<td>How confident are you that you correctly understood their point of view?</td>
<td>Not at all confident (1)</td>
</tr>
<tr>
<td>24.</td>
<td>At the time, to what extent did you share a similar perspective?</td>
<td>Very little (1)</td>
</tr>
<tr>
<td>25.</td>
<td>How difficult was it to take their perspective?</td>
<td>Not at all difficult (1)</td>
</tr>
<tr>
<td>26.</td>
<td>In relation to this empathy opportunity, did you feel compassion, warmth, or concern for this person? (e.g. have feelings of kindness or caring)</td>
<td>Yes</td>
</tr>
<tr>
<td>27.</td>
<td>How confident are you that your compassion was appropriate to the situation?</td>
<td>Not at all confident (1)</td>
</tr>
<tr>
<td>28.</td>
<td>At the time, to what extent did you feel warmth, compassion, or concern?</td>
<td>Very little (1)</td>
</tr>
<tr>
<td>29.</td>
<td>How difficult was it to generate feelings of compassion?</td>
<td>Not at all difficult (1)</td>
</tr>
<tr>
<td>30.</td>
<td>In the last 15 minutes, did anyone have an opportunity to empathize with you? (e.g. an option to share your emotions, see things from your perspective, or feel warmth or caring towards you)</td>
<td>Yes</td>
</tr>
<tr>
<td>31.</td>
<td>In relation to this opportunity to receive empathy, how close are you with the person or people involved?</td>
<td>Total stranger (1)</td>
</tr>
<tr>
<td>32.</td>
<td>In relation to this opportunity to receive empathy, did the person share or feel a similar emotion to the one you were feeling?</td>
<td>Yes</td>
</tr>
<tr>
<td>33.</td>
<td>In relation to this opportunity to receive empathy, to what extent do you think they felt a similar emotion?</td>
<td>Very little (1)</td>
</tr>
<tr>
<td>34.</td>
<td>In relation to this opportunity to receive empathy, did the person put themselves in your shoes or take your perspective?</td>
<td>Yes</td>
</tr>
<tr>
<td>35.</td>
<td>In relation to this opportunity to receive empathy, to what extent do you feel like they saw things from your perspective?</td>
<td>Very little (1)</td>
</tr>
<tr>
<td>Question</td>
<td>Response Options</td>
<td>T_value</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-------------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>36. In relation to this opportunity to receive empathy, did this person feel compassion, warmth, or concern for you?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>37. In relation to this opportunity to receive empathy, to what extent do you feel like they were compassionate?</td>
<td>Very little (1)</td>
<td>2</td>
</tr>
<tr>
<td>38. At the moment, how connected to other people do you feel?</td>
<td>Very disconnected (1)</td>
<td>Disconnected (2)</td>
</tr>
<tr>
<td>39. At the moment, how anxious do you feel?</td>
<td>Not at all anxious (1)</td>
<td>2</td>
</tr>
<tr>
<td>40. At the moment, how content do you feel?</td>
<td>Very discontent (1)</td>
<td>Discontent (2)</td>
</tr>
<tr>
<td>41. At the moment, to what extent do you feel loved?</td>
<td>Very unloved (1)</td>
<td>Unloved (2)</td>
</tr>
<tr>
<td>42. In the last 15 minutes, have you used the bathroom?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>43. At the moment, aside from this survey, what are you doing? (Select)</td>
<td>resting</td>
<td>work or study</td>
</tr>
<tr>
<td>44. Would you rather be doing something else?</td>
<td>Not at all (1)</td>
<td>2</td>
</tr>
<tr>
<td>45. At the moment, how lonely do you feel?</td>
<td>Not at all lonely (1)</td>
<td>2</td>
</tr>
<tr>
<td>46. Where are you at the moment? (Select)</td>
<td>at home</td>
<td>at family or friend's place</td>
</tr>
<tr>
<td>47. Who are you with at the moment? (Select)</td>
<td>partner</td>
<td>family (you live with)</td>
</tr>
<tr>
<td>48. In the last 15 minutes, did you interact with anyone by speaking on the phone?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>49. In the last 15 minutes, which of the following emotions have you experienced? Select ALL that apply.</td>
<td>Surprise</td>
<td>Anxiety</td>
</tr>
<tr>
<td>Question</td>
<td>Possible Responses</td>
<td>Variable</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>50. Please specify the other emotion you felt.</td>
<td>Descriptive</td>
<td>other_emo_self</td>
</tr>
<tr>
<td>51. In the last 15 minutes, which of the following platforms have you used? Select ALL that apply.</td>
<td>Facebook</td>
<td>Instagram</td>
</tr>
<tr>
<td>52. In the last 15 minutes, did you interact with anyone in person?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>53. In the last 15 minutes, did you interact with anyone through text messaging or social media?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>54. In the last 15 minutes, did you hear about, read about, or otherwise observe the emotional experiences of another person or people?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>55. How many people would you estimate you have spoken to today?</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>56. At the moment, to what extent do you feel like you are in control of your life?</td>
<td>No control at all (1)</td>
<td>2</td>
</tr>
<tr>
<td>57. At the moment, to what extent do you feel isolated?</td>
<td>Not at all isolated (1)</td>
<td>2</td>
</tr>
<tr>
<td>58. At the moment, do you feel hungry?</td>
<td>Not at all hungry (1)</td>
<td>2</td>
</tr>
<tr>
<td>59. At the moment, do you feel pain?</td>
<td>No pain at all (1)</td>
<td>2</td>
</tr>
</tbody>
</table>
### Appendix D: Selected Tables

#### Prosocial Behaviour Predicted by Daily Empathy

<table>
<thead>
<tr>
<th>Daily Empathy Predictor</th>
<th>z score</th>
<th>Adjusted p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empathy Opportunities</td>
<td>27.7</td>
<td>2.6e-15 *</td>
</tr>
<tr>
<td>Empathy Yes/No</td>
<td>3.738</td>
<td>0.001209 *</td>
</tr>
<tr>
<td>Emotion Share Yes/No</td>
<td>2.287</td>
<td>0.0572</td>
</tr>
<tr>
<td>Perspective Take Yes/No</td>
<td>2.052</td>
<td>0.078</td>
</tr>
<tr>
<td>Compassion Yes/No</td>
<td>2.617</td>
<td>0.028275 *</td>
</tr>
<tr>
<td>Emotion Share Extent</td>
<td>1.127</td>
<td>0.37555355555556</td>
</tr>
<tr>
<td>Perspective Take Extent</td>
<td>-0.355</td>
<td>0.78325</td>
</tr>
<tr>
<td>Compassion Extent</td>
<td>3.501</td>
<td>0.00200633333333333 *</td>
</tr>
<tr>
<td>Personal Distress</td>
<td>-0.813</td>
<td>0.491636363636364</td>
</tr>
<tr>
<td>Empathy Extent</td>
<td>1.783</td>
<td>0.1210625</td>
</tr>
<tr>
<td>Empathy Difficulty</td>
<td>-0.113</td>
<td>0.91</td>
</tr>
<tr>
<td>Empathy Confidence</td>
<td>0.834</td>
<td>0.491636363636364</td>
</tr>
<tr>
<td>Extent Empathy Received</td>
<td>2.22</td>
<td>0.0572</td>
</tr>
</tbody>
</table>

*Table 3. Shows z scores and adjusted p values for daily empathy predicting prosocial behaviour*

#### Prosocial Behaviour Predicted by Trait Empathy

<table>
<thead>
<tr>
<th>Trait Empathy Predictors</th>
<th>z score</th>
<th>Adjusted p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empathic Concern (IRI)</td>
<td>-0.025</td>
<td>0.98</td>
</tr>
<tr>
<td>Perspective Taking (IRI)</td>
<td>0.964</td>
<td>0.43</td>
</tr>
<tr>
<td>Personal Distress (IRI)</td>
<td>-0.747</td>
<td>0.51</td>
</tr>
<tr>
<td>Fantasy (IRI)</td>
<td>1.691</td>
<td>0.34</td>
</tr>
<tr>
<td>Empathy (EI)</td>
<td>-1.878</td>
<td>0.34</td>
</tr>
<tr>
<td>Behavioural Contagion (EI)</td>
<td>-1.589</td>
<td>0.34</td>
</tr>
<tr>
<td>Single Item Trait Empathy School</td>
<td>1.087</td>
<td>0.43</td>
</tr>
<tr>
<td>Empathy Selection Task</td>
<td>1.03</td>
<td>0.43</td>
</tr>
<tr>
<td>Malleability of Empathy</td>
<td>1.14</td>
<td>0.43</td>
</tr>
</tbody>
</table>

*Table 4. Shows z scores and FDR adjusted p values for trait empathy predicting prosocial behaviour*
### Subjective Well-being Predicted by Daily Empathy

<table>
<thead>
<tr>
<th>Daily Empathy Predictor</th>
<th>t score</th>
<th>Adjusted p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emp. Opportunities</td>
<td>6.32</td>
<td>2e-09 *</td>
</tr>
<tr>
<td>Empathy Yes/No</td>
<td>2.18</td>
<td>0.0347434555 *</td>
</tr>
<tr>
<td>Emotion Share Yes/No</td>
<td>2.5</td>
<td>0.0169 *</td>
</tr>
<tr>
<td>Perspective Take Yes/No</td>
<td>-0.84</td>
<td>0.399</td>
</tr>
<tr>
<td>Compassion Yes/No</td>
<td>1.19</td>
<td>0.2545833333</td>
</tr>
<tr>
<td>Emotion Share Extent</td>
<td>2.54</td>
<td>0.0164666667 *</td>
</tr>
<tr>
<td>Perspective Take Extent</td>
<td>2.58</td>
<td>0.01625 *</td>
</tr>
<tr>
<td>Compassion Extent</td>
<td>4.58</td>
<td>1.4144e-05 *</td>
</tr>
<tr>
<td>Empathy Extent</td>
<td>4.79</td>
<td>6.695e-06 *</td>
</tr>
<tr>
<td>Empathy Difficulty</td>
<td>-3.84</td>
<td>0.000250714 *</td>
</tr>
<tr>
<td>Empathy Confidence</td>
<td>5.72</td>
<td>6.9e-08 *</td>
</tr>
<tr>
<td>Extent of Empathy Received</td>
<td>4.4</td>
<td>3.0117e-05 *</td>
</tr>
<tr>
<td>Personal Distress</td>
<td>-6.51</td>
<td>2e-09 *</td>
</tr>
</tbody>
</table>

*Table 7. Shows t scores and FDR adjusted p values for daily empathy components predicting subjective well-being*

### Subjective Well-being Predicted by Trait Empathy

<table>
<thead>
<tr>
<th>Trait Empathy Predictor</th>
<th>t score</th>
<th>Adjusted p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perspective Taking (IRI)</td>
<td>1.659</td>
<td>0.223</td>
</tr>
<tr>
<td>Empathic Concern (IRI)</td>
<td>-0.21</td>
<td>0.834</td>
</tr>
<tr>
<td>Personal Distress (IRI)</td>
<td>-3.084</td>
<td>0.022 *</td>
</tr>
<tr>
<td>Fantasy (IRI)</td>
<td>-1.13</td>
<td>0.39</td>
</tr>
<tr>
<td>Behavioural Contagion (EI)</td>
<td>-2.355</td>
<td>0.059</td>
</tr>
<tr>
<td>Empathy (EI)</td>
<td>-2.398</td>
<td>0.059</td>
</tr>
<tr>
<td>Single Item Trait Empathy Scale</td>
<td>0.368</td>
<td>0.802</td>
</tr>
<tr>
<td>Empathy Selection Task</td>
<td>-0.506</td>
<td>0.788</td>
</tr>
<tr>
<td>Malieability of Empathy</td>
<td>1.484</td>
<td>0.252</td>
</tr>
</tbody>
</table>

*Table 8. Shows t scores and FDR adjusted p values for trait empathy scales predicting subjective well-being*
Appendix E: Selected Figures

Components of Everyday Empathy (Overall Data)

Structure of Empathy Experiences (Overall)

Structure of Received Empathy (Overall)

Figure 4. Overall Component Structure

Components of Everyday Empathy (Mean Proportions)

Structure of empathy received (Mean of participant means)

Structure of Empathy Experienced (Mean of Participant Means)

Figure 5. Participant average component structure
* Additional figures in supplementary materials at: https://osf.io/y3ud7/files