On the Importance of Perceived Interpersonal Safety: Antecedents and Consequences of Living A Subjectively Safe Life

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On the Importance of Perceived Interpersonal Safety: Antecedents and Consequences of Living A Subjectively Safe Life

A Dissertation Presented

by

STYLIANOS SYROPOULOS

Submitted to the Graduate School of the University of Massachusetts Amherst in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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Department of Psychological and Brain Sciences
Social Psychology
Psychology of Peace and Violence
On the Importance of Perceived Interpersonal Safety: Antecedents and Consequences of Living A Subjectively Safe Life

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ABSTRACT

On the Importance of Perceived Interpersonal Safety: Antecedents and Consequences of Living A Subjectively Safe Life

FEBRUARY 2023

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The need to be and feel safe is a fundamental human need. Despite extensive theoretical arguments on the subject, and research on relevant concepts, empirical work on what it means to feel interpersonally safe (i.e., in the presence of others or in social environments in general) is scarce. This dissertation presents four investigations that seek to address this gap. It also seeks to highlight the consequences of feeling interpersonally safe for our mental and physical health, and to what degree healthy and high-quality close relationships influence how safe we feel. Chapter 1 is a literature review summarizing theories underlying these investigations and distinguishes subjective from objective safety. Chapter 2 validates a novel, comprehensive and multidimensional scale that captures perceived interpersonal safety. Chapter 3 examines the consequences of feeling safe for our mental and physical health across three developmental stages (adolescence, emerging adulthood, adulthood). Chapter 4 examines how secure attachment relates to increased feelings of safety. Chapter 5 investigates whether high-quality romantic
relationships can increase overall perceptions of interpersonal safety. Finally, Chapter 6 concludes by highlighting the empirical, applied and theoretical contribution of the aforementioned investigations, concluding by posing suggestions for future research.

Keywords: subjective perceptions, interpersonal safety, close relationships, attachment theory, social safety theory, individual differences
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CHAPTER 1
INTRODUCTION

Living a happy and fulfilling life is a fundamental human motivation (Maslow, 1943). Since the rise of theoretical arguments about our fundamental human needs, psychologists have conducted numerous studies on the antecedents of positive life outcomes. One such antecedent however, we argue, has not received as much attention. This antecedent is perceived interpersonal safety, otherwise known as the degree to which one feels safe in their lives around others. Despite the theoretical importance of investigations on the potential impacts of living a safe life/living in a safe environment, two conclusions are quickly made apparent when one consults previous literature. First, psychological examinations of perceived safety are scarce compared to the frequency with which the concept of safety has been utilized in theoretical discussions (e.g., Bowlby 1951; Maslow, 1943; Schwartz et al., 2012; Slavich, 2020). Second, existing examinations of perceived interpersonal safety fail to capture the complex and multidimensional nature of perceived safety and often focus on objective (i.e., biological and macro-level statistics) indicators of safety, failing to account for the role of the perceiver/agent in the study of safety. The sections that follow will provide a definition of the construct, highlight it’s theoretical importance, distinguish it from objective indicators of safety, and highlight how researchers have studied it so far.

Theoretical Importance of Perceived Interpersonal Safety

To engage in a critical investigation of perceived interpersonal safety, we first must provide a definition of the construct. In its most straightforward form, perceived interpersonal safety is a person’s subjective perception of how (un)safe they feel around
others. Although broad, this definition captures the essence of the construct. The “perceived” part highlights that this construct is anthropocentric, with a given individual engaging in an assessment of how safe/unsafe they feel in a particular environment around particular people. The term “interpersonal” refers to the social aspect of the construct. Namely, it focuses on how safe we feel around people. This is an important parameter to consider as it highlights where the emphasis of this construct is placed. It centers on how safe we feel around others, whether we are afraid of others (i.e., whether we are scared of being victimized in a particular way) and whether we believe that we can protect ourselves from others. Finally, the word “safety” is a difficult construct to grasp. It is not necessarily the absence of fear, but rather it is a state in which one feels secure in their surroundings. Thus, we argue that feeling safe will be a subjective experience which can confer positive outcomes to the individual, especially with regards to their mental and physical health.

Perceived interpersonal safety is an individual difference, one that is greatly influenced across many stages of our lives. From birth, we rely on and become attached to our parents/primary caregiver, utilizing them as a safe haven from which we explore the world and retreat to, when we feel unsafe. From this early experience, we form relationship schemas (i.e., attachment styles; Ainsworth et al., 1978), that influence our behavior and feelings of safety within future relationships. Subjective interpersonal safety perceptions are influenced by the relationships people have, and the social and emotional context they are in. Sociocultural factors such as gender (Straus, 2016) and race (Lacoe, 2015) as well as external factors like our neighborhood environment (Syropoulos, 2022) have been established as antecedents of how safe people feel.
Why study how safe people feel interpersonally? We contend that doing so could be beneficial for three different reasons. First, it sheds light on core underlying processes of human psychology. Understanding what influences our perceptions of a particular environment as safe/unsafe has been historically of interest to psychologists (e.g., Cannon, 1915). Second, since there is existing evidence that suggests that how safe we feel relates to better mental and physical health outcomes (e.g., Syropoulos, 2020), we could further elucidate what the positive consequences of living a safe life are. Ultimately such studies could pave the way for interventions to increase both safety, and other downstream life outcomes (e.g., satisfaction with life). Third, by examining such subjective perceptions of safety, we can provide a tool that will allow researchers to account for different sociocultural factors and identities, allowing for intersectional approaches (Crenshaw, 1991) and the study of individual and group differences.

**Subjective vs Objective Indicators of Safety: The Role of Risk Perception**

Much like other constructs in psychology, one can study subjective (i.e., perceptions) and objective (i.e., biological markers or governmental statistics) safety. With regards to objective safety, two different ways of studying objective perceptions of safety exist. The first focuses on aggregated statistics (e.g., crime rates; FBI, 2021). Such investigations are very informative as they provide us with theoretically unbiased information on how (un)safe an area is. However, although informative, such approaches fail to consider the person. Ultimately, if an area is objectively safe, but the people living in it do not perceive it as such, then that area could still be unsafe. A second line of research follows the study of human physiology in response to threat. Although informative, these approaches are burdensome, costly, and take much more time to
conduct. They are also hard to implement outside of a lab space. In addition, they do not capture people’s perceptions, but rather their body’s reaction to a given stimulus.

Instead, perceived interpersonal safety aims to place emphasis on the individual. Self-reports can be surprisingly reliable and are able to capture a rich amount of information (e.g., a variety of emotions can be meaningfully captured via self-reports; Cowen & Keltner, 2017). Further, they are relatively easy to implement, and they can meaningfully be aggregated at different levels of analysis, making them scalable for investigations of different neighborhoods, cities, or even countries. Most importantly however, they place the emphasis on individuals and their own risk perception.

Objective risk is “the relative variation of actual loss from expected loss”, while “subjective risk is the uncertainty based on a person’s mental condition or state of mind” (Rejda & McNamara 2021). We place perceived interpersonal safety within the realm of subjective risk. Psychology has a rich tradition in the study of risk perception and risk analysis (e.g., Slovic, 1987). An important distinction in this work is that of danger and risk. As Dr. Slovic puts it “danger is real, but risk is socially constructed” (Slovic, 1999, p. 689). At its core, risk is a social construct. We created this construct to help us both understand and cope with the different threats and uncertainties that we will experience in our lives (Slovic, 1999). That is why, after all, in many different domains subjective risk perception trumps over actual threats that one might experience. For example, evidence from a meta-analysis of thirty four studies suggest that virtually all forms of subjective risk-perception predicted increased vaccination hesitancy, even though vaccines are safe (Brewer et al., 2007). Moreover, some risks, depending on their perceived severity, can be deemed acceptable, suggesting that even though some negative consequence could be
experienced, individuals are still open to the possibility of engaging in a particular threatening situation (for a review of the concept of acceptable risk, see Fischhoff et al., 1984).

Importantly, and supporting our argument for the need to differentiate and study both types of safety, extant research suggests that subjective risk perception does not always overlap with the actual risks that one might encounter. Within the realm of interpersonal safety, we can examine this subjective vs. objective gap by examining the degree to which subjective perceptions of crime overlap with objective ones. The correlation between subjective and objective crimes has been found to be weak and positive (see van Bakergem et al., 2017). Further, people fundamentally misperceive their social world as more dangerous. Evidence from a recent Axios-Ipsos poll suggests that the majority of Americans (6 in 10) feel that violent crime is higher today than it was in the 1990s (Ipsos, 2021). Importantly, in the same poll, differences in this perception were found based on people's geographical location, such that those living in urban areas felt the least safe. Consequently, people are both concerned about their safety, and they also misperceive the severity of objective threats to their safety. Given that the majority of people in the U.S. feel unsafe, it is critical that research examine the antecedents and consequences of feeling unsafe. In the next section, we discuss how existing empirical research has studied (concepts similar to) perceived interpersonal safety.

**Empirical Work on Perceptions of Safety**

*Worldviews and Primal Beliefs*

One line of research has examined how individuals perceive the state of the world in general, or their worldviews (Koltko-Rivera, 2004). Research within the worldview
literature that is relevant to our understanding of scholarship on perceived safety, is that of belief in a dangerous world. This worldview constitutes a subjective perception about the state of the world and the various actors in it. Thus, even though informative, it does not focus on the individual in question, and how safe they feel around others, but rather on how dangerous the world as whole is (e.g., Altemeyer, 1996). Whether we focus on worldviews (Perry et al., 2013) or primal world beliefs (Clifton et al., 2019), the argument that these beliefs are too broad still stands. It is important to note that worldviews and primal world beliefs are conceptually similar, but empirically distinct (albeit with a moderate to strong positive correlation observed between them, see Clifton et al., 2019). Worldviews were created to study how support for authoritarian leaders is generated (Altemeyer, 1996). Thus, literature on this subject has focused primarily on the downstream consequences of believing that the world is dangerous, on intergroup attitude formation rather than personal health and close relationships. Primal world beliefs seek to amend that, but literature on the subject is very nascent (see here for a perspective on this issue, Clifton, 2020). Thus, even though study on perceptions of the world as dangerous vs. safe are too broad to be relevant to perceived interpersonal safety, they do make a strong argument about the need to study individual perceptions, especially with an eye towards how safe people feel.

Experiences of Trauma

In contrast to literature on worldviews, another line of work that influences the operationalization of interpersonal safety focuses on exposure to safety-related stressors within close relationships. Experiencing stressors to one’s sense of safety, even at a young age, can have drastic and long-term consequences across the lifespan. Often
defined as Adverse Childhood Experiences (ACEs), such experiences are operationalized as living through abuse (which can include physical, sexual or emotional abuse), or household dysfunction (Centers for Disease Control and Prevention, 2013). A plethora of research has linked ACEs with a worse physical and mental health (e.g., Petruccelli et al., 2019; Racine et al., 2021; Sahle et al., 2021) This research suggests that stressors to our sense of safety, even at a young age can influence our mental and physical health. Thus, it is quite possible that how interpersonally safe people feel presently in their lives would exert an equal, if not stronger impact on our health.

Experiencing trauma and victimization in later stages of life (e.g., adulthood) is similarly destructive for individuals. For example, experiencing intimate partner violence relates to worse mental and physical health outcomes (for a review see Ellsberg & Emmelin, 2014). Similarly, being the victim of a violent crime, especially for women, results in severe negative mental and physical health consequences (e.g., Demaris & Kaukinen, 2005). Thus, any type of victimization is considered a risk to people’s health (mental or physical), with this effect compounded for multiple types of victimization (e.g., Rivara et al., 2019). Crucially, the impact of trauma and victimization is persistent, as individuals develop post-traumatic stress which leads to them relieving through these painful experiences (e.g., Pahl et al., 2020). It is therefore not surprising that experiences of victimization and trauma harm our physical and mental health (Ellsberg & Emmelin, 2014). However, we posit that this could be partially driven by the negative impact of trauma and victimization on feelings of interpersonal safety. As a result of such victimization, people might feel considerably less safe within interpersonal ties, which could in turn leave them more susceptible to maladaptive health outcomes. The link
between victimization and perceived safety has been established cross-nationally (e.g., Syropoulos, 2020). Thus, although not capturing safety per se, victimization and trauma literature does inform our understanding of safety. To explain why experiences of victimization and/or trauma might lead to decreased perceived interpersonal safety, we turn to the literature on shattered world assumptions (Janoff-Bulman, 1992).

**World Assumptions**

At the core of our existence, Janoff-Bulman suggests, we hold assumptions about the state of the world and our role in it (Janoff-Bulman, 1992). Such a system of world assumptions is much like our attachment system (Bowlby, 1994) and the inner working model we develop through our attachment to others. In order to understand the impact of victimization on individuals, as well as how they cope with this experience, it is paramount to understand the basic assumptions of the world that people hold in their minds. By shedding light on the nature of these assumptions, researchers have gained a better understanding of the processes of change and resistance following victimization (Janoff-Bulman, 1989).

When we look at people’s reactions to trauma, or negative life events in general, the most common reaction we observe is that of vulnerability (Janoff-Bulman & Frieze, 1983). As Janoff-Bulman states (1989) “Victims report that they never thought it could happen to them; they feel vulnerable, unsafe, and unprotected.” Importantly, subsequent work on world assumptions has mapped how people’s assumptions about the state of the world oftentimes change after intense negative life events (for a discussion see Janoff-Bulman, 1992). These assumptions are, the assumption of benevolence vs. malevolence (the world is a good vs. bad place); the assumptions of meaningfulness (there is justice
and controllability rather than luck in people’s actions); and the assumption of self-worth (the belief that one is good, and thus receives good and fair outcomes, and the belief that outcomes are under one’s control and not due to chance). Although not measured at the time, it is not unreasonable to consider how feeling interpersonally safe could increase more constructive assumptions about the state of the world.

Ultimately, such research is influential to the theoretical argument behind this dissertation. If we are to accept the fact that people’s own perceptions of themselves and the world (captured via their world assumptions) can exert a great deal of influence on their resistance and reactance to trauma, then it is possible to also consider that people’s own perceptions of how safe they feel around others, could also relate to key life outcomes, and the quality of their close relationships.

**Overview of the Dissertation**

This dissertation documents the importance of perceived interpersonal safety in day-to-day life; this research will contribute to the aforementioned empirical and theoretical evidence on the importance of safety for individual and relationship wellbeing. Our focus is on subjective (i.e., feelings and perceptions) rather than objective (i.e., biological markers or crime rates) indicators of safety, as we believe that regardless of the objective threat experienced in life, individual’s subjective perceptions of a situation are also important for their well-being. Across four chapters, the following three goals will guide the investigation:

**Goal 1.** Refine the measurement of perceived interpersonal safety by validating a novel scale which can adequately capture the multidimensionality of the construct.
**Goal 2.** Chart how perceived interpersonal safety can influence our relationships, as well as our physical and mental health.

**Goal 3.** Understand the influence of close relationships (i.e., secure attachment, relationship quality) on perceived interpersonal safety.

By studying different types of perceived safety in different stages of life we will integrate research from diverse theoretical backgrounds (e.g., attachment theory, social safety theory, hierarchy of needs). Further, by introducing a novel measure of perceived interpersonal safety and offering evidence for its validity and utility we will be producing a measurement tool that can be useful for future research on the subject. Four chapters follow this introduction, each discussing one multi-study manuscript that address one of the three goals. In-between chapters, we provide a section that bridges these manuscripts/chapters together.

In Chapter 2 we construct, validate and test a novel, comprehensive measurement model of perceived interpersonal safety (**Goal 1**). To date, most investigations of individual differences in safety have typically used single-item measures (example items include, “I feel safe walking alone at night” or “I generally feel safe”) or indirect measures. Further, when safety is assessed, the focus is placed on unique relational contexts shape safety-related experiences (e.g., in close relationships as attachment security, in childhood as ACEs) and not on day-to-day experiences of perceived safety (e.g., Felitti et al., 1998). To address this gap and to examine the multifaceted nature of perceived safety more directly and comprehensively, we introduce a novel measurement model of perceived safety, validated over the course of 6 studies (total $N = 4,390$).
In Chapter 3, we highlight how subjective perceptions of safety could be important for our physical and mental health (Goal 2). In particular, we re-evaluated the safety-health link during a time of high uncertainty (i.e., during the onset of the COVID-19 pandemic, April-May 2020). We surveyed emerging adults, and adolescent-parent dyads to ensure that any observed associations are replicable across different developmental stages, and to account for parental influences on adolescents’ physical and mental health.

In Chapter 4, we present a manuscript that examines the influence of an individual’s attachment style on their feelings of safety (Goal 3). The focus is exclusively on feelings of safety as this facet is more directly relevant to familiar and relatively proximal environments. Research stemming from attachment theory posits that the primary function of the attachment system is to ensure the safety and security of the developing infant, so that they can safely explore the social world and develop working models of relationship expectations and behaviors.

In Chapter 5, we expand upon the findings introduced in Chapter 4 and consider the possibility that high-quality romantic relationships could also increase how safe people feel (Goal 3). The focus this time is placed exclusively on samples drawn from Latinx/Hispanic adults. Three reasons guided this decision. First, our hypothesis is relying on the impact of high-quality relationships. Thus, we considered it important to study this phenomenon in a population which values high-quality relationships and emphasizes familial bonds to a great degree (e.g., Campos & Kim, 2017). Second, we considered studying this topic within Latinx/Hispanic populations, as in the United States, this ethnic group faces increased safety stressors relative to non-Hispanic White
Americans. For example, evidence suggests that hate crimes against Latinos are at an all-time high (Gamboa, 2020), that Latinos are disproportionately victimized (Violence Policy Center (2019), that these victimization trends are more consistent across time (Oudekerk, 2020), and that younger adults are more likely to be victimized compared to non-Hispanic White American young adults (U.S. Department of Health, 2019). The third and final reason was to study this phenomenon in a diverse population, in an effort to address racial inequality in psychological research (Roberts et al., 2020).

Finally, in Chapter 6, we offer a summary and integration of all aforementioned findings. We discuss the implications of these findings for psychological theory and provide recommendations for how safety should be measured in future research. We also discuss limitations of these studies and highlight key future research directions for the study of perceived interpersonal safety.
CHAPTER 2
INTRODUCING THE MULTIDIMENSIONAL MODEL OF PERCEIVED INTERPERSONAL SAFETY

The 21st century has been characterized by the most significant decrease in violence in human history (Pinker, 2012). However, as long as societal stressors of human safety exist (e.g., crime), so does the necessity to investigate their impact. Despite the importance of investigations on the topic of safety, two conclusions are apparent when one looks at the previous literature. One, psychological examinations of perceived safety are rather rare when compared to the frequency with which the concept of safety has been utilized in theoretical discussions, and two, when psychological examinations of perceived safety occur, they fail to capture the complex and multidimensional nature of perceived safety. This is particularly true with regards to research on interpersonal safety, namely how safe we feel around others, and/or in social environments. Across six studies, we provide evidence for the multidimensionality of perceived interpersonal safety, introduce a measure that captures safety above and beyond previous (unidimensional) conceptualizations, and highlight its importance as an antecedent of key mental health outcomes. We argue for the need to increase scholarship on perceived interpersonal safety and describe how several sub-fields of psychology can benefit from such research. Finally, we create a novel, valid, reliable and comprehensive measure of perceived interpersonal safety (the Perceived Interpersonal Safety Scale) which researchers can utilize to capture the finer details of individuals’ subjective perceptions of interpersonal safety.
What is Perceived Interpersonal Safety? Differentiating Between Objective and Subjective Safety

In its most straightforward definition, perceived interpersonal safety is an individual’s subjective perceptions of how (un)safe their social environment is. As with the study of other constructs in psychology, there are multiple ways of examining safety. It is therefore important to distinguish between investigations on subjective (i.e., perceived) safety, in addition to objective aspects of safety. Investigations on objective safety rely on aggregated statistics (e.g., crime rates; FBI, 2021). Although such investigations can be very informative as they provide us with unbiased information on how (un)safe an area is, they are at the same time limited in that they don't consider one of the most important aspects of psychology: the human mind.

From birth, humans rely on and become attached to their parents to feel safe, and in doing so form different relationships based on the attachment styles they develop (Ainsworth et al., 1978). Subjective safety perceptions are influenced by the relationships people have, and the social and emotional context they are in. For example, some people can become desensitized to threats (Gaylord-Harden et al., 2017), suggesting that their individual perception of a situation (shaped by their prior experiences) plays a critical role in assessing a threat. Subjective perceptions of any construct are also useful as they allow researchers to study the influence of different sociocultural factors on the construct. For example, by studying perceived interpersonal safety, we can determine the degree to which gender, race, and their intersection influences how safe people feel.

Single-Item Measures
Past psychological investigations on perceptions of interpersonal safety have heavily relied on single-item measures (e.g., Booth et al., 2012; Latham & Clarke, 2013; Ozer & Weinstein, 2004). While offering important contributions to our understanding of safety and its correlates, single-item measures naturally suffer from issues of measurement reliability (e.g., Gosling et al., 2003), construct, content and predictive validity, as well as sensitivity (Diamantopoulos et al. 2012). Oftentimes, this reliance on single-item measures leads to the utilization of proxy measures of perceived safety. One prime example is that of single-item measures of walkability (the tendency to feel safe walking alone at night; “I feel safe walking alone late at night”; e.g., Ballard, 2019; Crabtree & Nsubuga, 2012). Many individuals might feel safe in their lives in general but might choose not to venture out late at night due to situational factors or cultural norms. Thus, this item is not an indicator of perceived safety in any comprehensive sense, particularly given vast individual differences in experiences walking alone at night. It is thus evident, that existing literature has utilized measures that are either too broad or too narrow, limiting the conclusions we can draw with regards to the subject of perceived interpersonal safety.

The Case for the Multidimensionality of Safety

Perhaps the most prominent limitation of measurement approaches relying on single-item measures, is that by their own nature, they assume that perceived interpersonal safety (PIS) is a unidimensional construct. In the current investigation we argue against such conceptualizations and offer evidence for a more comprehensive and multidimensional conceptualization of PIS. We argue that perceived interpersonal safety comprises three facets: (1) Feelings of Safety (i.e., experiencing security in day-to-day
life); *Fear of Crime* (i.e., being afraid of victimization) and *Safety Confidence* (i.e., trusting one’s own ability to remain safe). In the sections that follow we delve into what these facets entail, why they could be influential for individual psychological outcomes and how extant theoretical and empirical work supports their existence. A conceptual model of the hypothesized structure of perceived interpersonal safety is provided in Figure 1.

![Figure 1. Conceptual model of the Multidimensionality of Perceived Interpersonal Safety.](image)

**Feelings of Safety**

The first facet of PIS is *Feelings of Safety*. It captures individual differences in how safe people feel in familiar environments in their day-to-day life. Most people spend a significant amount of time in safe environments (Bureau of Labor Statistics, 2018). Thus, it is imperative to measure perceptions of safety within these familiar environments (e.g., one’s residence). Two theoretical arguments also support the existence of this factor. One is the inclusion of safety as a primary human need by Maslow (1943), who theorized that safety is a need that has to be met so that self-actualization can be achieved. The
other is the conceptualization of security as a universal human value that is invariant across cultures (Schwartz et al., 2012). Both of these theoretical arguments are influential as they both provide a framework which emphasizes that valuing safety or needing to feel safe is a fundamental aspect of human existence. Importantly, however, neither framework has produced a measure capturing how safe people subjectively feel.

From a developmental perspective, attachment theory can also be used to emphasize the importance of safety in familiar environments. Bowlby (1951) investigated the idea that having a safe haven is a primary need that begins in infancy. In particular, Bowlby’s investigation of safety/security focused on how the relationship of a parent (primarily mothers) and their child impacts their sense of security. This influential work illustrates that from an early age, how we interact with others and how we act in a specific environment can greatly be influenced through our interaction with others. Thus, even in later stages of life, it is important to assess how safe people feel in environments that are (for the most part) free of threats.

Because of this lack of threat in familiar environments, one would expect individuals to score relatively high on this facet. Should participants not score high however, that would be a clear indication of something being amiss in their daily lives. For example, victims of intimate partner violence could feel unsafe due to abuse at the hands of their partner. In light of these theoretical and empirical considerations, we expected that a facet capturing how safe people feel in familiar environments would be one of the factors explaining variability in PIS.

Given the lack of a measure capturing subjective perceptions of safety in familiar environments and day-to-day life, it is only possible to speculate and hypothesize about
the influence of this facet on key life outcomes. To do this, we drew from recent advancements from Social Safety Theory (Slavich, 2020). The three main tenets of this theory are that: humans biologically evolved to foster and prioritize social safety; social safety as an experience is beneficial for health and behavior; social threat is harmful to health and behavior (Slavich, 2020). Consequently, acquiring and maintaining meaningful social bonds is a core motivation of human behavior, while feelings of rejection, isolation, and exclusion from social groups can act as stressors that impact our social safety (Slavich, 2020). From a young age we develop social safety schemas, based on our own perceptions of the world, and our interactions with others, which in turn shape how we navigate our social reality (Slavich, 2020). Importantly this theory provides researchers with substantive explanatory power with regards to how biological aspects of safety influence different aspects of our lives. We argue that subjective perceptions of safety, and the feelings of safety facet in particular, will play a similar role, influencing our well-being and behavior in different spheres of our existence.

**Fear of Crime**

A second major facet is an individual’s subjective fear of crime. We consider fear of crime to be a primary facet of PIS because regardless of the cultural context, crime is a universal stressor to human safety. An individual’s own subjective fear of crime is different from the actual occurrence of crime in a given area. For example, even though violent crime rates have been decreasing in the U.S. since the 1990’s (Gramlich, 2016) Americans still report high amounts of fear of crime (Gallup, 2021). Despite some disagreements regarding what the construct of fear of crime should include, and what its precise definition should be (see Hinkle, 2015), fear of crime has had a rich research
tradition outside the realm of psychological research (for a review see Henson & Reys, 2015).

Even though there is an inconsistency in the measurement of fear of crime (e.g., Hauser & Kleck, 2013) there exists a multitude of evidence on the (primarily demographic) antecedents of fear of crime (e.g., Collins, 2016). Further, but to a lesser degree, there is evidence to suggest that fear of crime is associated with key individual differences. For example, research suggests that fear of crime is associated with more state and trait anxiety (Ellis & Renouf, 2017), less life satisfaction (Hanslmaier, 2013), increased depressive symptomatology, more neuroticism, and a decreased sense of control (Klama & Egan, 2011). In the current investigation we sought to both re-examine some of these associations, but importantly we also aimed to incorporate the other two facets of PIS as antecedents of key life outcomes.

**Safety Confidence**

The last facet of PIS we anticipated to emerge was what we call *Safety Confidence*. This facet relates to an individual’s ability to protect themselves and remain safe. We argue that this is an important facet of PIS which also has its roots in psychological theory. Specifically, we argue that safety confidence is an individual’s perception of their ability to “fight or flee” (Cannon, 1932). We theorize that this is in fact the facet which explains gender differences in PIS the most. Such theorizing is in line with research highlighting gender differences in physical strength with men scoring higher than women (e.g., Miller et al., 1993). We speculate that this facet could also potentially be explained by other psychological phenomena such as a perceived sense of invincibility (e.g., Wickman et al., 2008) or an elevated expression of nerve, which has
been defined as a tendency to convey the impression that someone is unafraid to engage in violence (Melde et al., 2019).

We posit that safety confidence is an important facet of PIS, with only limited exploratory work arguing for its significance (e.g., Hughes et al., 2003). Recent evidence suggests that perceiving the world as dangerous is a significant motivation behind firearm ownership (Stroebe et al., 2017), such that individuals seek to compensate for their lack of safety by acquiring a firearm (see Buttrick, 2020). Further, those with higher safety confidence could also possess a greater degree of knowledge of self-defense strategies (e.g., Paulsen et al., 2003) which could increase their survival in a threatening situation. Finally, based on previous works in the psychology of violence and aggression (e.g., Björkqvist, 2018) and criminology (e.g., Anderson, 1999), there is ample evidence suggesting that men (on average) are more aggressive and violent than women, which could be an indicator of an increased sense of confidence in their safety. This does not imply that men are more or less afraid of crime (although such a difference has been noted; Chataway & Hart, 2019) or that they feel more or less safe in environments that they are familiar with, but specifically that they might be more confident in their ability to protect themselves. Such theorizing also aligns well with recent findings highlighting that sex differences in physical strength seem to explain differences in trait anxiety (Kerry & Murray, 2021). Based on this theorization, we contend that this facet could potentially account for most of the existing sex differences in perceived interpersonal safety.

The Current Studies
In the current investigation we had two primary goals: (1) to provide evidence for the multidimensional structure of PIS, and (2) to argue for the importance of this multidimensional structure by providing evidence for the association of each facet of perceived interpersonal safety with key life outcomes. Achieving goal 1 also led to the creation of a reliable and valid measurement of perceived interpersonal safety, while achieving goal 2 led to both the re-examination and replication of extant findings from criminological research, as well as the testing of novel hypotheses specifically for feelings of safety and safety confidence.

Our investigation spanned six studies. Study 1 examined the multidimensionality of PIS by compiling and factor analyzing previous measures from psychological and criminological investigations produced from an extensive review of the literature. Study 2 took into consideration laypeople’s responses, further improving the factor model and face validity of the construct while also highlighting the associations between the facets of perceived interpersonal safety and the BIG-5 personality traits. Study 3 confirmed the multidimensional factor model of the construct and showed that the different facets of PIS relate to an individual’s locus of control and perceptions of the police with differing patterns. Studies 4A-4D showed evidence for PIS’s association with positive (life satisfaction, subjective happiness, self-flourishment) and negative (depression, borderline personality symptomatology, experience of prejudice), life outcomes within three separate university samples and across time. Study 5 examined demographic (i.e., gender and neighborhood) differences in perceived interpersonal safety through an integrative analysis of several datasets in the United States. Study 6 showed evidence for the generalizability and invariance of this multidimensional construct across four different
European countries while also replicating the association of its facets with the BIG-5 personality traits. An overview of all the studies, their sample sizes, the type of each sample, and the type of validity each study offers is given in Table 1. For all of the studies presented below, to avoid repetition in our writing, unless otherwise noted, reliability was acceptable ($as > .70$). For all of these studies, data analysis was conducted with SAS version 9.4. No formal a-priori power analyses were conducted for determination of our sample size. Analyses were not pre-registered. All data and analysis files are available on the Open Science Framework (OSF).

Table 1.

Overview of All Studies.

<table>
<thead>
<tr>
<th>Study Number</th>
<th>Sample Size</th>
<th>Sample Type</th>
<th>Validity Type</th>
<th>Sensitivity analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 1</td>
<td>288</td>
<td>MTurk</td>
<td>Construct (EFA)</td>
<td>$\rho = .16$</td>
</tr>
<tr>
<td>Study 2</td>
<td>440</td>
<td>MTurk</td>
<td>Construct (EFA), Discriminant, Convergent</td>
<td>$\rho = .13$</td>
</tr>
<tr>
<td>Study 3</td>
<td>634</td>
<td>MTurk</td>
<td>Construct (CFA), Discriminant, Convergent</td>
<td>$\rho = .11$</td>
</tr>
<tr>
<td>Study 4A</td>
<td>197</td>
<td>Student</td>
<td>Discriminant</td>
<td>$\rho = .20$</td>
</tr>
<tr>
<td>Study 4B</td>
<td>890</td>
<td>Student</td>
<td>Discriminant, Convergent</td>
<td>$\rho = .09$</td>
</tr>
<tr>
<td>Study 4C</td>
<td>159</td>
<td>Student</td>
<td>Discriminant, Convergent</td>
<td>$\rho = .22$</td>
</tr>
<tr>
<td>Study 4D</td>
<td>138</td>
<td>Student</td>
<td>Predictive, Test-Retest Reliability</td>
<td>$\rho = .23$</td>
</tr>
<tr>
<td>Study 5</td>
<td>2450</td>
<td>Mixed</td>
<td>Construct (CFA), External, Measurement Invariance</td>
<td>$f = .06$</td>
</tr>
<tr>
<td>Study 6</td>
<td>1644</td>
<td>Cross-National (mixed)</td>
<td>Cross-National, Measurement Invariance</td>
<td>$f = .08$</td>
</tr>
</tbody>
</table>

*Note. Samples sizes for Studies 1-3 were also based on recommendations for conducting EFA and CFA, suggesting 5-10 participants per item included in the analysis. Sensitivity analyses were performed with G*Power (Faul et al., 2007). The following parameters: $\alpha = .05$, 1-$\beta$ error (power) = .80, tails = two, were used for Studies 1-4D. For Studies 5 and 6, where group comparisons were conducted, sensitivity analyses used the following parameters: $\alpha = .05$, power = .80, number of groups = two (results for three groups for the neighborhood type comparisons in Study 5 are similar).
Study 1

Study 1 examined the multidimensionality of PIS. The first author conducted a literature review on studies examining PIS. The following terms were searched on PsycINFO and PsycArticles: Safety + Police + Scale (217 results); Perceived Safety (768 results); Safety + Environment + Scale (1310 results); Fear of Crime (825 results). The search was limited to scientific articles published from 1900-2018 (January). From the articles produced by this search, the methods and results sections were reviewed. A total of 47 items were retained after grouping similar items.

Method

Participants

Three hundred and ten participants were recruited online through Amazon Mechanical Turk (MTurk). Studies have shown that data collection from MTurk produced valid and reliable data (Buhrmester et al., 2011). We used CloudResearch to operate data collection efforts (Litman et al., 2017) which enabled us to remove potential bots from our sample. After applying exclusion criteria (nationality had to be US American: \(n=5\), and they had to complete the survey in more than 5 minutes, \(n=15\)) and checking for multivariate outliers (\(n=2\)), 288 participants remained (\(N_{\text{female}} = 148, N_{\text{male}} = 140, N_{\text{other/non-binary}} = 1, N_{\text{White}} = 231, N_{\text{Black Indigenous and People of Color (BIPOC)}} = 58; M_{\text{age}} = 37.77, SD_{\text{age}} = 11.95\)).

Materials and Procedure

The 50 safety items generated by the literature review conducted prior to the commencement of this study, were shown to participants in a randomized order. The Social Interaction Anxiety (SIAS) Scale (Mattick & Clarke, 1998), the Multidimensional
Locus of Control Scale (Levenson, 1973) and the Police Legitimacy Scale (Tankebe et al., 2016) were also administered. Correlations between the facets of PIS and these measures are presented in the Supplementary Materials. After responding to these items measures participants were asked to state three things/factors that make them feel safe and three that make them feel unsafe, in order to generate additional items based on participants’ responses (which we later tested in Study 2). After all the questions were shown, participants provided demographic information and were subsequently debriefed.

Results

Multidimensionality of Perceived Interpersonal Safety

We conducted an Exploratory Factor Analysis (EFA) including the 50 items generated by our literature review. The initial results showed the emergence of the following components: 6 items focusing on fear of crime (matching previous literature), 5 items relevant to safety in everyday environments, and 3 items capturing an individual’s ability to protect themselves. The 36 items that were removed as a result of our analyses are displayed in the Supplementary Materials. Two out of the three factors met the eigenvalue-greater-than-one criterion, (Fear of Crime: 5.97, Feelings of Safety: 1.98). The third factor, Safety Confidence did not meet this criterion (eigenvalue = .87). Based on the scree-plot and the proportion criterion, however, we retained these factors.

Discussion

This study provided the first round of evidence supporting our argument for the multidimensionality of PIS. Results based on items generated from a literature review showed initial evidence for three hypothesized factors of PIS: fear of crime, feelings of safety, and safety confidence.
Study 2

In line with calls for research to increase the validity of psychological measurement models by accounting for public opinion (Gehlbach & Brinkworth, 2011) we coded the open-ended questions from Study 1 (1,728 responses, 6 per participant, from 288 participants) asking participants to name three things/factors that made them feel safe/unsafe, thus generating additional items in a bottom-up fashion. These 33 newly generated items were then combined with the original 14 items and factor analyzed in a new sample.

Method

Participants

Five hundred and six participants were recruited through CloudResearch and received remuneration for their participation in the study. Seventy participants were excluded because they met the following exclusion criteria: completing the survey too fast (n=55), failing the first (n=4) or second (n=5) attention checks, and being multivariate outliers (n=2). The final sample consisted of 440 participants (Nfemale = 255, Nmale = 182, Nother/non-binary = 3, NWhite = 343, NBIPOC = 97; Mage = 36.36, SDage = 11.72).

Materials and Procedure

A total of 47 items (33 generated + 14 from Study 1) assessing PIS were administered. These were followed by the Ten Item Personality Inventory (Gosling et al., 2003). The different subscales of the TIPI had mediocre reliability, which is attributable to their reduced number of items. This was expected, given low reliability in Gosling et al. (2003). Despite this limitation, the TIPI has been utilized thousands of times as a short
tool for assessing different personality traits. Participants were asked to express their agreement/disagreement with each measure on a 1–7 Likert scale.

Results

Multidimensionality of Perceived Interpersonal Safety

Based on an EFA (principal axis factoring, promax rotation), the same factors as in Study 1 emerged (fear of crime, feelings of safety, safety confidence). These factors retained most of the items from Study 1 with some additions from the new pool of items generated from the open-ended responses. To more closely examine the factor model, we kept 17 items (see Table 2) and conducted a second EFA (Table 2). The remaining 17 items loaded significantly onto the three factors (all loadings > .40). These factors met the established norms (eigenvalues > 1; proportion criterion; scree plot criterion).

Table 2.

Exploratory Factor Analysis for Study 2.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Fear of Crime</th>
<th>Safety Confidence</th>
<th>Feelings of Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel terrified that I am going to be the victim of a crime</td>
<td>.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel terrified that I may someday be the victim of a robbery.</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am afraid of being physically assaulted.</td>
<td>.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am afraid of somebody breaking into my home and stealing or damaging things.</td>
<td>.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel terrified of gang activity.</td>
<td>.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am afraid of being threatened by someone.</td>
<td>.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am afraid of becoming the victim of terrorist-related violence.</td>
<td>.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have the strength and skills to ward off criminals.</td>
<td></td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>If I was attacked at night, I am confident that I would be able to defend myself.</td>
<td></td>
<td>.88</td>
<td></td>
</tr>
<tr>
<td>I know enough self-defense to protect myself.</td>
<td></td>
<td></td>
<td>.82</td>
</tr>
<tr>
<td>If I thought somebody was following me, I would confront them.</td>
<td></td>
<td></td>
<td>.50</td>
</tr>
<tr>
<td>The way I look makes me feel safe.</td>
<td></td>
<td></td>
<td>.40</td>
</tr>
</tbody>
</table>
I feel at ease in familiar places. .60
Being at home makes me feel protected. .56
I feel safe when walking alone during the day. -.39 .47
I generally feel safe. -.40 .41
My family makes me feel secure. .41

Note: Factor loadings between -.35 and .35 are not displayed.

Bivariate correlations showed moderate associations between the three facets, showcasing preliminary evidence for discriminant validity, further supporting our hypothesis that PIS is multidimensional.

**Perceived Interpersonal Safety and Personality**

All the facets of PIS were significantly correlated with extraversion, emotional stability, and conscientiousness; these correlations were negative for fear of crime (see Table 3). Feelings of safety and safety confidence were also positively correlated with openness to experience, and feelings of safety were positively correlated with agreeableness.

Table 3.

<table>
<thead>
<tr>
<th></th>
<th>Fear of Crime</th>
<th>Feelings of Safety</th>
<th>Safety Confidence</th>
<th>Extraversion</th>
<th>Agreeableness</th>
<th>Conscientiousness</th>
<th>Emotional Stability</th>
<th>Openness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of Crime</td>
<td>--</td>
<td>-.43***</td>
<td>-.31***</td>
<td>-.11*</td>
<td>-.09</td>
<td>-.25***</td>
<td>-.35***</td>
<td>-.08</td>
</tr>
<tr>
<td>Feelings of Safety</td>
<td>-.43***</td>
<td>--</td>
<td>.26***</td>
<td>.10*</td>
<td>.28***</td>
<td>.29***</td>
<td>.34***</td>
<td>.10*</td>
</tr>
<tr>
<td>Safety Confidence</td>
<td>-.31***</td>
<td>.26***</td>
<td>--</td>
<td>.26***</td>
<td>.03</td>
<td>.15**</td>
<td>.33***</td>
<td>.16***</td>
</tr>
</tbody>
</table>

Note: *p < .05, **p < .01, ***p < .001

**Discussion**

Study 2 further supported our argument for the multidimensionality of PIS, as well as generating a scale for measuring these perceptions. Increased perceptions of
safety were associated with an increased tendency to socialize and participate in social gatherings (extraversion). Safer individuals also reported having higher levels of emotional stability and conscientiousness. Where the facets of PIS differed was with regard to openness and agreeableness. Feelings of safety and safety confidence (but not fear of crime) were associated with increased willingness to engage in novel experiences (openness). Only feelings of safety were related to increased agreeableness.

**Study 3**

Study 3 was designed to confirm the multidimensional three-factor structure of the 17-item PIS Scale. It also examined how perceived internal (i.e., locus of control) and external (i.e., the police) forces correlate with levels of safety. We hypothesized that higher levels of PIS would be positively associated with an inner locus of control (and negatively associated with an external locus of control), and also that higher levels of PIS would be positively associated with increased perceptions of police effectiveness and legitimacy. We also measured social desirability to ensure that subjective reports of PIS were not biased.

**Method**

**Participants**

Six hundred and sixty-nine participants were recruited via CloudResearch and received remuneration for their participation in the study. Thirty-five participants were excluded because they failed to pass the inclusion criteria: Not being U.S. American (n=7), not passing two attention checks (n=23) and being multivariate outliers (n=5). Our final sample consisted of 634 participants (N\text{female} = 353, N\text{male} = 284, N\text{White} = 520, N\text{BIPOC} = 117; M_{\text{age}} = 36.69, SD_{\text{age}} = 12.09).
Materials and Procedure

The 17-item PIS Scale from Study 2 was administered. The most commonly used single item measure of safety “I feel safe when walking alone at night” was also included to compare scores on this item with our novel multidimensional measure of safety. The Police Legitimacy Scale (Tankebe et al., 2016) and the Levenson Multidimensional Locus of Control Scale (Levenson, 1973) were also presented to establish discriminant validity. Finally, the Short Social Desirability Scale (Crowne & Marlowe, 1960) was included to examine whether answers provided by the respondents were influenced by tendencies to respond in a manner that would be perceived as positive by others. These measures were presented in a random order, followed by demographic questions, on a 1-7 Likert scale.

Results

Multidimensionality of Perceived Interpersonal Safety

We conducted a Confirmatory Factor Analysis (CFA) to examine the factor model of the PIS Scale (Figure 2). We evaluated model fit based on recommendations suggested by Kline (2016). In detail, these dictate that a non-significant chi square value suggests good fit to the data. However, a large sample size inflates a model’s chi square value. In that case, Kline recommended the use of the following fit indices and evaluation criteria: CFI ≥ .95, RMSEA ≤ .08, SRMR ≤ .08.

The Chi square was significant, $\chi^2(115) = 356.33, p < .001$, which could be attributed to the large sample size. However, the fit indices suggested a good fit to the data: CFI = .95, RMSEA = .06, and SRMR = .06. This three-factor model displayed
better fit to the data in comparison to a single factor model, \( \chi^2(3) = 223.44, p < .001 \), supporting our argument for the multidimensionality of PIS.

Note: \( N = 637, \chi^2(115) = 356.33, p < .001, \text{CFI} = .952, \text{RMSEA} = .057, \text{SRMR} = .060. \)

Figure 2.

*Factor Model of the Perceived Interpersonal Safety Scale for Study 3, with Standardized Weights Depicted.*
**Perceived Interpersonal Safety and Locus of Control**

All bivariate correlations are presented in Table 4. Fear of crime correlated negatively with an internal locus of control, and positively with an external locus of control. Feelings of safety were positively associated with an internal locus of control and negatively with an external locus. Safety confidence only positively correlated with an internal locus of control.

**Perceived Interpersonal Safety and Perceptions of Police Legitimacy**

Fear of crime was only positively correlated with perceived police effectiveness. Safety confidence and feelings of safety were significantly and positively correlated with both perceived police effectiveness and legitimacy.

**Perceived Interpersonal Safety and Social Desirability**

Social desirability was only weakly correlated with safety confidence and fear of crime. Socially desirable responding appeared to be associated with suppressed rather than increased scores on the PIS Scale.

Table 4.

*Correlations Between the Measures of Study 3.*

<table>
<thead>
<tr>
<th></th>
<th>Fear of Crime</th>
<th>Feelings of Safety</th>
<th>Safety Confidence</th>
<th>Fear of Crime</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel safe when walking</td>
<td>-.52****</td>
<td>-.22***</td>
<td>-.40***</td>
<td>--</td>
</tr>
<tr>
<td>alone at night</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of Crime</td>
<td>-.52****</td>
<td>-.22***</td>
<td>-.40***</td>
<td>--</td>
</tr>
<tr>
<td>Feelings of Safety</td>
<td>.45****</td>
<td>.21***</td>
<td>.21***</td>
<td>-.40***</td>
</tr>
<tr>
<td>Safety Confidence</td>
<td>.30****</td>
<td>--</td>
<td>.21***</td>
<td>-.22***</td>
</tr>
<tr>
<td>Lawfulness</td>
<td>0.02</td>
<td>.19***</td>
<td>.28***</td>
<td>-.07</td>
</tr>
<tr>
<td>Procedural Fairness</td>
<td>0.05</td>
<td>.21***</td>
<td>.28***</td>
<td>-.08*</td>
</tr>
<tr>
<td>Distributive Fairness</td>
<td>0.01</td>
<td>.21***</td>
<td>.20***</td>
<td>-.02</td>
</tr>
<tr>
<td>Police Legitimacy</td>
<td>0.03</td>
<td>.21***</td>
<td>.26***</td>
<td>-.06</td>
</tr>
<tr>
<td>Police Effectiveness</td>
<td>.21***</td>
<td>.18***</td>
<td>.31***</td>
<td>-.15***</td>
</tr>
<tr>
<td>Internality</td>
<td>.19***</td>
<td>.27***</td>
<td>.50***</td>
<td>-.21***</td>
</tr>
<tr>
<td>Powerful Others</td>
<td>-.13**</td>
<td>-.07</td>
<td>-.28***</td>
<td>.32***</td>
</tr>
<tr>
<td>Chance</td>
<td>-.08*</td>
<td>-.04</td>
<td>-.28***</td>
<td>.32***</td>
</tr>
<tr>
<td>Social Desirability</td>
<td>-0.03</td>
<td>-.10*</td>
<td>-.06</td>
<td>.10**</td>
</tr>
</tbody>
</table>

*Note:* *p < .05, **p < .01, ***p < .001
Comparison with Single-Item Measure

All three facets of PIS were moderately correlated with the single item used in previous studies: “I feel safe when walking alone at night,” providing evidence for the validity of the new measure, but also highlighting that they are not significantly overlapping with the single-item measure. To compare whether the multidimensional measure of PIS has better validity (defined through its association with the outcome variables included in the study), we computed several linear regression models. We included each facet of PIS and the one-item measure of safety in separate models.

Following the guidelines provided by Shrout and Yip-Bannicq (2017), we were able to compare the two regression weights for each outcome variable included in our study (see Table 5). The facets of PIS outperformed the one-item measure, except for the case of police effectiveness, where only feelings of safety outperformed the single-item measure.

Table 5.

Comparison of the Validity of Each of the Three Facets of the Perceived Interpersonal Safety Scale with the Single-Item Measure of Safety for the Measures of Study 3.

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>Comparison for Feelings of Safety</th>
<th>Comparison for Fear of Crime</th>
<th>Comparison for Safety Confidence</th>
<th>R² (adjusted)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fear of Crime</td>
<td>Single-item Measure</td>
<td>Safety Confidence</td>
<td>Single-item Measure</td>
</tr>
<tr>
<td>Internality</td>
<td>0.55&lt;sub&gt;a&lt;/sub&gt;</td>
<td>0.02&lt;sub&gt;b&lt;/sub&gt;</td>
<td>-0.11&lt;sub&gt;a&lt;/sub&gt;</td>
<td>0.06&lt;sub&gt;c&lt;/sub&gt;</td>
</tr>
<tr>
<td>Powerful Others</td>
<td>-0.37&lt;sub&gt;a&lt;/sub&gt;</td>
<td>-0.03&lt;sub&gt;b&lt;/sub&gt;</td>
<td>0.29&lt;sub&gt;a&lt;/sub&gt;</td>
<td>0.03&lt;sub&gt;b&lt;/sub&gt;</td>
</tr>
<tr>
<td>Chance</td>
<td>-0.39&lt;sub&gt;a&lt;/sub&gt;</td>
<td>0.00&lt;sub&gt;b&lt;/sub&gt;</td>
<td>0.31&lt;sub&gt;a&lt;/sub&gt;</td>
<td>0.07&lt;sub&gt;b&lt;/sub&gt;</td>
</tr>
<tr>
<td>Police Effectiveness</td>
<td>0.41&lt;sub&gt;a&lt;/sub&gt;</td>
<td>0.09&lt;sub&gt;b&lt;/sub&gt;</td>
<td>-0.05&lt;sub&gt;c&lt;/sub&gt;</td>
<td>0.13&lt;sub&gt;a&lt;/sub&gt;</td>
</tr>
<tr>
<td>Police Legitimacy</td>
<td>0.50&lt;sub&gt;a&lt;/sub&gt;</td>
<td>-0.04&lt;sub&gt;b&lt;/sub&gt;</td>
<td>na</td>
<td>na</td>
</tr>
</tbody>
</table>

Note: Subscripts denote significant differences between the unstandardized regression weight for the specific facet of PIS and the one-item measure. Subscripts “a” and “b” depict significant differences at p <.001, while “a” and “c” denote differences at p <.05. Subscript “a” signifies that the indicated regression weight is the highest one. “na” signifies that no test was conducted as the facet of personal safety was not correlated with the specific outcome variable. For R² estimates two separate regression models were estimated, one with only the single-item measure, and one with each of the three facets of PIS.
Discussion

Study 3 confirmed our hypothesis that PIS is multidimensional. Bivariate correlations further supported this argument, by providing a distinct pattern of associations between the three facets of PIS and participants’ perceptions of the police and of their own locus of control. The multidimensional conceptualization of PIS also displayed greater validity relative to previous approaches utilizing a single-item measure. In our next set of studies, we sought to evaluate how each of the facets of PIS influence positive life and mental health outcomes.

Study 4A

Our next study examined whether there is a significant association between positive life outcomes and perceptions of interpersonal safety. We expected that feelings of safety would be related to positive life outcomes, more so than fear of crime or an individual’s safety confidence, given that how safe individuals feel in their everyday lives should be a better marker of an individual’s well-being.

Method

Participants

Two hundred and thirty-one participants were recruited online from a student pool from a large public university in the northeastern United States. They received course credit for their participation. After applying exclusion criteria (nationality had to be US American: \(n=34\)) the final sample consisted of 197 participants (\(N_{\text{female}} = 156, N_{\text{male}} = 39, N_{\text{other/non-binary}} = 2, N_{\text{White}} = 142, N_{\text{BIPOC}} = 57; M_{\text{age}} = 20.02, SD_{\text{age}} = 1.66\)). This sample was more politically liberal than average: \(M = 3.39, SD = 1.46\) (1-9 scale).

Materials and Procedure
Participants were presented with the 17-item PIS Scale. The following measures were used to examine positive life outcomes: (1) Subjective Happiness Scale (4 items: e.g., “Compared with most of my peers, I consider myself… less/more happy”, Lyubomirsky & Lepper, 1999); (2) Satisfaction with Life Scale (5 items: e.g., “In most ways my life is close to my ideal”, Diener et al., 1985); (3) Flourishing Scale (8 items: e.g., “I lead a purposeful and meaningful life”, Diener et al., 2009). All the measures were presented on an analog slider scale ranging from 1 to 9. Participants were presented with these measures in a counterbalanced order (i.e., facets of safety first, positive life outcomes second, or vice versa). Students then provided demographic information and were subsequently debriefed.

**Results**

*Perceived Interpersonal Safety and Positive Life Outcomes*

Supporting our hypothesis (see Table 6), only feelings of safety were associated with increased positive life outcomes. This relationship held when regressing all three constructs on the three facets of safety while controlling for different demographic variables (gender, income, political beliefs, religiosity, spirituality), with feelings of safety being the strongest predictor in all three cases ($R^2$ ranging from .15 to .29; see Supplementary Materials).

Table 6

**Correlations for the Measures of Study 4A.**

<table>
<thead>
<tr>
<th></th>
<th>Feelings of Safety</th>
<th>Fear of Crime</th>
<th>Safety Confidence</th>
<th>I feel safe when walking alone at night</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective Happiness</td>
<td>.27***</td>
<td>-0.03</td>
<td>0.07</td>
<td>-0.06</td>
</tr>
<tr>
<td>Satisfaction with Life</td>
<td>.36***</td>
<td>-0.15</td>
<td>0.12</td>
<td>-0.01</td>
</tr>
<tr>
<td>Self-Flourishment</td>
<td>.48***</td>
<td>-0.05</td>
<td>0.08</td>
<td>0.02</td>
</tr>
</tbody>
</table>

*Note: ***p < .001*
Discussion

Supporting our hypothesis, our results suggest that individuals who reported feeling subjectively safer in familiar environments in their day-to-day lives also reporting living happier and more fulfilling lives. This effect remained significant after controlling for demographic variables, further attesting to the importance of subjective perceptions of safety.

Study 4B

Study 4B investigated whether increased PIS would be associated with lower reports of negative life outcomes. We defined negative life outcomes as: (1) recollection of past negative memories, (2) presence of borderline personality traits, (3) depression, and (4) perceived discrimination.

Method

Participants

One thousand and forty-four students completed a survey at a large public university in the northeastern United States, in exchange for research credit. After applying exclusion criteria (nationality had to be US American: $n=85$ and had to be alone when taking the survey: $n=58$) and checking for multivariate outliers ($n=11$), 890 students remained ($N_{female} = 712$, $N_{male} = 174$, $N_{other/non-binary} = 4$, $N_{White} = 624$, $N_{BIPOC} = 236$, $N_{missing} = 30$). The average age was 19.71, $SD_{age} = 1.40$. The sample was again politically liberal: $M_{politics} = 3.20$, $SD_{politics} = 1.43$ (1-8 scale).

Materials and Procedure

The 17-item PIS Scale was included. Negative life outcomes were measured broadly via different scales. We examined how often people thought about negative
events in their lives (with the Negative Memories Questionnaire; 20 items measured on a 1-5 scale, “1 = not at all, 5 = extremely”, e.g., “In the past month, how much were you bothered by repeated, disturbing dreams of the stressful experience?”; Weathers et al., 2013). We examined people’s Borderline Personality Disorder symptomatology with the Personality Assessment Inventory–Borderline Personality Disorder (BPD) Features scale (24 items, measured on a 1-4 scale, “1 = false, 4 = very true”; e.g., “My mood can shift quite suddenly”, Morey, 1991). The correlations between the facets of PIS and the subscales of the BPD were consistent across all facets of safety (see Supplementary Materials) and thus we only present results for the overall measure of borderline personality. Further, the Short version of the Depression Anxiety Stress Scale (DASS, 7 items, measured on a scale from 1-4, “1 = did not apply to me at all, 4 = applied to me very much, or most of the time” was also included (e.g., “I felt down-hearted and blue”; Lovibond & Lovibond, 1995). Finally, we also measured experiences of discrimination with the gender and race discrimination (Taylor et al., 1993) scales (5 items per scale, measured on a 1-7 scale, “1 = strongly disagree, 7 = strongly agree”, e.g., “I am personally discriminated against because of my gender/race”). The measure of racial discrimination had acceptable but lower than desired internal reliability (a = .60).

Results

Perceived Interpersonal Safety and Negative Life Outcomes

Bivariate correlations (see Table 7) suggested that feelings of safety and safety confidence scores negatively correlated with depression, borderline personality traits and recollection of negative memories, while fear of crime did so in the opposite direction. When regressing these outcomes on all facets of PIS, while controlling for gender and
political orientation, all facets of safety remained significant except for the association between safety confidence and recollection of negative memories ($R^2$ ranging from .11 to .12; see Supplementary Materials).

Table 7.

*Correlations for the Measures of Study 4B.*

<table>
<thead>
<tr>
<th></th>
<th>Fear of Crime</th>
<th>Feelings of Safety</th>
<th>Safety Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borderline Personality</td>
<td>.26***</td>
<td>-.28***</td>
<td>-.11**</td>
</tr>
<tr>
<td>Depression</td>
<td>.16***</td>
<td>-.24***</td>
<td>-.11***</td>
</tr>
<tr>
<td>Negative Memories Recollection</td>
<td>.27***</td>
<td>-.29***</td>
<td>-.07*</td>
</tr>
</tbody>
</table>

*Note:* *p < .05, **p < .01, ***p < .001.

*Discrimination and Perceived Interpersonal Safety*

Separate bivariate correlations for gender (defined here as male and female, given the very small number of participants who reported some other gender identity) and race (white and student of color, given the small percentage of each specific race/ethnicity) were estimated. Only for female students perceived discrimination was significantly negatively associated with every facet of PIS (reversely for fear of crime). Further, perceived racial discrimination was negatively associated with feelings of safety solely for students of color.

Table 8.

*Correlations for the PIS Facets and Perceived Discrimination.*

<table>
<thead>
<tr>
<th>Social Identity</th>
<th>Fear of Crime</th>
<th>Feelings of Safety</th>
<th>Safety Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female students ($N = 708$)</td>
<td>.11**</td>
<td>-.20***</td>
<td>-.11**</td>
</tr>
</tbody>
</table>
Male students \((N = 174)\) & .08 & -.08 & .07 \\
Students of Color \((N = 236)\) & .10 & -.19** & -.00 \\
White students \((N = 623)\) & .05 & -.02 & .15*** \\

*Note:* *p* < .05, **p** < .01, ***p** < .001

**Discussion**

Our results suggest that when individuals feel unsafe, they are also more likely to feel more depressed, exhibit more borderline personality traits. Further participants who recollected more negative memories also reported feeling less safe. Further, the unique association between perceived discrimination for female students and students of color elucidates the importance of incorporating first-person accounts of safety. However, it is important to acknowledge that these findings are correlational, and thus no causal claims can be made about the direction of these associations.

**Study 4C**

Our next study sought to replicate the findings of Studies 4A and 4B. It also investigated whether the three facets of PIS were independent from the endorsement of a dangerous worldview.

**Method**

**Participants**

One hundred and eighty-one undergraduate students completed a short 10-minute survey in exchange for research credit at a large public university in the northeastern United States. Twenty-five were excluded, because they were not U.S. American \((n=23)\) and because they were multivariate outliers \((n=2)\), leaving us with a sample of 156 participants \((12\% \text{ excluded})\). From the final sample, 130 were female and 24 were male while two students identified as some other gender identity, 109 where White \((69\%)\) and
the rest were students of color. The average age was: $M_{age} = 19.82$, $SD_{age} = 1.35$. This sample was also politically liberal: $M_{politics} = 3.44$, $SD_{politics} = 1.54$ (1-9 scale).

**Materials and Procedure**

A 15-item version of the PIS Scale was included. Since this survey was part of a larger departmental prescreening survey, two items from the Fear of Crime scale were excluded due to space constraints. The same scales of life satisfaction, self-flourishment and subjective happiness as Study 4A, together with the measure of depression used in Study 4B were used. The researchers also generated a measure of a harmonious worldview. This measure was intended to capture individual differences in how much people view the world as a place where harmony, cooperation and trust are present (12 items, e.g., “There are many people in our society who would go out of their way to help others”). Belief in a dangerous world was measured with a 11-item version of the scale developed by Altemeyer (1988, e.g., “Any day now chaos and anarchy could erupt around us, all signs are pointing to it”). For both worldview measures, three items failed to significantly load on each construct (factor loadings < .30) and were subsequently removed from the analyses that follow.

**Results**

**Perceived Interpersonal Safety and Life Outcomes**

Replicating the findings from Studies 4A and 4B, feelings of safety were uniquely correlated with every life outcome. The other two facets varied in their relationships, but for both fear of crime and safety confidence, their associations were weaker than that of feelings of safety.

**Perceived Interpersonal Safety and Worldviews**
Student reports of their feelings of safety and their safety confidence were correlated with having a harmonious worldview, while fear of crime was only correlated with a dangerous worldview.

Table 9.

*Correlations Between the Measures of Study 4C.*

<table>
<thead>
<tr>
<th></th>
<th>FoC</th>
<th>FS</th>
<th>SC</th>
<th>SWL</th>
<th>SH</th>
<th>SF</th>
<th>DEP</th>
<th>HW</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>FoC</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FS</td>
<td>-.26**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC</td>
<td>-.09</td>
<td>.13</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWL</td>
<td>-.10</td>
<td>.42***</td>
<td>.06</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SH</td>
<td>-.19*</td>
<td>.37***</td>
<td>.18*</td>
<td>.66***</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SF</td>
<td>-.03</td>
<td>.46***</td>
<td>.15</td>
<td>.74***</td>
<td>.72***</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEP</td>
<td>.09</td>
<td>-.32***</td>
<td>-.16</td>
<td>-.63***</td>
<td>-.69***</td>
<td>-.67***</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HW</td>
<td>-.06</td>
<td>.28***</td>
<td>.15</td>
<td>.40***</td>
<td>.25***</td>
<td>.39***</td>
<td>-.29***</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>DW</td>
<td>.25**</td>
<td>-.09</td>
<td>-.06</td>
<td>-.16*</td>
<td>-.25**</td>
<td>-.13</td>
<td>.15</td>
<td>-.36***</td>
<td>--</td>
</tr>
</tbody>
</table>

*Note:* FoC = Fear of Crime, FS = Feelings of Safety, SC = Safety Confidence, SWL = Satisfaction with life, SH = Subjective Happiness, SF = Self-flourishment, DEP = Depression, HW = Harmonious Worldview, DW = Dangerous Worldview. *p < .05, **p < .01, ***p < .001

**Discussion**

The current study replicated our results with regards to the association of the different perceived interpersonal safety facets and several positive and negative outcomes. Further, the correlation between the facets of PIS and the two worldviews, succeed in differentiating subjective perceptions of interpersonal safety from views of the world as dangerous or harmonious, while also showcasing that how safe we feel relates to but is independent of our perceptions of the world as harmonious or in danger.
Study 4D

Our next study aimed to examine the association between depression and PIS across time, while also providing test-retest reliability of our construct across the span of one year.

Method

Participants

Study 4D was conducted in the 2020 Spring semester, as an attempt to recruit participants from Study 4B, which was conducted in the 2019 Spring semester, one year later. Importantly, 138 students were in both samples, and thus we were able to examine the test-retest reliability of the scale, as well as its ability to predict depression scores a year later. From the 138 students, 7 were not American, and one was a multivariate outlier. Thus, a total of 130 students were included in these analyses ($N_{\text{female}} = 109$, $N_{\text{male}} = 21$, $N_{\text{White}} = 95$, $N_{\text{BIPOC}} = 33$, $N_{\text{missing}} = 3$; $M_{\text{age}} = 20.12$, $SD_{\text{age}} = 0.95$).

Materials and Procedure

The same 15-item version of the PIS Scale as Study 4C was included with two items from the Fear of Crime scale excluded due to space constraints. Depression was measured with the same scale as Study 4C.

Results

Correlations and Reliability Across Time

Overall, the facets of PIS had medium to strong correlations between Time 1 (Spring 2019) and Time 2 (Spring 2020), exhibiting good test-retest reliability (see Table 10). Only feelings of safety at Time 1 were significantly correlated with depression a year
later. This association was marginally significant after accounting for levels of depression a year earlier ($r = -.17, p = .061$).

Table 10.

**Correlations Between the Measures of Study 4D.**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>FoC (2019)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FS (2019)</td>
<td>-.44***</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC (2019)</td>
<td>.03</td>
<td>.02</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEP (2019)</td>
<td>.13</td>
<td>-.17*</td>
<td>.04</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FoC (2020)</td>
<td></td>
<td>-.22*</td>
<td>-.25***</td>
<td>.13</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FS (2020)</td>
<td>-.27***</td>
<td>.57***</td>
<td>.05</td>
<td>-.21*</td>
<td>-.27**</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC (2020)</td>
<td>-.05</td>
<td>.05</td>
<td>.58***</td>
<td>.08</td>
<td>.01</td>
<td>.15</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>DEP (2020)</td>
<td>.17</td>
<td>-.20*</td>
<td>-.03</td>
<td>.52***</td>
<td>.13</td>
<td>-.27**</td>
<td>-.01</td>
<td>--</td>
</tr>
</tbody>
</table>

*Note:* Numbers in parentheses depict the year in which the variable was measured. FoC = Fear of Crime, FS = Feelings of Safety, SC = Safety Confidence, DEP = Depression. *p < .05, **p < .01, ***p < .001

**Discussion**

Study 4D not only replicated the results regarding the association of depression with the facets of safety, but it also provided evidence for test-retest reliability and the predictive validity of PIS across the span of one year. Importantly, test-retest reliability was re-evaluated in two additional longitudinal MTurk studies. The first ($N = 275$), was conducted in May-June 2020. Results provided further evidence for test-retest reliability: fear of crime, $r = .72, p < .001$; feelings of safety, $r = .62, p < .001$; safety confidence, $r = .89, p < .001$. The second ($N = 164$) was conducted September-October 2020, providing highly similar results, this time from a sample of Latinx/Hispanic adults: fear of crime, $r = .65, p < .001$; feelings of safety, $r = .57, p < .001$; safety confidence, $r = .76, p < .001$.

Although our longitudinal design was underpowered and the result of convenience, the fact that feelings of safety were correlated with increased depression
scores a year later (and marginally so after accounting for starting levels of depression) is promising. Depression also predicted decreased feelings of safety a year later, highlighting the potential for a reciprocal association between safety and clinical symptoms.

**Study 5**

This study was intended as an integrative analysis of our data collection efforts within the United States with the purpose of examining demographic differences in perceptions of safety. We hypothesized that women would score significantly higher in their fear of crime and significantly lower in safety confidence compared to men. Extant research has provided evidence for the former claim (i.e., that women are more afraid of crime, e.g., Schafer et al., 2006). Other work suggests that women experience possess less physical strength on average, and that this lack of strength can be a contributor to personal anxiety (e.g., Kerry et al., 2021). This gender gap in physical strength could potentially contribute to a gender gap in one’s level of confidence in their ability to protect themselves. However, we did not necessarily expect a significant difference for feelings of safety, as this construct captures perceptions of safety within familiar environments where experiences of threat should be scarce regardless of gender.

We also hypothesized that individuals who reside in more urban rather than rural areas would perceive their environment as less safe. Urban centers experience higher crime and victimization rates than rural areas according to federal crime statistics (FBI, 2018). We expected higher levels of fear of crime and lower scores on their feelings of safety. We did not expect differences for safety confidence, as this facet is more reliant on an individual’s psychological and physical traits instead.
Method

Participants

For the purposes of this study, we combined data from Studies 2-4A, and included additional data from 3 other studies, two of which utilized an MTurk sample, which were part of the cross-national investigation conducted in Study 6, and one additional new study which employed a university sample. The samples from Studies 4C and 4D were not included as they did not include the full version of the scale. A combined sample of 2450 participants was thus obtained. Almost two thirds of the sample were females (66%) and 74% of the sample was White. The average age for the sample was 29.11, $SD_{age} = 12.22$. Half of the participants (53%) were students.

Materials and Procedure

The 17-item PIS Scale together with several demographic factors were examined. These were: gender, type of residence (urban, suburban, rural), spirituality and religiosity (measured on a 1-7 scale), conservative political beliefs (2 items, one about economic and one about social issues, measured in a 1-7 scale), education level and annual income. We also chose to include the most commonly used item capturing safety: “I feel safe walking alone at night” from previous works, to examine our hypothesis that this item is indicative of walkability and not PIS.

Results

Gender Differences

Before conducting any group comparisons, we tested for measurement invariance. For our approach to testing for measurement invariance, see Study 6. of the PIS scale across (1) gender (between male and female participants only), (2) neighborhood type
(between urban, suburban and rural neighborhoods), and (3) sample type (between students and MTurkers). For gender and neighborhood type we achieved scalar invariance, while for sample type we achieved metric invariance. These results are reported in the Supplementary Materials. To test for gender and neighborhood differences, we utilized SAS’s general linear model (GLM) procedure. The GLM procedure outputs $F$ instead of $t$ values. The corresponding $t$ values can be determined according to $F = t^2$. Due to a large sample size, we set our significance level (alpha) to .01. Women reported significantly higher levels of fear of crime, $F(2436) = 129.69, p < .001, \eta^2 = .051$, (female $M = 3.36, SD = 1.39$; male $M = 2.69, SD = 1.29$); and significantly lower levels of safety confidence: $F(2437) = 644.15, p < .001, \eta^2 = .209$ (female $M = 3.11, SD = 1.10$; male $M = 4.36, SD = 1.23$). No significant difference emerged for feelings of safety.

Since most previous studies have examined safety utilizing one item (“I feel safe walking alone at night”), we were interested in examining whether (1) this item is an outcome of PIS, rather than an actual measure of safety, and (2) whether gender differences in PIS would lead to differences in walkability. To that end, we conducted an indirect effect test, utilizing the PROCESS Macro (Model 4), with 10,000 bootstrap samples (Hayes, 2013). Our results showed that reported gender (male = 0, female = 1) significantly negatively related to PIS (combined measure of fear of crime [reversed], feelings of safety and safety confidence): $b = -.64, SEb = .04, 95\% \text{ C.I. } [-.72, -.56], p < .001$, which in turn significantly positively related to the 1-item measure of walkability: $b = 1.16, SEb = .05, 95\% \text{ C.I. } [1.07, 1.25], p < .001$ (see Figure 3). Both the direct, $b = -.65, SEb = .08, 95\% \text{ C.I. } [-.80, -.49]$, and indirect effect, $b = -.75, SEb = .05, 95\% \text{ C.I. } [-
were significant. Due to the correlational nature of this study, we also tested an alternative model (with the single item and the construct of PIS reversed). The indirect effect was significant but seemingly smaller, $b = -.34$, SE$_b$ = .03, 95% C.I. [-.39, -.29].

Note: ***$p < .001$. Gender was coded as: 0 = male, 1 = female.

Figure 3.

*Indirect Association of Gender with the Tendency to Feel Safe Walking Alone at Night Through the Pathway of Perceived Interpersonal Safety, for Study 5.*

**Neighborhood Differences**

Individuals who resided in more urban areas reported a higher fear of crime: $F(2, 1218) = 11.52, p < .001, \eta^2 = .019$, and lower feelings of safety: $F(2, 1218) = 15.71, p < .001, \eta^2 = .025$. As expected, no significant difference was observed in safety confidence. Planned comparisons showed that these effects were attributable to the significant difference between urban and rural environments ($t$s ranging from 4.64 to 4.82, all $ps < .001$). For a closer look at the significant differences by neighborhood type, see Figure 4.
Figure 4.

*Bar Graph Depicting the Means of the Facets of Perceived Interpersonal Safety for the 3 Different Neighborhood Types. Error Bars Depict +/- 1 S.E. From the Mean*

Note: *p < .05, ***p < .001.

To examine how an individual’s neighborhood could influence their tendency to feel safe walking alone at night through the mechanism of PIS, we conducted a second indirect effect test (Figure 5). Neighborhood type (0 = urban, 1 = suburban, 2 = rural) significantly predicted increased PIS ($b = .17$, SE$b = .03$, 95% C.I. [.10, .23]), which in turn predicted an increased tendency to walk alone at night ($b = 1.37$, SE$b = .05$, 95% C.I. [1.27, 1.46]). Only the indirect effect was significant: $b = .23$, SE$b = .05$, 95% C.I. [.14, .32]. Once again to account for the correlational nature of our study, we reversed the outcome with the mediating variable. In this alternative model, the indirect effect was not significant, further supporting our claim.
Discussion

Our results highlight that there are both gender and neighborhood differences in PIS. Gender differences were observed for fear of crime and safety confidence. Feelings of safety did not differ as a function of gender, in fact the mean scores were nearly equal ($M_{\text{male}} = 5.69$, $M_{\text{female}} = 5.62$). Previous studies have not taken into consideration the importance of perceived interpersonal safety within settings that are familiar to an individual. Further, past research has also failed to consider the uniqueness of safety confidence—a facet which, aside from explaining gender differences in PIS, could potentially explain similar differences in aggression. Fear of crime and feelings of safety were impacted by neighborhood type differences, while safety confidence was not. This evidence suggests that environmental factors appear to matter more for feelings of safety and fear of crime, while safety confidence is a trait that is shaped by individual rather than external differences. Overall, we conclude that both individual (gender identity) and
environmental (neighborhood type) differences can influence subjective perceptions of safety.

**Study 6**

Our final study examined PIS across nations (USA, Germany, Greece, France, Spain), attempting to replicate our findings in a cross-national setting. We were also interested in whether safety would be perceived in a similar way across countries, allowing us to make a stronger claim about the generalizability of our findings. The nations included in the investigation were selected because of prior collaborations between the research teams.

**Method**

**Participants**

We conducted our investigation in the following countries: Germany (\( N = 153 \), 77% female, \( M_{age} = 29.80, SD_{age} = 12.46 \)), Greece (\( N = 213 \), 67% female, \( M_{age} = 22.58, SD_{age} = 4.23 \)), France (\( N = 674 \), 56% female, \( M_{age} = 24.53, SD_{age} = 6.87 \)), Spain (\( N = 292 \), 50% female, \( M_{age} = 35.90, SD_{age} = 12.29 \)), and USA (\( N = 312 \), 48% female, \( M_{age} = 35.73, SD_{age} = 11.33 \)). An online community sample was recruited in Germany. An online student sample and a Reddit sample were recruited for France and Spain respectively. We collected data via Reddit as it provides a cheap alternative method for recruiting data from international populations (Shatz, 2017). A student sample was recruited for Greece. For the United States, data collection was conducted on MTurk. Every country’s sample except Germany’s was comprised by two studies, an experimental and a correlational study. The experimental study was part of an unpublished project examining the effect of immigration movements on PIS, which did not yield any significant results by condition.
Thus we combined the sample across conditions. Participants who were not citizens of each respective country ($n=158$), and who were multivariate outliers were excluded from analyses ($n=5$).

**Materials and Procedure**

The 17-item PIS Scale, the TIPI, and several demographic questions were included. Prior to the commencement of the study the materials were translated and back-translated with help from the research team from the collaborating universities.

**Results**

*Perceived Interpersonal Safety Across Nations (Measurement Invariance)*

To ensure that any results from our multi-group comparison are not due to differences in the properties of the PIS Scale, but rather due to differences between groups, we tested for measurement invariance. In doing so, we were also ensuring whether PIS is construed similarly across nations. Measurement invariance is commonly assessed in a series of increasingly complex CFA models. The first (configural invariance) estimates a fully unconstrained model in which factor loadings and intercepts are freely estimated. If this requirement is met, the next model (metric invariance) is specified by estimating a partially constrained model in which factor loadings are constrained to be equal. If metric invariance is achieved, then a final model (scalar invariance) is estimated in which both the factor loadings and intercepts are fixed to be equal across groups.

We started by examining the factor model of the scale (configural invariance). EFAs for each country showed cross-loadings for three items; two from the Feelings of Safety subscale (“My family makes me feel secure” and “Being at home makes me feel...
protected”) and one from the Safety Confidence subscale (“The way I look makes me feel secure”). Excluding these items ensured no significant cross-loadings. We then formally assessed configural invariance by estimating CFA models. Overall, the fit was acceptable both with and without the three items that cross-loaded significantly. For two countries, the fit was just slightly better with the three items removed (ΔCFI = .01).

Table 11.

*Fit Indices for the Factor Model of the Perceived Interpersonal Safety Scale, for Studies 2-6.*

<table>
<thead>
<tr>
<th>Study/Sample</th>
<th>SRMR</th>
<th>RMSEA</th>
<th>CFI</th>
<th>NFI</th>
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</thead>
<tbody>
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<td>1. Study 2</td>
<td>0.06</td>
<td>0.06</td>
<td>0.95</td>
<td>0.92</td>
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<td>2. Study 3</td>
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<td>0.06</td>
<td>0.95</td>
<td>0.93</td>
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<tr>
<td>3. Studies 4A–4B</td>
<td>0.06</td>
<td>0.09</td>
<td>0.9</td>
<td>0.89</td>
</tr>
<tr>
<td>4. Study 4C</td>
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<td>0.09</td>
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</tr>
<tr>
<td>5. Study 4D</td>
<td>0.08</td>
<td>0.09</td>
<td>0.92</td>
<td>0.9</td>
</tr>
<tr>
<td>6. Study 5</td>
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<td>0.07</td>
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<td>0.93</td>
</tr>
<tr>
<td>7. Study 6: USA</td>
<td>0.05</td>
<td>0.06</td>
<td>0.97</td>
<td>0.94</td>
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<tr>
<td>8. Study 6: Germany</td>
<td>0.05</td>
<td>0.07</td>
<td>0.95</td>
<td>0.90</td>
</tr>
<tr>
<td>9. Study 6: Greece</td>
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<td>0.05</td>
<td>0.97</td>
<td>0.92</td>
</tr>
<tr>
<td>10. Study 6: France</td>
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<td>0.05</td>
<td>0.97</td>
<td>0.95</td>
</tr>
<tr>
<td>11. Study 6: Spain</td>
<td>0.05</td>
<td>0.05</td>
<td>0.97</td>
<td>0.92</td>
</tr>
</tbody>
</table>

*Note:* Studies 4C and 4D did not include two items from the Fear of Crime subscale, and thus were analyzed separately from Studies 4A and 4B. For Study 6, the fit indexes are derived from the model where 3 items were removed to account for their cross-loading.

We then tested for metric invariance by specifying a partially constrained model (i.e., factor loadings fixed to be equal, but intercepts are freely estimated). As a stricter criterion, we also tested for scalar invariance by specifying a fully constrained model (i.e., factor loadings and intercepts are fixed to be equal). Although extant research has used the change in Chi-Square to test for measurement invariance, given that findings have shown that it is sensitive to differences in sample size, we did not use it to evaluate...
our results (Chen, 2007). Instead, to evaluate our findings, we primarily followed recommendations by Chen (2007). Researchers specify that in unequal sample sizes between groups, a change of \( \leq .025 \) in SRMR and a change of \( \leq .010 \) in CFI indicate invariance (Cheung & Rensvold, 2002). We performed these analyses both for the full three factor model of the scale, and each individual subscale. These results are presented in Table 12. Overall, we found evidence for configural invariance, as the factor structure of both the 14-item and the 17-item scale presented good fit. Similarly, configural invariance was observed for the individual subscales as well. Support for metric invariance was also found for 14-item version of the scale. No evidence for scalar invariance was observed.

Table 12.

_Model Fit Comparisons for Perceived Interpersonal Safety Between the United States and the Four European Countries._

<table>
<thead>
<tr>
<th>Model</th>
<th>SRMR</th>
<th>ΔSRMR</th>
<th>CFI</th>
<th>ΔCFI</th>
<th>Decision</th>
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<td><strong>PIS (14 items)</strong></td>
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<tr>
<td>Configural invariance</td>
<td>.047</td>
<td>-</td>
<td>.967</td>
<td>-</td>
<td>Accept</td>
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<tr>
<td>Metric invariance</td>
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<td>.957</td>
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<td>Accept</td>
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<td>Scalar invariance</td>
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<td>-.036</td>
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<td><strong>PIS (17 items)</strong></td>
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<tr>
<td>Configural invariance</td>
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<td>-</td>
<td>.929</td>
<td>-</td>
<td>Mixed</td>
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<tr>
<td>Metric invariance</td>
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<td><strong>.012</strong></td>
<td>.916</td>
<td>-.013</td>
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<tr>
<td>Scalar invariance</td>
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<td>.878</td>
<td>-.038</td>
<td>Reject</td>
</tr>
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<td><strong>Fear of Crime (7 items)</strong></td>
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<tr>
<td>Configural invariance</td>
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<td>Metric invariance</td>
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<td>Scalar invariance</td>
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<tr>
<td><strong>Feelings of Safety (5 items)</strong></td>
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<td></td>
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<tr>
<td>Configural invariance</td>
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<td>.941</td>
<td>-</td>
<td>Accept</td>
</tr>
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<td>Metric invariance</td>
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<td><strong>.002</strong></td>
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<td>-.013</td>
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<td>-.150</td>
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<td><strong>Feelings of Safety (3 items)</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Configural invariance</td>
<td>.001</td>
<td>-</td>
<td>.999</td>
<td>-</td>
<td>Accept</td>
</tr>
</tbody>
</table>
Metric invariance  |  .062  |  .061  |  .969  |  -.030  |  Reject  
Scalar invariance |  .173  |  .111  |  .813  |  -.156  |  Reject  

Safety Confidence (5 items)  
Configural invariance |  .029  |  -   |  .986  |  -   |  Accept  
Metric invariance |  .061  |  .032  |  .977  |  -.009  |  Mixed  
Scalar invariance |  .115  |  .054  |  .937  |  -.040  |  Reject  

Safety Confidence (4 items)  
Configural invariance |  .019  |  -   |  .994  |  -   |  Accept  
Metric invariance |  .054  |  .035  |  .988  |  -.006  |  Mixed  
Scalar invariance |  .118  |  .064  |  .947  |  -.041  |  Reject  

Note: Bolded values highlight that specific invariance criterion was met.

Cross-National Reliability

With and without the three items that cross-loaded significantly, reliability was high for every facet, with the exception of the Feelings of Safety subscale. For this measure, reliability ranged from mediocre to acceptable across countries. We suspect that this could be partially attributable to some of the items of these scale being idiomatically phrased (e.g., “I feel at ease in familiar places.”).

Table 13.

Cronbach’s Alpha and McDonald’s Omega (in Parentheses) for the Facets of Perceived Interpersonal Safety for Every Study.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Fear of Crime</th>
<th>Safety Confidence</th>
<th>Feelings of Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Study 2</td>
<td>.91 (.91)</td>
<td>.83 (.85)</td>
<td>.70 (.69)</td>
</tr>
<tr>
<td>2. Study 3</td>
<td>.90 (.90)</td>
<td>.85 (.86)</td>
<td>.74 (.72)</td>
</tr>
<tr>
<td>3. Study 4A</td>
<td>.93 (.93)</td>
<td>.86 (.87)</td>
<td>.73 (.72)</td>
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<td>4. Study 4B</td>
<td>.93 (.93)</td>
<td>.86 (.86)</td>
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<td>5. Study 4C</td>
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<td>6. Study 4D</td>
<td>.92 (.92)</td>
<td>.84 (.84)</td>
<td>.73 (.73)</td>
</tr>
<tr>
<td>7. Study 5</td>
<td>.92 (.91)</td>
<td>.86 (.87)</td>
<td>.75 (.72)</td>
</tr>
<tr>
<td>8. Study 6: USA</td>
<td>.92 (.92)</td>
<td>.85 (.86)</td>
<td>.80 (.80)</td>
</tr>
<tr>
<td>9. Study 6: Spain</td>
<td>.89 (.89)</td>
<td>.79 (.80)</td>
<td>.60 (.57)</td>
</tr>
<tr>
<td>10. Study 6: Greece</td>
<td>.86 (.85)</td>
<td>.78 (.80)</td>
<td>.57 (.56)</td>
</tr>
<tr>
<td>11. Study 6: Germany</td>
<td>.88 (.89)</td>
<td>.80 (.83)</td>
<td>.76 (.75)</td>
</tr>
<tr>
<td>12. Study 6: France</td>
<td>.90 (.90)</td>
<td>.79 (.79)</td>
<td>.61 (.58)</td>
</tr>
</tbody>
</table>

Note: Study 1 was not included as the factor model of the measure was not yet fully formed. For Study 6 estimates with the cross-loading items are displayed.
Perceived Interpersonal Safety and Personality Across Nations

To examine the association between PIS and the different personality facets across the four countries traits we conducted bivariate correlations. Results in the European countries primarily replicated the association between every facet of PIS and emotional stability. Results in the United States replicated the findings from Study 2.

Table 14.
Bivariate correlations for each country.

<table>
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<th></th>
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<th>EX</th>
<th>AG</th>
<th>CS</th>
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<tr>
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<tr>
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<td>.13***</td>
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<td>-.23***</td>
<td>.20***</td>
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</tbody>
</table>
Gender Differences

When examining the combined European sample (excluding the United States), women scored significantly higher in fear of crime, $F(1330) = 109.57, p < .001, \eta^2 = .076$, and significantly lower in safety confidence: $F(1330) = 84.88, p < .001, \eta^2 = .061$. For the combined sample women also scored significantly lower than men in their feelings of safety, unlike our previous study: $F(1, 1335) = 12.67, p < .001, \eta^2 = .009$. This effect was both smaller compared to the other facets, and, when examining the countries individually, there was no significant difference for three out of the four countries, with France only exhibiting a significant difference: $F(1, 673) = 15.69, p < .001, \eta^2 = .023$.

To examine the indirect effect of gender on an individual’s capacity to feel safe while walking alone at night through the pathway of PIS, we conducted an indirect effect test directly matching that of Study 5 (see Figure 6). Gender (male = 0, female = 1) significantly negatively predicted PIS (combined mean of fear of crime [reversed], safety confidence and feelings of safety): $b = - .52, SEb = .05, 95\% C.I. [- .61, -.43], p < .001$, which in turn significantly positively predicted the tendency to feel safe walking alone at night, $b = 1.19, SEb = .04, 95\% C.I. [-1.04, -.74], p < .001$. Both the direct, $b = -.89, SEb = .08, 95\% C.I. [-1.04, -.74] p < .001$, and the indirect effect, $b = -.62, SEb = .08, 95\% C.I. [-.73, -.51]$, were significant. When reversing PIS with the tendency to feel safe walking alone at night, the indirect effect was significant but seemingly weaker, $b = -.44, SEb = .03, 95\% C.I. [-.51, -.38]$.  

<table>
<thead>
<tr>
<th></th>
<th>CS</th>
<th>.16***</th>
<th>.02</th>
<th>-.24***</th>
<th>.09</th>
<th>.42***</th>
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</tr>
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<td>.17**</td>
<td>-.33***</td>
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<td>.48***</td>
<td>.46***</td>
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<td>OP</td>
<td>.26***</td>
<td>.06</td>
<td>-.22***</td>
<td>.22***</td>
<td>.36***</td>
<td>.32***</td>
<td>.26***</td>
</tr>
</tbody>
</table>

Note: $N_{Spain} = 292, N_{Greece} = 216, N_{Germany} = 154, N_{France} = 674, N_{USA} = 312$. FS = Feelings of Safety, SC = Safety Confidence, FoC = Fear of Crime, EX = Extraversion, AG = Agreeableness, CS = Conscientiousness, ES = Emotional Stability. *$p < .05$, **$p < .01$, ***$p < .001$.  


Figure 6.

*Indirect Association of Gender with the Tendency to Feel Safe When Walking Alone at Night Through the Pathway of Perceived Interpersonal Safety for the Combined European Sample of Study 6.*

**Discussion**

In four European countries, perceptions of safety were to some degree similar to those from the United States, with the factor structure of the PIS Scale being replicated across these countries. PIS appears to be a multidimensional construct that can be measured across Western countries, with some degree of similarity in its association with emotional stability. Importantly, women from four European countries reported more fear of crime and less safety confidence, replicating the patterns observed in the US.

**General Discussion**

How safe we feel is a key issue in several aspects of our life. Politicians often talk about safety as a means to gain public support and mobilize the masses (e.g., The Washington Post, 2020). Further, prominent social issues such as police brutality and systemic racism are conflated with our perceptions of safety. Inspired by both real-world events and past theoretical arguments, the aim of this paper was to reignite interest in the
scientific study of *perceived interpersonal* safety. Perceived interpersonal safety, in brief, is how safe people report feeling around others, and/or in social environments. Despite such a simple definition, this construct is multidimensional and complex, a claim that has been substantially supported by the current studies. In the current investigation, three major components have been empirically identified as reliable and valid facets of perceived interpersonal safety: *Fear of Crime, Safety Confidence, Feelings of Safety.*

**Fear of Crime**

Criminologists have studied this construct extensively and have discussed how it can at times be as important as actual crime rates (Collins, 2016). Fear of crime captures self-reported fears of victimization, providing individuals with the opportunity to express their own perspective, which could be different and sometimes more informative than crime trends in a neighborhood. Fear of crime was associated with a greater attribution of causality to events to others (or alternatively less to oneself), which is an important predictor of psychological and physical health. Further, fear of crime was negatively correlated with personality traits such as emotional stability (across all five nations tested), extraversion, and openness, while being positively correlated with depression and borderline personality, further demonstrating its potential to undermine an individual’s well-being. First-person accounts of how afraid of crime people feel allow for psychological examinations of how this construct impacts other aspects of their lives, something that crime rates cannot do in such a straightforward manner. Further, as previous researchers have suggested, such reports can be summarized at a neighborhood or even a national level, creating an informative index that can be utilized in scientific investigations (Stiglitz et al., 2009).
Safety Confidence

Safety confidence is an individual’s tendency to feel confident in their ability to feel safe in the face of threat. It seems logical that one’s trust in their capacity and skills to protect themselves should be directly related to their safety. However, this is the first study that considers safety confidence to be an underlying facet of PIS. Safety confidence was positively associated with increased emotional stability, extraversion, and openness, showing that individuals who exhibit this trait are more confident and outgoing, while individuals scoring lower on this construct tended to score higher on negative life outcomes. Our studies showed that men and women significantly differ in safety confidence, more so than any other facet of PIS. This could be attributed to both biological and sociocultural differences. Changing cultural and social norms regarding the perception of women, such as hostile and benevolent sexism (Devine et al., 2017), could increase safety confidence in women, which could reduce the gap in PIS (directly) and related outcomes (indirectly).

Feelings of Safety

Most people tend to spend a considerable amount of time in familiar environments (Bureau of Labor Statistics, 2018), which tend to be devoid of direct threats. Feelings of safety serve as a baseline marker of PIS, which could explain why no gender differences were observed in our studies. Nevertheless, stressors to this type of interpersonal safety could potentially exist. One such factor that can decrease feelings of safety in familiar environments is intimate partner violence (CDC, 2020). Increased feelings of safety were associated with decreased negative life outcomes, and with more constructive personality traits. Differing from the other two facets of safety, however, is
the association of feelings of safety with positive life outcomes. Feelings of safety was the sole significant correlate of life satisfaction, self-flourishment, and subjective happiness, showing its importance for living a fulfilling and satisfying life. Further, these findings also support Maslow’s theory about the role of safety in our lives (1943).

**Multidimensionality of Perceived Interpersonal Safety**

Our results suggest that PIS is multidimensional. This conclusion comes along with multiple replications with different types of samples (online, student, community and international), multiple types of validity (face, construct, convergent, discriminant, external, predictive) and good reliability, even across the span of one year. We theorized that the single-item measure “I feel safe when walking alone at night” captures (safety aspect of) walkability rather than safety in day-to-day life, a claim that our indirect effect tests for gender and neighborhood type supported. Using a single-item measure fails to capture enough variability (that is clearly depicted by the PIS Scale), does not match the complex and multidimensional character of the construct, and due to the sheer lack of number of items, is less reliable. Further, when we compared the validity of the single-item measure of safety with that of the facets of PIS, the single-item measure performed worse. In a scientific era where the replicability crisis has casted doubt on many social psychological findings, utilizing a more accurate measure to capture variance on a construct that is clearly impactful on our society will help researchers, practitioners, and policymakers in their work by increasing the accuracy in assessments of PIS, and allowing for an anthropocentric account of public safety.

**Limitations and Future Directions**
Our investigation was not without limitations. First of all, our samples were White, Western, educated, industrialized, rich and democratic (WEIRD; Henrich et al., 2010). Consequently, the racial/ethnic composition of our samples did not allow us to consider some crucial factors that arguably influence PIS, which disproportionately impact racial/ethnic minorities. Consequently, the current investigation fails to address the question of whether there are racial differences in PIS, an inquiry that future studies should rectify. Considering this, future research should aim to focus on recruiting people of color with the purpose of determining whether: (1) PIS is construed similarly across different racial and ethnic groups, (2) there exist differences in PIS due to the aforementioned stressors that people of color experience, (3) whether external factors (i.e., trust in the police, government, social cohesion of one’s living environment) relate to PIS in the same way, and (4) whether PIS is an important antecedent to psychological and physical health outcomes.

Recent evidence has suggested that PIS seems to be more closely related to positive life outcomes in Western but not Eastern societies (Syropoulos, 2020). These claims need to be re-examined with more comprehensive measures, such as the three facets of safety introduced in this investigation. Such an investigation would also address another limitation of our study, namely the overreliance on Western European and American samples. In the United States, racial and ethnic minorities experience prejudice and discrimination (Pew Research Center, 2016), microaggressions (Williams, 2019), and violence (Browning et al., 2017) to a greater degree than White Americans do in their lives. For example, Latinos experience disproportionate rates of gun violence relative to other demographics (Violence Policy Center, 2021). Hate crimes against Asian
Americans have increased since the onset of the COVID-19 pandemic (Jeung et al., 2021) with some findings suggesting that 3 in 10 Asian Americans have experienced discrimination on the basis of their race in relation to the COVID-19 pandemic (Ruiz et al., 2020). Black people face violence in the hands of the police at a higher rate than other demographic groups (Edwards et al., 2019), which has caused a racial divide in fear of the police (Pickett et al., 2022). People of color also face discrimination in their employment and housing opportunities (among other fields; for a review see Pager & Shepherd, 2008). As a result of these stressors, being a person of color in the U.S. could coincide with experiencing greater fear for one’s life and subsequently decreased perceptions of safety, leading to overall less psychological well-being.

A final important limitation is the correlational nature of our research. Although we provided evidence for a significant relationship between PIS and a host of important life outcomes and individual differences (i.e., personality traits, well-being, mental health, perceptions of self and the police), it is unclear which construct is driving these relationships. Future studies should use experimental methods to investigate the potential feedback loop that can occur between PIS and major life outcomes (i.e., if we feel safer, do we feel happier? or, if we feel happier, do we feel safer?).

Investigations on PIS could stand to benefit from interdisciplinary approaches. Fields such as public health, sociology, criminology, psychology, and even political science have a lot to gain from further exploring the impact of PIS on different aspects of our lives. Even within psychology, it is clear that research on PIS can generate important questions in several fields. Community and environmental psychology can investigate the interaction of built and living environments with subjective perceptions of safety.
Research on close relationships can determine how high-quality and meaningful relationships impact and are impacted by how safe we feel in our lives. Further, it would also be important to determine how attachment style, relationship conflict and intimate partner violence shape how safe we feel in our lives. Research from the perspective of intergroup conflict could examine how feeling less safe can exert negative downstream effects on intergroup attitudes and national identification. Work from a positive and/or health psychology perspective can elucidate the potential bidirectional relationship between perceptions of safety with better physical and mental health and vice versa (from improved physical and mental health to increased PIS). Finally, research from personality psychology could further illuminate how our PIS influences or is influenced by different personality traits. Aside from replicating current results with more comprehensive measures of the BIG-5 personality traits, researchers could also explore the relationship between the facets of PIS and the dark triad (Furnham et al., 2013), personal values (Schwartz et al., 2012) and primal beliefs (Clifton et al., 2019).

Ultimately, with issues such as police brutality, calls for the defunding of the police, systemic racism, gun control, and mass shootings, creating alternative ways to ensure people feel safe and understanding the consequences of the presence or absence of safety in people’s lives should be a major focus of social science research. The PIS Scale can be utilized to assess how safe we feel, enhance our understanding of what it means to really feel safe, and ultimately assist in the process of constructing interventions to deal with such stressors with the end goal of making our society a safer and more peaceful place.
Transition to Chapter 3

Chapter 2 finds consistent evidence for the multidimensional nature of perceived interpersonal safety. Two of the three facets of IPS have received some empirical attention in prior research. The facet that stands to benefit the most from further investigation is feelings of safety. This facet captures how safe people report feeling in familial and relatively safe environments (e.g., their residence, near their family or friends, or during the day). The next chapter seeks to address what the consequences/benefits of living in a subjectively safe environment are.

Our goal is to determine the degree to which scores on the facet of feelings of safety relate to self-reports of mental and physical health. To do that, we surveyed emerging adults, adolescents and their parents during the early onset of the COVID-19 pandemic, a time of high uncertainty, where individuals were confined to their households, which could potentially make the study of how safe they feel in such familiar environments all the more relevant. Thus, Chapter 3 seeks to address Goal #2, namely *chart how perceived interpersonal safety relates to indicators of physical and mental health.*
CHAPTER 3

PERCEIVED INTERPERSONAL SAFETY AND ITS ASSOCIATION WITH MENTAL AND PHYSICAL HEALTH ACROSS DEVELOPMENT

Feeling physically safe is an important antecedent of living a happy life (Syropoulos, 2020). Work from the perspective of Social Safety Theory (Slavich, 2020) suggests that humans inhabit safety circles (i.e., our family, our neighborhood, etc.) and that within these circles, objective experiences of threat such as physiological stress can influence our physical and mental health. However, little work has examined whether subjective perceptions, rather than objective experiences of physical safety, can also influence health outcomes.

In the current investigation, we focus on the role of perceived interpersonal safety (i.e., how safe we feel close to other people and/or in social environments) as a potential mechanism which could influence emerging adults’ mental and physical health during the COVID-19 pandemic. Our focus is on adolescents’ and emerging adults’ immediate environment (i.e., the places and people they see every day), as that is the context in which feelings of safety might matter the most. We also consider whether parental perceived physical safety can also potentially act as a safeguard against stressors to adolescents’ mental and physical health. We argue that perceived physical safety is an important factor worthy of attention as families have been forced to spend considerably more time at home as a result of the pandemic, and thus ensuring that an adolescent feels safe can potentially alleviate some of the mental and physical health stressors caused by the pandemic.

Mental and Physical Health During COVID-19
The COVID-19 pandemic is impacting individuals’ health in various ways. Contracting the virus, can result in severe physical health outcomes, including death. For adolescents specifically, evidence has emerged suggesting that stress caused by the pandemic has greatly influenced their mental health. Similar evidence has been found with emerging adults. For example, recent work suggests that adolescents experienced increased depression and anxiety symptoms during the pandemic (Cohen et al., 2021). In a longitudinal investigation, anxiety and depression scores during the pandemic for adolescents were significantly higher than estimated trajectories from previous years of the study (De France et al., 2021). The same investigation highlighted that deviating from one’s personal trajectory coincided with increased levels of perceiving that one’s lifestyle was impacted by the pandemic.

**Perceived Interpersonal Safety as a Protective Mechanism for Physical and Mental Health**

The stressors related to the COVID-19 pandemic could potentially be alleviated (or exacerbated) if adolescents and emerging adults feel (un)safe at their home. We argue that although feelings of safety are important for all people, they may be particularly important for adolescents and young adults who are transitioning from a developmental stage which emphasizes reliance on one’s parents to one that places emphasis on individual autonomy (Suleiman & Dahl, 2019). Additionally, adolescence is a developmental stage characterized by heightened sensitivity to stress (Dahl & Gunnar, 2009), suggesting that stressors that target one’s sense of safety may have a greater impact during this period. Despite the limited work available on the influence of subjective perceptions of safety in our lives, research on the impact of close relationships...
as a buffer to stressors of physical health (Pietromonaco et al., 2013) can inform the direction of our hypotheses, supporting an association between increased PIS and better mental and physical health.

**Relationships and Health**

Previous research has linked parent’s experiences and their adolescent’s mental health outcomes (e.g., Mercado et al., 2019), thus, we propose that how safe parents feel could influence their adolescents’ physical and mental health. This effect may be amplified when parents and adolescents are forced to stay at home due to the ongoing COVID-19 pandemic. Such theorizing reinforces the notion that potentially how safe caretakers feel in their day-to-day life could also influence the mental and physical health of adolescents. For example, if an adolescent is nested in an environment in which their caretakers do not feel safe, it is likely that the adolescent will not feel safe. The potential for members of a family to influence each other’s psychological and health outcomes has been documented across development (Chen et al., 2017). Studies within this realm have proliferated since the introduction of the Actor Partner Interdependence Modeling technique (APIM, Cook & Kenny, 2005), which are often frequently used in investigations of parent-child relationships (e.g., Milan & Carlone, 2018), as they test both actor (e.g., child) and partner (e.g., parent) associations with child outcomes. In these studies, there are often significant partner effects of parents on their children. Thus, we also propose that elevated parental perceptions of safety, could exert a direct influence on the mental and physical health of their adolescents.

To better understand the role that PIS plays, we turn to recent theoretical advances guided by Social Safety Theory. According to Social Safety Theory, we are embedded in
different spheres of influence, termed by Slavich as “social safety circles” (Slavich, 2020). These circles influence our health and behavior directly, by exposing or preventing exposure to stressors. They also influence health outcomes indirectly, via larger and more abstract factors such as messages or norms, policies, or environmental influences that in turn influence the social safety circles surrounding us. Work from the perspective of Social Safety Theory has focused on objective experiences of threat such as physiological stress, but not on subjective perceptions. It is possible that subjective perceptions of physical safety could also exert a similar effect on individuals’ lives. Although direct evidence on the matter is scarce (e.g., Syropoulos, 2020), evidence from constructs that are related to (increased) perceptions of safety support the argument that PIS could be an important mechanism for better physical and mental health outcomes. For example, a meta-analysis of 148 studies suggests that being well-integrated socially is related to a lower mortality risk (Holt-Lunstad & Smith, 2010). Since interpersonal safety focuses on how safe we feel in social environments, around others, it is possible that being socially integrated could be a predictor of interpersonal safety. Similar results were found in a more recent meta-analysis, which focused on social belonging and its buffering influence on inflammatory markers (Uchino et al., 2018). Feeling safe both within the confines of a relationship (expressed as a secure attachment; Simpson & Rholes, 2017) as well as within our lives in general (Syropoulos, 2020) could potentially exert a similar effect on mental and physical health.

**Studies 1A-1B**

The current studies examined the influence of PIS on mental and physical health outcomes across developmental periods. Our focus was primarily on adolescence and
emerging adulthood as these are the developmental stages during which reliance on one’s parents begins to shift towards reliance on oneself. We hypothesized that for both of these developmental stages, greater PIS would be related to better mental and physical health outcomes. We further investigated whether for adolescents specifically, how safe their parents feel, could also positively influence their mental and physical health (i.e., having a significant partner effect). We investigated this research question in two samples. The first was correlational and focused on emerging adults, and the second employed a dyadic design, with parent-adolescent dyads surveyed across the span of five weeks.

Method

Participants

Study 1A was conducted in a sample of emerging adults, obtained from a large public university, during April 2020. Participants received academic credit in exchange for their participation. The sample was comprised of 123 undergraduate students ($N_{female} = 100; N_{male} = 17; N_{non-binary} = 6; N_{white} = 65; N_{BIPOC} = 47$). The average age was 20.75 years (SD = 1.40). No participants were excluded from the analysis.

Study 1B was conducted by recruiting families from northeastern states in the United States, via (online and school) advertising; families received remuneration for their participation. The study employed a longitudinal design lasting 5 weeks (lasting April-June 2020). The aim of the second study was to extend research questions to a younger population and employ a dyadic research design to examine dyadic processes. A total of 77 dyads were recruited. Forty-four of the adolescents were female, 28 were male, and 2 identified as non-binary or transgender. Most of the adolescents ($n = 57$) were white, while 22 were BIPOC$^2$. The average age was 16.20 (SD = 1.22). Parents
mostly identified as female \((n = 63)\) and the rest were male \((n = 14)\). In terms of race, 56 identified as white, and 21 as BIPOC. For adolescents, 7 identified as Black or African American, 8 as Asian, 2 as American Indian, 5 as Latinx/Hispanic. For parents, 6 identified as Black, 8 as Asian, 3 as American Indian, 3 as Latinx/Hispanic, and 1 as some other race/ethnicity. The average age was 48.89 \((SD = 6.16)\).

**Measures**

All measures included in both studies were self-reports and had good reliability \((\alpha\)s ranging from .70 to .94, Median \(\alpha = .87\), Mean \(\alpha = .86\)\). For detailed information about the reliability of each measure in each study, see the Supplementary Materials.

**Perceived Interpersonal Safety**

For both studies, perceived physical safety in day-to-day life was captured with the Feelings of Safety Scale (masked for review). This five-item scale captures subjective feelings of safety with a focus on how safe people feel in familiar environments (e.g., “Being at home makes me feel protected”). For Study 1B, this measure was displayed only at Week 1. To measure feelings of safety, the mean score of the five items was calculated.

**Mental Health Outcomes**

**Depression.** Depression was measured in Study 1A and Week 1 of Study 1B with the Center for Epidemiologic Studies Depression-20 Scale (CESD-20; Radloff, 1977). For weeks 2-5 in Study 1B, depression was measured with the 10-item version of the CESD (Andresen et al., 1994). For both measures of depression, scores ranged from 0 = rarely or never, to 3 = all of the time. Scores were calculated by averaging the scores from the 20 and 10 items respectively.
Stress. Stress was measured in both studies, but only in week 1 in Study 1B. For both studies the 10-item Perceived Stress Scale was used (PSS, Cohen & Williamson, 1988). Scores ranged from 1 = never to 5 = very often. To measure stress, the sum of the 10 items was estimated.

Anxiety. In all timepoints, anxiety was measured with the seven-item Generalized Anxiety Scale (GAD-7; Spitzer et al., 2006), a sum score was created using all items. Scores ranged on a 0-3 scale, with 0 = not at all, and 3 = nearly every day.

Loneliness. We measured loneliness in Study 1A and Week 1 of Study 1B with the revised 20-item UCLA Loneliness Scale (Russell et al., 1980). For weeks 2-5 in Study 1B loneliness was captured with the eight-item version of the scale (Roberts et al., 1993). For both studies, we calculated the average across all items. Scores ranged from 1 = never to 4 = always.

Physical Health

For Study 1B, we measured the presence of upper respiratory infection (URI) symptoms, as the Coronavirus disease directly impacts this system. To capture such symptoms, a 19-item inventory developed by Cohen and colleagues (2003). At each timepoint, the sum of these scores was calculated, which were captured on a 1-4 scale with answers ranging from: 1 = absent, 2 = mild, 3 = moderate, 4 = severe.

Results

Analytic Procedure

Detailed descriptive statistics and reliability estimates (within each timepoint) are presented in the Supplementary Materials (Tables S1-S2). All analyses were conducted in SAS v.9.4. We first estimated bivariate correlations. To examine the potential effects of
parent’s perceived physical safety on their adolescent offspring (and vice versa) we computed Actor Partner Interdependent Models (APIM). These analyses account for a participant’s dependency as a member of a dyad (Kenny et al., 2006). A separate APIM model was estimated for each outcome (5 models total). In these models a participant’s predictor may influence their own outcome (actor effect) or the other member of the dyad’s outcome (partner effect). Our dyads were distinguishable (adolescents and parents) which resulted in the calculation of two actor and partner effects. For Study 1B, parent’s and children’s safety scores were positively correlated: \( r = .20, p < .001 \).

**Association of Perceived Physical Safety with Mental and Physical Health**

Both for emerging adults in Study 1A, as well as adolescents and parents in week 1 of Study 1B, higher safety scores related to better mental health outcomes (see Table 15). In detail, across all age ranges, higher scores in perceived physical safety were related to less generalized anxiety, loneliness, depression and stress. For parents, a significant negative association was observed for URI symptoms as well, with this association being marginally significant in adolescents.

Table 15.

*Bivariate correlations for emerging adults and for adolescents and parents (only for Week 1).*

<table>
<thead>
<tr>
<th>Perceived Physical Safety for</th>
<th>Generalized Anxiety</th>
<th>Loneliness</th>
<th>Depression</th>
<th>Stress</th>
<th>URI Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerging adults</td>
<td>-.20*</td>
<td>-.35***</td>
<td>-.27**</td>
<td>-.30**</td>
<td>--</td>
</tr>
<tr>
<td>Adolescents</td>
<td>-.40***</td>
<td>-.52***</td>
<td>-.46***</td>
<td>-.46***</td>
<td>-.21†</td>
</tr>
<tr>
<td>Parents</td>
<td>-.28*</td>
<td>-.52***</td>
<td>-.41***</td>
<td>-.26*</td>
<td>-.36**</td>
</tr>
</tbody>
</table>

**Note.** †\( p=.07, *p<.05, **p<.01, ***p<.001 \). “--” = measure not included.
Effects of Parent’s Perceived Physical Safety on Adolescents’ Health

For detailed results see Table 16.

Actor Effects

Controlling for the effects of parental levels of physical safety, adolescents’ own levels of perceived physical safety were associated with significantly less depression, loneliness, anxiety, stress, and URI symptomatology. Controlling for the effects of their adolescents’ levels of physical safety, parents’ perceived physical safety was associated with significantly less depression, loneliness, anxiety and URI symptomatology. Associations with stress were trending but did not reach significance. Importantly, the association between perceived physical safety and anxiety became significantly stronger across time for adolescents, such that perceived physical safety related to even less anxiety across the duration of the study (i.e., significant actor*time effect).

Partner Effects

Significant partner effects emerged only (as expected) for parents in line with the hypothesized buffering effect of parents’ levels of perceived physical safety. Controlling for an adolescent’s own levels of perceived physical safety (i.e., actor effect), increased parental perceived physical safety was associated with significantly lower levels of loneliness, depression, and URI symptomatology for their adolescent. Namely, the safer parents felt, the lower the adolescents’ scores were on loneliness, depression, and URI symptoms.
Table 16.

Longitudinal Actor Partner Interdependence Models (LAPIMs) for the effect of adolescents’ and parents’ perceived physical safety on their own (actor) and other member of the dyad (partner) levels of mental and physical health. For outcomes pertaining to adolescents, partner effects refer to the effect of parents’ levels of perceived physical safety on the adolescents’ outcome variables (and vice versa for parents).

<table>
<thead>
<tr>
<th>Outcome Measures</th>
<th>Safety Predictors for Adolescents</th>
<th>Safety Predictors for Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actor* Time</td>
<td>Partner* Time</td>
</tr>
<tr>
<td>Generalized Anxiety</td>
<td>( b = -3.88^{***} ) SE = 0.93</td>
<td>( b = -0.21 ) SE = 0.52</td>
</tr>
<tr>
<td>Loneliness</td>
<td>( b = -0.40^{**} ) SE = 0.08</td>
<td>( b = -0.14^{*} ) SE = 0.06</td>
</tr>
<tr>
<td>Depression</td>
<td>( b = -0.38^{***} ) SE = 0.24</td>
<td>( b = -0.14^{**} ) SE = 0.05</td>
</tr>
<tr>
<td>Stress (Week 1)</td>
<td>( b = -5.39^{***} ) SE = 1.05</td>
<td>( b = 1.68 ) SE = 1.06</td>
</tr>
<tr>
<td>URI Symptoms</td>
<td>( b = -3.13^{*} ) SE = 1.58</td>
<td>( b = -1.99^{*} ) SE = 0.83</td>
</tr>
</tbody>
</table>

Note. *p \leq 0.05, **p < 0.01, ***p < 0.001. “--” = measure only captured in week 1.

Discussion

The aim of the current investigation was to determine the association of PIS on mental and physical health and examine the potential influence of family members' sense of safety on one another’s health outcomes. Our focus was primarily on adolescence as this stage marks a crucial transition from reliance on others to autonomy while also being marked by elevated stress sensitivity (Dahl & Gunnar, 2009). Our results suggest that PIS was associated with decreased mental and physical health symptoms. We found that the safer participants felt, the lower their scores on loneliness, anxiety, stress, depression, and lower URI symptomatology were. Importantly, these findings were observed during a
time when the COVID-19 pandemic was an active stressor, and in which participants had to spend considerably more time at home to decrease the spread of the virus. This unique context could have elevated the importance of perceived physical safety, especially in day-to-day environments, as most families were under stay-at-home orders. In addition, our results suggest that for adolescents, the safer their parents reported feeling, the lower their scores on loneliness, depression, and URI symptomatology. This provides partial support for our hypothesis that elevated levels of PIS from parents can also be protective for adolescent’s mental and physical health, even after controlling for adolescent’s own levels of PIS.

From a theoretical perspective, our study expands upon previous arguments that highlight the potential influence that parents can exert on adolescent’s health. Although past work has examined safety within the confines of close relationships (through the lens of a secure attachment), or through the experience of stressors (e.g., ACEs) very few studies have looked at subjective perceptions of physical safety during adolescence or emerging adulthood. Our investigation suggests that the degree to which an adolescent and their parents feel safe, much like past arguments for social safety and social safety threats, relates to their mental and physical health. Ensuring that adolescents feel safe during times of unpredictable and uncontrollable stress (e.g., a health pandemic), could protect youth against the deleterious effects that such phenomena have on their mental and physical health. Further, ensuring that parents also feel safe could also protect adolescents by decreasing their levels of depression and physical symptomatology.

Our study was not without limitations. Our sample sizes were relatively small, which might have masked weak to moderate associations that with a larger sample size
might have been significant. The timing of our study (i.e., during the onset of the COVID-19 pandemic) as well as the costs associated with recruiting families for dyadic studies limited our ability to recruit a bigger sample. Despite this limitation, we believe that our investigation advances extant work.

In conclusion, thinking back to the fundamental argument that safety is a primary human need (Maslow, 1943), we wish to reiterate the importance of not only being safe, but also feeling safe. Our results suggest that regardless of our developmental stage, feeling safe could influence our mental and physical health, and that for specific developmental stages such as adolescence, how safe close partners feel (parents) might also have an important influence on the well-being of those directly dependent on those partners (i.e., adolescents).

**Transition to Chapter 4**

Chapter 3 suggests that how safe people report feeling in familiar environments, in their day-to-day life and near others relates to better mental and physical health outcomes. By establishing a correlational link between increased PIS and better mental health outcomes a first step towards showcasing the validity and utility of PIS is taken. However, what remains unanswered is what makes people feel more/less safe in their lives?

To answer this question, we turn to literature on close relationships. We consider the possibility that both individual differences that hold explanatory power in how people approach close relationships, namely their patterns of (secure) attachment, as well as the quality of their close relationships, should both play an important role in shaping how
safe people report feeling. Chapter 4 focuses on secure attachment as an antecedent of increased perceived interpersonal safety, as the primary function of the attachment system is to ensure the safety and security of a person, so that they can safely explore the social world. By investigating this research question, we are addressing Goal #3, namely understanding the influence of close relationships on perceived interpersonal safety.
CHAPTER 4

SECURE ATTACHMENT AS AN ANTECEDENT OF PERCEIVED INTERPERSONAL SAFETY: EVIDENCE ACROSS THREE DEVELOPMENTAL STAGES

Attachment theory (Bowlby, 1973, 1980, 1982) proposes that humans possess an innate psychobiological system (the attachment behavioral system), which motivates us to seek comfort and security in others (attachment figures). One of the primary functions of the attachment system is to ensure our safety and security, so that we can safely explore the world and form meaningful bonds with others (Mikulincer & Shaver, 2003). Considering this foundational aspect of the attachment system, we theorized that secure attachment should therefore be associated with feelings of interpersonal safety in day-to-day life. We tested this possibility relying on both correlational and longitudinal findings, examining this phenomenon across different developmental stages, both in terms of adult/romantic and parental attachment, in majority White and Hispanic/Latino samples.

Attachment Theory: An Overview

Starting in infancy, the presence or absence of caregivers (i.e., attachment figures), and the quality of caregiver’s responses to one’s needs, influence the formation of their attachment style. A caregiver who is readily available and responds to a child’s needs in a sensitive manner, facilitates that child’s development of a secure attachment style. Conversely, the absence of/rejection from an attachment figure often promotes a more insecure attachment style. Insecure attachment in turn can lead to prolonged insecurity in relationships across the lifespan. Even though attachment style is perhaps
most relevant during infancy and childhood, its importance is not diminished in later stages of life (Mikulincer et al., 2005).

Attachment theory has generally been conceptualized via two (orthogonal) dimensions, attachment avoidance and attachment anxiety (for a review see Mikulincer & Shaver, 2003). Attachment avoidance pertains to a person’s tendency to distance from and express distrust towards an attachment figure. Conversely, attachment anxiety refers to a person’s expressed worry and concern over the availability of their partner. Scoring low on both dimensions is often described as possessing a secure attachment style, while scoring high on both is often discussed as an insecure attachment style.

**Influence of Attachment Style on the Self**

Attachment theory was originally created to explain the formation of bonds between infants and their caregivers. However, its scholars posited that as a system, it has enduring consequences "from the cradle to the grave" (Bowlby 1994 p. 129). This notion was further explored in the late 20th century as researchers began using this framework to explain differences in outcomes in adult relationships (e.g. Rubenstein & Shaver, 1982; Shaver & Hazan, 1987). This is evident by the plethora of findings that highlight the impact of (in)secure attachment on individuals mental and physical health. Results from meta-analyses suggest that insecure attachment relates to increased Borderline Personality Disorder symptomatology (Smith & South, 2020), depression (Zheng et al., 2020), post-traumatic stress (Woodhouse et al., 2015), and less symptomatic recovery from psychotic disorders (van Bussel et al., 2021). Furthermore, those with an insecure attachment style also display greater aggression (Ogilvie et al., 2014; Velotti et al., 2020), engage in risky behaviors more frequently (e.g., Kim & Miller, 2020), and report less
resilience (Rasmussen et al., 2018). In fact, the attachment system has been conceptualized as a central framework for understanding biopsychosocial processes and key physical health outcomes (see Pietromonaco et al., 2013 for a review).

Further empirical evidence suggests that our attachment style can also influence reactions to various stressful events, such as fear of personal death, war-related stressors, and chronic pain (Mikulincer & Florian, 1998). Attachment anxiety in particular has been found to predict behavioral responses to threats above and beyond personality traits (Ein-Dor et al., 2011). Clearly, the influence of the attachment system on our mental and physical health has been widely charted. However, the degree to which attachment styles can influence how safe one feels, especially outside the scope of close relationships, has not received as much attention. Since from its early conceptualization, attachment theory was speculated to have such a capacity to shape our reactions to phenomena that fall outside the scope of our close relationships (Ainsworth, 1989). Consequently, our attachment style could also exert a strong influence on how safe we feel in our lives.

**Attachment Style and Subjective Perceptions of Interpersonal Safety**

The primary function of the attachment system is to ensure the safety and security of a person, so that they can safely explore their social world. Thus, we theorize that secure attachment will relate to increased perceptions of safety in day-to-day life. We theorize this link based on arguments stemming from Social Safety Theory (SST, Slavich, 2020). SST suggests that creating and maintaining social bonds is crucial to our existence. The maintenance of social bonds can also influence the appraisal of threats to our social safety (Slavich, 2020). This argument stems from evidence which highlights that our relationships are vastly influential for our survival (Ainsworth et al., 1978).
Another core postulate is that as humans, we have an innate need to feel socially connected to others (Baumeister & Leary, 1995). SST also suggests that due to the nature of our society we are embedded in different circles of existence (termed social safety circles). These circles are concentric, with spheres of existence closer to the person (i.e., the person as a unit, their family, friends, all the way up to their country and the rest of the world) influencing our social safety (as well as other related outcomes). Each social safety circle can influence both state and trait outcomes, as people can be exposed to threats temporarily (state) or in a prolonged fashion (trait). These circles are theorized to be interconnected. Threats experienced at one social safety circle can influence outcomes at different social safety circles. For example, experiences with our primary caregivers can influence outcomes outside the scope of these relationships.

Research from SST has focused so far on biological markers of threat. However, we theorize that a similar conceptualization of human existence is useful for subjective markers of safety. Specifically, we hypothesize that secure attachment will increase how safe people feel in their day-to-day life. Since a person’s attachment style is foundational to their psychological make-up, serving as a system that influences how they approach other relationships, explore new environments and the social world in general. We consider that one’s attachment style would consequently also influence how interpersonally safe they feel. Such theorizing is in line with Slavich’s (2020) argument that “these networks (i.e., the social safety circles) can indirectly affect health and behavior by exposing individuals to construals, messages, and meanings that shape their social safety schemas, which in turn influence their perceptions of their surrounding environment as socially safe versus threatening.”
Partial empirical support for this relationship has been noted. For example, experimentally priming a secure attachment base increased felt security (Boag et al., 2016). Another variable capturing chronic concerns about one’s safety is the endorsement of a dangerous worldview (Altemeyer, 1996). Those who see the world as a dangerous place, are always on the lookout for people who are conspiring against them, are sensitive to threat, and express increased fear towards others. Correlational findings suggest that at the very least, anxious attachment relates to an increased belief that the world is a dangerous place (Weber & Federico, 2007). In sum, experiencing a sense of security in our close relationships (i.e., one of the smallest social safety schemas) could influence how interpersonally safe we feel in general (i.e., an outer social safety schema). Such an argument is in accordance with SST.

The Current Studies

We tested our hypothesis that secure attachment will relate to increased feelings of interpersonal safety in day-to-day life across five studies. Studies 1 and 2 tested this hypothesis in two Latinx/Hispanic samples. Study 3 tested this relationship in a majority White American sample. Studies 4 and 5 examined this association in emerging adults and adolescents respectively. Throughout our studies, we investigated this association using different measures of attachment security (adult attachment in Studies 1-3 and parent-child attachment in Studies 4 and 5), and in longitudinal designs (Studies 2 and 3). All data and syntax files are available on the Open Science Framework (OSF) at https://osf.io/xcgwp/?view_only=96953f82b3e9444299c1a487f0e0e0134.
Study 1

Our first study sought to examine the association between adult attachment style and feelings of safety in Latinx/Hispanic adults. A correlational design was used to test this association.

Methods

Participants

An a-priori power analysis ($\rho = .25$; alpha < .05, expected power = .95) using G*power (Faul et al., 2007) recommended a sample of 202 participants. A starting sample of 283 Latinx adults who were in a committed relationship via CloudResearch was therefore recruited. CloudResearch allowed us to utilize a pre-screening process (Litman et al., 2017) to specifically target these individuals. In the final sample 219 participants remained, after application of exclusion criteria. In detail, 19 participants missed an attention check included in the survey, 33 reported that they did not take the survey seriously enough (evident by a score of less than 5 on a 1-9 slider scale), and 12 were multivariate outliers. This sample had a roughly equal split in gender (104 male and 110 female participants). The average age of the sample was 32.73 years ($SD = 8.77$).

Materials

The full survey instrument included questions about participants' emotions towards the Coronavirus, their subjective perceptions of safety, their attachment style, and experiences in their romantic relationships. Of relevance to the current investigation are the measures of attachment style and feelings of safety in day-to-day life. All measures were captured on 1-9 analog slider scales, with the following labels, 1 =
strongly disagree, 9 = strongly agree. Across all studies, to compute a measure’s score, we averaged across all of its items.

**Attachment style.** The 36-item inventory of experiences in close relationships scale revised (Brennan et al., 1998) was used to measure participants avoidant (18 items, $a = 0.93, M = 3.23, SD = 1.40$) and anxious attachment (18 items, $a = 0.97, M = 3.84, SD = 2.19$).

**Feelings of safety.** We used the feelings of safety subscale ($a = 0.82, M = 7.63, SD = 1.11$) from the PIS scale. This facet of PIS focuses on how safe people feel in familiar environments, in their day-to-day lives. This measure comprises five items: (1) “Being at home makes me feel protected”, (2) “I feel at ease in familiar places.”, (3) “I generally feel safe.”, (4) “I feel safe when walking alone during the day.”, (5) “My family makes me feel safe.”

**Data Analysis Plan**

For all studies, analyses were conducted on SAS 9.4. We first estimated bivariate correlations to examine the associations between attachment style and feelings of safety, followed by linear regressions to account for the shared variance between avoidant and anxious attachment. Results for bivariate associations are presented in Table 1, and results for linear regressions in Table 2.

**Results**

Both avoidant ($r = -0.53, p < .001$) and anxious attachment ($r = -0.34, p < .001$) related to significantly lower reports of feelings of safety. Regressing feelings of safety on both attachment styles, suggested that avoidant attachment ($b = -0.44, SE = 0.06, p < .001, 95\% \text{ C.I.} [-0.56, -0.31]$) but not anxious attachment ($b = 0.02, SE = 0.04, p = .621$,}
95% C.I. [-0.06, 0.10]) was associated with decreased feelings of safety. Attachment style accounted for 28% of the variance in feelings of safety.

Discussion

Study 1 suggests that among Latinx/Hispanic adults who are in a committed romantic relationship, insecure attachment is associated with decreased feelings of safety. These preliminary results show a potentially more robust association between avoidant attachment and feelings of safety, when including both avoidant and anxious attachment as predictors of feelings of safety.

Study 2

Study 2 re-examined this association. Importantly, by employing a two-timepoint longitudinal design we were able to examine this association across the span of one month, and while accounting for initial levels of feelings of safety. Like Study 1, Study 2 also focused on Latinx/Hispanic adults in romantic relationships.

Methods

Participants

We conducted this study on Prolific, using a prescreening process to recruit Latinx participants who were in a committed relationship. T1 was conducted in August 2020, and T2) one month later. Based on results from Study 1, we sought to recruit a similar across both timepoints. We collected data from 309 participants, with 164 participants (53% of the starting sample) also completing T2. In detail, 2 participants missed an attention check included in the survey, 0 participants reported that they did not take the survey seriously enough, and 3 were multivariate outliers. At T1, 157 participants were
male and 151 female, and in T2, 70 were male and 92 female. At T1, participants were on average 28.62 years ($SD = 8.64$), and at T2 they were 29.56 years ($SD = 9.39$).

**Materials**

Like Study 1, Study 2 had a longer survey instrument which included questions about participants emotions towards the Coronavirus, their subjective perceptions of safety, their attachment style, and experiences in their romantic relationships. Once again, of relevance to the current investigation were the measures of attachment style and feelings of safety in day-to-day life. All measures were captured on 1-9 analog slider scales, with the following labels, 1 = strongly disagree, 9 = strongly agree.

**Attachment style.** The short version (12-item) of the experiences in close relationships scale revised (Wei et al., 2007) was used to measure participants avoidant (6 items, $a = 0.83$, $M = 2.87$, $SD = 1.45$) and anxious attachment (6 items, $a = 0.73$, $M = 4.52$, $SD = 1.60$).

**Feelings of safety.** The same measure of PIS as Study 1 was used (T1: $a = 0.81$, $M = 7.48$, $SD = 1.31$; T2: $a = 0.83$, $M = 7.57$, $SD = 1.19$).

**Results**

At T1, both avoidant ($r = -0.30$, $p < .001$) and anxious attachment ($r = -0.31$, $p < .001$) related to significantly lower reports of feelings of safety. Independently, both avoidant ($r = -0.39$, $p < .001$) and anxious attachment ($r = -0.16$, $p = .039$) related to significantly lower reports of feelings of safety at month later at T2.

At T1, regressing feelings of safety on both attachment styles, suggested that both avoidant attachment ($b = -0.20$, $SE = 0.05$, $p < .001$, 95% C.I. [-0.30, -0.10]) and anxious attachment ($b = -0.20$, $SE = 0.04$, $p < .001$, 95% C.I. [-0.29, -0.11]) related to decreased
feelings of safety. At T1, attachment style accounted for 15% of the variance in feelings of safety. At T2, regressing feelings of safety on both attachment styles, suggested that avoidant attachment ($b = -0.30, SE = 0.06, p < .001, 95\% \text{ C.I.} [-0.43, -0.18]$) but not anxious attachment ($b = -0.03, SE = 0.06, p = .581, 95\% \text{ C.I.} [-0.15, 0.08]$) predicted decreased feelings of safety one month later. At T2, attachment style accounted for 15% of the variance in feelings of safety. Avoidant attachment remained a significant predictor of feelings of safety even after accounting for feelings of safety at T1 ($b = -0.17, SE = 0.06, p = .004, 95\% \text{ C.I.} [-0.28, 0.05]$).

Discussion

Study 2 replicated the results of Study 1. Findings from this study also suggested that the relationship between attachment style and feelings of safety is robust across the span of one month. Further, for avoidant attachment specifically, this association remained significant even after accounting for feelings of safety a month prior.

Study 3

Our third study tested this association longitudinally, across a period of two months, in a third sample. This time, the sample was primarily White American adults.

Methods

Participants

We conducted this study on MTurk via the use of CloudResearch. This study was conducted between December 2020 to February 2021. As this study was part of a larger investigation, we had aimed to collect data from 350-400 people across all timepoints. Thus, our starting sample was set to roughly 600 participants. At T1 594 participants complete the survey ($N_{male} = 253, N_{female} = 335, N_{white} = 420, N_{BIPOC} = 89, M_{age} = 43.69, SD$
= 13.98). At T2 434 participants remained did at T2 (N\text{male} = 195, N\text{female} = 235, N\text{white} = 325, N_{\text{BIPOC}} = 89, M_{\text{age}} = 45.50, SD = 13.74). Finally, at T3 316 completed the survey (N\text{male} = 145, N\text{female} = 166, N\text{white} = 239, N_{\text{BIPOC}} = 63, M_{\text{age}} = 47.17, SD = 13.62).

Materials

Similar to Studies 1-2, this study was part of a longer survey instrument. The goal of this survey was to examine which psychological factors influence individuals’ national identity. However, measures of attachment style and PIS were also included. All measures were captured on 1-9 analog slider scales, with the following labels, 1 = strongly disagree, 9 = strongly agree.

Attachment style. Similar to Study 2, at T2 the same short version (12-item) of the experiences in close relationships scale revised was used to measure participants avoidant (6 items, $a = 0.88, M = 2.94, SD = 1.54$) and anxious attachment (6 items, $a = 0.83, M = 3.74, SD = 1.77$).

Feelings of safety. The same measure of PIS as Studies 1-2 was included in T1 ($a = 0.83, M = 7.47, SD = 1.13$) and in T3 ($a = 0.84, M = 7.46, SD = 1.21$).

Results

When examining associations from T2 to T3, both avoidant ($r = -0.37, p < .001$) and anxious attachment ($r = -0.31, p < .001$) related to significantly lower reports of feelings of safety. At T3, regressing feelings of safety on both attachment styles (at T2), suggested that both avoidant attachment ($b = -0.22, SE = 0.04, p < .001, 95\% \text{ C.I. [-0.31, -0.13]}$) and anxious attachment ($b = -.15, SE = 0.04, p < .001, 95\% \text{ C.I. [-0.23, -0.08]}$) related to decreased feelings of safety, accounting for 17\% of the variance in feelings of safety. After accounting from feelings of safety at two months prior, both avoidant
attachment \((b = -0.09, SE = 0.04, p = .012, 95\% \text{ C.I.} [-0.16, -0.02])\) and anxious attachment \((b = -0.07, SE = 0.04, p = .013, 95\% \text{ C.I.} [-0.14, -0.02])\) predicted decreased feelings of safety.

**Discussion**

Study 3 tested and found support for our hypothesis in a sample that was mostly non-Hispanic White Americans, suggesting that the relationship between attachment style and feelings of safety is relatively consistent across both Latinx/Hispanic (Studies 1-2) and non-Hispanic White American (Study 3) adults.

**Study 4**

Study 4 tested our hypothesis in a different age group (emerging adults), and in a different relationship context (adult-parent relationships), by examining how attachment to one’s parents relates to feelings of safety.

**Participants**

Study 4 was conducted in a sample of emerging adults, obtained from a large public university via the use of SONA. The study was conducted during April 2020. Participants received academic credit in exchange for their participation in the study. The sample was comprised of 123 undergraduate students \((N_{female} = 100; N_{male} = 17; N_{white} = 65; N_{BIPOC} = 47)\). The average age was 20.75 years \((SD = 1.40)\).

**Materials**

This study was part of a larger investigation which examined how emerging adults responded psychologically to the onset of the COVID-19 pandemic. Below we report information only for the measures relevant to the current investigation.
**Attachment style.** To measure attachment to one’s parents we used the Inventory of Peer and Parent Attachment Revised (Gullone & Robinson, 2005). This measure is employed to capture attachment to parents (and peers) in adolescence. It comprises three subscales, trust (10 items), communication (9 items), and alienation (6 items). All items were captured on a 5-point Likert scale (1 = almost never or never true, 5 = almost always or always true). Scores were obtained for both parents. These were moderately to strongly correlated across both parents ($r$s ranged from .37 to .49, all $p$s < .001) and were thus averaged into a single construct, capturing attachment to both parents to avoid any potential collinearity issues in our subsequent analyses. Further, we also collapsed across all trust, communication, and alienation (reversed-coded) to create a single composite score for secure attachment ($M = 3.57$, $SD = 0.75$). Overall, all of these measures were highly reliable ($a$s ranged from .84 to .94).

**Feelings of safety.** The same measure of PIS as Studies 1-3 was included in in Study 4 ($a = 0.87$, $M = 5.89$, $SD = 1.06$). Scores were captured on an 1-7 Likert scale (1 = strongly disagree, 7 = strongly agree).

**Results**

Alienation from parents related to decreased feelings of safety ($r = -0.40$, $p < .001$), while trust in parents ($r = 0.50$, $p < .001$) and effective communication with parents ($r = 0.42$, $p < .001$) related to increased feelings of safety. Overall secure attachment related to increased feelings of safety ($b = 0.64$, $SE = 0.11$, $p < .001$, 95% C.I. [0.42, 0.87]), accounting for 21% of the variance in how safe emerging adults felt.

**Discussion**
Results from Study 4 suggest that in emerging adults, increased attachment security (i.e., increased trust and communication, and decreased alienation) with their parents related to increased feelings of safety, showing that our hypothesis is relatively consistent across developmental stages (emerging adulthood and adulthood).

**Study 5**

Our final study tested our hypothesis in a sample of adolescents. Once again, we expected that secure attachment would relate to increased feelings of safety in day-to-day life.

**Methods**

**Participants**

For Study 5 we recruited families from northeastern states in the United States via online and school advertising and received remuneration for their participation. Participants were recruited to participate in the study in April 2020. This study employed a longitudinal design lasting 5 weeks (April 2020 to June 2020); however, the measures of interest were only including in T1. Although this study had a dyadic design, with 77 dyads being recruited, our focus was exclusively on the adolescents, as they were the only group with a measure of parental attachment. Forty-four of the adolescents were female, 28 were male. Most of the adolescents \((n = 57)\) were White, while 22 were BIPOC. The average age was 16.20 (SD = 1.22).

**Materials**

This study was part of a larger investigation which examined how families responded psychologically to the onset of the COVID-19 pandemic. Below we report information only for the measures relevant to the current investigation. Both feelings of
safety \((a = .70, M = 5.81, SD = 0.76)\) and secure attachment to one’s parents \((M = 3.68, SD = 0.69)\; all\; sub-scales\; were\; highly\; reliable,\; as \geq .84)\).

**Results**

For adolescents, alienation from parents related to decreased feelings of safety \((r = -0.41\; p < .001)\), while trust in parents \((r = 0.61, p < .001)\) and effective communication with parents \((r = 0.52, p < .001)\) related to increased feelings of safety. Overall secure attachment related to increased feelings of safety \((b = 0.61, SE = 0.11, p < .001, 95\%\; C.I. [0.40, 0.83])\), accounting for 31% of the variance in how safe adolescents felt.

Table 17.

*Bivariate correlations between romantic attachment style (Studies 1-3) and parental attachment security (Studies 4-5) and feelings of safety.*

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<tr>
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<td>3. Feelings of Safety</td>
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<td>-0.34***</td>
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<td>3. Feelings of Safety (T_1)</td>
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<tbody>
<tr>
<td>1. Parent Alienation</td>
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<td></td>
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<tr>
<td>2. Parent Trust</td>
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<td>2. Parent Trust</td>
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91
Table 18.

*Unstandardized linear regression coefficients for the association between romantic attachment style (Studies 1-3) and parental attachment security (Studies 4-5) and feelings of safety:*

<table>
<thead>
<tr>
<th>Study Information</th>
<th>$b$</th>
<th>SE</th>
<th>$B$</th>
<th>95% C.I.</th>
<th>$R^2$ (Adj $R^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 1 ($N = 220$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidant Attachment</td>
<td>-.44***</td>
<td>0.06</td>
<td>-0.55</td>
<td>-0.56, -0.31</td>
<td>.28 (.27)</td>
</tr>
<tr>
<td>Anxious Attachment</td>
<td>0.02</td>
<td>0.04</td>
<td>0.04</td>
<td>-0.06, 0.10</td>
<td></td>
</tr>
<tr>
<td>Study 2 ($N = 309$); Safety at $T_1$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.15 (.14)</td>
</tr>
<tr>
<td>Avoidant Attachment T1</td>
<td>-.20***</td>
<td>0.05</td>
<td>-0.22</td>
<td>-0.30, -0.10</td>
<td></td>
</tr>
<tr>
<td>Anxious Attachment T1</td>
<td>-.20***</td>
<td>0.04</td>
<td>-0.24</td>
<td>-0.29, -0.11</td>
<td></td>
</tr>
<tr>
<td>Study 2 ($N = 164$); Safety at $T_2$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.15 (.14)</td>
</tr>
<tr>
<td>Avoidant Attachment $T_2$</td>
<td>-.30***</td>
<td>0.06</td>
<td>-0.38</td>
<td>-0.43, -0.18</td>
<td></td>
</tr>
<tr>
<td>Anxious Attachment $T_1$</td>
<td>-.03</td>
<td>0.06</td>
<td>-0.04</td>
<td>-0.15, 0.08</td>
<td></td>
</tr>
<tr>
<td>Study 2 ($N = 164$); Safety at $T_2$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.36 (.35)</td>
</tr>
<tr>
<td>Avoidant Attachment $T_1$</td>
<td>-.17**</td>
<td>0.06</td>
<td>-0.21</td>
<td>-0.28, -0.05</td>
<td></td>
</tr>
<tr>
<td>Anxious Attachment $T_1$</td>
<td>.04</td>
<td>0.06</td>
<td>0.05</td>
<td>-0.06, 0.14</td>
<td></td>
</tr>
<tr>
<td>Feelings of Safety $T_1$</td>
<td>.52***</td>
<td>0.07</td>
<td>0.50</td>
<td>0.38, 0.69</td>
<td></td>
</tr>
<tr>
<td>Study 3 ($N = 314$); Safety at $T_3$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.17 (.16)</td>
</tr>
<tr>
<td>Avoidant Attachment $T_2$</td>
<td>-.22***</td>
<td>0.04</td>
<td>-0.27</td>
<td>-0.31, -0.13</td>
<td></td>
</tr>
<tr>
<td>Anxious Attachment $T_2$</td>
<td>-.15***</td>
<td>0.04</td>
<td>-0.22</td>
<td>-0.23, -0.08</td>
<td></td>
</tr>
<tr>
<td>Study 3 ($N = 314$); Safety at $T_3$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.49 (.49)</td>
</tr>
<tr>
<td>Avoidant Attachment $T_2$</td>
<td>-.09*</td>
<td>0.04</td>
<td>-0.11</td>
<td>-0.16, -0.02</td>
<td></td>
</tr>
<tr>
<td>Anxious Attachment $T_2$</td>
<td>-.07*</td>
<td>0.03</td>
<td>-0.11</td>
<td>-0.14, -0.02</td>
<td></td>
</tr>
<tr>
<td>Feelings of Safety $T_1$</td>
<td>.68***</td>
<td>0.05</td>
<td>0.61</td>
<td>0.58, 0.77</td>
<td></td>
</tr>
<tr>
<td>Study 4 ($N = 117$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.21 (.21)</td>
</tr>
<tr>
<td>Secure Attachment</td>
<td>.64***</td>
<td>0.11</td>
<td>0.46</td>
<td>0.42, 0.87</td>
<td></td>
</tr>
<tr>
<td>Study 5 ($N = 75$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.31 (.30)</td>
</tr>
</tbody>
</table>
Discussion

Our final study replicated the results of Study 4 in a sample of adolescents. Across all studies, evidence emerged in support of our hypothesis, that a more secure attachment (both with one’s parents, and with one’s romantic partner) across different developmental stages (adolescence, emerging adulthood, adulthood) relates to increased feelings of safety.

General Discussion

One of the core theoretical underpinnings of attachment theory is that secure attachment helps alleviate anxiety and instill an enduring sense of felt security (Sroufe & Waters, 1977). In fact, researchers have empirically shown that a sense of attachment security “allows a redistribution of attention and resources, away from self-protection and toward other behavioral systems” (Mikulincer et al., 2005, p. 818). Thus, a common argument that stems from attachment literature is that attachment-figure availability and the resulting sense of attachment security provide a stable and secure foundation for individuals’ well-being (Mikulincer & Shaver, 2005). In this model, researchers conceptualize loving attachment figures as capable of providing an important sense of personal safety and protection during times of threat or need (Mikulincer & Shaver, 2005). Even though such arguments are extensive in psychological literature, the degree to which attachment security can increase how safe people feel outside the score of their close relationships (operationalized as subjective perceptions of safety in day-to-day life)
has not received as much scientific attention. The current investigation addressed this gap.

Across five studies we found robust evidence that attachment security (namely decreased attachment anxiety and avoidance) related to increased feelings of safety in day-to-day life. This finding was true for Latinx/Hispanic individuals in committed romantic relationships (Studies 1 and 2) as well as in a sample that was primarily White American (Study 3). Similar results were observed for emerging adults (Study 4), and adolescents (Study 5). When examining this result across time (1 month later in Study 2 and 2 months later in Study 3) this finding remained significant, even after adjusting for existing feelings of safety.

This finding lends credence to theoretical arguments stemming from attachment theory (e.g., Mikulincer & Shaver, 2003; 2005; Sroufe & Waters, 1977), which suggest that bolstering individual’s secure attachment can improve both their sense of security and their well-being overall. It also supports more recent arguments stemming from Social Safety Theory (Slavich, 2020) which consider that our relationships and experiences in social safety circles that are closer (societally) to us, influence our cognition, behavior and emotions within circles which are further away from the individual.

From an applied perspective, the current findings could be considered as a foundational basis for future intervention work which seeks to increase individual perceptions of safety. Child rearing practices, early life relations, as well as the developmental trajectory and experiences of individuals all shape their attachment style. Thus, it is important to ensure that individuals grow up in safe and caring environments,
which could in turn influence their attachment security, ultimately influencing how safe they will feel during their lives. Further, although our attachment style has been found to be relatively stable, our development and different life events can lead to changes in our attachment style (Arriaga et al., 2018, 2014; Fraley et al., 2013; Simpson et al., 2003). Thus, ensuring that individuals share meaningful and high-quality social bonds with others, and that their attachment style is characterized by security rather than avoidance or anxiety could be an intervention point for efforts that seek to increase feelings of safety. Since how safe people feel relates to better indicators of individual well-being (e.g., Syropoulos, 2020) such efforts could prove crucial in ensuring that people live fulfilling lives.

**Limitations and Future Directions**

Despite the robust and consistent results of the current investigation, there are several limitations that can be addressed in future research. First, re-examination of the current findings within other racial/ethnic demographics as well as within other cultures is important. Such efforts can not only highlight the consistency and generalizability of the current research, but potentially also pinpoint how race/ethnicity and cultural background moderate this link. Further, more intensive longitudinal investigations spanning more than 2 timepoints are necessary. Examining individual trajectories in how safe people feel during their adolescence, as well as in later stages of life could better examine if the link between attachment security and feelings of safety is bidirectional. Such an approach could also elucidate whether a secure attachment style could influence individuals’ trajectories of their feelings of safety in their lives.
In addition, if we consider that threats to one’s safety are an established and robust antecedent of prejudice (Perry et al., 2013), ensuring that individuals grow up in a safe environment that nurtures them into a secure attachment style could not only increase how safe they feel, but also indirectly reduce prejudicial attitudes. In fact, experimental evidence has shown that priming a secure attachment base can reduce prejudice (Saleem et al., 2015) and increase prosociality and altruism (Mikulincer and Shaver, 2005). Consequently, future work can combine two distinct lines of research to examine, whether feelings of safety are a crucial antecedent that shapes prejudicial attitudes, and one that can be bolstered by attachment security. Ultimately, prioritizing attachment security can prove to be beneficial not only for individual well-being, by ensuring that people feel safe in their lives, but also for intergroup relations, as those who feel safer, will potentially perceive less intergroup threat, thus promoting both individual and collective peace.

Transition to Chapter 5

Evidence from Chapter 4 suggests that indeed our close relationships can influence how safe people feel in their day-to-day lives. Importantly, this evidence was specific to attachment security, examined via both adult romantic attachment styles, and attachment to parents. Although our attachment styles influence key life outcomes at all stages of life, they are often conceptualized as predictors of relationship quality, they are also considered to be empirically distinct from such constructs/indicators. Further, since feelings of safety as a facet concerns how interpersonally safe people feel in familiar environments, and with regards to their family/friends, it is possible that the perceived
relationship quality with a close other might also influence feelings of interpersonal safety

Chapter 5 sought to address this question in two studies. Study 1A was a correlational study, and Study 1B a longitudinal investigation spanning one month. Our focus was on adults who were in romantic relationships and were Hispanic/Latinx as they constitute a group for whom high-quality close relationships are very important and are also disproportionately victimized compared to other racial/ethnic groups, which could make perceived interpersonal safety even more important for them. Ultimately, Chapter 5 also seeks to address Goal #3, which aims to understand the influence of close relationships on perceived interpersonal safety.
CHAPTER 5

PERCEIVED RELATIONSHIP QUALITY PREDICTS INCREASED FEELINGS OF SAFETY IN LATINX/HISPANIC ADULTS

One of the fundamental motivations in human life, is the need to be, and ultimately feel, safe (Maslow, 1943). Despite its theoretical significance, empirical research on subjective perceptions of safety is scarce. Such subjective perceptions are important, as they could potentially override the objective markers of threat that render an environment safe or unsafe (i.e., a person who subjectively feels safe in their life might feel safe in a dangerous environment, and vice versa). In the current investigation we sought to explore how a core framework of human existence, namely our close relationships, can influence how safe we feel in our lives. Relying on the stress-buffering function of close relationships (Cohen & Wills, 1985), and building upon recent work from social safety theory (Slavich, 2020) we examined how the perceived quality of romantic relationships, relates to three core facets of perceived safety. We placed our focus on Latinx/Hispanic adults as they are a demographic which both emphasizes meaningful bonds in close relationships (Campos & Kim, 2017), and is also at risk of being exposed to greater safety related threats (e.g., violent crime; Violence Policy Center, 2019).

Protective effects of Close Relationships

A long-standing line of research has charted the beneficial effects of meaningful, high-quality, close relationships (for reviews see Uchino, 2004; Pietromonaco & Collins, 2017). This research highlights that the social support that individuals receive can alleviate stress and increase well-being (e.g., Cohen & Wills, 1985). In fact, high-quality
close relationships can also alleviate existential concerns (e.g., Florian et al., 2002). Meta-analyses of research on the effects of marital quality on physical health outcomes suggest small positive effects on several outcomes (Robles et al., 2014). Evidence suggests that increased strength of social relationships can decrease individuals’ mortality risk (Holt-Lunstad et al., 2010). We therefore hypothesize that given close relationships’ capacity to provide a buffer against stress and anxiety inducing situations, increased relationship quality could also increase perceptions of safety (i.e., increase how safe people feel in their lives). Such theorization is also in line with recent advances from social safety theory (Slavich, 2020).

Social safety theory posits that the creation and maintenance of social bonds (friendly or romantic) is integral to our existence, and that it can influence our appraisal of threats to our social safety (Slavich, 2020). Foundational support for this theory comes from core psychological arguments, such as evidence that our relationships are vastly influential for our survival (Ainsworth et al., 1978), and that as humans, we have a fundamental need to feel socially connected to others (Baumeister & Leary, 1995), a need that influences our cognition and behavior (Gilbert, 2005). Social safety theory, similar to ecological systems theory (Bronfenbrenner, 1992), suggests that as social beings, we are embedded in different circles of existence. These circles are concentric, with spheres of existence closer to the person (i.e., the person as a unit, their family, friends, all the way up to their country and the rest of the world) influencing our social safety and related outcomes. These circles are characterized as “social safety circles”. Each social safety circle can influence both state and trait outcomes. Most importantly, these circles are interconnected, such that threats at one social safety circle can influence outcomes at
different social safety circles. Although this research focuses on biological markers of threat, we theorize that a similar conceptualization of human existence is useful for subjective markers of safety and more specifically, that increased relationship quality is potentially an indicator of increased social safety, which in turn can increase how safe people feel in general. Such an argument is in line with Slavich’s (2020) argument that “these networks (i.e., the social safety circles) can indirectly affect health and behavior by exposing individuals to construals, messages, and meanings that shape their social safety schemas, which in turn influence their perceptions of their surrounding environment as socially safe versus threatening.”

**Studies 1A-1B**

Our investigation sought to establish a link between perceived relationship quality and perceived interpersonal safety. Further, it sought to do so with samples drawn from Latinx/Hispanic adults. Our focus was placed on this population for three reasons. First, our hypothesis is relying on the impact of high-quality relationships. Thus, we considered it important to study this phenomenon in a population which values high-quality relationships and emphasizes familial bonds to a great degree (e.g., Campos & Kim, 2017). Second, we considered studying this topic within Latinx/Hispanic populations, as in the United States, this ethnic group faces increased safety stressors relative to White Americans. For example, evidence suggests that hate crimes against Latinos are at an all-time high (Gamboa, 2020), that Latinos are disproportionately victimized (Violence Policy Center (2019), that these victimization trends are more consistent across time (Oudekerk, 2020), and that younger Latinx adults are more likely to be victimized compared to White American young adults (U.S. Department of Health, 2019). The third
and final reason was to study this phenomenon in a diverse population, in an effort to address racial inequality in psychological research (Roberts et al., 2020).

We hypothesized that our expected association between increased perceptions of relationship quality and perceived interpersonal safety would be observed primarily for facets of interpersonal safety that are more directly influenced by a person’s close environment and less influenced by external and societal circumstances. By close environment we refer to how safe people feel near their families, during the day (when crimes are less likely to occur) or within familiar environments (i.e., a person’s residence). Using a multidimensional approach to the operationalization of perceived interpersonal safety (Syropoulos et al., under review), we measured feelings of safety (how safe people feel in their day-to-day life and in familiar environments), fear of crime (how afraid people are of falling victim to a particular type of crime), and safety confidence (trust and confidence in one’s ability to remain safe). Thus, we hypothesized that this association would be mostly observed for feelings of safety, and not necessarily observed for fear of crime. For fear of crime, societal factors, such as disorder, police presence (or lack thereof) or the frequency of crime in one’s neighborhood is a more established predictor, all of which constitute factors outside one’s own close environment (although other societal factors also contribute to fear of crime, for a review see Gray et al., 2012). Instead, safety confidence is a factor that concerns one’s ability to protect themselves, rather one’s ability to feel at ease/secure in their day-to-day life. Thus, we had no a-priori prediction about the nature of this association for safety confidence but considered a possible weak positive association as one possibility. We tested these
hypotheses in two correlational studies, with samples drawn from two different online platforms, including a longitudinal investigation spanning a one-month period.

**Method**

**Participants**

**Study 1A**

For Study 1A, conducted during March and April of 2020 (i.e., the onset of COVID-19 in the United States), 283 participants who were in a romantic relationship were recruited via Amazon Mechanical Turk (MTurk) through the use of CloudResearch (Litman et al., 2017). CloudResearch allowed us to both remove potential bots and to recruit participants who identified as Latinx/Hispanic. For both studies, a similar screening question was asked to screen participants’ ethnic background. This question was open ended however, the majority of participants responded “Hispanic” or “Latino/Latinx”. The following exclusion criteria were implemented: a survey item asking participants to move a slider scale to the left end (n = 19 exclusions); an item asking how seriously participants took the survey, captured on 1-9 slider scale (n = 33 exclusions) which participants had to drag to a score of at least ≥ 5 ; and exclusions of multivariate outliers based on distance score h (n = 12 exclusions), which was estimated by regressing a random number on all measures of relevance included in the study. After applying these exclusion criteria, our final sample comprised 219 individuals (see Table 1 for additional information). Although not pre-registered, this sample size was well-powered for the purposes of our study. An a-priori power analysis (using G*Power, Faul et al., 2009) with $\rho = .25$; alpha < .05 and expected power set to .95. The results
suggested a sample of 202 participants would be required; our sample of 219 participants meet these criteria.

**Study 1B**

The second study was conducted on Prolific. We utilized Prolific to ensure that our results are reliable regardless of the platform used to collect data. Although this study’s original purpose as dictated in our pre-registration was different, the association between perceived relationship quality and PIS was pre-registered and expected (https://aspredicted.org/blind.php?x=2jd9p5). Participants completed the first survey (T1) during the last week of August 2020 and the second survey (T2) one month later (last week of September 2020). Our pre-registered a-priori power analysis (see pre-registration for further details) suggested a sample of 202 participants.

We collected data from 300 participants (Latinx/Hispanic adults in romantic relationships) at T1 to ensure that even after exclusions and participant dropout we would have an adequately large sample at T2. Consequently, 309 participants completed the survey at T1. After participant exclusions (the same exclusion criteria as Study 1A were used) and dropouts, 164 participants (53% of the original sample) completed the survey. Importantly, a significant difference in income was observed between the participants who remained in the study compared to those who did not (T2 had a significantly higher income): $F(1, 316) = 14.99, p < .001, \text{partial } \eta^2 = .045, 95\% \text{ C.I. [.01, .10]}$. Similarly, the remaining sample was of significantly higher age, $F(1, 316) = 8.27, p = .004, \text{partial } \eta^2 = .025, 95\% \text{ C.I. [.00, .07]}$. No other differences were observed between the two samples.
Table 19.

**Demographic information for both studies.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Study 1A</th>
<th>Study 1B&lt;sub&gt;T1&lt;/sub&gt;</th>
<th>Study 1B&lt;sub&gt;T2&lt;/sub&gt;</th>
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</thead>
<tbody>
<tr>
<td>N&lt;sub&gt;total&lt;/sub&gt;</td>
<td>219</td>
<td>309</td>
<td>164</td>
</tr>
<tr>
<td>N&lt;sub&gt;male&lt;/sub&gt;</td>
<td>104</td>
<td>157</td>
<td>70</td>
</tr>
<tr>
<td>N&lt;sub&gt;female&lt;/sub&gt;</td>
<td>110</td>
<td>151</td>
<td>92</td>
</tr>
<tr>
<td>Income M (SD)</td>
<td>3.90 (1.62)</td>
<td>3.80 (1.77)</td>
<td>3.93 (1.75)</td>
</tr>
<tr>
<td>Age in years M (SD)</td>
<td>32.73 (8.77)</td>
<td>28.62 (8.64)</td>
<td>29.56 (9.39)</td>
</tr>
<tr>
<td>Relationship Length in years M (SD)</td>
<td>8.23</td>
<td>6.08</td>
<td>6.58</td>
</tr>
<tr>
<td>N&lt;sub&gt;Married&lt;/sub&gt;</td>
<td>117</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**Note.** For income the range was 1-8. Participants had an average income of $70,000-$90,000 and an average education level indicative of a 2-year college degree.

**Materials and Procedure**

Participants were presented with the relationship measures first, followed by measures of PIS in a fixed order. Participants then completed other measures focusing on their mental health, attachment style as well as certain reactions to COVID-19. These measures were outside the scope of the investigation and thus not used in our analyses. Scores were captured on slider scales ranging from 1-9, with values recorded up to two decimal points. Detailed information about the measures of the two studies can be found in Table 20. All measures were presented to participants in English.

**Perceived Relationship Quality**

We measured the perceived quality of participants’ romantic relationship with the Perceived Relationship Quality Components Inventory. This measure encompasses six indicators: satisfaction, commitment, intimacy, trust, passion, and love, each with three items (PRQ, 18 items; Fletcher et al., 2000). We examined these aspects of relationship quality individually and as one overarching construct which was calculated by estimating the average score across the six indicators.
Perceived Interpersonal Safety

Individual differences in PIS were captured with the PIS Scale. In detail, three facets were captured: feelings of safety (how safe people feel in their day-to-day life; 5 items, e.g., “Being at home makes me feel protected”); fear of crime (participants’ fear of being victimized in a particular manner 7 items, e.g., “I am afraid of being physically assaulted”); and safety confidence (the perceived ability to protect oneself from threats, 5 items, e.g., “I have the strength and skills to ward off criminals”).

Table 20.

Means, standard deviations and reliability estimates (Cronbach’s α) for all relevant measures.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Study 1A</th>
<th>Study 1B</th>
<th>Study 1B</th>
<th>Study 1B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>α</td>
<td>M</td>
<td>SD</td>
<td>α</td>
</tr>
<tr>
<td>Feelings of Safety</td>
<td>.82</td>
<td>7.62</td>
<td>1.11</td>
<td>.78</td>
</tr>
<tr>
<td>Fear of Crime</td>
<td>.95</td>
<td>4.52</td>
<td>2.20</td>
<td>.93</td>
</tr>
<tr>
<td>Safety Confidence</td>
<td>.90</td>
<td>5.63</td>
<td>1.99</td>
<td>.90</td>
</tr>
<tr>
<td>Perceived Relationship Quality</td>
<td>.94</td>
<td>7.59</td>
<td>1.28</td>
<td>.93</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>.95</td>
<td>7.51</td>
<td>1.56</td>
<td>.97</td>
</tr>
<tr>
<td>Commitment</td>
<td>.91</td>
<td>8.02</td>
<td>1.16</td>
<td>.92</td>
</tr>
<tr>
<td>Intimacy</td>
<td>.90</td>
<td>7.56</td>
<td>1.55</td>
<td>.87</td>
</tr>
<tr>
<td>Trust</td>
<td>.85</td>
<td>7.75</td>
<td>1.32</td>
<td>.86</td>
</tr>
<tr>
<td>Passion</td>
<td>.92</td>
<td>6.79</td>
<td>2.00</td>
<td>.85</td>
</tr>
<tr>
<td>Love</td>
<td>.91</td>
<td>7.94</td>
<td>1.30</td>
<td>.94</td>
</tr>
</tbody>
</table>

Note. ***p < .001.

Results

Data Analysis Plan

All analyses were executed in SAS version 9.4. We first examined the association between perceived relationship quality and the three facets of PIS across the two studies (see Table 21). We then explored more fine-grained associations between the sub-
indicators of perceived relationship quality and each facet of PIS (see Table 22). Finally, for any significant associations, we also examined whether this relationship is significant across time, after adjusting for demographic covariates that influence how safe people feel (age, gender, and income), and after controlling for original levels of safety (see Table 23). Finally, as an exploratory analysis, we examined the opposite path (i.e., PIS → relationship quality). To evaluate the strength of the observed associations we used recommendations by Gignac and Szodorai (2016) who recommend that small, medium and large effect sizes for individual differences research are $r = .10$, $r = .20$, $r = .30$ respectively. Meta-correlations across the two studies were calculated via the methodology recommended by Goh and colleagues (2016). Meta correlations present us with the average correlation across the studies, providing a more generalizable estimate of the association at hand.

**Bivariate and Meta Correlations**

Across the two studies, feelings of safety were related to increased safety confidence and decreased fear of crime (see Table 3). Fear of crime was not consistently associated with safety confidence. Importantly, meta-analyzing these correlations suggested overall positive associations between feelings of safety and safety confidence, and negative correlations between fear of crime and feelings of safety as well as safety confidence.

Increased relationship quality was moderately to strongly associated with increased feelings of safety. Further, it was also weakly to moderately positively associated with safety confidence. Meta-correlations suggested an overall significant and large positive association with feelings of safety, and a positive but weak association with
safety confidence. Across the two studies (and unsurprisingly in the meta correlations as well), no significant association between perceived relationship quality and fear of crime was observed.

Table 21.

**Bivariate and meta correlations across the two studies.**

<table>
<thead>
<tr>
<th>Study 1A (N = 219)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feelings of Safety</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Fear of Crime</td>
<td>-0.24***</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Safety Confidence</td>
<td>0.27***</td>
<td>-0.04</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>4. Perceived Relationship Quality</td>
<td>0.53***</td>
<td>-0.03</td>
<td>0.16*</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study 1B T1 (N = 309)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feelings of Safety</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Fear of Crime</td>
<td>-0.39***</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Safety Confidence</td>
<td>0.29***</td>
<td>-0.23***</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>4. Perceived Relationship Quality</td>
<td>0.25***</td>
<td>-0.12*</td>
<td>0.12*</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study 1B T2 (N = 163)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feelings of Safety</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Fear of Crime</td>
<td>-0.47***</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Safety Confidence</td>
<td>0.25***</td>
<td>-0.13</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>4. Perceived Relationship Quality</td>
<td>0.40***</td>
<td>0.00</td>
<td>0.16*</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Meta correlations (Studies 1A and 1B)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feelings of Safety</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Fear of Crime</td>
<td>-0.36***</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Safety Confidence</td>
<td>0.27***</td>
<td>-0.15***</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>4. Perceived Relationship Quality</td>
<td>0.38***</td>
<td>0.06</td>
<td>0.14***</td>
<td>--</td>
</tr>
</tbody>
</table>

**Note.** Bolded values highlight significant results. *p < .05, **p < .01, ***p < .001.

Examining the sub-indicators of perceived relationship quality further, yielded moderate to strong and positive associations between each indicator and feelings of safety (see Table 4). Meta-analysis of these coefficients suggested moderate to strong associations for each indicator, except passion, for which the association was weak to moderate. For safety confidence, associations ranged from non-significant to moderate. Meta-analysis of these associations suggested weak to moderate positive associations.
with each indicator except commitment. Most associations were not significant for fear of crime. Meta-analyses suggested a significant and negative association of weak to moderate size between relationship quality indicators and trust.

Table 22.

_Bivariate and meta correlations between the three facets of perceived interpersonal safety and the underlying factors of perceived relationship quality across the two studies._

<table>
<thead>
<tr>
<th>Study 1A (N = 219)</th>
<th>Satisfaction</th>
<th>Commitment</th>
<th>Intimacy</th>
<th>Trust</th>
<th>Passion</th>
<th>Love</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feelings of Safety</td>
<td><strong>0.52</strong>*</td>
<td><strong>0.51</strong>*</td>
<td><strong>0.48</strong>*</td>
<td><strong>0.50</strong>*</td>
<td><strong>0.28</strong>*</td>
<td><strong>0.55</strong>*</td>
</tr>
<tr>
<td>Fear of Crime</td>
<td>-0.01</td>
<td>-0.05</td>
<td>-0.04</td>
<td>-0.08</td>
<td>0.03</td>
<td>-0.07</td>
</tr>
<tr>
<td>Safety Confidence</td>
<td><strong>0.14</strong>*</td>
<td>-0.03</td>
<td><strong>0.18</strong>*</td>
<td>0.12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study 1B T1 (N = 309)</th>
<th>Satisfaction</th>
<th>Commitment</th>
<th>Intimacy</th>
<th>Trust</th>
<th>Passion</th>
<th>Love</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feelings of Safety</td>
<td><strong>0.23</strong>*</td>
<td><strong>0.21</strong>*</td>
<td><strong>0.19</strong>*</td>
<td><strong>0.29</strong>*</td>
<td>0.13*</td>
<td><strong>0.23</strong>*</td>
</tr>
<tr>
<td>Fear of Crime</td>
<td>-0.10</td>
<td>-0.08</td>
<td>-0.10</td>
<td>-0.23***</td>
<td>-0.02</td>
<td>-0.09</td>
</tr>
<tr>
<td>Safety Confidence</td>
<td>0.08</td>
<td>0.05</td>
<td><strong>0.13</strong>*</td>
<td>0.10</td>
<td></td>
<td>0.12*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study 1B T2 (N = 163)</th>
<th>Satisfaction</th>
<th>Commitment</th>
<th>Intimacy</th>
<th>Trust</th>
<th>Passion</th>
<th>Love</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feelings of Safety</td>
<td><strong>0.42</strong>*</td>
<td><strong>0.44</strong>*</td>
<td><strong>0.36</strong>*</td>
<td><strong>0.46</strong>*</td>
<td>0.15*</td>
<td><strong>0.34</strong>*</td>
</tr>
<tr>
<td>Fear of Crime</td>
<td>-0.05</td>
<td>-0.02</td>
<td>-0.01</td>
<td>-0.12</td>
<td>0.12</td>
<td>0.00</td>
</tr>
<tr>
<td>Safety Confidence</td>
<td>0.15</td>
<td>0.11</td>
<td>0.14</td>
<td>0.15</td>
<td></td>
<td><strong>0.17</strong>*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Meta-Correlations</th>
<th>Satisfaction</th>
<th>Commitment</th>
<th>Intimacy</th>
<th>Trust</th>
<th>Passion</th>
<th>Love</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feelings of Safety</td>
<td><strong>0.37</strong>*</td>
<td><strong>0.37</strong>*</td>
<td><strong>0.33</strong>*</td>
<td><strong>0.40</strong>*</td>
<td><strong>0.18</strong>*</td>
<td><strong>0.37</strong>*</td>
</tr>
<tr>
<td>Fear of Crime</td>
<td>-0.06</td>
<td>-0.05</td>
<td>-0.06</td>
<td>-0.16***</td>
<td>0.03</td>
<td>-0.06</td>
</tr>
<tr>
<td>Safety Confidence</td>
<td><strong>0.12</strong>*</td>
<td>0.04</td>
<td><strong>0.15</strong>*</td>
<td><strong>0.17</strong>*</td>
<td><strong>0.19</strong>*</td>
<td><strong>0.08</strong>*</td>
</tr>
</tbody>
</table>

_Note._ Bolded values highlight significant results. *p < .05, **p < .01, ***p < .001.

**Linear Regressions**

We opted to test any linear regression models exclusively in Study 1B, as that was the only study in which we had a temporal sequence which allowed us to study the directionality of our hypothesis. We did not conduct tests for fear of crime as an outcome, as the bivariate association between fear of crime and perceived relationship quality was not significant. We estimated a series of linear regression models, in which safety confidence and feelings of safety at T2 were regressed on perceived relationship quality.
at T1 (Model 1). We then included gender, age, and income as covariates (Model 2), and finally we also included the T1 measure of each outcome (Model 3).

For safety confidence, we stopped at Model 1, as the association between perceived relationship quality and safety confidence was not significant ($b = .16, SE = .12, p = .206$). For feelings of safety, a significant effect of perceived relationship quality was observed, which remained significant after adjusting for age and gender, as well as feelings of safety at T1 (see Table 5). Visual representations of this association in Study 1A, T1 of Study 1B, and across time in Study 1B can be found in the Supplementary Materials. Perceived relationship quality accounted for 12% of the variance in feelings of safety, which was considerably higher than age or gender (which increased the $R^2$ value from .12 to .16). Including T1 feelings of safety increased the adjusted $R^2$ from .16 to .37.

Although not a primary research question, we also considered the possibility that increased feelings of safety could contribute to increased relationship quality. Exploratory analyses indicated that, although feeling safe at T1 significantly predicted increased perceived relationship quality at T2 ($b = .39, \beta = .31, SE = .09, p < .001$, adj. $R^2 = .09$), and this effect was significant after adjusting for demographic covariates, ($b = .45, \beta = .37, SE = .09, p < .001$, adj. $R^2 = .15$), this effect was not significant when we controlled for T1 scores of perceived relationship quality ($b = .05, \beta = .04, SE = .05, p = .333$, adj. $R^2 = .77$).
Table 23.

Linear regression models for feelings of safety in Study 2.

<table>
<thead>
<tr>
<th>Feelings of Safety at T2 on</th>
<th>Model 1 (Adj R² = .12)</th>
<th>Model 2 (Adj R² = .16)</th>
<th>Model 3 (Adj R² = .37)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b  β  SE  p</td>
<td>b  β  SE  p</td>
<td>b  β  SE  p</td>
</tr>
<tr>
<td>Perceived Relationship Quality at T1</td>
<td>.32  .07  .35  &lt;.001</td>
<td>.35  .39  .07  &lt;.001</td>
<td>.18  .19  .06  .007</td>
</tr>
<tr>
<td>Gender (Male = 1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.02  .18  .01  .020</td>
<td>.01  .07  .01  .261</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>.02  .18  .01  .638</td>
<td>-.04  -.06  .05  .353</td>
<td></td>
</tr>
<tr>
<td>Feelings of Safety at T1</td>
<td></td>
<td></td>
<td>.53  .51  0.07  &lt;.001</td>
</tr>
</tbody>
</table>

*Note.* Bolded values highlight significant effects. T1 and T2 were collected one month apart. Adj = Adjusted.

Discussion

High quality romantic relationships can act as a buffer against stressors, and ultimately boost physical and mental health (Pietromonaco & Collins, 2017; Robles et al., 2014). Although this evidence is conclusive, considerably less attention has been placed on how relationship quality can also instill a sense of safety in individuals, especially in communities that place an added emphasis on close bonds and face disproportionate levels of safety related threats (e.g., Latinx/Hispanic Americans). Our evidence suggests that at the most basic level, significant positive associations between all components of perceived relationship quality (satisfaction, commitment, intimacy, trust, passion, love) related to increased feelings of safety (i.e., safety in familiar environments). Weaker yet consistent positive associations emerged for safety confidence (i.e., how confident people are in their ability to protect themselves/remain safe). No association was observed for
fear of crime, however. These associations suggest prioritizing healthy and high-quality romantic relationships can not only serve as a buffer to stressors experienced in day-to-day life, but also elevate how safe people feel in their lives in general.

Of the two significant associations, only the association with feelings of safety remained significant one month later, and after adjusting for gender, age, and baseline levels of feelings of safety. These results suggest that the impact of relationship quality on how safe people feel in familiar environments is robust, and of moderate strength. From a theoretical perspective, this study expands upon social safety theory (Slavich, 2020), by highlighting that safety within relationships (expressed via increased relationship quality, as high-quality relationships are characterized by intimacy, trust, and commitment) can also lead to safety outside the scope of our relationships (safety in day-to-day life). From an applied perspective, this finding illustrates that prioritizing high-quality romantic relationships could prove a fruitful avenue for interventions that seek to increase how safe people feel. By increasing how safe people feel, we could also potentially help improve their mental health. Subjective perceptions of safety after all constitute an outcome of great theoretical (Maslow, 1943) and empirical importance, influencing several life outcomes such as our mental and physical health (Syropoulos, 2020).

Although we do not argue that other more important avenues to increase safety should be overlooked (e.g., ensuring that crime and disorder in an area is low; increasing the quality of an environment), we contend that close relationships can potentially contribute to individuals' well-being, in a manner that was previously unexplored and should be targeted alongside environmental factors that influence safety.

**Limitations**
Although we found evidence for robust associations between perceived relationship quality and two facets of PIS, our study had limitations. The most prominent one pertains to the large dropout rate in Study 1B, which resulted in an underpowered sample. We believe that our meta-analytical results do provide some consistency in our findings despite the low power of Study 1B. A second limitation is the correlational nature of our data. Even though we conducted a replication study which examined our associations across time, we have not provided a causal link between our hypothesized variables. Future investigations could employ interventions targeting specific aspects of close relationships, seeking to improve their quality, with the aim of examining their influence on levels of safety. Further, a more rigorous longitudinal investigation with a larger timespan would allow for a more in-depth examination of how variability in perceived relationship quality leads to changes in PIS.

Conclusion

The need to feel safe is fundamental to our existence, and a crucial life indicator. Although there are more direct interventions to ensure that people feel safe, close relationships could potentially play an important role in such efforts. The current investigation provided the first round of evidence for this link, for an ethnic-racial group that emphasizes meaningful bonds in close relationships and is disproportionately impacted by violent victimization. We conclude that prioritizing high-quality romantic relationships (and close relationship in general) could not only increase positive life outcomes, but also do so by increasing how safe people feel in day-to-day life.
CHAPTER 6
GENERAL DISCUSSION

Summary of Key Findings

Across 4 different manuscripts this dissertation focused on three primary goals:

(1) refining the measurement of perceived interpersonal safety by validating a novel scale which can adequately capture the multidimensionality of the construct; (2) Charting how perceived interpersonal safety can relate to indicators of high-quality close relationships, as well as indicators of physical and mental health; (3) Understanding the influence of close relationships (i.e., secure attachment, relationship quality) on perceived interpersonal safety.

The first manuscript included a review of existing literature about subjective perceptions of safety, which was incorporated in the original pool of items used to validate the PIS scale. It also used a bottom-up approach method of generating potential items. Through this double-pronged approach, we ensured that both expert opinion and lay perceptions were incorporated in the scale creation process. In several subsequent studies, 17 and 15-item versions of the PIS scale were found to be psychometrically valid and reliable. Through the use of SEM techniques, and by adhering to standardized criteria for evaluating model fit (e.g., Kline, 2016) we provide evidence that a 3-factor model fits the data the best. Importantly, this 3-factor model was also supported by Item Response Theory (Lawley, 1943) analyses (see Supplementary Materials) which suggested that difficulty and discrimination were optimal for each facet of the PIS separately rather than one singular construct.
In this model, perceived interpersonal safety, namely, how safe people subjectively feel around others in social environments, comprises: (1) *Fear of Crime* (how afraid of being victimized by others in different ways people report feeling), (2) *Safety Confidence* (how confident people feel in their ability to protect themselves and confront potential threats), and (3) *Feelings of Safety* (how safe people feel in day-to-day life, in familiar and relatively safe environments). Evidence for discriminant and convergent validity for these facets was provided in subsequent studies, through correlations, gender identity comparisons, and geographic comparisons. Furthermore, this 3-factor model version of the PIS scale received validation in five other European countries and performed psychometrically similarly (after modification) to a US sample (i.e., it achieved metric invariance). Thus, manuscript 1 (i.e., Chapter 2) directly addressed Goal 1, by introducing a novel, reliable, comprehensive measure of perceived interpersonal safety.

Manuscript 2 (Chapter 3) sought to highlight the importance of living a subjectively safe life, by capturing the degree to which higher scores on an indicator of subjective perceptions of interpersonal safety related to higher scores on physical and mental health indicators. Although the samples used for these studies were relatively small, it is important to note that consistent correlations between all measures in support of our hypothesis were observed across three different developmental stages (i.e., for adolescents, emerging adults, and adults/parents). Participants who reported feeling safer in day-to-day life also reported lower levels of anxiety, loneliness, stress, depression, as well as less upper respiratory infection symptomatology. Moreover, the degree to which parents felt safe also related to their adolescents’ scores on loneliness, depression, and
URI symptomatology, suggesting that for adolescents, even after accounting for the association between their levels of perceived interpersonal safety, how safe their parents feel also plays a role in shaping their mental health. It is possible that parents who feel unsafe might exhibit specific maladaptive parenting behaviors (e.g., more aggression, less parental warmth, more neglect) that lead to youth’s own feelings of less safety which could in turn further exacerbate any mental or physical health issues that children experience (for reviews see Mehta et al., 2021; Spring et al., 2003). However, since these potential explanatory mechanisms were not captured, future research should examine whether indeed it is through these behavioral mechanisms that this partner effect is explained. In summary, Manuscript 2 (i.e., Chapter 3) addresses Goal 2, by showing that how safe people feel does in fact relate to self-reports of physical and mental health.

Manuscripts 3 and 4 (Chapters 4 and 5) sought to highlight whether high-quality close relationships could in fact shape perceptions of interpersonal safety. This research question was driven by existing theoretical arguments about the importance of secure attachment for fostering a sense of security (from an early age) which individuals rely on to explore their social world (Ainsworth et al., 1978). Further, more recent theorizing has also suggested that close relationships processes can influence our health (Pietromonaco et al., 2013), and since perceived interpersonal safety appears to relate to better mental and physical health, it stands to reason that similar close relationship processes could shape how interpersonally safe people feel.

Manuscript 3 suggests that secure attachment relates to increased perceptions of interpersonal safety. This finding is robust across race/ethnicity as it was observed for Latinx adults in romantic relationships, and a majority non-Hispanic White American
sample, and developmental stages, as it was observed in adolescents, emerging adults and adults. Further, this association was also significant after accounting for the influence of perceptions of interpersonal safety from a month prior. When we consider the avoidance-anxiety dichotomy of adult attachment, we find that avoidant attachment is a more consistent predictor of interpersonal safety. Social Defense Theory posits that anxiously-attached individuals are hypervigilant of threats (e.g., Ein-Dor, 2014a). Instead, as Ein-Dor (2014b) suggests “People high on attachment avoidance relegate appraisals of threats and downgrade sensations of pain and vulnerability (e.g., Fraley and Shaver, 1997). Therefore, they are usually less vigilant to signs of danger and tend to recognize the extent of threat later than others (Ein-Dor et al., 2010)”. Thus, it is possible that because of their disassociation with a particular threat, avoidant individuals are not prepared to face a threat, and thus feel more unsafe. Further, from a pragmatic point of view, feeling interpersonally safe near others in social environments, could potentially be something that avoidantly-attached individuals might seek to circumvent.

Manuscript 4 (Chapter 5) expands on these findings by looking at the perceived quality of romantic relationships as a predictor of perceived interpersonal safety. Meta-analytic evidence suggests that both attachment anxiety and avoidance negatively influence relationship satisfaction (rs ranging from .30 to .40; Li & Chan, 2012). Thus, even though relationship quality (which is a construct strongly related to satisfaction) is influenced by a person’s attachment style, these two constructs are empirically distinguishable. Further, while attachment style focuses on the person, relationship quality focuses on the person’s appraisal of their romantic relationship. In this manuscript, we find that those who reported greater relationship quality also reported
feeling more interpersonally safe, and more confident in their ability to remain safe. Importantly, the former association was stronger, and more consistent than the latter, remaining significant even after accounting for existing levels of interpersonal safety. Taken together, the findings of Chapters 4 and 5 lend credence to our theorization that close relationships can influence how subjectively interpersonally safe people feel, thus addressing Goal 3.

**Theoretical Contributions**

From a theoretical perspective, this dissertation meaningfully intersects several different lines of research to shed light on a relatively understudied topic. Relying on theoretical arguments about the importance to be and feel safe (e.g., Theory of Human Needs, Maslow, 1943; Theory of Basic Human Values, Schwartz et al., 2012), this dissertation highlights how perceived interpersonal safety is an important antecedent for mental and physical health. In this exploration, it also integrates work from literature on risk perception (e.g., Slovic, 1987). In doing so, it combines a long tradition of work suggesting that subjective perceptions of risk (or in this case, interpersonal safety) matter for individual well-being.

Further, it discusses how perceived interpersonal safety is a construct that is theoretically distinct from other broader aspects of personal safety. These include primal world beliefs (Clifton et al., 2019), which constitute a general view of the world as safe or unsafe, much like dangerous worldviews (Altemeyer, 1996). In the same vein, in Chapter 1 a theoretical discussion of how perceived interpersonal safety is distinct from assumptions about the world (e.g., Janoff-Bulman, 1992) is also provided. Following this discussion, we highlight that perceived interpersonal safety is an antecedent of
experiences of trauma, suggesting that the latter (i.e., experiencing trauma) could potentially influence how interpersonally safe we feel, a finding that has been supported in extant cross-national empirical work (see Syropoulos, 2020). Importantly, future work needs to empirically connect the two, studying how shattered assumptions about the benevolence of the world could be the mechanism linking experience of trauma to perceived interpersonal safety.

This dissertation also contributes to work on the link between close relationships and health (e.g., Pietromonaco et al., 2013), by providing the first round of evidence for a potential indirect effect of close relationships on physical and mental health, by potentially influencing how interpersonally safe we feel. Chapters 4 and 5 suggest that attachment security and close relationships (both of which have been found to influence our health, see Pietromonaco et al., 2013) also influence how interpersonally safe we feel. In turn, Chapter 2 links interpersonal safety with physical and mental health. Taken together, it is possible that the impact of close relationships on health, could be partially explained by its influence on how interpersonally safe we feel. Crucially, this was not tested directly in this dissertation, as the primary goal of the dissertation was to establish the construct of perceived interpersonal safety. However, we contend that this is an important avenue for future research.

In addition, the present work directly contributes to work on Social Safety Theory (Slavich, 2020) by directly applying it to new domain. Extant theorization on Social Safety Theory has focused on physiological markers of safety. In this dissertation we posit that a similar process can be observed from a subjective point of view. In the current investigation preliminary evidence for this claim is provided, as at the very least how
secure people feel in relationships (i.e., secure attachment) strongly related to how interpersonally safe they feel in their lives. Future work could expand on this claim by investigating this link further, tapping into perceptions of safety within broader contexts (i.e., one’s neighborhood, city, country), and examining whether these subjective perceptions are linked across levels.

**Applied Contributions**

The present work has three primary applied contributions. First and foremost, it introduces a novel measure of perceived interpersonal safety. This tool can be used by researchers, practitioners, and lay people alike to help them gain a better understanding of how subjectively interpersonally safe they feel. In turn, averaging such perceptions from multiple people at higher-order levels (e.g., neighborhood, city, country) can create subjective indicators of interpersonal safety. One such example is Numbeo, the world’s largest cost of living database (Numbeo, 2022). This database uses responses from users from all over the world to create a Safety Index. We propose that such approaches could stand to benefit from incorporating a multidimensional measure of perceived interpersonal safety, which would more accurately depict current levels of safety. Such an index can highlight how interpersonal safety is linked to inequality, education, and environmental outcomes (among other key indicators). Further, such information can be useful for the tourism industry, as it can provide an anthropocentric perspective on safety, from people who already reside in a specific area, which could prove more useful than crime statistics.

A second implication of this work is that by highlighting a link between close relationships and perceived interpersonal safety on the one hand, and perceived
interpersonal safety and health outcomes on the other, we are paving the way for potential future interventions to be constructed targeting these factors. For example, relationship counseling, and interventions that seek to improve relationship quality (e.g., Finkel et al., 2013) could also increase how safe people feel. Further, emphasizing the development of a secure attachment could also prove to be beneficial. In turn, passing policies or implementing measures that increase how interpersonally safe people feel, could have downstream consequences for their mental and physical health, as the correlational evidence presented here suggests.

A third implication is the potential for interpersonal safety to have downstream consequences for intergroup attitudes and conflict resolution. Research on right-wing authoritarianism (e.g., Altemeyer, 1996) suggests that at the basis of such prejudicial ideologies lies an elevated chronic concern about one’s sense of safety. Thus, it is possible that by increasing how interpersonally safe people feel, for example by ensuring that they live in a high-quality urban environment (Syropoulos, 2022), we could decrease their extremist tendencies, instead promoting constructive intergroup attitudes rooted in cooperation rather than threat. Evidence from a series of studies documents a positive link between increased interpersonal safety and constructive national identification (Syropoulos & Leidner, 2022). Given this link, it is possible that by increasing how safe we feel, we could decrease more authoritarian methods of identifying with one’s country. Such work can draw from research on the influence of priming a secure attachment base (Saleem et al., 2015; but also see Mikulincer & Shaver, 2005, 2007 for reviews) as a method of reducing prejudice and intergroup hostility to develop interventions to increase safety and decrease downstream intergroup hostility. Thus, by potentially increasing
perceived interpersonal safety we could not only improve individuals’ well-being, but also we could promote beneficial outcomes at the intergroup level.

**Limitations and Future Directions**

Although the current work advances our understanding of what it means to feel interpersonally safe to a great degree, by highlighting the underlying structure of the construct, and charting its antecedents and consequences for the individual, there are several limitations that should be acknowledged, and addressed in future research. Even though this dissertation discussed theoretical arguments about how perceived interpersonal safety is distinct from primal world beliefs and world assumptions, no empirical evidence highlighting this difference was provided. Chapter 2 includes a study that partially addresses this concern, by highlighting a weak association between all facets of perceived interpersonal safety and dangerous worldviews. Nevertheless, future research should examine the intercorrelation of these constructs to provide further evidence for discriminant validity.

Chapter 2 also provided evidence for gender differences in perceived interpersonal safety. Even though such evidence is informative, it fails to address how other social identities (e.g., race, ethnicity, class, sexual orientation) influence such perceptions. Further, intersections of identities were not examined, which could highlight a potential interaction between race or ethnicity with gender or sexual orientation, such that individuals with multiple minoritized backgrounds could report even less perceived interpersonal safety. Future work can address this gap by explicitly recruiting participants from these populations to understand these phenomena.
From a psychometric perspective, evidence for the validity of the PIS scale was provided. Further, evidence for configural and metric invariance was also noted. Where the PIS scale was lacking was in reliability for the Feelings of Safety facet. This facet includes a lot of items that use idioms or phrases that although easy to comprehend in English, might not translate clearly in other languages. Thus, future work could stand to benefit from revising this facet and conducting a larger cross-national investigation on the topic. Such work could also consider how various individual differences (e.g., personality traits) or cultural differences (e.g., individualism-collectivism, cultural tightness-looseness) moderate the link between perceived interpersonal safety and well-being. One potential hypothesis could be that in more individualistic and culturally loose societies, this link could be more prominent, as each person places a greater emphasis on individual rather than collective well-being.

A final noteworthy limitation is the need to conduct intensive longitudinal investigations on perceived interpersonal safety, and several other variables included in the dissertation. Although some longitudinal investigations were conducted, they were either the product of convenience (for Chapter 2), they were limited to a two-timepoint design (Chapters 4 and 5), or they included perceived interpersonal safety only at T1 (Chapter 3). Future work should employ daily-diary designs and/or examine individual’s perceptions of interpersonal safety across a larger period of time. Each of these designs can offer a lot to our understanding of perceived interpersonal safety. The former (daily-diary design) can help us understand whether perceived interpersonal safety fluctuates at a daily level, due to events within or outside one’s close relationship. The latter (longer longitudinal design) can inform our understanding of how impactful life events influence
our perceptions of interpersonal safety (for such an example on attachment style, see Fraley et al., 2021).

Both designs can also address a major concern stemming from the current studies. This concern is whether the associations noted in this dissertation are bidirectional and reciprocal in their nature. Chapter 3 notes that perceived interpersonal safety relates to mental and physical health but fails to examine whether the opposite is also true. Further, Chapters 4 and 5 highlight that secure attachment and high-quality romantic relationships (respectively) relate to increased perceived interpersonal safety. However again, the opposite, namely whether perceived interpersonal safety influences our attachment style, and the quality of our close relationships remains unanswered. Thus, future research should consider the possibility for a reciprocal relationship between indicators of mental and physical health, indicators of successful close relationships (attachment security, perceived relationship quality) and perceptions of interpersonal safety. Finally, an important future direction is the study of both subjective and objective markers of safety simultaneously. This could take the form of a laboratory study which employs physiological measures of safety, to examine how much they correspond with state perceptions of PIS. In the same study, trait PIS could also be a moderator of potential effects on physiological markers of safety. Alternatively, multilevel approaches which examine the influence of neighborhood, city or country-level factors on people’s perceptions of interpersonal safety could also elucidate the degree to which the two are related. Such investigations can help differentiate the two types of safety, while also highlighting whether they both independently contribute to individual well-being.
Conclusion

In conclusion, the motivation behind this dissertation was to shed light on the importance of perceived interpersonal safety. Although there is extensive theoretical evidence about its importance, and a long tradition of research on relevant constructs, research explicitly on what it means to feel interpersonally safe has been lacking. Thus, this dissertation sought to directly inform our understanding of what it means to feel interpersonally safe. It did so, by providing a novel, reliable, and comprehensive measure of the construct. It also highlighted the antecedents and outcomes of perceived interpersonal safety. It meaningfully integrated different theoretical perspectives to investigate these links. Through this integration of different psychological literatures, this dissertation has highlighted how distinct fields of psychology could benefit from the study of subjective perceptions of interpersonal safety. Further, although preliminary evidence for the importance of this construct was provided, several unanswered, theoretical, and empirical questions remain, which stand as fertile ground for future investigations. By studying the antecedents and the outcomes of what makes us feel safe in the presence of others, we can not only advance our understanding of how humans perceive threats and how they influence their psychology, but we can also take a step towards increasing interpersonal safety in our society, making the world a safer, and potentially happier place.
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