Examining the Empathy Profiles, Personality Traits and

Work Outcomes of Trauma Workers

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Abstract: Research on trauma and emergency workers has continued to grow over the past several decades. However, most of the research on this population has tended to focus on the personal consequences associated with trauma work. The current study utilizes a person-centered approach to examine the empathy profiles and professional outcomes of these workers. Latent profile analyses were conducted on two samples of trauma and emergency workers using the Interpersonal Reactivity Index (IRI), a four-facet measure of empathy. Two similar groups of empathy profiles emerged from the two samples, with significant differences being observed among the profiles in terms of both work outcomes and occupational groupings. Significant differences were also noted among the empathy profiles in terms of the Big Five personality traits, several of which were covariates in the relationships between the profiles and specific work outcomes. The theoretical implications, practical considerations and limitations of the current study are discussed.

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Research on the different cognitive, emotional and somatic consequences of working with traumatized individuals has continued to grow over the past several decades (Cohen & Collens, 2013). According to the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (*DSM-5*), trauma requires "actual or threatened death, serious injury, or sexual violence" (as cited in Pai, Suris & North, 2017, p. 2). The *DSM-5* also acknowledges four distinct ways in which an individual can be exposed to trauma: 1) direct personal exposure; 2) witnessing the trauma of others; 3) indirect exposure (through the trauma experience of a family member or associate); and 4) through "repeated or extreme exposure to aversive details of a traumatic event, which applies to workers who encounter the consequences of traumatic events as part of their professional responsibilities" (Pai, Suris & North, 2017, p. 3).

The latter makes reference to a specific group of individuals who are identified in the psychological literature as 'trauma workers', who are "professionals and paraprofessionals trained to work with persons in the aftermath of traumatic events" (Dutton & Rubinstein, 1995, p. 82). Specifically, trauma workers are exposed to the prolonged and often compounded aftermath of their clients' original traumatic events, whether through the recounting and revivification of the event by the client, through the survivor's reactions to the trauma (via intense emotional pain, rage, despair, etc.), and through institutional or social responses that may end up re-victimizing the client (of which the trauma worker may have little or no control over) (Dutton & Rubinstein, 1995).

Professionals such as counselors, therapists, psychologists and social workers are often identified and studied when it comes to this conception of trauma workers (Cohen & Collens, 2013). However, for emergency and crisis workers (e.g., paramedics, firefighters, law enforcement personnel, emergency medical technicians, etc.), the potential for exposure to

trauma is always present (Beaton & Murphy, 1995). Specifically, these individuals are "exposed to events involving human pain and suffering on a daily basis. They work to rescue individuals trapped in crashed vehicles, they extricate people from fires, they collect the remains of suicide victims, they care for victims of assault" (Regehr, Goldberg & Hughes, 2002, p. 505). Due to these realities, and for the purposes of the current study, 'trauma work' can be understood to encompass both trauma and emergency professionals.

Personal consequences of trauma work

Given the sometimes somber nature of trauma work, it is not surprising that there are several deleterious outcomes that tend to befall individuals who are exposed to human pain and suffering on a regular basis. One common personal outcome is secondary traumatic stress (STS), a syndrome of symptoms that is virtually identical to post-traumatic stress disorder (PTSD) (Figley, 1995). Specifically, secondary traumatic stress "is acquired through exposure to persons suffering from the effects of trauma" (Baird & Kracen, 2006, p. 181). Symptoms of STS include intrusion (e.g., unintended thoughts and/or disturbing dreams about one's work with clients, reliving the traumas experienced by the clients), avoidance (e.g., feeling emotionally numb, feeling discouraged about the future, having little interest in being around others), and arousal (e.g., trouble sleeping, feeling jumpy, feeling annoyed, trouble concentrating); Bride, Robinson, Yegidis & Figley, 2004). It should also be noted that secondary traumatic stress is often used interchangeably with the term 'compassion fatigue', with the latter being "favored by nurses… emergency workers, and other professionals who experience STS" (Figley, 1995, p. 15).

Regarding specific trauma-related occupations, Bride (2007) found that in a sample of social workers who engaged directly with traumatized individuals, 70% experienced at least one symptom on STS in the previous week while 55% met the criteria for at least one of the three clusters of symptoms (i.e., intrusion, avoidance, arousal). Meanwhile, Morrison and Joy (2016)

found that 75% of emergency department nurses at a Scottish hospital reported at least one

symptom of STS in the previous week, while Duffy, Avalos and Dowling (2015) found that 64%

of emergency room nurses in three different regions of Ireland met the criteria for secondary

traumatic stress. Similarly, Kellogg, Knight, Dowling and Crawford (2018) found that over half

of a sample of United States pediatric nurses reported moderate, high or severe levels of STS

symptoms, regardless of age or years of work experience.

MacRitchie and Leibowitz (2010) also found that trauma workers in South Africa who

work with victims of violent crime also reported symptoms of STS, especially when those

workers had also been exposed to violent crimes in their personal lives. Similarly, Schauben and

Frazier (1995) found that female counselors who had a high percentage of sexual violence

survivors in their caseload also reported more PTSD symptoms, as well as disrupted beliefs (for

example, the basic goodness of other people). And, in a completely different area of emergency

work, Hyman (2004) found that among a sample of 90 Israeli Police Forensic Identification

technicians, 51% scored in the medium or high severity range for intrusion symptoms of STS,

while 68% scored in the medium or high severity range for avoidance symptoms.

Very similar to secondary traumatic stress and compassion fatigue is the concept of

vicarious traumatization, which occurs when trauma workers "find their cognitive schemas…

altered or disrupted by long-term exposure to the traumatic experiences of their victim clients"

(McCann & Pearlman, 1990, p. 132). Specifically, working with traumatized individuals can

result in profound changes to the trauma worker's beliefs, expectations and assumptions about

both themselves and other people, as well as in painful and disruptive psychological effects that

can last for months or years after work with the traumatized client ends (McCann & Pearlman,

1990). For example, exposure to clients' graphic and painful experiences, as well as peoples'

intentional cruelty, can result in "significant disruptions in one's sense of meaning, connection,

identity, and world view, as well as in one's affect tolerance, psychological needs…interpersonal relationships, and sensory memory" (Pearlman & Saakvitne, 1995, p. 151). When it comes to prevalence among trauma workers, Peled-Avram (2017) found that in a sample of 109 Israeli social workers, 9% reported a high-average level of vicarious traumatization, while 14% had very high or extremely high levels of the syndrome. Similar to the aforementioned study on STS by MacRitchie and Leibowitz (2010), Peled-Avram (2017) also found that a personal history of trauma also predicted higher levels of vicarious traumatization in the sample of social workers.

Aside from secondary traumatic stress, compassion fatigue and vicarious traumatization, several other negative personal outcomes have been associated with trauma and emergency work. For example, Milner, Witt, Maheen and LaMontagne (2017) conducted a study where they examined the suicide rates of emergency and protective services personnel (e.g., police officers, firefighters, ambulance personnel and prison guards) in Australia over a 12-year period, and found that the suicide rate was 22.4 out of 100,000 for males, and 7.8 out of 100,000 for females. This was in contrast to only 15.5 out of 100,000 for males and 3.4 out of 100,000 for females in all other occupations. Given the higher suicide rates for emergency and protective services personnel, the researchers argue that integrated suicide prevention efforts should be made by these professions in order to address work-related stressors and stigma about disclosing suicidal thoughts, and to also ensure that at-risk individuals have access to help.

Similarly, Stanley, Hom, Hagan and Joiner (2015) found that in a United States-wide sample of 1027 current and retired firefighters, career prevalence estimates for suicide ideation was 46.8%, while suicide plans was 19.2%, suicide attempts was 15.5% and non-suicidal self-injury was 16.4%. To put these numbers into perspective, the researchers point to the findings of Nock et al. (2008b) who found that the lifetime prevalence of suicide ideation, suicide plans, suicide attempts, and non-suicide self injury was only 5.6–14.3%, 3.9%, 1.9–8.7%, and 5.9%,

respectively, for the general U.S. adult population. In other words, the levels of suicide ideation and actual suicides are greater for emergency and protective service personnel not only when compared to other occupations, but to the general population as a whole.

When it comes to maladaptive coping, Jeong et al. (2017) reported that "first responders are an at-risk occupational group for alcohol use disorders (AUD) considering their frequent exposure to life-threatening incidents and stressful work environment" (p. 1069). Indeed, Piazza-Gardner et al. (2014) found that in a sample of 160 professional firefighters, 34% reported binge-drinking alcohol in the past 30 days, and the overall drinking levels reported by the sample exceeded those of the general adult population. Bacharach, Bamberger and Doveh (2008) also found that the relationship between the intensity of firefighters' involvement in critical incidents and their consumption of alcohol (in order to cope) was mediated by the severity of their distress. In other words, trauma and emergency workers are at risk for not only a variety of psychological and mental health outcomes because of their work, but also problematic lifestyle and coping behaviours as well.

Professional consequences of trauma work

Currently, research on trauma and emergency work appears to be focused primarily on the personal consequences associated with these lines of work (e.g., secondary traumatic stress, compassion fatigue, vicarious traumatization, suicide, substance abuse, etc.). However, a limited number of studies have investigated some of the different professional outcomes that are associated with such work. For example, Levin et al. (2012) found positive relationships between the level of exposure to trauma-exposed clients and attorneys' symptoms of functional impairment (as well as PTSD and depression), regardless of gender, age or years on the job. Additionally, the researchers also found that the level of exposure to trauma-exposed clients also predicted reductions in attorneys' weekly work hours over time. Bride and Kintzle (2011) also

found in a sample of substance abuse counselors that those who reported higher levels of

secondary traumatic stress also tended to report lower levels of job satisfaction and occupational

commitment. More troubling, the researchers noted that counselors "experiencing STS are

believed to be at a higher risk of making poor professional judgments such as misdiagnosis, poor

treatment planning, or abuse of clients" (Bride & Kintzle, 2011, p. 22).

In addition to the aforementioned studies that examined the functional impairment,

reduced working hours, job satisfaction and occupational commitment, the most commonly

researched professional consequence of trauma work appears to be burnout. According to

Maslach & Jackson (1981), burnout is "a syndrome of emotional exhaustion and cynicism that

occurs frequently among individuals who do 'people-work' of some kind" (p. 99). Specifically,

burnout consists of three key aspects: emotional exhaustion (i.e., no longer being able to give

oneself on a psychological level); cynicism (i.e., the development of negative attitudes and

feelings about clients); and a reduced level of professional efficacy (i.e., evaluating one's work

and work with their clients negatively, and an unhappiness or dissatisfaction with one's job

accomplishments (Maslach & Jackson, 1981; Maslach et al., 1996). Also, unlike secondary

traumatic stress, which can emerge suddenly and without warning, burnout emerges gradually

and is primarily the result of emotional exhaustion (Figley, 1995). Functionally, burnout has

serious occupational consequences for both the individual and organizations, as it "appears to be

a factor in job turnover, absenteeism, and low morale" (Maslach & Jackson, 1981).

Cieslak et al. (2014) conducted a meta-analysis investigating professionals who work

with trauma survivors and are indirectly exposed to traumatic material, and found that the

association between burnout and secondary traumatic stress was strong ($r = .69$). Meanwhile,

Turgoose et al. (2017) found that among a sample of 142 police officers who work with victims

of sexual assault and rape, longer-serving officers had greater levels of burnout, compassion

fatigue and secondary traumatic stress. Similarly, Jo et al. (2018) found that among a sample of

109 firefighters, burnout was a significant predictor of PTSD symptoms. Interestingly, the

researchers also found that higher burnout was associated with more severe PTSD symptoms for

firefighters who had a high sense of 'calling' for their profession (i.e., those who identified

strongly with being a firefighter). Despite the aforementioned research findings, though, there

does not appear to be many research studies within the psychological literature that have focused

specifically on the relationships between trauma/emergency work, burnout levels, and specific

occupational outcomes (e.g., job performance, turnover intentions, job satisfaction, etc.).

Empathy and trauma work

In everyday situations, empathy can be understood as "the ability to correctly perceive

the troubles of others and as a result develop an emotional connection with another and respond

to their suffering in an emotional manner" (MacRitchie & Leibowitz, 2010, p. 151). On a more

theoretical level, empathy is conceptualized to consist of four separate facets: empathic concern,

perspective taking, personal distress, and fantasy (Davis, 1980, 1983). Empathic concern

(experiencing feelings of warmth, compassion and concern for other people) and perspective

taking (anticipating the behavior and reactions of others) constitute 'other-oriented' aspects of

empathy, while personal distress (experiencing feelings of anxiety and discomfort in emotional

settings) and fantasy (transposing oneself into the feelings and actions of fictitious characters in

books, movies or plays) constitute the 'self-oriented' aspects of empathy.

These four individual aspects also comprise the Interpersonal Reactivity Index (Davis,

1980), a 28-item questionnaire that is the most common psychometric tool for measuring

individual differences in empathy (Chrysikou & Thompson, 2016). Originally validated in

English by Davis (1983), the factor structure was later confirmed by Carey, Fox and Spraggins

(1988) and the measure has been validated in various languages and samples including in

French-speaking Swiss adults (Gilet et al., 2013), Chinese primary and middle school teachers (Huang et al., 2012), Spanish-speaking Chilean university students (Fernández, Dufey & Kramp, 2011), and even Spanish-speaking ex-combatants in Columbia (Garcia-Barrera et al., 2017).

In addition to the four individual facets, Davis (1983) also noted two types of empathic responses: cognitive and emotional. In fact, Chrysikou and Thompson (2016) claim that "it has become common practice in recent psychological studies on empathy to combine the Perspective Taking and the Fantasy subscales of the IRI into a single "Cognitive Empathy" factor, and the Empathic Concern and the Personal Distress subscales into a single "Affective Empathy" factor" (p. 770). However, the researchers also conducted a confirmatory factor analysis that showed poor statistical evidence for this two-factor model of empathy, and argue for the continued use of the original four-factor Interpersonal Reactivity Index (Davis, 1980, 1983) when it comes to assessing individual differences in empathy.

When it comes to trauma and emergency work, empathy is considered to be a major resource that professionals can draw upon to help those who are traumatized (Figley, 1995). Unfortunately, individuals who have a high capacity for empathy are also more at risk for developing compassion fatigue and secondary traumatic stress, as empathy appears to be a key factor that allows for the transmission of trauma from a primary victim to a secondary victim (Figley, 1995; MacRitchie & Leibowitz, 2010). As Figley (1995) so aptly states, "the process of empathizing with a traumatized person helps us to understand the person's experience of being traumatized, but, in the process, we may be traumatized as well" (p. 15). For example, in a sample of 108 Canadian pediatric nurses, Pink de Champlain (2016) found that 81.5% of the sample was found to be at a moderate to high risk for secondary traumatic stress, while 72.2% were at a moderate to high risk for burnout. Additionally, the personal distress facet of empathy was found to be positively correlated with STS and burnout, while the perspective taking and

empathic concern facets were both positively correlated with compassion satisfaction (i.e., the invigoration and inspiration a nurse receives from connecting with a patient and selflessly using their skills and resources to relieve and/or alleviate the patient's pain; Coetzee & Klopper, 2010). Gleichgerrcht (2013) also found these same associations in a sample of 7,584 physicians.

In a pilot study by Atwood & Gilin Oore (2017), the researchers moved beyond the typical focus of secondary traumatic stress and examined both the personal and occupational outcomes of the relationship between empathy and trauma work. Utilizing a multi-profession sample of 339 trauma and emergency workers (e.g., police, firefighters, paramedics, nurses, physicians, social workers, corrections officers, etc.), the researchers found that higher levels of personal distress were associated with greater burnout, greater negative job-related emotions, and a greater number of physical health symptoms. Meanwhile, higher levels of fantasy were also associated with greater burnout, as well as greater turnover intentions and a less general well being. However, despite these insightful findings, it does not appear that any further research studies have explored the relationship between empathy and specific occupational outcomes when it comes to trauma and emergency workers.

Relationship between empathy and personality

A small number of studies have also examined the relationship between empathy (as measured by the IRI) and the Five Factor Model of personality (McCrae & Costa, 1987), which consists of the traits extraversion (being sociable, assertive, energetic, outgoing), neuroticism (emotional stability), openness (being curious, imaginative and unconventional), agreeableness (being cooperative, helpful and easy to get along with) and conscientiousness (being purposeful, determined, organized and controlled) (Muchinsky & Culbertson, 2016). Song and Shi (2017) conducted a hierarchical regression analysis on a sample of surveys collected from 530 Chinese clinical medical students and found that the personality traits of agreeableness, openness,

conscientiousness and neuroticism were all significantly associated with the perspective taking facet of empathy. The researchers also found that agreeableness was significantly associated with empathic concern, while neuroticism and openness were both significantly associated with the personal distress facet of empathy. Similarly, Melchers et al. (2016) also explored the relationship between personality and the IRI in adults at universities in China, Germany, Spain and the United States. In the combined sample, the researchers found that the highest correlations existed between neuroticism and personal distress ($r = 0.55$), agreeableness and empathic concern ($r = 0.35$), and agreeableness and perspective taking ($r = 0.33$).

Taking a different approach to empathy, Sobhani and Gilin Oore (2019) employed the latent profile analysis (LPA) statistical method to determine whether there was evidence for the existence of distinct empathy profiles within the IRI responses of undergraduate and graduate university students. After conducting both exploratory and confirmatory LPAs, the researchers did indeed find evidence for four different empathy profiles: 'Low Empathy' (characterized by low levels on each of the IRI subscales); 'Moderate Other-oriented' (characterized by moderate levels of perspective taking and empathic concern, and low levels of personal distress and fantasy); 'High Affective' (characterized mainly by high levels of personal distress and fantasy); and 'High-functioning Empathy' (which had the highest levels of perspective taking, empathic concern and fantasy, but also low personal distress).

The researchers then conducted several one-way analyses of variance (ANOVA) to examine the differences between the four empathy profiles on each of the five personality traits. Individuals in the 'Low Empathy' profile scored the lowest on all of the five personality traits, while individuals in the 'Moderate Other-oriented' profile scored mostly average across all personality traits with the exception of slightly above-average conscientiousness. Meanwhile, participants in the 'High Affective' profile scored the highest on neuroticism, but were fairly

moderate with respect to the other four personality traits. Lastly, participants in the 'High-functioning Empathy' profile scored significantly higher on openness than the other three empathy profiles, and also scored high on agreeableness and conscientiousness as well.

The current study

The current research study follows directly on the two lines of research started by both Atwood and Gilin Oore (2017) and Sobhani and Gilin Oore (2019), as it examines: 1) whether similar latent empathy profiles exist within different samples of trauma and emergency workers; and 2) whether workers belonging to specific empathy profiles differ when it comes to specific personality dimensions and occupational outcomes (e.g., occupational burnout, person-job fit, job performance, turnover intentions and tenure). The melding of these two objectives is important because, in addition to the aforementioned relationships between burnout, personality and the four facets of empathy, several of these work outcomes have already have been found to correlate with one another. For example, person-job fit, which occurs when a person has the knowledge, skills, abilities, competencies and other attributes required for the job (Catano, Wiesner & Hackett, 2019), was shown to be correlated with job satisfaction ($r = .56$), quitting intentions ($r = -.46$), supervisor satisfaction ($r = .33$), job performance ($r = .20$), tenure ($r = .18$) and turnover ($r = -.08$) (Kristof-Brown, Zimmerman & Johnson, 2005). Finally, utilizing a person-centered, analytical approach to studying empathy will provide greater insights as to how organizations can best recruit, train and counsel their trauma and emergency workers. Doing so will not only benefit the workers and their organizations, but also the clients they serve.

Hypotheses

Although the current study is exploratory in nature, it would be beneficial if the makeup of the empathy profiles is similar to those found by Sobhani and Gilin Oore (2019). However, given that the previous research was conducted using a non-trauma student sample, it is entirely

possible that samples comprised solely of trauma workers will yield different types of empathy

profiles. Regardless, it is expected that:

- Hypothesis 1a: Distinct empathy profiles will emerge from a sample of trauma

  workers (Sample 1) who completed the Interpersonal Reactivity Index (Davis, 1983).

- Hypothesis 1b: The same empathy profiles that are found in Sample 1 will emerge in a

  second, similar sample of trauma workers (Sample 2).

If Sample 1 and Sample 2 are successful in identifying and confirming the existence of

statistically distinct empathy profiles, the next set of hypotheses will determine if:

- Hypothesis 2a: Trauma workers who are assigned to their respective empathy profile

  (based on their highest statistical probability of belonging to that profile) will differ

  significantly when it comes to the three facets of occupational burnout (emotional

  exhaustion, cynicism, professional efficacy).

Specifically, the differences between empathy profiles should echo previous studies (e.g.,

Atwood & Gilin Oore, 2017; Gleichgerrcht, 2013; Pink de Champlain, 2016;). For example,

profiles that are characterized by higher levels of personal distress should also be associated with

higher levels of burnout when compared to profiles that are low in this dimension.

- Hypothesis 2b: Trauma workers who are assigned to their respective empathy profiles

  will differ significantly when it comes to specific work outcomes (e.g., job affect,

  turnover intentions, tenure, job performance and person-job fit).

For example, it is possible that workers with profiles characterized by higher levels of

fantasy might be more prone to higher turnover intentions (e.g., Atwood & Gilin Oore, 2017)

when compared to profiles that are low in fantasy. Likewise, it is possible that workers with

profiles characterized by higher levels of perspective taking are more prone to higher levels of

person-job fit, much like how Pink de Champlain (2016) and Gleichgerrcht (2013) found that

perspective taking was associated with increased compassion satisfaction.

- Hypothesis 3: Trauma workers who are assigned to their respective empathy profiles

  will differ significantly when it comes to specific personality traits.

It is conceivable that workers with empathy profiles characterized by high levels of

personal distress and/or fantasy will also report higher levels of neuroticism (e.g., Sobhani &

Gilin Oore, 2019), when compared to workers with profiles that are low in these dimensions.

Similarly, it is possible that workers with empathy profiles characterized by high levels of

perspective taking and/or empathic concern will report higher levels of agreeableness (e.g., Song

& Shi, 2017), when compared to workers with profiles that are lower in these dimensions.

In addition to the aforementioned hypotheses, the current study will also explore the

differences among the empathy profiles when it comes to professions, job tenure and level of

trauma exposure. For example, it is possible that certain empathy profiles may be comprised of

certain types of professions (e.g., profiles characterized by high empathic concern could consist

of large numbers of nurses or counselors). Additionally, because highly empathic trauma

workers are vulnerable to compassion fatigue (Figley, 1995), it is conceivable that the level of

trauma a worker experiences could moderate the relationship between their empathy type and job

tenure (that is, individuals who are both highly empathic and are exposed to high levels of

trauma in their professions might be more likely to have shorter careers). Similarly, it is

conceivable that person-job fit could also play a moderating role when it comes to the

relationship between empathy profiles and job tenure. For example, trauma workers who view

themselves to be in the "right" job could still have long careers despite having a problematic

empathy profile (i.e., a profile that is characterized predominantly by high personal distress).

SAMPLE 1

Method

The dataset used for Sample 1 was the same set created and used by Atwood and Gilin Oore (2017). As per the method section of that study, data collection occurred during February and March of 2016 via an online self-report questionnaire hosted by the FluidSurveys website. Participants were recruited primarily through e-mails to personal contacts working in trauma-related fields, as well as by posting invitations on Facebook and in relevant discussion boards (e.g., 'nursing', 'EMT', 'psychology study') on the website Reddit. All callouts for participation specifically requested individuals who self-identified as working in a traumatic profession (i.e., jobs involving exposure to abuse, death or the physical/emotional distress of others as part of their work). All invitations contained an enclosed link that took participants directly to the online survey. Participants were not offered incentives to participate in the original study.

Participants

The dataset created by Atwood and Gilin Oore (2017) contained a total of 339 participants, however only 295 were originally screened in for usage in Sample 1. A total of 44 participants were screened out if either it was unclear they worked in a trauma-related field, and/or they failed to complete the majority of all four subscales of the Interpersonal Reactivity Index (i.e., at least four of the seven items for each subscale). An additional six participants were also screened out after the latent profile analysis stage (see below), as these individuals could not be decisively assigned to one of the distinct empathy profiles (that is, there was less than a 50% probability that the participant belonged to at least one of the proposed profiles). An additional participant was also excluded from the final analyses after a search for univariate outliers among the main study variables revealed one extreme case (see results section for more information).

Of the 288 participants who were included in the final analyses, 40.6% identified as male, 58.3% as female and 1% as neither. The majority of participants resided in either the United States (62.5%) or Canada (26.4%), and ranged in age from 18 to 62 years ($M = 30.26$, $SD = 8.29$). Participants were predominately Caucasian (91%), were either married (47.9%) or single (28.8%), and the majority (74.3%) did not have dependents.

In terms of profession, nurses comprised the majority (53.5%) of the sample, followed by firefighters and EMTs (19.8%), medical professionals (6.6%), paramedics and ambulance personnel (6.3%), social work related occupations (5.6%), psychology and counselling related occupations (5.2%) and police, corrections, and military personnel (3.1%). In terms of tenure, 56.3% of participants had been working in their field for 1-3 years, 22.2% had between 4-7 years, 11.8% between 8-12 years, and 9% had 13 or more years in their profession.

Regarding trauma exposure, all of the 288 participants reported experiencing at least some form of trauma throughout the course of their careers. Although the estimated percentage of trauma experience ranged from 5% to 100%, the majority of participants (79.5%) reported experiencing a 'high' level of trauma (i.e., more than 50% of their weekly shifts had involved experiencing trauma of some kind).

Procedure

In the original study by Atwood and Gilin Oore (2017), participants first had to provide their consent prior to participating in the study. Participants also had to answer a screening question where they confirmed that they worked in a traumatic occupation (i.e., a job in which they were often faced with other humans' pain and suffering) before they could continue with the survey. Participants who did not agree that their job met the criteria for a traumatic occupation were prevented from completing the rest of the survey.

Measures

Demographics. The demographic section of the online survey consisted of a mixture of multiple choice and open-ended questions designed to record participants' age, gender, ethnicity, country of residence, job type, marital status, number of dependents, job tenure and the estimated percentage of work shifts involving trauma during a typical work week.

Empathy. All of the 295 participants who were screened into Sample 1 completed the Interpersonal Reactivity Index (IRI) (Davis, 1983), a 28-item questionnaire containing four 7-item subscales designed to capture individual differences on four facets of empathy: empathic concern; perspective taking; personal distress; and fantasy. All 28 items operate on a 5-point Likert scale where the participant responds to how well each item describes them. Examples of specific items include "when I see someone being taken advantage of, I feel kind of protective towards them" (empathic concern), "I try to look at everybody's side of a disagreement before I make a decision" (perspective taking), "being in a tense emotional situation scares me" (personal distress), and "I really get involved with the feelings of the characters in a novel" (fantasy). Response options range from 1 ("does not describe me well") to 5 ("describes me very well").

Burnout. Occupational burnout was measured using the Maslach Burnout Inventory General Survey (MBI-GS) (Maslach et al., 1996), a 16-item tool that measures individuals' levels of emotional exhaustion, cynicism and professional efficacy. Participants respond to items inquiring about their feelings about their job using a 7-point Likert scale with values ranging from 0 (never) to 6 (every day). Examples of items include "I feel emotionally drained from my work" (emotional exhaustion), "I doubt the significance of my work" (cynicism) and "in my opinion, I am good at my job" (professional efficacy).

Job affect. A short version of the Job-related Affective Well-being Scale (JAWS) (Van Katwyk, Fox, Spector & Kelloway, 2000) was used to assess how frequently participants had

experienced negative feelings about their job within the past 30 days. This version consisted of

two negative subscales: low pleasure high arousal emotions (e.g., anger), and low pleasure low

arousal emotions (e.g., boredom). Examples of items included "in the past month my job made

me made me feel furious" and "…made me feel gloomy". Participants responded to each

statement using a 5-point Likert scale, with values ranging from 1 (never) to 5 (always).

      Job performance. Job performance was measured using a short 3-item scale developed

by Gilin Oore, LeBlanc, Pope and Hildebrand (2016). Respondents report how their supervisor

or boss would rate their quality of work, amount of work, and overall job performance within the

past month. Responses are captured using a 5-point Likert scale, with values ranging from 1

(poor) to 5 (excellent).

      Turnover intentions. Participants' intent to leave their current job was measured using

three items from a scale originally developed by Kelloway, Gottlieb and Barham (1999) to assess

the source, nature and direction of work and family conflict. The three turnover items were "I

plan on leaving my job within the next year", "I have been actively looking for other jobs" and "I

want to remain in my job". Responses were recorded using a 5-point Likert scale, with values

ranging from 1 (strongly disagree) to 5 (strongly agree).

      Analytic approach. Unlike the aforementioned measures, which use directly observed

variables, a person-centered approach to data analysis was required to identify the unobserved

(or latent) groups of empathy profiles within Sample 1. With the person-centered approach, the

focus is on the relationships among individuals, rather than on the relationships among variables

(Muthén & Muthén, 2000). Specifically, person-centered analyses reject "the assumption that the

entire population is homogenous with respect to how variables influence each other" (Laursen &

Hoff, 2006, p. 389). Furthermore, these types of analyses seek to find categories or subgroups of

individuals who are both similar within groups and different between groups, based on their

patterns of association among specific outcome variables (Laursen & Hoff, 2006; Pastor, Barron, Miller & Davis, 2007).

One person-centered technique that allows researchers to classify individuals into homogeneous subgroups is latent variable mixture modeling (Pastor et al., 2007). When this technique is used with a cross-sectional research design and categorical variables, it is referred to as latent class analysis (LCA); when it is used with a cross-sectional design and continuous indicator variables, it is referred to as latent profile analysis (LPA) (Bray & Dziak, 2018; Pastor et al., 2007; Williams & Kibowski, 2016).

In addition to assigning participants to latent groups based on their responses to specific outcome variables, LCA/LPA also calculates the likelihood of each participant belonging to the other classes found within a specific solution (Williams & Kibowski, 2016). This is particularly advantageous, as class memberships that are based on patterns of responses "can be used to inform policies and practice-based interventions aimed at targeting a specific latent class that has emerged from the analysis" (Williams & Kibowski, 2016, p. 2). As the current study attempts to identify problematic empathy profiles within cross-sectional samples of trauma workers (using continuous means from the four IRI subscales), it was determined that LPA was the most appropriate person-centered technique to use.

All latent profile analyses for Sample 1 were completed using the Mplus (Version 8) Demo software (Muthén & Muthén, 1998-2017). As stated by Masyn (2013), most mixture models (including LPA) follow an iterative approach where "successive sets of parameters estimates are tried using a principled search algorithm with a pair of stopping rules: (1) a maximum number of iterations and (2) a convergence criterion" (p. 562). In practice, this iterative approach begins by first estimating a one-class solution, and then increasing the class numbers by one in a stepwise fashion until a best-fitting solution is found (Muthén & Muthén,

2000; Williams & Kibowski, 2016). To assist with determining a best-fit model (and by

extension, a feasible number of latent classes), Mplus provides the following fit statistics: Log-

likelihood (LL), Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC),

Sample Size Adjusted BIC (SSA-BIC), entropy, the Lo-Mendell-Rubin adjusted Likelihood

Ratio Test (LMR), and Bootstrapped Likelihood Ratio Test (BLRT).

　　　According to Oberski (2016), the AIC and BIC are both common measures of fit;

however, the practice of choosing a model based on the lowest BIC value is currently the most

used procedure when it comes to LCA (and by extension, LPA). Similarly, Williams and

Kibowski (2016) noted that evaluations of class solutions should take place when the AIC, BIC,

and adjusted BIC values are at their lowest, and that higher entropy values are indicative of

"better probabilities of being able to successfully classify participants into a latent class" (p. 5).

Additionally, a statistically significant LMR indicates that a model with more latent profiles fits

the data significantly better than a model with one less profile (Ferguson & Hull, 2018).

However, Nylund, Asparouhov and Muthén (2007) found that the BLRT outperformed all other

tests when it came to predicting the correct number of classes in a simulation study, followed by

the BIC and the adjusted BIC.

　　　Despite these endorsements, Masyn (2013) pointed out that "deciding on the number of

classes is often the most arduous phase of the mixture modelling process…as there is no single

method for comparing models with differing numbers of latent classes that is widely accepted as

best" (p. 566). This sentiment is echoed by Bauer and Curran (2003), who state that no model is

ever 'correct', especially when viewed from outside the realm of artificial simulation studies.

Rather, concerns such as parsimony, theoretical consistency, description, explanation and

prediction "should be weighted according to the scientific goals of the particular application"

(Bauer & Curran, 2003, p. 391).

In terms of the practicality of selecting an appropriate model, Oberski (2016) stated that it is "often also possible to pick a lower or a higher number of classes based on substantive concerns or ease of interpretation" (p. 8). It is clear, then, that choosing a best-fitting model is a complicated matter that should involve a balanced consideration of statistical measures, theoretical implications and practical concerns.

Results

Multivariate assumption checks for outliers, normality and linearity were conducted on the main outcome variables of Sample 1 prior to commencing the LPA. An inspection of Cook's distance did not reveal any substantial concerns regarding outliers, nor did visual inspections of the histogram, P-P plot and scatterplot diagrams reveal any concerns regarding normality or linearity. However, it must be noted that individual inspections of each of the outcome variables revealed significant Shapiro-Wilk values for each one, which typically indicates a violation of the assumption of normality. This should not be viewed as alarming, however, as larger samples sizes (i.e., those greater than 200) tend to yield significant results "even in the case of a small deviation from normality" (Ghasemi & Zahediasl, 2012). More importantly, the central limit theorem dictates that "regardless of the shape of the population, parameter estimates of that population will have a normal distribution provided the samples are 'big enough'" (Field, 2013, p. 170). Given that the current sample size is certainly not small ($N = 295$), significant Shapiro-Wilk values should not pose a serious threat in terms of the main analyses.

Confirmatory Factor Analysis of the IRI

The factor structure of the IRI was also assessed via confirmatory factor analysis (CFA) to ensure it was consistent with the four-factor structure originally reported by Davis (1983). A modified version of the Sample 1 dataset was used for the CFA, as 11 cases needed to be deleted because of missing values in at least one of the IRI scale items. However, these 11 cases were

retained for the LPA, as that analysis relied on composite means for each of the four IRI

subscales (i.e., the means were computed as long as participants answered four of the seven

items in each subscale – a process that did not result in any missing values for those means).

The CFA itself was conducted using the IBM SPSS Amos (Version 24.0) structural equation

modeling software (Arbuckle, 2016).

In terms of assessing overall model fit, Hooper, Coughlan and Mullen (2008) suggested

that it is sensible to report the following SEM fit indices: the model chi-square (χ^2) value (with

its degrees of freedom and significance value); the root mean square error of approximation

(RMSEA) with its associated confidence intervals; the standardized root mean square residual

(SRMR); the comparative fit index (CFI); and at least one parsimony fit index, such as the

parsimonious normed fit index (PNFI). The authors note that the aforementioned indices "have

been chosen over other indices as they have been found to be the most insensitive to sample size,

model misspecification and parameter estimates" (Hooper et al., 2008, p. 56).

The χ^2 value is the conventional null hypothesis significance test (NHST) used to assess

the model's overall goodness of fit (Barrett, 2007; Hooper et al., 2008). However, unlike the

typical NHST, the aim is to *accept* the null hypothesis rather than reject it (Barrett, 2007). In

other words, χ^2 values of less than .05 are indicative of poor model fit. Meanwhile, the RMSEA

is "recognized as one of the most informative criteria in covariance structure modelling" (Byrne,

2010, p. 80), as it favours parsimony and chooses the model with the least number of parameters

(Hooper et al., 2008). MacCallum and Austin (2000) strongly encourage the use of this statistic,

as "commonly used guidelines for interpretation seem to yield appropriate conclusions about

model quality" (p. 219).

In recent years, the commonly used guideline for the RMSEA cut-off seems to be the

stringent .06 advocated by Hu and Bentler (1999) (Ferguson & Hull, 2018; Hooper et al., 2008;

Marsh, Hau & Wen, 2004). However, Marsh et al. (2004) argued, somewhat strenuously, that some of the goodness-of-fit statistic cut-offs advocated by Hu and Bentler (1999) were too restrictive, particularly the RMSEA. Specifically, the researchers claimed that "it is almost impossible to get an acceptable fit (e.g., CFI, RNI ,TLI >.9; RMSEA < .05) for even "good" multifactor rating instruments when analyses are done at the item level and there are multiple factors" (p. 325). Earlier, though, Browne and Cudeck (1992) had argued that while RMSEA values of .05 or less indicate good model fit, values between .05 and .08 indicate "a reasonable error of approximation" (p. 239), but values greater than 0.1 indicate poor model fit. MacCallum, Browne and Sugawara (1996) also considered RMSEA values between 0.08 and 0.10 to indicate mediocre fit, but cautioned that "these guidelines are intended as aids for interpretation of a value that lies on a continuous scale and not as absolute thresholds" (p. 134). Recently, personality researchers (e.g., Ferguson & Hull, 2018; Hopwood & Donnellan, 2010) have advocated for adopting more liberal RMSEA criteria (e.g., < .10), mostly citing the complex nature of personality constructs in general.

Regarding the SRMR, this statistic represents the average value across all standardized residuals and ranges from zero to 1.00, with smaller values (.05 or less) indicating good model fit (Byrne, 2010). Unlike their more stringent RMSEA cut-off recommendation, Hu and Bentler (1999) have argued that a score closer to .08 should be adopted as the cut-off for the SRMR statistic. This is not the case for CFI values, however, which also "range from zero to 1.00 and are derived from the comparison of a hypothesized model with the independence (or null) model" (Byrne, 2010, p. 78). Currently, the .95 value proposed by Hu and Bentler (1999) seems to be the agreed-upon cut-off threshold for this statistic (Byrne, 2010; Hooper et al., 2008).

Finally, the PNFI considers the number of degrees of freedom used to obtain a certain level of fit, and seriously penalizes for model complexity (Hooper et al., 2008; Schumacker &

Lomax, 2016). While Hooper et al. (2008) point out that no threshold levels have been recommended for this statistic, they do acknowledge that parsimony fit index values are "considerably lower than other goodness of fit indices" (p. 55). To illustrate this point, Byrne (2010) claimed in an example of her own that a PNFI value of .74 falls "in the range of expected values" (p. 79). In any event, given the lack of consensus around threshold values for parsimony fit indices, Hooper et al. (2008) caution that statistics such as the PNFI should be used in tandem with other measures of fit.

Table 1

Confirmatory Factor Analysis Fit Indices for the IRI

Sample	χ^2	df	p	RMSEA	RMSEA LO 90, HI 90	SRMR	CFI	PNFI	R^2 Range
Sample 1	815.79	344	.00	.07	.063, .076	.07	.86	.71	.07-.67

Note. $N = 284$. χ^2 = model chi-square; df = degrees of freedom for χ^2; p = significance value for χ^2 (significant at $p < .05$); RMSEA = root mean square error of approximation; RMSEA LO 90 = RMSEA lower bound at the 90% confidence interval; RMSEA HI 90 = RMSEA higher bound at the 90% confidence interval; SRMR = standardized root mean square residual; CFI = comparative fit index; PNFI = parsimonious normed fit index; and R^2 = squared multiple correlation coefficient (or reliability). One item on the IRI fantasy subscale ("I daydream and fantasize, with some regularity, about things that might happen to me") had an R^2 value below .10 (i.e., less than 10% of the variance explained by the factors).

The robust fit indices and factor inter-correlations for the IRI are presented in Table 1 and Table 2, respectively. All 28 items loaded significantly on their intended factors (i.e., perspective taking, empathic concern, personal distress and fantasy), providing evidence for the same four-factor model originally proposed by Davis (1983). However, because both the model χ^2 value was significant ($< .05$) and the CFI value is well below the .95 cut-off recommended by Hu & Bentler (1999), it is possible to assume that the model does not fit the data. However, because the RMSEA and its upper confidence level are both below .08, it is alternatively possible to argue that the model does indeed fit the data in a fair manner (MacCallum et al., 1996). This claim is further bolstered by the fact that the SRMR is well below the .08 cut-off recommended by Hu

and Bentler (1999), and the PNFI value (.71) is very close to the example value (.74) that Bryne

(2010) reported was "in the range of expected values" (p. 79).

Table 2
Factor Inter-correlations for the IRI (Sample 1)

IRI Factors	1	2	3
1. Perspective Taking (PT)			
2. Empathic Concern (EC)	.66***		
3. Personal Distress (PD)	.02	.35***	
4. Fantasy (FS)	.39***	.57***	.28**

Note. $N = 284$. *** indicates $p < .001$. ** indicates $p < .01$. * indicates $p < .05$.

In addition to the current CFA, previous research studies have also examined the original

four-factor structure proposed by Davis (1980). For example, Gilet et al. (2013) confirmed the

four-factor structure of the French version of the IRI and reported fit statistics that were

remarkably similar ($\chi^2(344) = 789$, $p = .01$, CFI = .81, RMSEA = .065, 90% CI [.06, .07], SRMR

= .07) to those reported here in Sample 1. Similarly, Chrysikou and Thompson (2015) conducted

a four-factor CFA of the regular English version of the IRI and not only found that it had

acceptable fit indices (e.g., CFI = .955; TLI = .950), but that it also had better fit indices than a

two-factor model (cognitive vs. affective) and a hierarchical model. Likewise, Sobhani and Gilin

Oore (2019) also found that the original four-factor model had a significantly better model fit

than three other models (e.g., a one-factor model, a 'cognitive vs. affective' two-factor model,

and a 'self vs. other' two-factor model).

In keeping with these previous research studies, the current study also examined the fit

indices of a one-factor model and two different two-factor models (cognitive vs. affective and

self vs. other). The results of these alternative models, as well as their comparisons to the

aforementioned four-factor model, are presented in Table 3.

Table 3

Confirmatory Factor Analysis Alternate Model Comparisons to Four-factor Model (Sample 1)

Model	χ^2	*df*	*p*	RMSEA	RMSEA LO 90, HI 90	SRMR	CFI	PNFI	Difference (χ^2, *df*)
1-Factor	2113.78	350	.00	.13	.128, .139	.14	.47	.39	1297.99,6[*]
Self-Oth	1598.68	349	.00	.11	.107, .118	.14	.62	.52	782.89,5[*]
Cog-Aff	1849.32	349	.00	.12	.118, .129	.16	.54	.46	1033.53,5[*]
4-Factor	815.79	344	.00	.07	.063, .076	.07	.86	.71	–

Note. χ^2 = model chi-square; *df* = degrees of freedom for χ^2; *p* = significance value for χ^2 (significant at *p* < .05); RMSEA = root mean square error of approximation; RMSEA LO 90 = RMSEA lower bound at the 90% confidence interval; RMSEA HI 90 = RMSEA higher bound at the 90% confidence interval; SRMR = standardized root mean square residual; CFI = comparative fit index; and PNFI = parsimonious normed fit index. [*] indicates significant at the .01 level.

As shown in Table 3, an evaluation of the fit indices and difference tests revealed that the four-factor model remained the best-fitting model for the Sample 1 CFA. Because of this fact, combined with the fact that the four-factor model itself was found to have acceptable fit indices, it was deemed acceptable to proceed with the latent profile analysis using the Sample 1 data.

Latent Profile Analysis

The LPA for Sample 1 (*N* = 295) was conducted using the Mplus (Version 8) Demo software (Muthén & Muthén, 1998-2017). The main variables used in the analysis were the composite scores of each of the four IRI subscales, for which there were no missing values. Adhering to the iterative/stepwise approach (Masyn, 2013; Muthén & Muthén, 2000; Williams & Kibowski, 2016), the LPA process began by first estimating a one-profile solution and continued by increasing the number of specified profiles by one until a viable solution was found. The fit statistics for each of these iterative steps are presented in Table 4.

As mentioned earlier, the process of deciding on the number of profiles is often arduous because 1) there is no single method for comparing models that is widely accepted as the 'best', and 2) no model is ever really 'correct' outside the realm of simulation studies (Bauer & Curran,

2003; Masyn, 2013). Rather, the process of selecting a best fitting model and number of profiles

is one that should not only consider the statistical evidence, but issues such as parsimony,

theoretical consistency, description, prediction and explanation as well (Bauer & Curran, 2003).

It is this multi-faceted, complex approach that was adopted for the current analysis.

Table 4

Fit Statistics for Empathy Profiles (Sample 1)

No. of Profiles	LL	FP	AIC	BIC	SSA-BIC	LMR (p)	BLRT (p)	Entropy
1	-3665.450	8	7346.900	7376.396	7351.025	N/A	N/A	N/A
2	-3575.407	13	7176.814	7224.744	7183.518	.001	.000	.745
3	-3545.196	18	7126.392	7192.758	7135.674	.078	.000	.797
4	-3533.980	23	7113.960	7198.761	7125.821	.384	.000	.733
5	-3517.785	28	7091.570	7194.806	7106.009	.086	.000	.768
6	-3507.935	33	7081.870	7203.540	7098.887	.539	.000	.744
7	-3501.327	38	7078.655	7218.760	7098.251	.427	.250	.762

Note. $N = 295$. LL = Log-likelihood. FP = free parameters. AIC = Akaike Information Criterion.
BIC= Bayesian Information Criterion. SSA-BIC = Sample Size Adjusted BIC. LMR = Lo-Mendell-
Rubin adjusted Likelihood Ratio Test. BLRT = Bootstrapped Likelihood Ratio Test.

In terms of interpreting the different fit statistics, the heaviest consideration was paid to

both the Bayesian Information Criterion (BIC) and the Bootstrapped Likelihood Ratio Test

(BLRT). This was done for two reasons. First, the procedure of choosing the lowest BIC value is

currently the most used approach in latent class analysis (Oberski, 2016). This is likely done

because a "variety of textbooks and articles suggest the use of the BIC as a good indicator for

class enumeration over the rest" (Nylund et al., 2007). In their own simulation study, Nylund et

al. (2007) did indeed find evidence for the superiority of the BIC, as it was the information

criteria (IC) statistic that most consistently identified the correct number of classes, especially

when it came to continuous data.

Second, despite the apparent superiority and popularity of the BIC, Nylund et al. (2007)

also found that the BLRT consistently outperformed all other statistics (including IC statistics

such as the BIC) when it came to choosing the correct model. The researchers did note some

disadvantages of the BLRT, however, mainly that outliers and/or a skewed distribution of the variables could lead to incorrect *p*-values. So, rather than place one of these statistics over the other in terms of importance, it was decided to consider the BIC and BLRT in tandem with each other when it came to assessing overall model fit.

With this approach in mind, Table 4 clearly shows that the three-, four- and five-profile solutions had the lowest BIC values in the group, and all three solutions had significant BLRT values ($p < .001$). These solutions also appeared to have moderately high entropy values, which is an indication that there is a greater probability of successfully classifying participants into latent classes (Williams & Kibowski, 2016). It should also be noted that none of these three solutions had a significant LMR value, but given the noted superiority of both the BIC and BLRT as predictors of model fit, this observation did not constitute a major concern. For all of these reasons, it was decided that the three-, four- and five-profile solutions would be the main models of interest for Sample 1.

Table 5 provides a summary of how each of these solutions compare to one another in terms of their final class counts, relative class sizes and mean scores on the four IRI subscales. From a statistical perspective, the three-profile solution appears to have the best model fit when compared to the other two solutions; it has a significant BLRT value, the lowest BIC value, and the highest entropy value). This solution also has parsimony going for it as well, as it could be argued that the existence of three empathy profiles is ultimately simpler than the existence of four. In terms of the profiles, the three-profile solution appears to consist of the following: a 'low empathy' profile (marked by the lowest scores on all four of the IRI subscales); a 'cognitive empathy' profile (marked by the perspective taking facet being the highest and personal distress facet being the lowest); and a 'high functioning empathy' profile (characterized by high levels of perspective taking, empathic concern and fantasy, and a very low level of personal distress).

Table 5

Comparisons of the Three-, Four- and Five-Profile Solutions in Sample 1
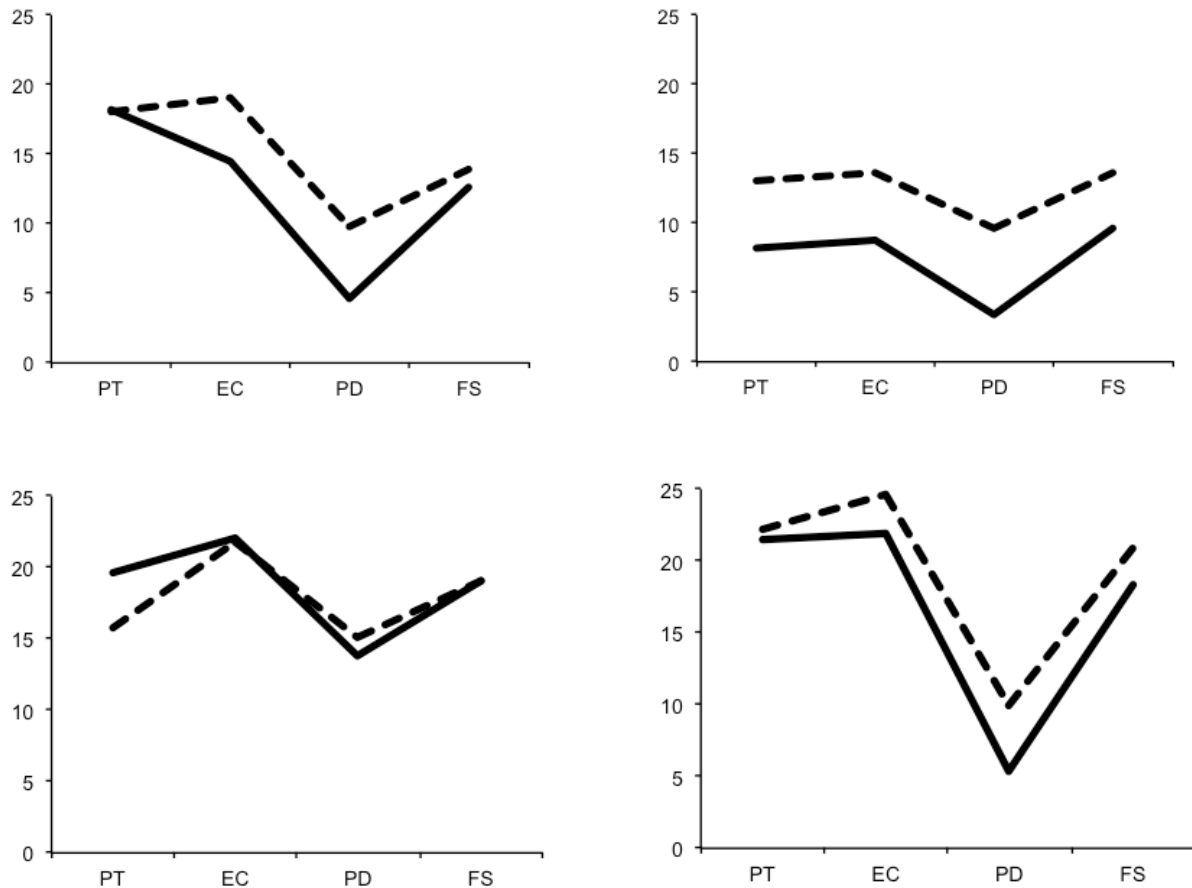
	Three-Profile Solution				Four-Profile Solution				Five-Profile Solution		
Profile	Class Count	Sample %	IRI Means	Profile	Class Count	Sample %	IRI Means	Profile	Class Count	Sample %	IRI Means
1	22	0.075	PT: 8.662 EC: 8.896 PD: 3.642 FS: 9.665	1	109	0.369	PT: 18.204 EC: 14.441 PD: 4.584 FS: 12.625	1	21	0.071	PT: 8.170 EC: 8.780 PD: 3.285 FS: 9.544
2	115	0.390	PT: 18.271 EC: 14.693 PD: 4.959 FS: 13.101	2	20	0.068	PT: 8.161 EC: 8.760 PD: 3.400 FS: 9.646	2	17	0.058	PT: 15.392 EC: 15.016 PD: 12.362 FS: 15.089
3	158	0.536	PT: 21.170 EC: 22.403 PD: 7.925 FS: 18.689	3	50	0.169	PT: 19.610 EC: 22.065 PD: 13.807 FS: 19.081	3	95	0.322	PT: 18.602 EC: 14.269 PD: 3.621 FS: 12.461
				4	116	0.393	PT: 21.554 EC: 21.930 PD: 5.361 FS: 18.325	4	50	0.169	PT: 20.765 EC: 23.142 PD: 13.558 FS: 19.426
								5	112	0.380	PT: 21.346 EC: 21.801 PD: 5.072 FS: 18.137

Note. *N* = 295. PT = Perspective Taking. EC = Empathic Concern. PD = Personal Distress. FS = Fantasy. All four IRI subscale scores can range from 0-28.

Statistically speaking, the four-profile solution had the third lowest BIC when compared to the three- and five-profile solutions. However, it should be noted that the difference between these three BIC values is a mere 6 points, as they range from 7192.76 (three-profile solution) to 7198.76 (four-profile solution). It should also be noted that the four-profile solution maintains a strongly significant BLRT value ($p < .001$), which is the same as both the three- and five-profile solutions. In terms of the actual profiles, the same three from the three-profile solution ('low empathy', 'cognitive empathy' and 'high functioning empathy') were also found in the four-profile solution. With the exception of a somewhat lower level of personal distress in the 'high functioning empathy' profile (four-profile solution), these three profiles effectively mirror each another other across the two models.

The addition of a unique fourth profile, however, does appear to add an important new descriptive layer to the group of profiles. While being similar to the 'high functioning empathy' profile (i.e., high levels of perspective taking, empathic concern and fantasy), this profile also contains the highest level of personal distress out of any of the profiles in the four-profile solution. For this reason, it may be called 'high affective empathy'. This fourth profile is also quite sizeable, as it constitutes approximately 17% of the total sample. For this reason, it could be argued that it does indeed add an important descriptive element that Bauer and Curran (2003) mentioned should be taken into consideration when considering the best-fitting model.

The four-profile solution also had theoretical consistency going for it as well. Recall that Sobhani and Gilin Oore (2019), who appear to be the only other researchers who have identified latent empathy profiles using the IRI, argued that a four-profile solution was the best fit for their particular samples. Figure 1 compares these four empathy profiles to the four profiles that were found in the four-profile solution of Sample 1.

Figure 1. Comparisons between the four empathy profiles found by Sobhani & Gilin Oore (2019) (dashed lines) and the four empathy profiles of the four-profile solution in the current Sample 1 (solid lines). Clockwise, from top left are: Profile 1 ('Moderate Other-Oriented' in Sobhani & Gilin Oore and 'Cognitive Empathy' in Sample 1; Profile 2 ('Low Empathy'); Profile 3 ('High Affective'); and Profile 4 ('High Functioning').

Although the four profiles are not perfect matches, the overall patterns of the IRI means are very similar between the two studies. The one major exception would be Profile 1 ('cognitive empathy' in the current study) which has a much lower level of empathic concern than the 'moderate other-oriented' profile in Sobhani & Gilin Oore (2019), and has resulted in a different descriptive name. The 'low empathy' profile found in the current study also exhibits much lower IRI means when compared to the same profile in Sobhani and Gilin Oore (2019), however the overall pattern / shape of the data pattern is nearly identical. So, given the fact that three of the

four profiles are very similar and the fourth is somewhat similar (with the exception of the empathic caring facet), it is more than plausible to argue that the four-profile solution has theoretical consistency and previous research in its favour.

Finally, the five-profile solution was statistically the second best model as it had the second lowest BIC, a strongly significant BLRT value ($p < .001$), and the second highest entropy value. In terms of the actual profiles, Table 5 clearly shows that the same four profiles that appeared in the four-profile solution also appeared in the five-profile solution. A very small (5.8% of the total sample) fifth profile also emerged in this solution (Profile 2 on the far right in Table 5). This profile appeared to be a variant of the 'high affective empathy' profile, as it had a comparable level of personal distress but lower levels of perspective taking, empathic concern and fantasy. Although a descriptive (albeit convoluted) name for this profile could be 'high affect with moderate other-oriented empathy', the descriptive utility of this profile was highly questionable due to its similarity to the larger 'high affective' profile and its very small class size. For these reasons, combined with the fact that it is not as parsimonious as the other solutions, the five-profile solution was deemed to be the least appropriate model for Sample 1.

This left the three- and four-profile solutions as the most likely models for the Sample 1 LPA. Technically the three-profile solution performed better statistically (e.g., it had the lowest BIC value and the highest entropy value), and it was also possibly the more parsimonious of the two solutions. However, when it came to descriptive utility and theoretical consistency / previous research, the four-profile solution ultimately had the clear edge. And, although the four-profile solution did not have the best fit statistics, it did still have one of the lowest BIC values (only 6 points less than the three-profile solution), as well as a statistically significant BLRT value.

Ram and Grimm (2009) remind us that "model selection is an art – informed by theory, past findings, past experience, and a variety of statistical fit indices" (p. 571). Recall also that Oberski (2016) stated that it is "often also possible to pick a lower or a higher number of classes based on substantive concerns or ease of interpretation" (p. 8). With all of these considerations in mind, it was decided that the four-profile solution was the best-fitting model for Sample 1. Therefore, Hypothesis 1a (i.e., distinct empathy profiles will emerge from a sample of trauma / emergency workers) was supported.

Empathy Profiles and Work Outcomes

After the four-profile solution was selected, five new variables were imported into the Sample 1 dataset from the Mplus output file. The first four variables were continuous in nature (ranging from .000 to 1.000) and reported the likelihoods of each participant belonging to each of the four empathy profiles (with values closer to 1.000 indicating greater probabilities). The fifth variable was categorical in nature and assigned each participant to one of the four empathy profiles based on the highest value in each of the aforementioned likelihood variables. It is this categorical variable that would become the main grouping variable used for comparing the trauma workers on the various work outcomes. However, participants ($n = 6$) who did not have at least a 50% (.500) probability of belonging to at least one of the empathy profiles were filtered out of the main analyses. An additional participant was also filtered out after an inspection of the z-scores for each of the main study variables revealed one extreme univariate outlier (i.e., more than four standard deviations from the mean) for the professional efficacy variable. This resulted in a final sample size of 288 for the main analyses. Descriptive statistics and inter-correlations for each of the main study variables in Sample 1 are presented in Table 8.

Occupational burnout. A one-way multivariate analysis of variance (MANOVA) was

conducted using IBM SPSS to analyze the effect of empathy profile membership on workers'

emotional exhaustion, cynicism and professional efficacy. The multivariate effect of empathy

profile membership on each of these three burnout facets was found to be statistically significant;

Wilks' Lambda = .796, $F(9, 516.10) = 5.633$, $p < .001$, $\eta_p^2 = .073$. The univariate F ratios,

univariate significance values, partial eta squared values and other relevant statistics for the three

burnout variables are presented in Table 6.

Table 6

One-way ANOVA Results for the Three Burnout Variables

Dependent Variable	Sum of Squares	df	Mean Square	F	p	η_p^2
Emotional Exhaustion	46.907	3	15.636	5.844	.001	.076
Cynicism	27.267	3	9.089	3.598	.014	.048
Professional Efficacy	13.852	3	4.617	5.676	.001	.074

Note. $N = 218$. *df* represents degrees of freedom. *F* represents the univariate *F* statistic. *p* represents the univariate significance value. η_p^2 represents Partial Eta Squared.

Games-Howell post hoc tests revealed that individuals with the 'high affective' empathy

profile ($n = 38$, $M = 5.06$, $SD = 1.54$) had a significantly higher ($p < .001$) level of emotional

exhaustion than individuals with the 'cognitive empathy' profile ($n = 70$, $M = 3.72$, $SD = 1.41$).

Additionally, participants with the 'high affective' empathy profile also had a significantly

higher ($p = .022$) level of emotional exhaustion than participants with the 'high functioning'

empathy profile ($n = 95$, $M = 4.16$, $SD = 1.72$).

For cynicism, the Games-Howell post hoc tests revealed that individuals with the 'high

affective' profile ($n = 38$, $M = 3.85$, $SD = 1.56$) had a significantly higher ($p = .023$) level of

cynicism than those with the 'high functioning' profile ($n = 95$, $M = 2.97$, $SD = 1.59$). Regarding

professional efficacy, the Games-Howell post hoc tests revealed that participants with the 'high

functioning' profile ($n = 95$, $M = 6.17$, $SD = .84$) had a significantly higher ($p = .005$) level of

professional efficacy than those with the 'cognitive empathy' profile ($n = 70$, $M = 5.68$, $SD =$

.97). Also, individuals with the 'high functioning' empathy profile also had a significantly higher

($p = .012$) level of professional efficacy than those with the 'high affective' empathy profile ($n =$

38, $M = 5.63$, $SD = .91$). Thus, because significant differences were observed between the

empathy profiles when it came to each of the three facets of occupational burnout, Hypothesis 2a

was supported. The means for each of the four empathy profiles are presented in Table 7.

Table 7
Comparisons of the Profile Means for the Three Facets of Burnout (Sample 1)

	Emotional Exh.		Cynicism		Prof. Efficacy	
Profile	*M*	*SD*	*M*	*SD*	*M*	*SD*
Cognitive (*n* = 70)	3.72	1.41	3.53	1.44	5.68	0.97
Low Empathy (*n* = 15)	3.75	2.20	3.67	2.22	6.12	0.94
High Affective (*n* = 38)	5.06	1.54	3.85	1.56	5.63	0.91
High Functioning (*n* = 95)	4.16	1.72	2.97	1.59	6.17	0.84

Note. $N = 218$. *M* represents mean. *SD* represents standard deviation.

Empathy profiles and work outcomes. Several one-way, between group ANOVAs and

chi-square tests of association were conducted to examine the relationships between empathy

profile membership and the following work outcomes: job-related affective well-being, turnover

intentions, tenure, job performance and the level of trauma exposure at work. None of these tests

proved to be significant, resulting in Hypothesis 2b not being supported. The one-way ANOVA

for job affect did trend toward significance, however, $F(3, 220) = 2.567$, $p = .055$, $\eta_p^2 = .034$, and

the Games-Howell post hoc test revealed that individuals with the 'high affect' profile ($n = 38$, M

$= 2.88$, $SD = .73$) did have a significantly higher ($p = .032$) level of negative job-related emotions

than individuals with the 'cognitive empathy' profile ($n = 73$, $M = 2.48$, $SD = .68$). Individuals

with the 'high affect' profile also had a higher ($p = .050$) level of negative job-related emotions

than those with the 'high functioning' profile ($n = 98$, $M = 2.51$, $SD = .77$).

Empathy profiles and professions. As the current study is exploratory in nature, additional chi-square tests of association were conducted to investigate whether there were significant differences in the relative representation of different professions within the empathy profiles (in other words, do individuals with certain empathy profiles tend to gravitate towards certain professions). The first chi-square test, which examined all professions' relationships to the empathy profiles, was indeed significant, χ^2 (18, $n = 288$) = 91.74, $p < .001$. Specifically, the cross-tabulations revealed that the majority of participants with the 'cognitive empathy' profile were nurses (48.6%) and firefighters / EMTs (32.7%). Meanwhile, the majority of individuals with the 'low empathy' profile were firefighters/EMTs (40%), nurses (25%), police/military/ corrections (20%) and paramedics (15%). The majority of individuals with the 'high affective' and 'high functioning' empathy profiles were nurses (63.8% and 58.8%, respectively).

To further investigate whether there was a broader difference between the empathy profiles when it came to nurses and first responders (e.g., police, firefighters/EMTs, corrections, paramedics), the original 'profession' variable was recoded into a simplified variable where all first responders were grouped together. Two chi-square tests were then conducted to examine nurses' and non-nurses', and then first responders' and non-first responders' relationships to the empathy profiles. The chi-square test for nurses was significant, χ^2 (3, $n = 288$) = 10.85, $p = .013$, as was the chi-square test for first responders, χ^2 (3, $n = 288$) = 62.82, $p < .001$.

As shown in Figure 2, nurses comprised the majority of the 'high affective' (63.8%) and 'high functioning' (58.3%) empathy profiles. Conversely, Figure 3 shows that first responders made up the vast majority (75%) of the 'low empathy' profile, but were greatly underrepresented in the 'high affective' and 'high functioning' empathy profiles.
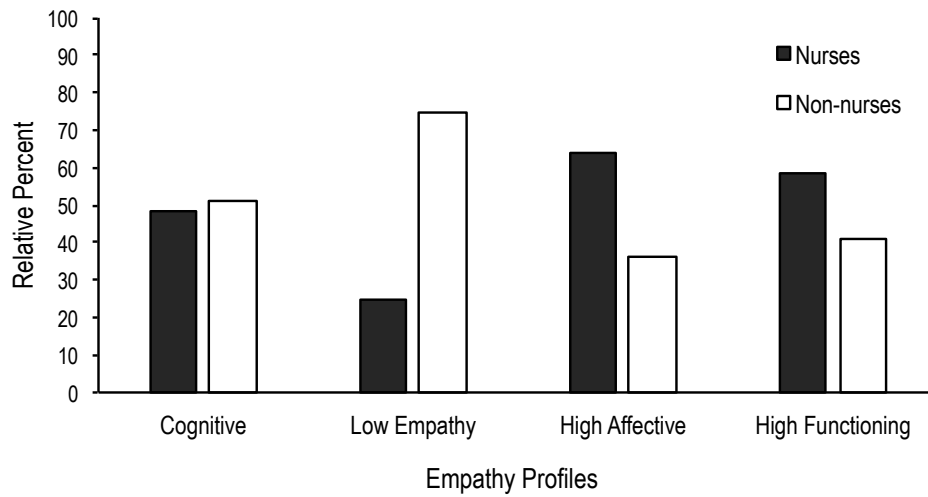
Figure 2. Comparisons of the relative percentages of nurses versus non-nurses in each of the four empathy profiles.
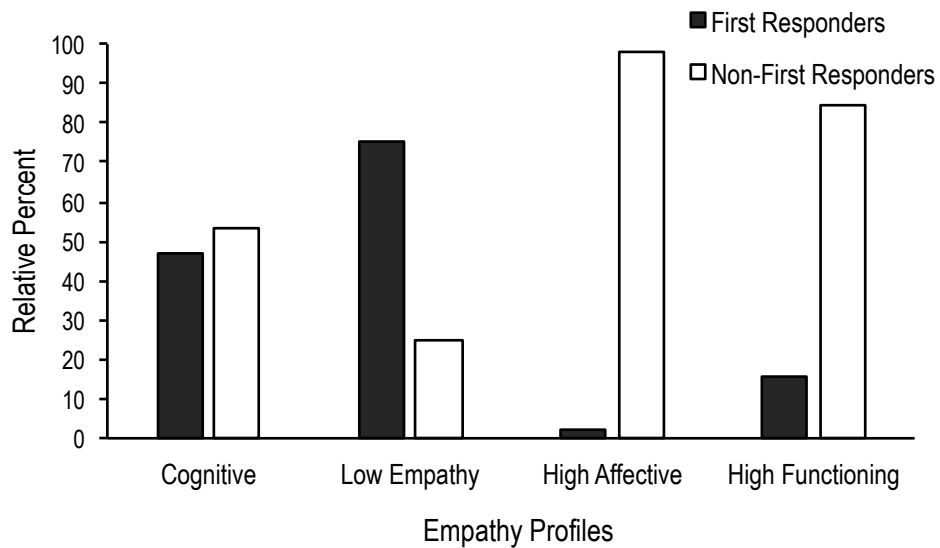

Figure 3. Comparisons of the relative percentages of first responders versus non-first responders in each of the four empathy profiles.

Table 8

Descriptive Statistics and Inter-correlations for the Main Study Variables in Sample 1 (N = 288)

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. Tenure (*n* = 286)	1.73	.99	-											
2. Percent of shifts w/ Trauma (*n* = 279)	77.48	30.02	-.16**	-										
3. IRI - Perspective Taking (*n* = 288)	19.02	5.25	-.00	.07	**.85**									
4. IRI - Empathic Concern (*n* = 288)	18.33	5.55	.01	.05	.56**	**.83**								
5. IRI - Personal Distress (*n* = 288)	6.37	4.97	-.22**	-.07	.04	.33**	**.85**							
6. IRI – Fantasy (*n* = 288)	15.78	6.07	-.21**	.13*	.27**	.47**	.28**	**.81**						
7. MBI - Emotional Exhaustion (*n* = 221)	4.12	1.69	-.13*	.24**	.00	.13	.36**	.25**	**.92**					
8. MBI - Cynicism (*n* = 218)	3.35	1.62	.01	.08	-.16*	-.17*	.19**	.04	.62**	**.85**				
9. MBI - Professional Efficacy (*n* = 218)	5.91	.93	.05	-.02	.07	.09	-.28**	.07	-.34**	-.54**	**.80**			
10. JAWS (*n* = 224)	2.57	.78	-.07	.16*	-.10	.02	.31**	.18**	.76**	.67**	-.38**	**.89**		
11. Job Performance (*n* = 222)	3.97	.77	.12	-.04	.04	.11	-.18**	.07	-.26**	-.30**	.47**	-.30**	**.91**	
12. Turnover Intentions (*n* = 222)	2.26	1.20	-.07	.10	-.06	-.02	.15*	.14*	.49**	.56**	-.37**	.51**	-.16*	**.89**

Note. *M* = mean. *SD* = standard deviation. IRI = Interpersonal Reactivity Index. MBI = Maslach Burnout Inventory. JAWS = Job-related Affective Well-being Scale. Not all outcome variables were available for all participants, so pairwise deletion was used when conducting the correlations. Any *n* that is different from the overall *N* is noted next to the applicable outcome variable. Scale reliability alphas are located on the diagonal. ** indicates $p < .01$. * indicates $p < .05$.

SAMPLE 2

Method

Data for Sample 2 was collected during April-May, 2020 via an online self-report

questionnaire hosted by the website Qualtrics. Similar to Sample 1, participants were recruited

through e-mails to personal contacts working in trauma-related fields, by posting invitations on

social media platforms such as Facebook and Twitter, and by posting in multiple trauma and

emergency worker discussion boards on the website Reddit. All callouts for participation stated

that interested participants had to be: 1) either currently working, or have worked in the past, in a

field that is exposed to human pain and suffering on a regular basis; 2) at least 18 years of age or

older; and 3) currently living/working in the United States or Canada. All invitations contained

an enclosed link that took participants to the online survey. In exchange for their participation,

participants were offered the opportunity to enter into a draw to win one of five $100 gift cards.

Participants

Of the 456 participants who agreed to complete the survey, a total of 141 were screened

out for either: 1) failing to acknowledge they were a trauma / emergency worker; 2) failing to

provide a relevant job title; 3) reporting zero instances of work-related trauma; 4) failing to

complete all four of the IRI subscales; or 5) failing a key attention check item. This resulted in a

total number of 315 participants being screened in for use in Sample 2. Of these 315 participants,

14 were screened out of the final analyses after the latent profile analysis stage revealed they had

less than a 50% likelihood of belonging to at least one of the different empathy profiles. Nine

additional participants were also excluded from the main work outcomes analyses after a search

for univariate outliers among the various study variables revealed extreme cases in the tenure,

job performance and 'trauma total' variables (see results section for more information).

Of the 292 participants who were included in the final analyses, approximately 43.8%

identified as male, 53.4% as female, and 2.7% identified as 'other'. The majority of participants

resided and/or worked in the United States (76%) and Canada (23.6%), and ages ranged from 18

to 67 (*M* = 33.4, *SD* = 9.02). Participants were predominately Caucasian (85.3%), were either

married / common-law (53.1%) or single (39%), and the majority (56.7%) did not have

dependents. In terms of educational attainment, 17.8% of participants reported having a

technical/vocational diploma, 14% reported having an associate's degree, 37% reported having a

bachelor's degree, 19.9% reported having a master's degree, and 3.1% reported having an

advanced degree (e.g., PhD, MD, JD). Regarding household income, 23% of participants earned

less than $50,000 per year, while 42.3% earned between $50,000 and $100,000, and 34.7%

earned more than $100,000 per year.

Regarding the different professions, 21.2% were nurses, 20.9% were paramedics, 19.2%

were firefighters / EMTs, 16.4% were social workers, 10.6% were police/military/corrections,

5.8% were psychology related (e.g., psychologists, counselors, psychiatric nurses, etc.) and 5.8%

were medical professionals (e.g., physician assistants, emergency room technicians, respiratory

therapists). Regarding tenure, the average length of time on the job was 7.65 years (*SD* = 7.01).

In terms of work status, 226 (77.4%) of the participants reported actively working in a trauma-

related field, while 66 (22.6%) had left. For those participants who were no longer on the job, 27

(40.9%) reported quitting, 7 (10.6%) reported taking a medical leave, 4 (6.1%) reported retiring,

and 28 (42.4%) reported other reasons (e.g., moved, burned out, diagnosed with PTSD due to

trauma exposure, pursued other career opportunities, tired of low pay, poor management, etc.).

In terms of trauma exposure, the number of highly traumatic events (e.g., death, sexual

assault, gruesome injury, etc.) ranged from 1-500 (*M* = 46.90, *SD* = 80.43), and participants

reported that, on average, 31.12% (*SD* = 27.51) of their shifts involved witnessing or

experiencing some type of trauma. Finally, because data collection for Sample 2 occurred near

the beginning of the COVID-19 / coronavirus pandemic in North America, the majority of

participants reported that their level of job stress had gone up either moderately (27.4%), a lot

(24%) or a great extent (20.9%).

Procedure

Similar to the procedure noted in Sample 1, participants had to first provide their consent

prior to participating in the study. They then had to answer a screening question where they

confirmed that they worked, or had worked in the past, in a trauma-related profession (i.e., a job

in which they were exposed to human pain and suffering on a regular basis) before they could

continue with the survey. Participants who stated that their job did not meet the criteria for a

traumatic occupation were automatically prevented from completing the rest of the survey.

Measures

Demographics. Similar to Sample 1, specific demographic questions were posed to

participants in order to capture their age, gender, ethnicity, country of residence, job type, marital

status, number of dependents and job tenure, as well as to quantify their trauma experiences at

work. Additional demographic questions were also added to gauge participants' level of

education, total household income, and reason for leaving their job (if applicable). Finally,

because data collection occurred near the beginning of the North American outbreak of the

COVID-19 pandemic, two multiple-choice questions were added to gauge the extent to which

participants' level of work-related stress had gone up and/or down as a result of the global health

crisis. An additional open-ended question was also added in the event that participants wanted to

elaborate on either their work experiences during the COVID-19 pandemic, or any of the

previous information they provided in Sample 2.

Sample 1 measures. Several of the measures used in Sample 1 were also retained for use in Sample 2. These measures included the 28-item Interpersonal Reactivity Index (Davis, 1983), the 16-item Maslach Burnout Inventory General Survey (Maslach et al., 1996), the three-item job performance scale (Gilin Oore et al., 2016), and the three turnover intention items (Kelloway et al., 1999). Summaries of each of these measures can be found in the Sample 1 methods section. For the burnout, job performance and turnover intention scales, participants were instructed that they could simply skip over these questions if they were no longer on the job, or if they wished to answer the items, they could answer based on their last month or so on the job.

Person-job fit. In order to properly capture participants' perceptions of their overall fit with their current or previous trauma-related job, the Job-related Affective Well-being Scale (JAWS) was dropped in favor of the global person-job fit measure created and validated by Brkich, Jeffs and Carless (2002). This nine-item scale specifically measures the singular person-job fit construct, and "provides an assessment of the degree to which an individual's knowledge, skills, abilities, needs and values match job requirements" (Brkich et al., 2002, p. 43). Examples of items include: "all things considered, this job suits me"; "I am able to use my talents, skills and competencies in my current job"; and "I feel like this is not the right type of work for me". All responses are given using a 7-point Likert scale, where 1 represents "strongly disagree" and 7 represents "strongly agree".

Personality. The Five Factor Model of personality (which consists of extraversion, neuroticism, agreeableness, openness and conscientiousness) was measured using the 20-item Mini-IPIP (International Personality Item Pool) scale developed by Donnellan, Oswald, Baird and Lucas (2006). The Mini-IPIP is a shortened version of the 50-item IPIP measure proposed by Goldberg (1999), and consists of four items per personality trait. Examples of items include "I am the life of the party" (extraversion), "I like order" (conscientiousness), and "I am relaxed

most of the time" (neuroticism). Participants respond to each item using a five-point Likert scale, with 1 representing "strongly disagree" and 5 representing "strongly agree". Although it is much shorter than the original 50-item IPIP, the Mini-IPIP has been shown to be a reliable short-form measure of the Five Factor Model of personality that "may be particularly useful in assessment situations where time or other circumstances only allow a limited number of measures to be used" (Cooper, Smillie & Corr, 2010, p. 690).

Analytic approach. The process of conducting the latent profile analysis and identifying the different empathy profiles was exactly the same for Sample 2 as it was for Sample 1. That is, the LPA was conducted using the Mplus (Version 8) Demo software (Muthén & Muthén, 1998-2017) and the process followed the iterative / stepwise approach explained by Masyn (2013), Muthén and Muthén, (2000), and Williams and Kibowski (2016). Similarly, when determining the best-fitting model and appropriate number of empathy profiles, the same balanced approach to the different considerations outlined in Sample 1 (e.g., statistical measures, theory, previous research findings, practical concerns) was also adopted for Sample 2.

Results

Multivariate assumption checks for outliers, normality and linearity were conducted on the main outcome variables of Sample 2 prior to commencing the LPA. An inspection of the Cook's distances revealed only one extreme outlier (i.e., a value greater than 1). A further inspection of the main study variables revealed that this participant had reported an extremely high value (10,000) for the 'trauma total' variable (i.e., the total number of highly traumatic events they experienced throughout the course of their career). This outlier was addressed by Winsorizing the extreme value, which consisted of replacing the 10,000 value with a number that was 1 greater than the next highest value in 'trauma total' variable (in this case, a value of 2001). After Winsorizing this data point, updated Cook's distances revealed no multivariate outliers.

Meanwhile, visual inspections of the histograms, P-P plot and scatterplot did not reveal any concerns regarding normality or linearity. Similar to Sample 1, an inspection of the Shapiro-Wilk statistics for each of the main study variables did reveal that all values were significant (indicating a violation in the assumption of normality). However, as was the case with Sample 1, Sample 2 was deemed to be a large enough ($N = 315$) so as to not have its distribution affected by these violations.

Confirmatory Factor Analysis of the IRI

As in Sample 1, the factor structure of the IRI was assessed via confirmatory factor analysis (CFA) to ensure it was consistent with the four-factor structure reported by Davis (1983). A modified version of the Sample 2 dataset was used for the CFA, as 13 cases needed to be deleted due to missing values in the individual IRI scale items. These 13 cases were retained for the LPA, however, as that analysis utilized composite scores for each of the four IRI subscales (a process which resulted in no missing values). Again, the CFA itself was conducted using SPSS Amos, Version 24.0 (Arbuckle, 2016). The robust fit indices and factor inter-correlations for the IRI are presented in Table 9 and Table 10, respectively.

Table 9

Confirmatory Factor Analysis Fit Indices for the IRI

Sample	χ^2	*df*	*p*	RMSEA	RMSEA LO 90, HI 90	SRMR	CFI	PNFI	R^2 Range
Sample 1	569.706	344	.00	.047	.040, .053	.06	.90	.71	.14-.53

Note. $N = 302$. χ^2 = model chi-square; *df* = degrees of freedom for χ^2; *p* = significance value for χ^2 (significant at $p < .05$); RMSEA = root mean square error of approximation; RMSEA LO 90 = RMSEA lower bound at the 90% confidence interval; RMSEA HI 90 = RMSEA higher bound at the 90% confidence interval; SRMR = standardized root mean square residual; CFI = comparative fit index; PNFI = parsimonious normed fit index; and R^2 = squared multiple correlation coefficient (reliability).

As with Sample 1, and as recommended by Hooper et al. (2008), the following fit indices were considered when evaluating the model fit for the Sample 2 CFA: the model chi-square value (χ^2), its degrees of freedom and significance value; the RMSEA and its confidence intervals; the SRMR; the CFI; and the PNFI. Although all 28 items loaded significantly on their intended factors, Table 9 shows that the model χ^2 was significant and the CFI value was below the .95 cut-off recommended by Hu & Bentler (1999). However, the RMSEA was less than .05, which Browne and Cudeck (1992) argued was an indication of good model fit. Additionally, the SRMR (.06) was well below the .08 cut-off recommended by Hu and Bentler (1999), and the PNFI value (.71) was again close to the example value (.74) that Bryne (2010) stated was in the range of expected values.

Table 10
Factor Inter-correlations for the IRI (Sample 2)

IRI Factors	1	2	3
1. Perspective Taking (PT)			
2. Empathic Concern (EC)	.53***		
3. Personal Distress (PD)	-.05	.27***	
4. Fantasy (FS)	.33***	.42***	.16*

Note. $N = 302$. *** indicates $p < .001$. ** indicates $p < .01$. * indicates $p < .05$.

As with Sample 1, alternate confirmatory factor analyses were also conducted to examine the viability of one- and two-factor models (e.g., cognitive vs. affective, self vs. other). The fit indices and difference tests, compared to the four-profile solution, are presented in Table 11. As was the case for Sample 1, the fit indices and difference tests revealed that the four-factor model was the best-fitting model for the Sample 2 CFA. Due to this fact, and combined with the fact that the four-factor model itself was found to have acceptable fit indices, it was considered acceptable to proceed with the latent profile analysis using the Sample 2 data.

Table 11

Confirmatory Factor Analysis Alternate Model Comparisons to Four-factor Model (Sample 2)

Model	χ^2	*df*	*p*	RMSEA	RMSEA LO 90, HI 90	SRMR	CFI	PNFI	Difference (χ^2, *df*)
1 Factor	1483.85	350	.00	.10	.098, .109	.11	.48	.39	914.14, 6[*]
Self-Oth	1120.26	349	.00	.09	.080, .091	.10	.65	.52	550.55, 5[*]
Cog-Aff	1363.12	350	.00	.10	.093, .104	.12	.54	.43	793.41, 6[*]
4 Factor	569.71	344	.00	.047	.040, .053	.06	.90	.71	–

Note. χ^2 = model chi-square; *df* = degrees of freedom for χ^2; *p* = significance value for χ^2 (significant at *p* < .05); RMSEA = root mean square error of approximation; RMSEA LO 90 = RMSEA lower bound at the 90% confidence interval; RMSEA HI 90 = RMSEA higher bound at the 90% confidence interval; SRMR = standardized root mean square residual; CFI = comparative fit index; and PNFI = parsimonious normed fit index. [*] indicates significant at the .01 level.

Latent Profile Analysis

The LPA for Sample 2 (*N* = 315) was conducted using the Mplus (Version 8) Demo software (Muthén & Muthén, 1998-2017). The variables used in the LPA were the composite means of each of the four IRI subscales, which were computed as long as four out of the seven items on each subscale were completed. All composite means were indeed computed, resulting in no missing values for the LPA. The iterative/stepwise approach advocated by Masyn (2013), Muthén and Muthén (2000) and Williams and Kibowski (2016) was once again followed.

The fit statistics for each of these iterative steps are presented in Table 12. In terms of evaluating the different fit statistics, the BIC and BLRT were once again given the foremost considerations. As such, Table 12 clearly shows that the two-, three- and four-profile solutions were the main models of interest for Sample 2, as all three had the lowest BIC values in the group, as well as significant BLRT values (*p* < .05). These three models also had very similar entropy values, indicating that they had roughly the same probability of correctly classifying the participants into the correct latent classes. Table 13 provides a summary of the final class counts, relative class sizes and mean IRI scores for each of these three models.

Table 12

Fit Statistics for Empathy Profiles (Sample 2)

No. of Profiles	LL	FP	AIC	BIC	SSA-BIC	LMR (*p*)	BLRT (*p*)	Entropy
1	-3781.695	8	7579.391	7609.411	7584.038	N/A	N/A	N/A
2	-3725.844	13	7477.689	7526.472	7485.240	.000	.000	.685
3	-3707.905	18	7451.810	7519.357	7462.266	.011	.000	.674
4	-3699.772	23	7445.544	7531.853	7458.904	.311	.040	.678
5	-3693.621	28	7443.242	7548.314	7459.506	.659	.333	.680

Note. $N = 315$. LL = Log-likelihood. FP = free parameters. AIC = Akaike Information Criterion. BIC= Bayesian Information Criterion. SSA-BIC = Sample Size Adjusted BIC. LMR = Lo-Mendell-Rubin adjusted Likelihood Ratio Test. BLRT = Bootstrapped Likelihood Ratio Test.

Statistically speaking, the two-profile solution had the second best fit indices as it had the second lowest BIC value (7526.472) and a strongly significant BLRT ($p < .001$). Also, one could argue that it was the most parsimonious of the three solutions, as it only had two profiles. The first profile was characterized by low to moderate levels of perspective taking, empathic concern and fantasy, and a very low level of personal distress, suggesting that 'low empathy' might be an appropriate name. The second profile consisted of high levels of perspective taking, empathic concern and fantasy, and a low level of personal distress, suggesting that 'high functioning empathy' might be an appropriate name for this profile. The fact that Sobhani and Gilin Oore (2019) and Sample 1 both had 'low empathy' and 'high functioning' profiles was good in terms of theoretical consistency, however because both studies recommended a four-profile solutions, previous research was ultimately not on the side of the two-profile solution.

When it came to the three-profile solution, this model offered the best statistical fit in the group as it had the lowest BIC value (7519.357) combined with a very strong BLRT significance value ($p < .001$). In terms of the individual profiles, the three-profile solution also appeared to contain the same 'low empathy' (profile 1) and 'high functioning empathy' (profile 3) profiles found in the two-profile solution.

Table 13

Comparisons of the Two-, Three- and Four-Profile Solutions in Sample 2

Two-Profile Solution				Three-Profile Solution				Four-Profile Solution			
Profile	Class Count	Sample %	IRI Means	Profile	Class Count	Sample %	IRI Means	Profile	Class Count	Sample %	IRI Means
1	84	0.27	PT: 16.139 EC: 14.164 PD: 3.981 FS: 12.671	1	70	0.22	PT: 15.662 EC: 13.651 PD: 3.457 FS: 12.099	1	65	0.21	PT: 15.493 EC: 13.217 PD: 3.256 FS: 12.011
2	231	0.73	PT: 21.716 EC: 21.840 PD: 5.365 FS: 18.034	2	100	0.32	PT: 20.246 EC: 21.916 PD: 9.032 FS: 18.404	2	56	0.18	PT: 18.098 EC: 19.394 PD: 9.111 FS: 16.568
				3	145	0.46	PT: 22.328 EC: 21.193 PD: 3.007 FS: 17.478	3	153	0.48	PT: 22.191 EC: 21.076 PD: 2.955 FS: 17.218
								4	41	0.13	PT: 22.567 EC: 24.497 PD: 8.729 FS: 20.462

Note. $N = 315$. PT = Perspective Taking. EC = Empathic Concern. PD = Personal Distress. FS = Fantasy. All four IRI subscale scores can range from 0-28.

The additional third profile (profile 2) had high levels of perspective taking, empathic concern and fantasy, but also a much higher level of personal distress than the 'high functioning empathy' profile, suggesting that 'affective empathy' might be an appropriate name for this profile. The fact that the three-profile solution contained essentially the same three types of profiles found by in Sobhani and Gilin Oore (2019) and in Sample 1 provides good support for the previous research component of the overall model evaluation. However, because the three-profile solution (by its very definition) contained only three profiles, it could ultimately be argued that it falls short in terms of theoretical consistency.

Finally, the four-profile solution technically exhibited the third-best statistical fit, as its BIC value (7531.853) was the third-lowest and its BLRT significance value ($p = .04$) was not as strong as either the two- or three-profile solutions. However, it should be noted that the four-profile solution did have the lowest sample size adjusted BIC (SSA-BIC) out of the five models run in the LPA. While it technically does not carry as much weight as the BIC or BLRT values, Nylund et al. (2007) did conclude that the SSA-BIC was the third-best statistical index when it came to identifying the correct number of classes in simulated mixture modelling studies. Also, and as noted earlier, the differences between the entropy values for the two-, three- and four-profile solutions were negligible, indicating that each of those models had roughly the same probability of classifying the participants into the correct latent classes.

In terms of the specific profiles, Table 13 shows that the four-profile solution essentially contains the same three profiles found in the three-profile solution: 'low empathy' (profile 1), 'high functioning empathy' (profile 3) and 'affective empathy' (profile 4). Regarding the additional fourth profile (profile 2 on the right side of Table 13), this profile was characterized by moderate levels of perspective taking, empathic concern and fantasy, and a level of personal distress that was similar to the level found in the 'affective empathy' profile in the two-profile

solution. Thus, an appropriate name for this profile might be 'moderate other-oriented empathy'.

Figure 4 shows how each of these four profiles compares to the other profiles found in Sample 1 and in Sobhani and Gilin Oore (2019).
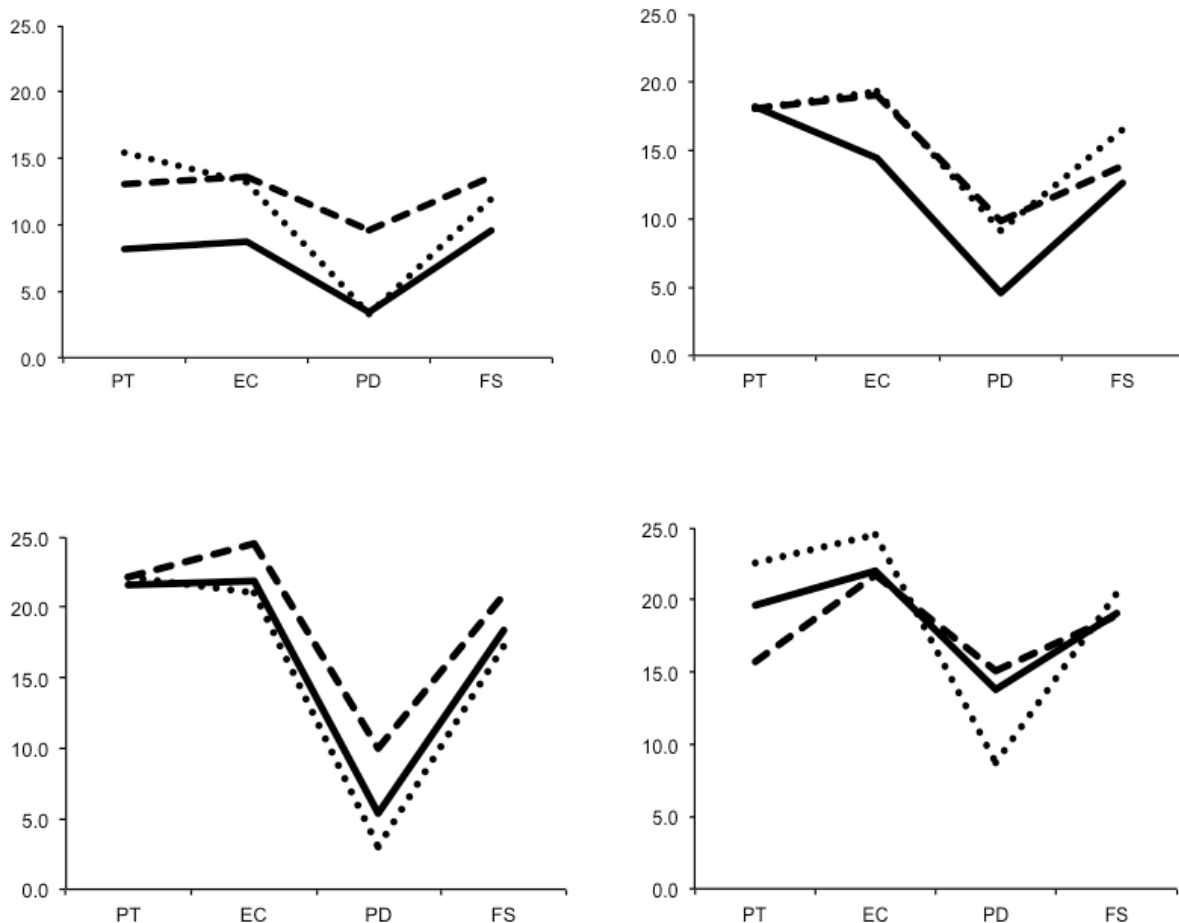
Figure 4. Comparisons between the four empathy profiles found in the four-profile solution of Sample 2 (dotted lines), the four empathy profiles found in Sample 1 (solid lines), and the four empathy profiles found by Sobhani & Gilin Oore (2019) (dashed lines). Clockwise, from top left are: Profile 1 ('Low Empathy'); Profile 2 ('Moderate Other-Oriented' in Sample 2 and Sobhani & Gilin Oore (2019); 'Cognitive Empathy' in Sample 1); Profile 3 ('High Functioning Empathy'); and Profile 4 ('Affective Empathy' in Sample 2; 'High Affective Empathy' in Sample 1 and in Sobhani & Gilin Oore, 2019).

As can be seen in Figure 4, the four empathy profiles found in Sample 1, Sample 2, and in Sobhani and Gilin Oore (2019) are remarkably consistent across studies. Certain important differences are evident, however, such as how the levels of personal distress appear to be lower

in Sample 1 and Sample 2 when compared to Sobhani and Gilin Oore (2019), and how the 'cognitive empathy' profile in Sample 1 appears to be the exception to the 'moderate other-oriented' profiles found in both Sample 2 and in Sobhani and Gilin Oore (2019).

Still, the fact that the general patterns and overall shapes of the empathy profiles seem to be relatively consistent across each of the three studies provides very strong evidence for the theoretical consistency, descriptive utility, prediction and explanation components noted by Bauer and Curran (2003). These realities, along with the fact that the fit indices revealed the model is statistically viable, are why the four-profile solution was chosen as the most appropriate model for Sample 2. Hypothesis 1b (i.e., the same empathy profiles found in Sample 1 will emerge in Sample 2) was therefore supported.

Empathy profiles and work outcomes

After the four-profile solution was selected, the same process of importing the four 'profile likelihood' variables and one 'class membership' grouping variable from the Mplus output file to the main Sample 2 dataset was carried out for Sample 2. Once again, any participants ($n = 14$) who did not achieve at least a 50% probability of belonging to at least one of the four empathy profiles were filtered out.

Nine additional participants were filtered out after an inspection of the z-scores for each of the main study variables revealed extreme univariate outliers (i.e., more than four standard deviations from the mean) for the tenure, job performance and 'trauma total' variables. Thus, a final sample of 292 was used for the main work outcome analyses. Descriptive statistics and inter-correlations for each variable are presented in Table 14.

Table 14

Correlations and Descriptive Statistics for the Main Study Variables in Sample 2 (N = 292)

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Tenure (*n* = 291)	7.65	7.01	-																	
2. Trauma – Total	46.90	80.43	.27**	-																
3. Trauma – Shifts	31.12	27.51	-.05	.15*	-															
4. Perspective Taking	20.19	4.92	-.15**	-.03	.12*	.79														
5. Empathic Concern	19.72	5.23	-.01	-.11	.09	.44**	.80													
6. Personal Distress	4.95	3.73	-.12*	-.22**	-.05	-.04	.19**	.71												
7. Fantasy	16.70	6.24	-.14*	-.04	-.04	.30**	.35**	.17**	.82											
8. Exhaustion. (*n* = 276)	3.10	1.44	-.13*	-.01	.13*	.11	.19**	.27**	.24**	.91										
9. Cynicism (n = 275)	2.46	1.54	-.05	-.00	-.06	-.08	-.03	.17**	.16*	.62**	.85									
10. Efficacy (*n* = 277)	4.96	0.84	-.01	.10	.02	.08	.06	-.24**	.00	-.30**	.49**	.75								
11. Person-Job Fit (*n* = 274)	5.47	1.20	.11	.09	.10	-.03	-.02	-.37**	-.07	-.50**	-.63**	.55**	.90							
12. Job Performance (*n* = 279)	4.10	0.65	.09	.08	.14*	.06	.07	-.27**	-.06	-.22**	-.28**	.45**	.34**	.84						
13. Turnover Intent (*n* = 271)	2.17	1.14	-.16**	.01	.08	.10	.17**	.21**	.11	.47**	.50**	-.31**	-.65**	-.17**	.85					
14. Extraversion (*n* = 254)	2.93	0.96	.04	.05	.07	.12	.07	-.15*	.06	-.11	-.17**	.22**	.15*	.19**	-.10	.83				
15. Neuroticism (*n* = 254)	2.84	0.83	-.02	.00	.10	-.01	.24**	.36**	.20**	.47**	.33**	-.27**	-.31**	-.18**	.25**	-.13*	.76			
16. Openness (*n* = 254)	3.95	0.71	-.01	.06	.00	.25**	.26**	-.11	.40**	.00	-.02	.11	-.03	.13*	.10	.16*	.03	.74		
17. Agreeableness (*n* = 254)	3.86	0.72	-.07	-.10	.06	.48**	.70**	.13*	.40**	.18**	-.08	.11	.03	.05	.08	.25**	.13*	.30**	.76	
18. Conscientiousness (*n* = 255)	3.50	0.84	.17**	.13*	.10	.02	-.02	-.30**	-.10	-.19**	-.29**	.24**	.29**	.23**	-.16*	-.02	-.17**	-.01	-.01	.71

Note. M = mean. *SD* = standard deviation. Not all outcome variables were available for all participants, so pairwise deletion was used when conducting the correlations. Any *n* that is different from the overall *N* is noted next to the applicable outcome variable. Scale reliability alphas are located on the diagonal. ** indicates *p* < .01. * indicates *p* < .05.

Occupational burnout. As in Sample 1, a one-way multivariate analysis of variance (MANOVA) was conducted to analyze the effect of empathy profile membership on workers' emotional exhaustion, cynicism and professional efficacy. The multivariate effect of empathy profile membership on each of these three burnout facets was found to be statistically significant; Wilks' Lambda = .823, $F(9, 652.39) = 5.788$, $p < .001$, $\eta_p^2 = .063$. The univariate F ratios, univariate significance values, partial eta squared values and other relevant statistics for the three burnout variables are presented in Table 15.

Table 15
One-way ANOVA Results for the Three Burnout Variables

Dependent Variable	Sum of Squares	df	Mean Square	F	p	η_p^2
Emotional Exhaustion	38.532	3	12.844	6.545	.000	.068
Cynicism	30.751	3	10.250	4.467	.004	.047
Professional Efficacy	14.137	3	4.712	7.129	.000	.073

Note. $N = 274$. *df* represents degrees of freedom. *F* represents the univariate *F* statistic. *p* represents the univariate significance value. η_p^2 represents Partial Eta Squared.

The Games-Howell post hoc tests revealed that, just like in Sample 1, individuals with the 'affective empathy' profile ($n = 36$, $M = 3.88$, $SD = 1.56$) had a significantly higher ($p = .012$) level of emotional exhaustion than those who had the 'high functioning' profile ($n = 135$, $M = 2.96$, $SD = 1.44$). Unlike Sample 1, however, individuals who had the 'affective empathy' profile also had a significantly higher ($p = .002$) level of emotional exhaustion than those who had the 'low empathy' profile ($n = 57$, $M = 2.70$, $SD = 1.24$). Also, individuals who had the 'moderate other-oriented' profile ($n = 46$, $M = 3.42$, $SD = 1.34$) had a significantly higher ($p = .032$) level of emotional exhaustion than those who had the 'low empathy' profile.

Regarding cynicism, the Games-Howell post hoc tests revealed that, like in Sample 1, individuals with the 'affective empathy' profile ($n = 36$, $M = 2.98$, $SD = 1.69$) had a significantly higher ($p = .043$) level of cynicism than individuals with the 'high functioning empathy' profile

($n = 135$, $M = 2.13$, $SD = 1.55$). Participants with the 'high functioning empathy' profile also had

a significantly lower ($p = .028$) level of cynicism than individuals with the 'low empathy' profile

($n = 57$, $M = 2.77$, $SD = 1.50$). Regarding professional efficacy, the Games-Howell post hoc test

revealed that, just like in Sample 1, participants with the 'high functioning empathy' profile ($n =$

135, $M = 5.15$, $SD = .79$) had significantly higher ($p = .029$) levels of professional efficacy than

did individuals with the 'affective empathy' profile ($n = 36$, $M = 4.66$, $SD = .94$). Participants

with the 'high functioning' profile also had significantly higher ($p = .001$) levels of professional

efficacy than participants with the 'moderate other-oriented empathy' profile ($n = 46$, $M = 4.60$,

$SD = .81$). The means and standard deviations for each empathy profile on the three facets of

burnout are presented in Table 16.

Table 16
Comparisons of the Profile Means for the Three Facets of Burnout (Sample 2)

	Emotional Exh.		Cynicism		Prof. Efficacy	
Profile	*M*	*SD*	*M*	*SD*	*M*	*SD*
Low Empathy ($n = 57$)	2.70	1.24	2.77	1.50	4.97	0.79
Mod. Other-oriented ($n = 46$)	3.42	1.34	2.61	1.26	4.60	0.81
Affective ($n = 135$)	2.96	1.44	2.13	1.55	5.15	0.79
High Functioning ($n = 36$)	3.88	1.56	2.98	1.69	4.66	0.94

Note. $N = 274$. *M* represents mean. *SD* represents standard deviation.

Person-job fit. Unlike the JAWS scale from Sample 1, the ANOVA for person-job fit

was significant, $F(3, 270) = 12.514$, $p < .001$, $\eta_p^2 = .122$. The Games-Howell post hoc tests

revealed that individuals with the 'low empathy' profile ($n = 57$, $M = 5.61$, $SD = 1.02$) reported

significantly greater levels of person-job fit than individuals with either the 'moderate other-

oriented' ($n = 48$, $M = 4.87$, $SD = 1.24$, $p = .008$) or 'affective empathy' ($n = 36$, $M = 4.82$, $SD =$

1.43, $p = .027$) profiles. Similarly, participants with the 'high functioning' empathy profile ($n =$

133, $M = 5.80$, $SD = 1.04$) reported significantly greater levels of person-job fit than individuals

with either the 'moderate other-oriented' ($p < .001$) or 'affective empathy' ($p = .002$) profiles.
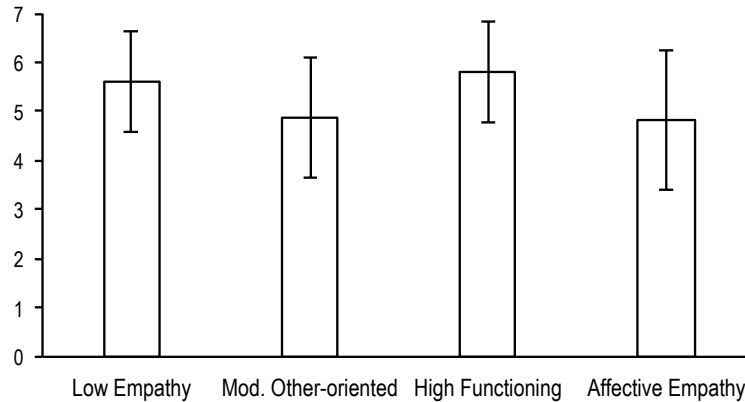
Figure 5. Comparisons of the empathy profile means for person-job fit.

Turnover intentions. Also unlike the results of Sample 1, the ANOVA for turnover intentions was significant, $F(3, 267) = 6.272$, $p < .001$, $\eta_p^2 = .066$. Specifically, the Games-Howell post hoc tests revealed that individuals who had the 'affective empathy' profile ($n = 35$, $M = 2.86$, $SD = 1.10$) had significantly greater turnover intentions than those who had the 'low empathy' profile ($n = 57$, $M = 1.92$, $SD = .95$, $p = .001$) and those who had the 'high functioning empathy' profile ($n = 134$, $M = 2.05$, $SD = 1.17$, $p = .002$).
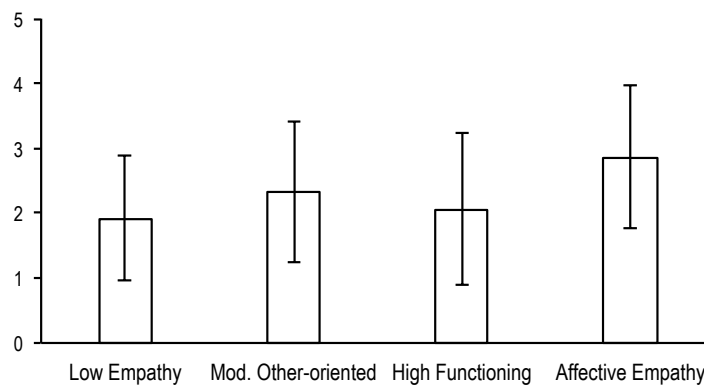

Figure 6. Comparisons of the empathy profile means for turnover intentions.

Job performance. Once again, unlike the results of Sample 1, the ANOVA for job performance was significant, $F(3, 275) = 6.299$, $p < .001$, $\eta_p^2 = .064$. Specifically, the Games-Howell post hoc tests revealed that individuals who had the 'moderate other-oriented' empathy profile ($n = 47$, $M = 3.75$, $SD = .68$) reported significantly lower levels of job performance than individuals who had the 'low empathy' profile ($n = 58$, $M = 4.16$, $SD = .62$, $p = .010$) and those who had the 'high functioning empathy' profile ($n = 136$, $M = 4.21$, $SD = .60$, $p = .001$).
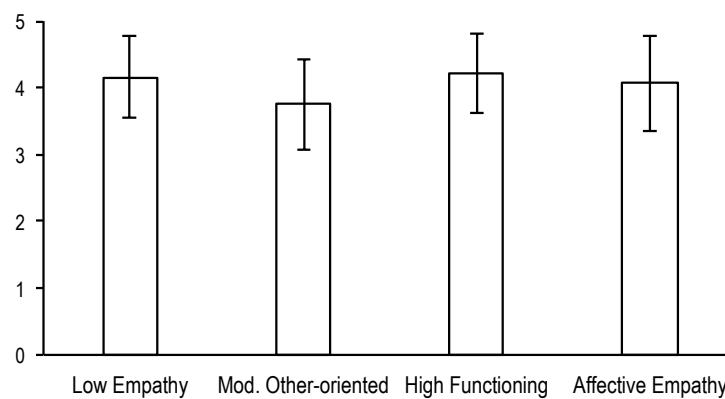

Figure 7. Comparisons of the empathy profile means for job performance.

Other work outcomes. One-way, between group ANOVAs were conducted to examine the relationships between empathy profile membership and tenure, total number of trauma incidents experienced at work, and percentage of work shifts involving trauma. As in Sample 1, the ANOVA for tenure was not significant, nor was the ANOVA for the total number of trauma incidents. However, regarding the latter, it should be noted that the Games-Howell post hoc test did reveal that individuals with the 'high functioning' empathy profile ($n = 140$, $M = 53.39$, $SD = 91.82$) reported, on average, a significantly greater ($p = .031$) number of traumatic incidents than did individuals with the 'moderate other-oriented' profile ($n = 51$, $M = 25.29$, $SD = 46.45$).

Also, although the ANOVA for percentage of work shifts involving trauma was significant, $F(3, 288) = 3.125$, $p = .026$, $\eta_p^2 = .032$, none of the post hoc tests revealed any significant differences between the empathy profiles. Still, given that significant differences were observed in the other work outcomes (i.e., burnout, person-job fit, turnover intentions and job performance), it is plausible to say that Hypothesis 2b was partially supported in Sample 2.

Empathy profiles and professions. Chi-square tests were conducted to investigate whether the professional representations observed among the empathy profiles in Sample 1 also existed among those in Sample 2. The chi-square test examining all professions' relationships to the empathy profiles was once again significant, $\chi^2 (18, n = 301) = 54.00$, $p < .001$, and the cross-tabulations revealed that the majority of the participants with the 'low empathy' profile were first responders: firefighters/EMTs (31.7%), paramedics (25%), police/military/corrections (16.7%). Meanwhile, the majority of participants with the 'affective empathy' profile were either social workers (41.5%) or psychology-related professionals (e.g., psychologists, counsellors, psychiatric nurses) (9.8%).

To further investigate whether there was a broader difference between the empathy profiles when it came to first responders and social work / counselling / psychology-related professionals, the 'profession' variable was recoded into a simplified variable where these two groups of workers were placed in their own categories (e.g., all first responders in one group, and all social workers and psychology-related professionals in another). Two chi-square tests of association were then conducted to examine first responders' and non-first responders', and psychology and non-psychology-related professionals' relationships to the profiles. The test for first responders was significant, $\chi^2 (3, n = 290) = 23.85$, $p < .001$, as was the test for psychology-related professionals, $\chi^2 (3, n = 290) = 34.40$, $p < .001$.
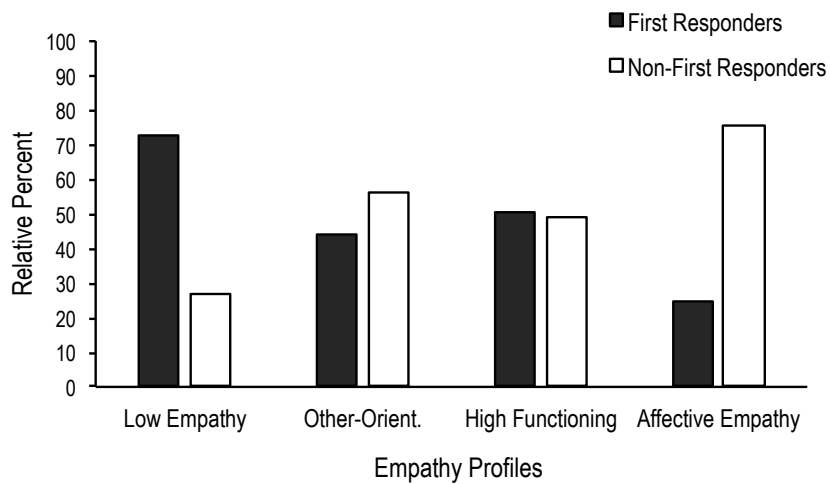
Figure 8. Comparisons between the relative percentages of first responders versus non-first responders in each of the four empathy profiles in Sample 2.

As shown in Figure 8, first responders made up the majority of the 'low empathy' profile (72.9%), but only made up a minority of the 'affective empathy' profile (24.4%) when compared to all other non-first responders. Conversely, Figure 9 shows that psychology-related trauma professionals (e.g., psychologists, social workers, counsellors) made up only a miniscule portion of the 'low empathy' profile (1.7%), and were also in the minority when it came to the 'moderate other-oriented' (20%) and 'high functioning' (23.6%) empathy profiles.
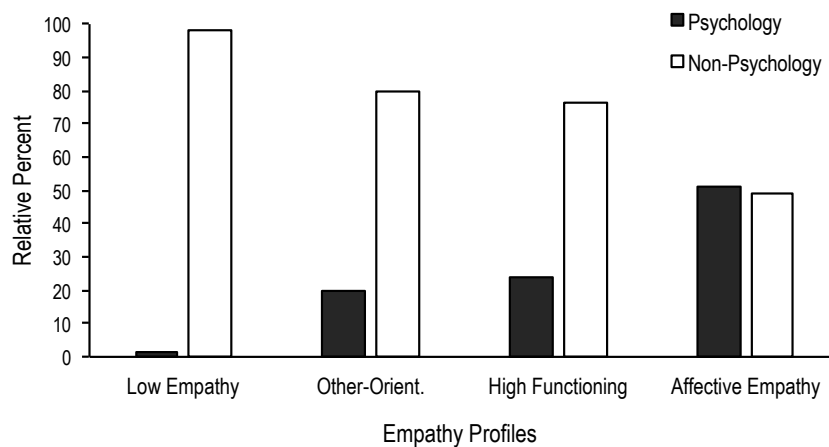

Figure 9. Comparisons between the relative percentages of psychology-related professionals versus non-psychology-related professionals in each of the four empathy profiles in Sample 2.

Empathy profiles and personality traits

Five one-way, between group ANOVAs were conducted to examine the differences

between the empathy profiles when it comes to each of the Big Five personality traits. The

means and standard deviations for each empathy profile are presented in Table 17.

Table 17
Comparisons of the Empathy Profile Means for the Big Five Personality Traits

	Extra.		Neurot.		Agree.		Open.		Consc.	
Profile	M	SD	M	SD	M	SD	M	SD	M	SD
Low Empathy (n = 55)	2.81	1.07	2.47	0.76	3.13	0.64	3.57	0.71	3.55	0.83
Mod. Other (n = 44)	2.69	0.94	3.20	0.64	3.77	0.45	3.77	0.76	3.16	0.70
High Funct. (n = 121[*])	3.09	0.93	2.69	0.81	4.06	0.61	4.14	0.61	3.67	0.85
Affective (n = 34)	2.84	0.85	3.47	0.72	4.49	0.45	4.16	0.71	3.25	0.84

Note. $N = 254$ except in the case of Conscientiousness, where $N = 255$ (the 'Affective
Empathy' profile increased to $n = 122$ for this analysis). M = mean. SD = deviation.

The first ANOVA for extraversion was not significant, however the ANOVA for

neuroticism was, $F(3, 250) = 17.069$, $p < .001$, $\eta_p^2 = .170$. Specifically, the Games-Howell post

hoc tests revealed that individuals with the 'low empathy' profile ($n= 55$, $M = 2.47$, $SD = .76$)

reported significantly lower levels of neuroticism than individuals in the 'moderate other-

oriented' ($n = 44$, $M = 3.20$, $SD = .64$, $p < .001$) and 'affective empathy' ($n = 34$, $M = 3.47$, $SD =$

$.72$, $p < .001$) profiles. Likewise, participants with the 'high functioning empathy' profile ($n =$

121, $M = 2.69$, $SD = .81$) reported significantly lower levels of neuroticism than participants with

the 'moderate other-oriented' ($p < .001$) and 'affective empathy' ($p < .001$) profiles.

The ANOVA for agreeableness was also significant, $F(3, 250) = 48.598$, $p < .001$, $\eta_p^2 =$

$.368$, and the Games-Howell post hoc tests revealed several different relationships among the

empathy profiles. First, participants with the 'low empathy' profile ($n = 55$, $M = 3.13$, $SD = .64$)

reported significantly lower levels of agreeableness than any of the other empathy profiles:

'moderate other-oriented' ($n = 44$, $M = 3.77$, $SD = .45$, $p < .001$); 'affective empathy' ($n = 34$,

M = 4.49, SD = .45, p < .001); and 'high functioning' (n = 121, M = 4.06, SD = .61, p < .001).

Second, participants with the 'affective empathy' profile reported significantly greater levels of

agreeableness than participants with the 'moderate other-oriented' profile (p < .001) and the

'high functioning empathy' profile (p < .001). Third, participants with the 'high functioning

empathy' profile reported significantly greater (p = .007) levels of agreeableness than individuals

with the 'moderate other-oriented' profile.

Next, the ANOVA for openness was also significant, $F(3, 250)$ = 10.911, p < .001, η_p^2 =

.116. Specifically, participants with the 'low empathy' profile (n = 55, M = 3.57, SD = .71)

reported significantly lower levels of openness than those with the 'high functioning empathy'

profile (n = 121, M = 4.14, SD = .61, p < .001) and the 'affective empathy' profile (n = 34, M =

4.16, SD = .71, p = .002). Additionally, participants with the 'high functioning empathy' profile

reported significantly greater (p = .030) levels of openness than participants with the 'moderate

other-oriented' profile (n = 44, M = 3.77, SD = .76).

Finally, the ANOVA for conscientiousness was also significant, $F(3, 251)$ = 5.431, p =

.001, η_p^2 = .061, as participants with the 'high functioning empathy' profile (n = 122, M = 3.67,

SD = .85) reported significantly greater levels (p = .001) of conscientiousness than participants

with the 'moderate other-oriented' profile (n = 44, M = 3.16, SD = .70). With all of these

personality measures taken into account, it would be appropriate to conclude that Hypothesis 3

(i.e., trauma workers assigned to different empathy profiles will differ significantly when it

comes to specific personality traits) was supported.

Personality traits as covariates. In addition to each of these ANOVAs, an additional

multivariate analysis of covariance (MANCOVA) was conducted to examine whether each of the

Big Five personality traits were significant covariates when it came to the relationship between

the empathy profiles and the three facets of burnout. A check of the Levene's Tests revealed no

violations in the homogeneity of variances assumption for each of the three burnout variables.

Checks for violations in the homogeneity of regression slopes assumption revealed no significant

interactions between the empathy profiles and four of the five personality traits. One significant

interaction was found between empathy profile membership and openness, Wilks' Lambda =

.927, $F(9, 547.74) = 1.918$, $p = .047$, $\eta_p^2 = .025$, however it must be noted that the significance

value for this interaction was barely significant.

Table 18
*One-way ANCOVA Results for the Relationship between the Burnout Variables and
Empathy Profiles with the Big Five traits as covariates*

Dependent Variable	Sum of Squares	df	Mean Square	F	p	η_p^2
Emotional Exhaustion	.355	3	.118	.074	.974	.001
Cynicism	15.289	3	5.096	2.689	.047	.032
Professional Efficacy	3.156	3	1.052	1.699	.168	.021

Note. $N = 251$. *df* represents degrees of freedom. *F* represents the univariate *F* statistic. *p* represents the univariate significance value. η_p^2 represents Partial Eta Squared.

The overall MANCOVA was significant, Wilks' Lambda = .921, $F(3, 240) = 2.226$, $p =$

.019, $\eta_p^2 = .027$, however Table 18 clearly shows that only the cynicism variable produced a

significant univariate effect in terms of the relationship between empathy profile membership

and burnout. Extraversion was found to be a significant covariate for both cynicism, $F(1, 242) =$

4.932, $p = .027$, $\eta_p^2 = .020$, and professional efficacy, $F(1, 242) = 5.888$, $p = .016$, $\eta_p^2 = .024$.

Meanwhile, neuroticism was found to be a significant covariate for emotional exhaustion, $F(1,$

$242) = 45.564$, $p < .001$, $\eta_p^2 = .158$, cynicism, $F(1, 242) = 23.457$, $p < .001$, $\eta_p^2 = .088$, and

professional efficacy, $F(1, 242) = 8.103$, $p = .005$, $\eta_p^2 = .032$. Agreeableness was found to be a

significant covariate for emotional exhaustion only, $F(1, 242) = 4.765$, $p = .030$, $\eta_p^2 = .019$.

Finally, conscientiousness was found to be a significant covariate for emotional exhaustion, $F(1,$

242) = 3.911, p = .049, η_p^2 = .016, cynicism, $F(1, 242)$ = 17.062, p < .001, η_p^2 = .066, and

professional efficacy, $F(1, 242)$ = 8.853, p = .003, η_p^2 = .035.

Additional one-way analyses of covariance (ANCOVA) were conducted to examine whether the big five personality traits were significant covariates when it came to the other main work outcome variables. For person-job fit, homogeneity of variances was violated, $F(3, 248)$ = 3.896, p = .010. A check for violations in the homogeneity of regression slopes revealed no significant interactions between the empathy profiles and four of the five personality traits. As in the case of the burnout variables, a significant interaction was found between empathy profile membership and openness, $F(3, 228)$ = 2.684, p = .047, η_p^2 = .034, however the significance value for this interaction was also barely significant. For the actual analysis, the relationship between person-job fit and empathy profiles remained significant, $F(3, 243)$ = 3.779, p = .011, η_p^2 = .045, and both neuroticism, $F(1, 243)$ = 8.341, p = .004, η_p^2 = .033, and conscientiousness, $F(1, 243)$ = 12.295, p = .001, η_p^2 = .048, were found to be significant covariates.

For turnover intentions, homogeneity of variances was not violated, however a check for violations in the homogeneity of regression slopes revealed a significant interaction between the empathy profiles and extraversion, $F(3, 223)$ = 2.880, p = .037, η_p^2 = .037. The dataset was then split by empathy profile and a simple linear regression was calculated to predict turnover intentions based on extraversion. The regression model was significant and positive for the 'moderate other-oriented' profile only, b = .371, $t(39)$ = 2.672, p = .040, R^2 = .102. For the main analysis, the relationship between turnover intentions and empathy profiles did not remain significant, and neuroticism was found to be a significant covariate, $F(1, 238)$ = 5.837, p = .016, η_p^2 = .024.

Finally, regarding job performance, homogeneity of variances was not violated, but a check for violations in the homogeneity of regression slopes revealed a significant interaction

between empathy profile membership and conscientiousness, $F(3, 229) = 3.220$, $p = .024$, $\eta_p^2 = .040$. The dataset was again split by empathy profile and a simple linear regression was calculated to predict job performance based on conscientiousness. Once again, the regression model was significant and positive for the 'moderate other-oriented' profile only, b = .550, $t(41) = 4.820$, $p < .001$, $R^2 = .307$. For the actual analysis, the relationship between job performance and empathy profile membership remained significant, $F(3, 244) = 2.990$, $p = .032$, $\eta_p^2 = .035$, and both extraversion, $F(1, 244) = 5.081$, $p = .025$, $\eta_p^2 = .020$, and conscientiousness, $F(1, 244) = 8.538$, $p = .004$, $\eta_p^2 = .034$, were found to be significant covariates in this relationship.

Active versus former workers

Since Sample 2 recruited both active and former trauma workers, an additional chi-square test was conducted to examine if there were any differences in empathy profile representation when it came to these two groups of workers (i.e., if individuals with certain trauma profiles more likely to be active versus former trauma workers). However, the result of this chi-square test was not significant.

Discussion

The current research study was exploratory in nature and had two main objectives: 1) to examine whether similar latent empathy profiles existed within two separate samples of trauma and emergency workers; and 2) to determine whether individuals possessing different empathy profiles differed significantly when it came to work outcomes and personality traits. Utilizing a two-sample, person-centered approach, the results of both LPAs provided evidence for the existence of four distinct empathy profiles in each sample. These four empathy profiles were not only similar across Sample 1 and Sample 2, they were also very similar to the four profiles found by Sobhani & Gilin Oore (2019) among their samples of non-trauma workers.

Regarding specific work outcomes, similar types of relationships between the empathy profiles were observed across the two samples when it came to occupational burnout (emotional exhaustion, cynicism and professional efficacy), job tenure, level of trauma exposure, and representation of professions. For Sample 2, meaningful differences were also observed between the four empathy profiles when it came to person-job fit, turnover intentions, job performance, and four of the Big Five personality traits (with the exception of extraversion).

Empathy profiles

To the best of this researcher's knowledge, the current study appears to be the first of its kind to utilize a person-centered / LPA approach to discover the existence of latent empathy profiles within samples of trauma and emergency workers. Furthermore, the current study also appears to be only the second study (after Sobhani and Gilin Oore, 2019) to use LPA and the IRI to uncover latent empathy profiles within a sample of participants. Interestingly, the four empathy profiles discovered in Sample 1 and Sample 2 were not only similar to each other, but were very similar to the four profiles found by Sobhani and Gilin Oore (2019) as well. In terms of the actual profiles, the 'low empathy' profile in Sample 1 was characterized by extremely low mean scores (i.e., less than 10 points out of a possible 28) on each of the four IRI subscales (perspective taking, empathic concern, personal distress and fantasy).

Although the level of personal distress was essentially the same as in Sample 1, the 'low empathy' profile in Sample 2 exhibited higher means for the perspective taking, empathic concern and fantasy facets that were more on par with those found in the 'low empathy' profile found in Sobhani and Gilin Oore (2019). Still, as seen in Figure 4, all three of the 'low empathy' profiles generally exhibited the same types of IRI subscale patterns, indicating that a 'low empathy' profile exists in different types of populations. Similarly, the 'high functioning

empathy' profiles observed in Sample 1 and Sample 2 both generally matched the 'high

functioning' profile found in Sobhani and Gilin Oore (2019).

All three versions of this profile were consistently characterized by high levels of

perspective taking and empathic concern, relatively high levels of fantasy, and very low levels of

personal distress. Likewise, the 'high affective empathy' profile found in Sample 1 and the

'affective empathy' found in Sample 2 were both very similar to the 'high affective' profile

found in Sobhani and Gilin Oore (2019). All three of these profiles were characterized by the

empathic concern facet being the highest, followed by either the perspective taking or fantasy

facets, and then an elevated level of personal distress that was higher than in any of the other

profiles. The only exception to this was the 'affective empathy' profile in Sample 2, as the level

of personal distress in that profile was very close to the level found in the 'moderate other-

oriented' profile in Sample 2 (resulting in the "high" being dropped from the profile name).

Regardless, just as the patterns of the 'low empathy' and 'high functioning empathy' profiles

were consistent across the studies, so too were the patterns of the 'high affective empathy' /

'affective empathy' profiles.

The only major inconsistency found among the profiles was the difference between the

'cognitive empathy' profile in Sample 1 and the 'moderate other-oriented' profile in Sample 2.

Although both of these profiles exhibited similar levels of perspective taking, personal distress

and fantasy, the 'cognitive empathy' profile was marked by a much lower level of empathic

concern compared to the 'moderate other-oriented' profiles in Sample 2 and in Sobhani and Gilin

Oore (2019) (thus resulting in a completely different descriptive name). Still, because the general

pattern of the IRI scores are basically similar (with the exception of the empathic concern facet),

and because the 'moderately other oriented' profiles in Sample 2 and in Sobhani and Gilin Oore

(2019) are near perfect matches, it could be argued that this profile is indeed the same one that keeps reappearing across different studies.

Empathy profiles and work outcomes

The second main objective of the current research study was to examine how individuals with different empathy profiles might differ when it comes to specific work-related outcomes. Before addressing the results that were significant, it is worth noting those that were not. In both samples, there was no difference among the empathy profiles when it came to tenure (i.e., time on the job) or the total amount of trauma witnessed / experienced at work. These finding are important for two reasons. First, they indicate that trauma workers' career length appears to be unaffected by the type of empathy profile they have. This result is tangentially contradictory to the findings of Gentry et al. (2015), who found that leaders' display of empathic concern towards their direct reports was negatively related to their boss' and peers' ratings of career derailment potential (that is, the more a leader displayed empathic concern behaviours toward their subordinates, the less likely their bosses and peers would rate their career derailment potential). However, these findings are only tangentially related because that study measured the outward manifestations of empathic concern, not the innate facet of empathy captured by the IRI.

Second, workers' perceived volume of trauma witnessed or experienced at work does not appear to be influenced by their empathy profile. Although it is true that one post hoc test in Sample 2 revealed that individuals with the 'high functioning' profile reported more traumatic incidents than individuals with the 'moderate other-oriented' profile, the overall model was not significant and therefore this difference cannot be substantiated. Similarly, the model for the 'percentage of work shifts involving trauma' variable was significant, but the post hoc tests revealed no meaningful differences between the empathy profiles. This lack of evidence suggests that individuals' empathy profiles are not dependent upon the amount of trauma that exists in

their environment, which itself suggests that empathy is a relatively stable individual trait. This sentiment would also be in line with the longitudinal findings of Grühn et al. (2008), who found that individuals' empathy levels are indeed relatively stable across the adult lifespan.

In terms of the significant results, consistent findings for occupational burnout were observed across Sample 1 and Sample 2. In both samples, trauma workers with the 'high affective' or 'affective empathy' profile reported greater levels of emotional exhaustion and cynicism than those with the 'high functioning' empathy profile. Conversely, individuals with the 'high functioning' empathy profile reported greater levels of professional efficacy than those with the 'high affective' / 'affective empathy' profile, as well as those with the 'cognitive empathy' / 'moderate other-oriented' profile. These results involving the 'affective empathy' profile are not surprising, given that Gleichgerrcht (2013) and Pink de Champlain (2016) both found that the personal distress facet of empathy was positively associated with burnout. This result also makes sense regarding the 'moderate other-oriented' profile found in Sample 2, which actually had a slightly higher level of personal distress than the 'affective empathy' profile.

Taken together, these findings suggest that the type of empathy profile a trauma worker has matters greatly when it comes to occupational burnout. Specifically, profiles that are made up of higher levels of personal distress are more likely to experience to cynicism and emotional exhaustion. Conversely, profiles that are characterized by higher levels of the other-focused empathy facets (i.e., perspective taking and empathic concern) and lower levels of the personal distress facet are less likely to report cynicism and emotional exhaustion (and in the case of the 'high functioning' empathy profile, more likely to report greater professional efficacy).

In addition to the similar results that appeared in both samples, there were several results that only appeared in one of the samples. For example, in Sample 1, individuals with the 'high affective' empathy profile reported higher levels of emotional exhaustion than those with the

'cognitive empathy' profile. Likewise, in Sample 2, individuals with the 'affective empathy'

profile reported greater levels of emotional exhaustion than individuals with the 'low empathy'

profile. Neither of these findings were particularly surprising, given the aforementioned

connection between high levels of personal distress and burnout. In each of these cases, the

'affective empathy' profiles in both samples had relatively high levels of personal distress

compared to the 'cognitive empathy' (Sample 1) and 'low empathy' (Sample 2) profiles. The

real question, then, is why these two findings did not appear in both samples.

The most plausible explanation, it seems, is that the 'cognitive empathy' profile in

Sample 1 and the 'low empathy' profile in Sample 2 are really quite similar in terms of their IRI

subscale means. Specifically, the means for perspective taking and empathic concern in the

'cognitive empathy' profile (Sample 1) are really only a few points higher than those in the 'low

empathy' profile (Sample 2). Meanwhile, the mean scores for personal distress are comparable to

one another, and the means for fantasy are nearly identical. So, although the two profiles are

technically different and represent different types of empathy within their respective samples,

they may just be similar enough in a cross-sample manner that the results are similar when they

are compared to the 'affective empathy' profile in each of the samples. Future studies involving

occupational burnout and empathy profiles may be able to definitively address this discrepancy.

Another example of results occurring in one sample but not the other is cynicism. In

Sample 2, individuals with the 'low empathy' profile reported greater levels of cynicism than

participants with the 'high functioning' profile. On this surface this might seem intuitive, but in

this case these profiles have the two lowest levels of personal distress in the four-profile solution.

One must logically deduce, then, that another empathy facet is at play when it comes to this

relationship. However, the current study produced mixed results when it came to the correlations

between the remaining IRI facets and cynicism. For example, although the correlation between

fantasy and cynicism was significant in Sample 2 ($r = .16$), it was not in Sample 1. Conversely, the correlations for cynicism and perspective taking ($r = -.14$), and cynicism and empathic concern ($r = -.17$) were both significant in Sample 1, but not in Sample 2.

Because of these discrepancies, there is currently no consistent indicator that might conclusively explain why the 'low empathy' profile was higher in cynicism than the 'high functioning' profile. As such, future studies that are similar to the current research study must determine 1) whether there is indeed a real difference between the 'low empathy' and 'high functioning empathy' profiles when it comes to cynicism, and 2) possibly use other measures to get to the heart of this difference. For example, perhaps it is the case that individuals who gravitate towards the 'low empathy' profile also have elevated levels of certain dark triad traits (i.e., narcissism, Machiavellianism and psychopathy). For instance, Jonason and Kroll (2015) found that psychopathy was negatively correlated with perspective taking, fantasy and personal distress, while individuals who are high in Machiavellianism "are consistently found to possess low empathy" (Wai & Tiliopoulos, 2012, p. 794).

Regarding person-job fit (which replaced the Job-related Affective Well-being Scale in Sample 1), individuals with the 'low empathy' profile reported greater levels on this measure than individuals with either the 'moderate other-oriented' or 'affective empathy' profiles. Alternatively, participants with the 'high functioning' empathy profile also reported greater levels of person-job fit than individuals with either the 'moderate other-oriented' or 'affective empathy' profiles. These relationships are intriguing because the two profiles on both ends of the empathy spectrum turned out to be the highest in person-job fit.

Yet again, perhaps the simplest explanation for this is that both of these profiles had the lowest levels of personal distress out of the four profiles. In Sample 2, personal distress was

found to have a moderately negative correlation ($r = -.37$) with person-job fit, indicating that as an individual's level of personal distress goes down, their level of person-job fit goes up. Although it is not an identical construct, this sentiment was echoed in Sample 1 as individuals with the 'high affect' profile reported more negative job-related emotions than individuals with the 'high functioning' profile, which is another indication that greater personal distress is ultimately related to less positive perceptions about one's job and their relation to it.

Another example of results occurring in one sample but not the other is turnover intentions. In Sample 2, individuals with the 'affective empathy' profile had greater turnover intentions than individuals who had either the 'low empathy' profile or the 'high functioning empathy' profile. Again, the elevated level of personal distress in the 'affective empathy' profile can likely shed a light on these differences, as the current study found personal distress to be correlated with turnover intentions in both Sample 2 ($r = .21$) and Sample 1 ($r = .15$). In other words, it appears that as an individual's level of person distress increases, so too does their intent to turnover in their occupation, and vice versa.

A final example of results occurring in one sample but not the other is job performance. In Sample 2, individuals who had the 'moderate other-oriented' profile reported lower levels of job performance than individuals who had the 'low empathy' profile and those who had the 'high functioning empathy' profile. Out of these three profiles, the 'moderate other-oriented' profile was the one that had the highest level of personal distress, which was once again correlated with the variable in question ($r = -.27$ in Sample 2; $r = -.18$ in Sample 1). In fact, out of all four of the IRI subscales, personal distress was the only facet to be significantly correlated with job performance in both samples, providing strong support and important context behind the connection between these two variables.

Empathy profiles and professions

In both Sample 1 and Sample 2, the majority of participants comprising the 'low empathy' profiles were first responders (e.g., police, fire, paramedics, EMTs, military and corrections officers). First responders were also underrepresented in the 'high affective' / 'affective empathy' profiles in both samples. These results provide an interesting contextual layer to the previous research findings on first responders and the personal consequences of trauma-related work. Recall that these workers often struggle with higher suicide rates (e.g., Milner et al., 2017; Stanley et al., 2015), secondary traumatic stress (Hyman, 2004) and substance abuse (Jeong et al., 2017). Recall also that Turgoose et al. (2017) also found that longer tenured police officers who worked on traumatic rape and sexual assault cases were also more likely to suffer from burnout.

However, when it comes specifically to professional outcomes, the current study did not find that the 'low empathy profile' (which was made up predominantly of first responders) stood out as a group that experienced massively higher or lower levels of burnout, negative job-related affect, person-job fit, turnover intentions, job performance or tenure when compared to the other profiles. Quite the opposite was true actually, as participants of the 'low empathy' group tended to fare reasonably well in terms of the aforementioned work outcomes. Conversely, it was more so the participants of the 'high affective' (Sample 1) and 'affective empathy' (Sample 2) profiles that most consistently reported the disadvantageous levels of burnout, job affect / person-job fit, turnover intentions, etc. As mentioned above, this profile was comprised predominantly of nurses (Sample 1) and psychology-related individuals (Sample 2). The research literature is full of examples (e.g., Bride, 2007; Duffy et al., 2015; Kellogg et al., 2018; MacRitchie & Leibowitz, 2010; Morrison & Joy, 2016) of these professions who tend to experience the negative personal outcomes of trauma work (e.g., compassion fatigue, vicarious traumatization, secondary

traumatic stress). The current research study appears to add another troubling layer to these findings, albeit from a professional / work outcomes perspective.

Empathy profiles and personality traits

For Sample 2, the Mini-IPIP scales were added to gain further insight into the differences between empathy profiles and the Big Five personality traits (i.e., extraversion, neuroticism, openness, agreeableness and conscientiousness). No meaningful differences were found between the four profiles when it came to extraversion, but there were multiple differences noted between the profiles when it came to neuroticism. Specifically, individuals with the 'low empathy' profile reported lower levels of neuroticism than individuals with the 'moderate other-oriented' and 'affective empathy' profiles. The 'low empathy' profile also had the lowest levels of perspective taking, empathic concern and fantasy, and the second lowest level of personal distress among the four empathy profiles. With the exception of perspective taking, the remaining three IRI facets all had positive correlations with neuroticism. That is, as empathic concern, personal distress and fantasy all increase, so too does participants' levels of neuroticism. Given that all three of these facets are low in the 'low empathy' profile, it is not surprising that individuals with this profile reported lower levels of neuroticism than the other profiles.

Likewise, participants with the 'high functioning empathy' profile reported lower levels of neuroticism than individuals with either the 'moderate other-oriented' or 'affective empathy' profiles. Given that the mean for personal distress was the lowest in the 'high functioning' empathy profile, and given that the correlation for personal distress was the strongest ($r = .36$) out of the three IRI variables, it is again not surprising that this profile (along with the 'low empathy' profile) had the lowest levels of neuroticism.

Regarding agreeableness, they key finding here was that individuals who had the 'affective empathy' profile had, on average, higher levels of this personality trait than all other

profiles. This finding also makes of sense, since the 'affective empathy' profile had by far the highest level of empathic concern out of the four profiles, and empathic concern itself shared an extremely strong correlation ($r = .70$) with agreeableness. Positive correlations were also found between openness and perspective taking ($r = .25$) and empathic concern ($r = .26$). Given that the 'high functioning' and 'affective empathy' profiles had the highest levels of these two facets, it is not surprising that individuals with these profiles had higher levels of openness than individuals with the 'low empathy' and 'moderate other-oriented' profiles.

Regarding conscientiousness, individuals with the 'high functioning' profile reported greater levels of this trait than participants with the 'moderate other-oriented' profile. Just as it was with most of the other work outcome variables, the most likely reason for this is that the 'high functioning' profile had an extremely low level of personal distress, which was negatively correlated ($r = -.30$) with conscientiousness. That is, the lower a trauma worker's level of personal distress was, the higher their level of conscientiousness was.

Interestingly, the current study also found that several of the Big Five personality traits were covariates when it came to the relationships between the empathy profiles and certain work outcomes. For example, neuroticism and conscientiousness were both significant covariates for all three of the burnout facets and person-job fit. This intuitively makes sense, as the current study also found that these two personality traits were strongly correlated with the burnout and person-job fit variables. Similarly, neuroticism was a covariate when it came to turnover intentions, and conscientiousness was a covariate when it came to job performance. Again, the current study found that each pair of variables were correlated with one another, making the covariance not overly surprising.

What was surprising, however, was that several of the original relationships between empathy profile membership and work outcomes became non-significant once personality traits

were added to the mix. Specifically, this was the case for the emotional exhaustion, professional efficacy and turnover intentions. Perhaps the most obvious interpretation of this finding is that personality traits may be the driving force behind individuals' behaviours when it comes to these work outcomes, more so than empathy profiles. For example, Ghorpade, Lackritz and Singh (2007) did find that emotional stability was negatively related to both emotional exhaustion and depersonalization (i.e., cynicism). So, if personality traits like neuroticism really are the main driving force behind work outcomes, it could also be argued that empathy profiles are really just a form of personality.

This sentiment might be considered a bit hasty, however, as the Big Five model's relation to empathy measures is not currently well understood (Melchers et al., 2016). Also, given that personality scales (such as the Five Factor Model) and empathy scales (such as the Interpersonal Reactivity Index) have been validated to measure independent constructs, there is currently no reason to assume that one should be discarded in favour of the other when it comes to measuring individual differences at work. In fact, because at least one empathy profile showed a unique pattern of having different personality traits interact to drive outcomes (i.e., the 'moderate other-oriented' profile interacting with both extraversion and conscientiousness to drive turnover intentions and job performance, respectively), there is no reason to conclude that empathy profiles are completely synonymous with personality. In all likelihood, empathy appears to be inextricably tied to personality when it comes to work outcomes.

Active versus former trauma workers

The final analysis that must be discussed is the comparison between current / active trauma workers and those that have left their fields (whether it was because they quit, retired, went on sick leave, became burned out, were diagnosed with PTSD, etc.). The current study did not find any meaningful differences between the empathy profiles in terms of current versus

former trauma workers. That is, no one empathy profile was more likely to be represented among active versus former trauma workers. This finding is important, because it provides preliminary evidence for the notion that possessing a certain empathy profile does not mean that the trauma worker will end up leaving his or her field. Rather, it is likely that the decision to leave a job is based on a number of different reasons. For example, in Sample 2 alone, the correlations for turnover intentions were the strongest for person-job fit ($r = -.65$), cynicism ($r = .50$), emotional exhaustion ($r = .47$) and professional efficacy ($r = -.31$). Also, Muchinsky and Culbertson (2016) remind us that the simple fact of whether or not an individual likes their job is a good indicator of whether or not they will withdraw from it, with "the research (showing) that the more people dislike their job, the more likely they are to quit" (p. 310).

Theoretical and practical implications

As mentioned earlier, the current research study appears to be the first of its kind to have utilized a person-centered / LPA approach to extract distinct empathy profiles from two separate samples of trauma workers using the Interpersonal Reactivity Index (Davis, 1983). However, this is not the first time the IRI has been used in tandem with an LPA to extract empathy profiles from different samples of participants. Sobhani and Gilin Oore (2019) accomplished this feat by using samples of university students and found evidence for four distinct empathy profiles across samples: 'low empathy'; 'moderate other-oriented'; 'high affective'; and 'high functioning'.

The current research study has built upon this line of inquiry by finding four very similar empathy profiles in two independent samples of trauma / emergency workers. To the best of this researcher's knowledge, this is the first time an LPA replication has been achieved using the IRI and both similar and dissimilar samples of participants. This is a beneficial result, as it lends support to the possibility that universal empathy profiles might exist across different types of

populations (i.e., not just trauma workers and university students). However, similar types of studies would need to be conducted in the future before such a claim could be substantiated.

In terms of the implications for previous theory and research, one of the most important findings of the current study (other than the existence of the latent empathy profiles) is the cross-sample replication of several of the findings for the work-related outcomes. For example, it was found in both Sample 1 and Sample 2 that trauma workers with the 'high affective' or 'affective empathy' profile reported greater levels of emotional exhaustion and cynicism than those with the 'high functioning' empathy profile. Individuals with the 'high functioning' empathy profile also reported greater levels of professional efficacy than those with the 'affective empathy' profile, as well as those with the 'cognitive empathy' / 'moderate other-oriented' profile. These findings seem to confirm the work of Pink de Champlain (2016) and Gleichgerrcht (2013), who both found that the personal distress facet of empathy was positively associated with burnout.

Another important finding was the fact that first responders made up the majority of the 'low empathy' profiles in both samples. This is novel in the sense that first responders are not generally viewed as being synonymous (within the literature anyway) with having low empathy. And, even though the current research study has shown that having the 'low empathy' profile is not nearly as deleterious as having the 'high affective empathy' profile when it comes to say, burnout, the 'low empathy' label is still one that could have serious reputational implications for the members of those professions. It is therefore highly recommended that future research studies explore and confirm this connection before such a bold claim is accepted by either the academic community or general public.

Finally, regarding personality traits, the current study attempted to 1) examine the differences between the empathy profiles when it came to each of the Big Five personality traits, and 2) highlight the correlational relationships between the Big Five traits and the key IRI facets

associated with each of the four empathy profiles. Specifically, the 'self-focused' facet of personal distress appears to lie at the heart of several of the key differences among the profiles, and the current study confirms one of the main findings of Melchers et al. (2016), that some of the largest correlations exist between neuroticism and personal distress, agreeableness and empathic concern, and agreeableness and perspective taking. However, because the exact nature of the relationship between personality and empathy measure are not well understood (Melchers et al., 2016), future research studies should continue to explore and expand on this relationship.

Finally, although the current research study did not find a difference between active and former trauma workers in terms of their empathy profile membership, this could actually be viewed as a positive finding because it indicates that certain empathy profiles are not prone to leaving or staying in a trauma field more than others. Hence, any practical application of using empathy profiles in the workplace should be limited to self-knowledge and/or personal development purposes only, rather than as a personnel selection tool.

For example, nurses or social workers who find that they identify with the 'high affect' empathy profile could be urged by their organizations to take preemptive protective precautions and be vigilant for signs of emotional exhaustion, cynicism, turnover intentions, etc. A proactive approach such as this is even more critical for high-risk occupations in general, as Brassington and Lomas (2020) found in a systematic literature review that resilience training efforts tend to be less effective for individuals who have already been exposed to or are already suffering from the consequences of adverse events. In other words, helping trauma and emergency workers to become more psychologically resilient needs to happen before they experience trauma on the job, and providing them with information about their potential empathy profile beforehand might be a useful component of such an organizational resilience program.

Limitations and future research

One limitation of the current study is that it is cross-sectional in nature. Although similar key findings were observed in both of the samples, the findings that were only found in Sample 2 should be replicated in at least one new independent sample of trauma/emergency workers prior to being widely endorsed. It would also be beneficial to conduct a similar research study in a longitudinal format to examine whether the key research findings hold constant across different time points. Specifically, it would be intriguing to know whether individuals' empathy profiles remain stable across the lifespan, and whether their connection to burnout, person-job fit, turnover intentions and job performance are also stable across one's career.

A second limitation of the current research study is that it did not focus explicitly on gender. As such, future follow-up studies and analyses of the Sample 1 and Sample 2 datasets could investigate the patterns of empathy among the genders to determine their different realities when it comes to work outcomes and professions. For example, in his original study on the development of the Interpersonal Reactivity Index, Davis (1980) found that women reported higher scores than men on each of the four empathy subscales. Additionally, Innstrand et al. (2011) found that women tended to report slightly higher levels of burnout than men. It would therefore be prudent to investigate whether there is an overall gender imbalance when it comes to, say, the 'low empathy' profile versus the 'high functioning' or 'high affect' empathy profile, as each of these profiles have been found to have differing levels of burnout. Similarly, the current study (in both Sample 1 and Sample 2) found that first responder professions consistently comprised the 'low empathy' profile. Given that first responder-type professions such as firefighting, policing and corrections have been traditionally gendered towards males (Jacobsson et al., 2015; Purvanova & Muros, 2010), it is possible to hypothesize that the combinations of gender and empathy will vary depending on the type profession.

If future studies do indeed find this to be the case, such studies will also need to investigate the potential reasons for why professions have these varying combinations of gender and empathy. For example, in so-called 'low empathy' professions such as policing and firefighting, perhaps it is the case that both men and women with low empathy profiles naturally self-select into these professions. Or, perhaps this is only true for male workers, as female police officers and firefighters simply experience greater levels of burnout, which in turn affects the reporting of their empathy levels. Further analyses examining the possible split between gender and empathy when it comes to these professions could provide further clarity on this issue, and thus result in more concrete implications for the interpretation and generalizability of the main findings of the current study.

A third potential limitation of the current research study is the timing of the Sample 2 data collection. As mentioned in the method section, data was collected from current and former trauma and emergency workers who were living in the United States and Canada during April-May 2020. These dates coincide with the beginning of the COVID-19 coronavirus outbreak in North America, a period of time that had (and still has) serious consequences for health care and emergency workers. Given that Sample 2 is comprised of several different types of frontline emergency healthcare workers, it is possible that the societal and personal concerns affecting Sample 2 may have contributed to it being a different population than Sample 1. Interestingly, though, some profiles in Sample 2 such as the 'high functioning' and 'affective empathy' profile displayed much lower levels of personal distress than their counterparts in Sample 1, indicating that COVID-19 might not be negatively influencing the Sample 2 data as much as originally anticipated. In any event, a third sample collected in a different time period should be used to determine whether the main findings of the current study are indeed generalizable to other populations of trauma and emergency workers.

Conclusion

The current study appears to be the first of its kind to investigate the empathy profiles, personality traits and work outcomes of trauma-related professionals using a person-centred, analytic approach to research. Similar groups of empathy profiles were found within two separate samples of trauma workers, and similar work-related differences were observed amongst the empathy profiles across the two samples. Similar relationships were also observed across the two samples when it came to the empathy profiles and trauma workers' professions, and meaningful differences were observed between the empathy profiles on four of the Big Five personality traits measured in Sample 2. Several of these personality traits (notably neuroticism and conscientiousness) were also found to be significant covariates when it came to the relationship between the empathy profiles and specific work outcomes. Correlational statistics and previous research findings were used help to illuminate the possible explanations for these differences. Taken as a whole, the current research study addresses important gaps in the psychological literature when it comes to the individual differences of trauma and emergency workers, and also supplements similar research findings that have been found with this population of workers as well.

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