Empathy
Advanced Research and Applications

Edited by Sara Ventura

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Meet the editor

Sara Ventura obtained a bachelor's degree in Psychology from the University of Padua, Italy, and a master's degree from the Catholic University of Milan, Italy. In 2020, she obtained a Ph.D. in Clinical Psychology from the University of Valencia, Spain. Dr. Ventura is a postdoctoral researcher at the University of Valencia and visiting researcher at the University of Bologna. Her research focuses on the application of advanced technologies such as virtual reality for clinical and social well-being. Her main interest is the study of the body illusion paradigm to promote empathy in challenging contexts as well as clinical rehabilitation. She is passionate about travel, which is reflected in her partnership with various universities around the globe.

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Preface

Empathy is the ability to understand and share the feelings of others. Researchers have also described the concept as the capacity to "walk in someone else's shoes" and see the world from their perspective. It is comprised of emotional empathy, which involves the ability to share the emotions of another person, and cognitive empathy, which is the intellectual ability to understand another person's emotions and mental state. Empathetic skill plays a key role in social life as it contributes to promoting prosocial behavior and avoiding or limiting aggressive situations. Specifically, it is essential when the protagonists of the social interaction belong to opposite social groups, such as race, age, gender, and formal or informal groups (e.g., doctor versus patient, professor versus student, caregiver versus care recipient). For example, the literature shows how sexual offenders have lower levels of both cognitive and emotional empathy than the general population. A possible reason for this is that individuals with low levels of empathy do not understand the other person's distress and thus they are unable to take the perspective of the victim.

Due to its relevance to all aspects of life and interactions with others, empathy has received interest and attention from social science and neuroscience to understand the mechanisms behind empathetic skills and the possibility to train them. From the neuroscience point of view, it has been investigated that the empathetic relationship involves mirror neurons that are activated when someone observes and experiences emotions and that the medial prefrontal cortex is primarily involved. Alternatively, clinical psychology has demonstrated how the ability to be empathetic moderates levels of depression and anxiety and contributes to increasing positive emotions. However, it is interesting how often empathy and compassion, the latter of which is the feeling of care and concern for others, are interchangeable and how sometimes excessive levels of empathy can generate compassion fatigue.

Regarding empathy training programs, in the last decade, virtual reality (VR) was defined as an empathy machine. VR is a tridimensional and immersive environment and, thanks to the head-mounted display, permits the user to embody another body and feel the emotions of that avatar.

This book discusses advanced research on empathy and its social impact. Chapters cover theoretical models and innovative research in the field of empathy with experimental validation and high scientific value.

We would like to express our appreciation to all the contributing authors and their respective institutions. This book would not have been possible without our publisher IntechOpen and Author Service Manager Mrs. Dajana Jusic.

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Chapter 1

From Empathy to Compassion Fatigue: A Narrative Review of Implications in Healthcare

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Abstract

Evidence is clear regarding the importance of empathy in the development of effective relationships between healthcare professionals (HCPs) and patients in the delivery of successful healthcare. HCPs have pledged to relieve patient suffering, and they value the satisfaction felt from caring for their patients. However, empathy may lead to negative consequences for the empathiser. If there is a personal identification with the emotions of the distressed person, empathic concern may evolve into personal distress leading to compassion fatigue over time. A narrative review was used to explore the connection between empathy and compassion fatigue. A search of MEDLINE, PsychINFO and CINAHL resulted in 141 articles meeting the inclusion criteria. The results included in this chapter explore the practical implications of empathy in relation to compassion fatigue, examining the impact on HCPs as well as the potential risk factors and effective strategies to reduce compassion fatigue. The negative impact of compassion fatigue can have a severe impact on HCP well-being and can in turn impact the care received by the patient. Nevertheless, and despite existing effective strategies to support and manage those experiencing compassion fatigue, more needs to be done to prevent its development in HCPs.

Keywords: empathy, compassion fatigue, health, healthcare profession, burnout, secondary traumatic stress, vicarious trauma

1. Introduction

1.1 Empathy and compassion in the healthcare profession

Compassion and respect for human dignity is enshrined in the codes of conduct for healthcare professionals (HCPs). Providing high-quality compassionate care is a fundamental aim of the helping professions and provides them with job satisfaction and a sense of value [1]. Being treated with compassion also has many patient benefits including increasing compliance with professional advice, improving satisfaction with services and enhancing health and quality of life [2]. Providing compassionate care requires kindness, empathy, and sensitivity [3].

Empathy refers to the capacity to understand and share the feelings of others such as pain, joy, fear, and other emotions [4, 5]. Historically, emotional responses to patients were seen as threats to objectivity and doctors strived for detachment to be able to care, reliably, for all patients regardless of their personal feelings. Blumgart [6] recalls Sir William Osler's "Aequanimitas" in his definition of 'neutral empathy' which states that a physician will do what needs to be done without feeling grief, regret, or other difficult emotions. Osler argues that by neutralising their emotions to the point that they feel nothing in response to patient suffering, physicians can 'see into' and, thereby, be able to 'study' the patient's 'inner life' [7].

To avoid this conceived conflict between emotions and objectivity, 'professional empathy' was defined, on purely 'cognitive' basis, as "the act of correctly acknowledging the emotional state of another without experiencing that state oneself" [8]. This model of 'detached concern' assumes that knowing how the patient feels is no different from knowing that the patient is in a certain emotional state. However, the function of empathy is to recognise what it feels like to experience something, not merely to label emotional states [9]. Halpern [9] emphasises that patients sense when physicians are 'emotionally attuned' and that patients trust 'emotionally attuned' physicians and adhere better to their treatment.

In the clinical context, Stepien and Baernstein [10] combined the different definitions within the literature to put forward an expanded definition of empathy. This proposed definition includes four distinct dimensions: 'moral, emotive, cognitive, and behavioural', all working in harmony to benefit the patient.

1.2 From empathy to compassion fatigue

Empathic perspective-taking is the level of empathy which most psychologists refer to when they speak of 'empathy'. In this view, empathy is a cognitive state—dependent on imagination and mental attribution—combined with emotional engagement. A major manifestation of empathic perspective-taking is 'targeted helping' i.e., help and care based on a cognitive appreciation of the other's specific need or situation [11]. The emotional component in providing care and support to people in distress can, over time, deplete the caregiver's emotional resources engendering 'compassion fatigue'; which is characterised by feelings of indifference to the suffering of others [12]. Joinson [13] in 1992 described compassion fatigue as a form of 'occupational burnout' experienced by those in the caring professions. Figley [14] then described compassion fatigue as 'caregiver burnout' and his 2002 model of compassion fatigue emphasised "the costs of caring, empathy, and emotional investment in helping the suffering" [15]. These 'costs' include the increased risk of mental and physical health problems in helping professionals [16, 17]. Radey and Figley [12] suggest, "as our hearts go out to our clients through our sustained compassion, our hearts can give out from fatigue" (p. 207).

Compassion fatigue exists across a diverse range of healthcare professional groups, disciplines, and specialties [18–20]. Close to 7% of professionals who work with traumatised individuals exhibit emotional reactions that are similar to symptoms of post-traumatic stress disorder (PTSD). This is not only seen in the healthcare sector, where it has been demonstrated in physicians, psychotherapists, and nurses—especially those working with critically ill children, in oncology and in trauma care [21–24]—but also, beyond the hospital setting in first responders, emergency teams, social workers, police officers, migration workers, and those working with the homeless [25–29].

Levels of compassion fatigue have increased over the last decade [30]. More recently, compassion fatigue has become a significant concern during the COVID-19

crisis which has intensified the feelings of burnout, and compassion fatigue in healthcare workers, especially those working in specific COVID-19 units and in emergency departments, leaving no mental space for clinicians to experience authentic clinical empathy [31–34]. Recent pooled subscale scores indicate average to high levels compassion fatigue across a diverse healthcare practitioner groups [18]. For nurses, compassion fatigue rates are currently reported as just above 50% [35].

2. Aim of this chapter

The aim of this narrative review is to describe and synthesise the literature to explore the associations between empathy and compassion fatigue, and the impact of the latter in the healthcare profession. Also, to examine screening and management strategies of compassion fatigue in HCPs and deduce a conclusion from the evidence.

3. Methodology

We conducted a narrative review using the process described by Green et al. [36] to present objective conclusions based upon previously published literature that we have comprehensively reviewed. We opted for a narrative overview as narrative reviews can often serve to provoke thought and controversy and may be an excellent venue for presenting philosophical perspectives in a balanced manner [36].

3.1 Identifying relevant studies

We determined the search strategy through team discussions and pilot explorations of the different databases. We searched MEDLINE (Ovid), APA PsycINFO (EBSCOhost), and CINAHL Plus using the Boolean/Phrase (Empathy AND ('Compassion Fatigue' OR 'Vicarious Trauma') AND Health). We conducted the search during May and June of 2022 and included literature published between 2003 and 2022, including articles published online ahead of print. Initial search recovered 290 results from MEDLINE, 112 from CINAHL Plus, and 215 from PsycINFO.

3.2 Study selection

EndNote X9 (Clarivate Analytics, Philadelphia, PA, USA) was used to download the bibliographic details of studies yielded from the database searches and duplicates were deleted. Researchers screened article titles and abstracts to determine eligibility for full-text review based on relevance to the research topic. After this initial screening, all researchers read full texts of articles to determine eligibility for inclusion.

Inclusion criteria: The literature review included full text empirical research, which described empathy and compassion fatigue in healthcare workers, published in the English language in academic peer-reviewed journals over the last 20 years.

Exclusion criteria: Studies which covered other forms of vicarious trauma and post-traumatic stress, and studies which explored compassion fatigue in other professions, e.g., police officers, chaplaincy, caregivers, and migration agents, were excluded from this review.

Figure 1 shows a flowchart indicating the search and selection process. Following screening and full-text review, 92 articles were included in this literature review.
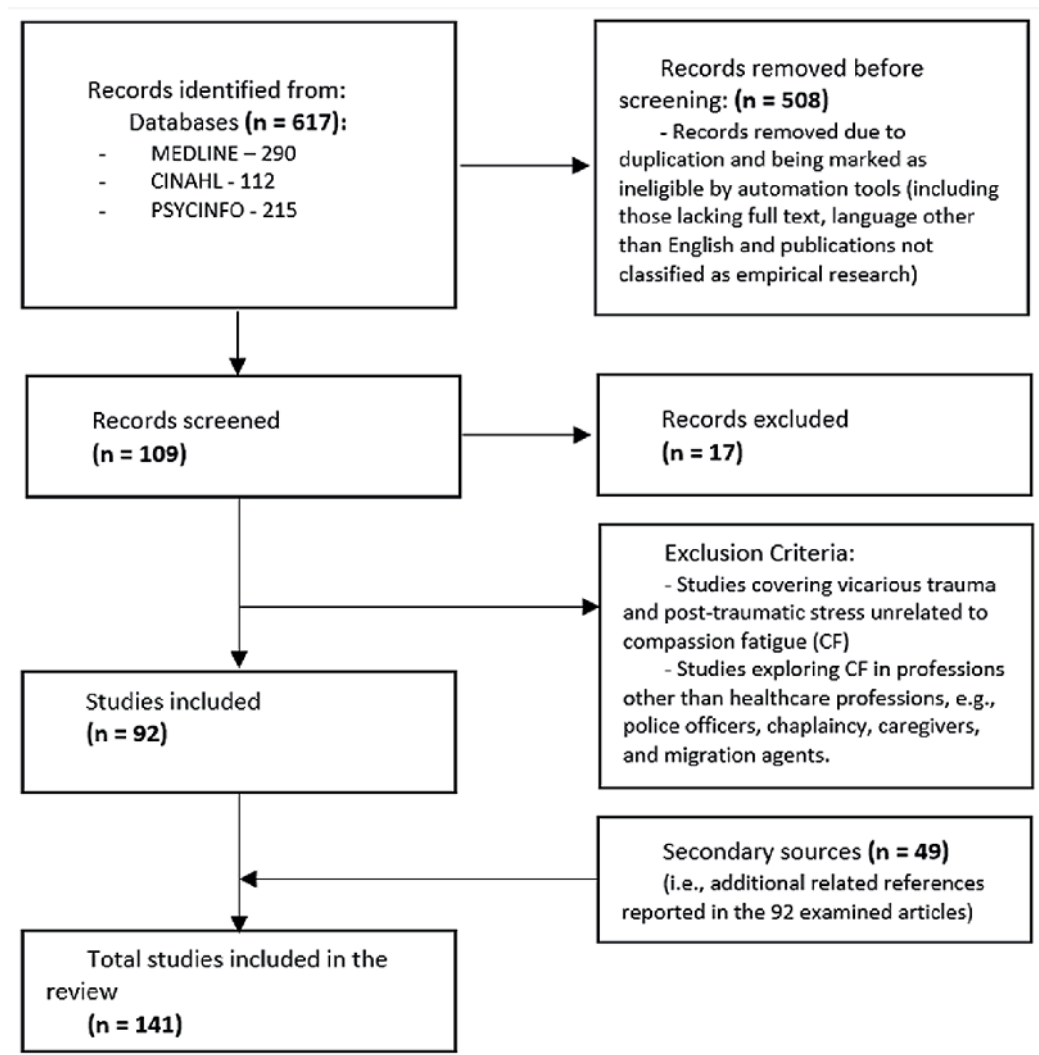
Figure 1.
Flow diagram showing records identified from databases and the screening and selection process.

Subsequent to the full text review, additional related references reported in the 92 examined articles were inspected, and those satisfying the inclusion criteria (n = 49) were also included in this literature review as secondary sources, leading to a total of 141 studies included in this review.

3.3 Collating, summarising, and reporting results

Authors read and objectively evaluated each of the 141 articles. They recorded how each article relates to the objectives of this narrative review. The authors are all HCPs, a chiropractor, psychologist, and a physician. This expertise in the area was useful in interpreting the literature but the authors were careful not to incorporate predispositions or biases by having multiple discussions throughout the review process.

The subsequent data was then organised into four areas:

1. The connection between empathy and compassion fatigue

2. The impact of compassion fatigue in healthcare

3. The detection and assessment of compassion fatigue

4. Management of compassion fatigue in healthcare professionals

4. Results

HCPs are continually exposed to stressful events in their day-to-day work including frequent encounters with: (a) death and dying, (b) grieving families, (c) personal grief, (d) traumatic stories, (e) observing extreme physical pain in patients, (f) strong emotional states such as anger and depression, and (g) emotional and physical exhaustion [37–39]. Over time, high levels of stress can lead to burnout [39, 40]. Burnout, a much-researched topic in the helping professions, has been defined as "a syndrome composed of emotional exhaustion, depersonalization, and reduction of personal accomplishments" [41]. Burnout may also lead to negative self-concept, negative attitudes about work, and a loss of caring about work-related issues [38].

Compassion fatigue, a construct similar to burnout, is a topic that has emerged in the literature in recent years [42–44]. Radley and Figley [12] define compassion as a "deep sense or quality of knowing or an awareness [among helping professionals] of the suffering of another coupled with the wish to relieve it" (p. 207). Compassion fatigue, a possible effect of long-term demonstrations of compassion, is defined as "a deep physical, emotional, and spiritual exhaustion accompanied by acute emotional pain" [45]. Compassion fatigue is thought to be a result of long exposure to the suffering of others, listening to descriptions of traumatic events experienced by others, little to no emotional support in the workplace, and poor self-care [12].

4.1 The connection between empathy and compassion fatigue

Compassion is an essential component of patient care provided by health professionals [46]. The care-giving relationship is founded on empathy and a critical characteristic of compassion fatigue is a loss or lack of empathy [47, 48].

4.1.1 Temporary lapses in empathy

Temporary lapses in empathy are not uncommon in professional intervention and can have a variety of causes, ranging from experiences in the professional's own life to reactions to clients' situation [49, 50]. Most clinicians experience them from time to time, and they rarely arouse major distress. There are reports of self-perceived lapses of empathy among emergency workers who provide services in the acute phase of the disaster and psychotherapists engaged in long-term psychotherapeutic relationships that started before and continued during and after the disaster. Many experience the conflict of 'attention-to-self versus attention-to-client' as temporary and normal for the situation. Reports by these professionals suggest that their lapses in availability and empathy cause them distress by impairing their self-esteem and fostering feelings of guilt, shame, and inadequacy [51, 52].

Baum [53] suggests that the source of much of the widely reported distress among clinicians is an intra-psychic conflict between two conflicting psychological needs: the need to distance themselves from their clients and their need to raise their self-esteem,

especially in experienced professionals whose anxiety is doubly intensified by their prior experiences. Much of the identity and self-esteem of helping professionals is anchored in their ability to be empathic, present, and containing towards those they help. The conflict from the fact that distancing helps the professionals to cope but reduces their ability to empathise with their clients, can lead to feelings of guilt, shame, and self-reproach.

Empathy is seen as comprising affective and cognitive components, whereas compassion is defined in terms of affective and behavioural elements. More specifically, compassion is perceived as comprising both of 'feelings for' the person who is suffering and a desire to act to relieve the suffering. The desire to act is distinct from the act itself [54, 55].

Compassion fatigue involves a decline in one's energy, desire, and/or ability to love, nurture, care for, or empathise with another's suffering [56–58]. These critical defining attributes were used to develop a theoretical definition: "Compassion fatigue is the physical, emotional, and spiritual result of chronic self-sacrifice and/or prolonged exposure to difficult situations that renders a person unable to love, nurture, care for, or empathize with another's suffering" [59].

4.1.2 Compassion fatigue and burnout

Compassion fatigue is strongly correlated with burnout [21, 60–62]. Whilst stress and exhaustion are critical attributes of both concepts [21, 60] the experience is of being in a 'tired' state in burnout and being in a 'drained' state in compassion fatigue [60] and thus devoid of ones resources [14, 60].

Wynn [60] performed a comparative concept analysis examining the terms 'burnout' and 'compassion fatigue' using Walker and Avant methodology. The ability to recognise both concepts is pivotal in helping to establish strategies that support healthcare workers cope and achieve optimal occupational health. Wynn noted that burnout can be an antecedent of compassion fatigue. The important difference is that burnout as a precursor may be more readily responsive than compassion fatigue to restorative strategies such as time away from the work environment and behaviour modification [14, 60]. If not addressed in its early stages compassion fatigue can permanently alter the compassionate ability of the individual [63]. Thus compassion fatigue may be considered to be a consequence of ongoing burnout in healthcare and indicate a further decline in the wellbeing of the healthcare professional.

The development of compassion fatigue is understood to be a cumulative and progressive process [64] Whist the development is cumulative, the onset of the experience compassion fatigue for the healthcare worker is a rapid one [35, 65]. Comparatively burnout, a larger overarching construct, is experienced as a slowly progressing disorder and is associated with working in burdensome organisational environments [65]. Thus, in burnout conflict associated with the employer-employee relationship, and in compassion fatigue the conflict is primarily an internal one which is associated with the relationship between the healthcare professional and their patient [60, 66].

4.1.3 Vicarious trauma and secondary traumatic stress

Meadors et al. [67] investigated the relationships between the terms associated with secondary traumatization using a correlational design. They established that there is a significant overlap between compassion fatigue, secondary traumatic stress

Term	Definition
Primary traumatization	Primary traumatization is the process that can occur from having direct contact with a traumatic event [68]
Secondary traumatization (ST)	Secondary traumatization (ST), via an indirect exposure, may develop from hearing about a traumatic event or caring for someone who has experienced such an event [68]
Compassion fatigue (CF)	The consequence of working with a significant number of traumatised individuals in combination with a strong empathic orientation [43] or a formal caregiver's reduced capacity and interest in being empathetic for a suffering individual [16]
Secondary traumatic stress (STS)	The distress and emotional disruption connected to an encounter with an individual who has experienced a primary traumatization [42]
Burnout	Burnout is a "defensive response to prolonged occupational exposure to demanding interpersonal situations that produce psychological strain and provide inadequate support" [69]. (p. 424)

Adapted from [67].

Table 1.
Definition of compassion fatigue and related terms.

(STS), and burnout, but that each of the concepts also had significant unexplained variance which suggests that there were differences between the concepts (**Table 1**).

Secondary traumatization (ST) occurs as a natural consequence of caring between two people: one who has been traumatised and the other who is affected by the first's traumatic experience [70, 71]. Empathy and exposure are central in the development of ST [72] and can alter the way in which the healthcare worker experiences self, others, and the world [73].

The potential for ST begins with exposure to a client's experience that is sufficient to evoke an arousal or emotional response [71, 74]. Vulnerability to the client's experience may be heightened by pre-existing conditions (risk factors) that produce greater sensitivity to the elements in the client's situation leading to one's absorption of the suffering itself [70]. The vicarious experiencing of the feelings, thoughts, or attitudes of another may result in the development of empathy, or the emotional connection that occurs through listening and bearing witness to graphic depictions of traumatic events. While bearing witness to the client's suffering, the healthcare worker is susceptible to responses or reactions that may be physiological, behavioural, emotional, and/or cognitive in nature. Figley describes this as the "cost of caring" for those in emotional pain [71]. Alternate discussions such as those by Ledoux contest the notion of a '*cost to caring*' and propose that compassion fatigue occurs when 'care is obstructed' [54].

Osland [75] reported that dietitians in high-risk workloads reported higher levels of STS than those with low-risk workloads, those in smaller facilities reported higher STS than larger facilities, and that working for >5 years as a dietitian was associated with higher rates of STS and burnout than in those working for <5 years. Those who perceived greater levels of support reported lower rates of burnout and higher rates of compassion satisfaction.

Zeidner et al. [47] examined the role of some personal and professional factors in compassion fatigue among health-care professionals. Research participants included 182 healthcare professionals who completed an assessment battery measuring compassion fatigue, emotion management, trait emotional intelligence, situation-specific coping strategies, and negative affect. Major findings indicate that self-reported

traits 'emotional intelligence' and 'ability-based emotion management' are inversely associated with compassion fatigue; 'adaptive coping' is inversely related to compassion fatigue. Furthermore, problem-focused coping appeared to mediate the association between trait emotional intelligence and compassion fatigue. These findings highlighted the role of emotional factors in compassion fatigue among health-care professionals [47].

Rayner et al. [76] examined STS and related factors of empathetic behaviour and trauma caseload among 190 social workers and psychologists. Approximately 30 percent of participants met the criteria for a diagnosis of STS. Results indicated that there was a significant interaction between caseload trauma and personal trauma history on STS. Similarly, empathy alone was not directly related to changes in STS, yet the trauma in caseload effect on STS was moderated by empathy. A personal history of trauma was found to be related to increased levels of STS. However, contrary to expectation of prior research, empathy contributed to a reduction in STS, meaning that lower empathy levels were associated with a higher risk of developing STS.

Hubbard et al. [77] demonstrated consistency between the five key concepts of ST discussed in the literature, i.e., exposure, vulnerability, empathic engagement, reaction, and transformation. The analysis revealed a dynamic, fluid process in which the energy of the nurse, client, and environment were integrated and part of a diverse whole [78]. The dynamic nature of the nurses' experiences created a "kaleidoscope of potentialities" [78], the outcome of which was either a positive or a negative trajectory. This revealed a new aspect of the dimension of alteration/transformation, which was the identification of a positive outcome during the ST process. These results suggest the importance of further research to assess the role and value of reflective supervision for HCPs and how this may enhance their personal and professional resilience.

4.2 Risk factors for compassion fatigue

Risk factors for the development of compassion fatigue include the intensity of the patient setting as healthcare professionals who care for traumatised individuals in critical care environments are at greater risk of acquiring compassion fatigue [20]. Engaging with the patients loved ones also places the healthcare professional at risk, particularly if the interactions involve conflict [20]. Other factors that place the professional at risk including undertaking difficult discussion with patients and families such as breaking bad or uncertain news to patients and their families. A lack of perceived managerial support compounds the risk [20, 65] and working more hours perpetuates emotional exhaustion in providers [79].

Personal factors also appear to play a role in the risk of the development of compassion fatigue. Those who have less experience working as a healthcare professional are at greater risk [20, 80] as are those with less maturity [80] or those who have not acquired a higher level of education or qualification in their profession [35, 46].

Poor coping strategies and difficulty with emotional regulation also place providers at greater risk. These include being unable to process feelings in relation to trauma and caring for those who are impacted by suffering [20, 47]. Being unable to identify effective coping mechanisms, adapt, manage emotion and develop one's emotional intelligence [20, 47]

There is some indication that one's personality may also play a role and people with high sensitivity may be more vulnerable to compassion fatigue. People with an

increased ability to perceive others feelings may have stronger emotional and physiological reactivity [81] and thus be more prone to compassion fatigue [82]. This may be compounded by the contract between the quality of care the healthcare professional may want to provide with what they are actually able to achieve [80].

Negative life events and pre-existing mental illnesses such as anxiety or depression have been found to increases a person's susceptibility for compassion fatigue [18]. Similarly coexisting physical and emotional stress increases levels of existing compassion fatigue [80].

Certain workplace conditions and events are more likely to trigger the onset of compassion fatigue [60]. These include continuous and intense contact with patients, exposure to high levels of stress, exposure to suffering and work which requires a high use of self [83].

4.3 The impact of compassion fatigue

Compassion fatigue negatively impacts the healthcare professional, the patient, the organisation, and the healthcare system [19].

4.3.1 Impact on the healthcare professional

In order to support patient autonomy healthcare providers practice patient centred care. This care requires genuine engagement and an empathetic approach making exposure to patient trauma and suffering unavoidable for the health care professional [79].

4.3.1.1 Signs of compassion fatigue

Indicators of compassion fatigue frequently cited in the literature include exhaustion [14, 60], reduced capacity for self-care [13, 60], ineffective coping, poor judgement [83], inability to function [63, 83], loss of empathy [60, 83] and depersonalisation of patients [83].

4.3.1.1.1 Exhaustion

The experience of the depth of exhaustion has a number of descriptors in the literature. These include a include feelings of weariness [63, 64] emptiness, of being drained [14, 60] and a 'profound fatigue of mind and body' [80]. People with compassion fatigue feel completely depleted of one's "biological, psychological, and social resources" [14] such that they have nothing more to give [14, 60]. The individual wants to rest although concerningly rest does not result in increased energy levels or a sense of rejuvenation [14, 60]. Individuals may try various attempts to replenish and yet the feeling of exhaustion remains [14, 60].

4.3.1.1.2 Reduced capacity for self-care

In 1992 Joinson described compassion fatigue as the reduced capacity to self-care as a result of the sustained fatigue acquired by caring for others [13]. Recent synthesised descriptions of the experience of compassion fatigue include being left so physically and mentally exhausted and drained by patient care that the provider lacks empathy and is unable to cope [60].

4.3.1.1.3 Ineffective coping

Ineffective coping is a critical indicator of the occurrence of compassion fatigue [13, 60]. When healthcare professionals are no longer able to recover from a depleted state despite using coping strategies the result is ineffective coping [60]. Coping strategies that may have worked successfully in the past become no longer effective [60]. Recovery from the stress and exhaustion of providing patient care [60], is no longer possible. Emotional responses may include feeling emotionally overwhelmed [63, 84, 85] and potentially experiencing an emotional breakdown [15, 20, 63].

4.3.1.1.4 Inability to function

Inability to function may be experienced as a diminished ability [15] or reduced endurance and output [63, 83], leading to a diminished or ineffective work performance [13, 63, 83]. The experience of trauma-based symptoms, in addition to significant exhaustion results in a deterioration of function [63]. The compassionate energy required to care for patients has been consumed over time is distinguished beyond the point of possible replenishment. An inability to compassionately care for patients moves beyond the work environment and leads to an inability to function which impacts all aspects of the professionals life [63].

4.3.1.1.5 Loss of empathy

Whilst attempting to employ coping strategies to manage the stress of caregiving a loss of empathy occurs. In response to the relentless overwhelming stress and resultant exhaustion of care-giving a deep psychological shift occurs [60, 86]. Health professionals lose their sensitivity to and understanding of the patient's needs. The professional is no longer able to comprehend the patient's perspectives or recognise their thoughts and feelings [60, 86]. Thus patient experiences are no longer relatable and the health professional experiences compassion fatigue [60, 86]. Factors that inhibit sustained energy and perpetuate compassion fatigue include time constraints, burnout [87] and caring for high-stakes patients [60]. Health professionals with their own personal history of trauma are also at greater risk of acquiring compassion fatigue [88] due to their sensitivity to secondary traumatic stress [76]. As a consequence of their empathy loss, the healthcare professional appears indifferent [14, 15], unresponsive [63], callous [15, 84, 89] and unable to share in or alleviate the patients suffering [15].

4.3.1.1.6 Depersonalisation

Depersonalisation is a sense of detachment from oneself in which individuals perform tasks in a robotic fashion without emotion. It presents as a coping mechanism used to manage exhaustion [90] and to avoid the feelings of distress that may arise when a person is experiencing compassion fatigue. Whilst the response does not arise from a lack of empathy for the patient [60] the depersonalisation coping mechanism once triggered in the professional results in a lack human feelings or emotions in the work place. Consequently, this translates to a lack of human feelings in how the professional provides care, which results in substandard care [83]. The serious implications of depersonalisation in healthcare professionals arises when the lack of emotion in self, results in the professional viewing the patient as also inert or an 'object' and approaches the patient with an attitude of indifference [90].

Depersonalisation is a maladaptive coping mechanism seen in both burnout and compassion fatigue and occurs when individuals detach from their feelings and emotions in order to be able to function and complete work-related tasks [60]. Yet the severity of depersonalisation experienced in compassion fatigue leads the provider to view the patient as an 'object' [90] and the provider is no longer able to respond to the humanity within the patient. This emotionally dissociated approach sharply contrasts with anticipated patient expectations.

4.3.1.2 Symptoms of compassion fatigue

Compassion fatigue is a significant risk factor for well-being [20, 25]. Compassion fatigue impacts ones physical and mental health [63, 64] and leading to an array of potentiation indicators including psychological, physical, spiritual, and social symptoms [86]. As the condition progresses the professional experiences an increase in the scope and severity of symptoms [63]. For example the individual may experience physical symptoms of burnout, reduced work performance and physical complaints, the intellectual effects of impaired concentration, emotional effects of breakdown, the social symptoms of indifference towards patients and desire to quit, the spiritual effects of disinterest in introspection and dysfunctional coping behaviours [63].

4.3.1.2.1 Physical symptoms

Physical symptoms may include health complaints, intellectual effects and fatigue [15, 63]. Health complaints may include gastrointestinal conditions and stomach pain, and headaches, including migraine [20, 83, 91]. Sleep disturbance is frequently cited [20, 65, 91, 92] and people may be at greater risk of accidents [15, 83]. Intellectual effects include impaired ability to concentrate [13–15, 63], poor judgement [20] and disorganisation [63, 89]. Fatigue may manifest as weariness [63, 85] lack of energy [13, 15, 63, 85, 89] loss of strength [63, 85] loss of endurance [63, 85] and power of physical recovery [63] Complications of fatigue include weight gain or weight loss [83].

4.3.1.2.2 Psychological impact

The psychological impact of compassion fatigue is well established in the literature and manifests as stress, burnout [13], intrusive and pervasive thoughts [65, 91] anxiety [13, 63, 64], and depression [13, 20, 60, 63–65]. Compassion fatigue has been found to have a moderate correlation with anxiety and depression [93].

4.3.1.2.3 Emotional impact

The emotional impact of a loss of compassion is typically one of devastation for those in healthcare professions [13]. Compassion for others drives workplace motivation to serve and alleviate suffering [54]. People in nurturing roles are rewarded for putting others needs ahead of their own [13], and ethically a drive to nurture others connects with the ideal archetype of those in caring professions and a societal sense of social justice [54].

Emotional exhaustion and its consequential impact on one's personal life are the most frequently reported emotional effects of compassion fatigue [20, 94]. A person's capacity to communicate with others is impaired and this extended into personal

relationships. Individuals feel emotionally distressed or bereft and may well experience an emotional breakdown [15, 60, 63, 65, 80, 83].

Indicators of compassion fatigue may include fluctuations in emotional states [91, 92] or mood swings [20]. Impacted healthcare professionals may feel emotionally overwhelmed [63, 84, 85], irritable [14, 20, 63, 64] angry, fearful, out of control [13]. or apathetic [13, 63, 84]. Ones outlook is likely to become negative [60] and people experience 'work related dreads'. [91] Healthcare professionals are no longer able to feel empathy for those in their care or respond compassionately. They have an inability to share in, or alleviate suffering [15] and may respond with indifference [14, 15], callousness [15, 84, 89] or be unresponsiveness [63] to patients at times when they previously would have been empathetic.

Spiritual effects include a lack of spiritual awareness and disinterest in introspection [15, 63, 85] which has the potential to result in poor judgement [15, 63] cynical humour and dysfunctional coping behaviours such an increased consumption of alcohol, unhealthy food or pornography [91]. The impact is a loss of self-worth [95] which may be compounded by weight gain or loss [83] and its emotional impact.

4.3.2 The impact of compassion fatigue on patients

Patient care is negatively impacted by compassion fatigue and this impact is recognisable to patients. Health professionals effected by compassion fatigue experience a decreased ability to feel empathy and hence lack meaning in their work [20, 96]. which results in substandard care [20, 83, 96]. The stress of the working environment is palpable to patients and is identifiable as a consequence of poor-quality care [60, 97]. Patients depend on health professionals to alleviate the stress, anxiety and fear associated with their illness [90]. When patients sense the impact of compassion fatigue they question the quality and appropriateness of care which in turn escalates patient stress [60].

The relationship between the healthcare professional and the patient becomes compromised. The trauma response associated with compassion fatigue results in reduced or decreased workplace engagement [21] and avoidance of particular situations or patients [96]. The ultimate consequence of compassion fatigue and burnout is poor patient outcomes [60]. Indeed significant concerns arise regarding the potential for increased medical errors and patient safety [21, 64, 83].

4.3.3 The impact of compassion fatigue on organisations and the healthcare system

Staff who are experiencing compassion fatigue have reduced job satisfaction [21] and reduced efficiency levels resulting in reduced service quality [98]. Patient satisfaction levels are lower in institutions where job satisfaction and burnout levels are reduced [97]. Poor patient satisfaction levels result in reduced patient recommendation rates of same facility to family and friends [60, 97].

Relationships with co-workers become negatively impacted [20, 96] when a person is impacted by compassion fatigue. If working with colleagues who are equally exhausted and apathic [13] productivity and workplace morale decline [95]. The result is a poor work environment with lower levels of productivity, patient satisfaction and patient care outcomes [21]. Compassion fatigue is triggered by the ongoing use of empathy while caring for those who are suffering and the effect of a poor work environment [18, 99]. Thus, the cycle of compassion fatigue perpetuates.

As staff fatigue, the rates of sick leave increase [83]. More staff members experience an intensifying desire to leave their workplace, profession [15, 24, 60] and specialty [80]. Compassion fatigue and burnout result in workplace imbalances [24, 60] with higher rates of staff turnover [95], and attrition and eventually, workforce dropout [98]. Staff turnover rates are particularly volatile in in high-stakes environments [100] such as oncology and emergency medicine. Staff seek alternate employment opportunities in an attempt to combat excessive workplace stress. As turnover rates increase, the stress in the workplace intensifies as remaining staff attempt to continue short staffed [60].

Compounding the impact of compassion fatigue is the perception that indicators of a poor working environment, such as increased rates of absenteeism, reduced service quality, low levels of efficiency are being ignored by the organisation and healthcare system [18, 98]. Concerns include the conclusion by staff that administrators do not consider caregiver stress when allocating tasks [13]. The impact of compassion fatigue is intensified when management fail to provide workplace acknowledgement, fail to provide opportunities for peer support and appear not to value work-life balance [80]. When the workplace culture is not addressed with opportunity for employee training, and a shift towards a compassionate organisational culture [65] staff in healthcare will continue to experience moderate to high levels of compassion fatigue.

As a consequence of the negative impact on productivity, job satisfaction and staff turnover, compassion fatigue also impedes workplace focus on patient safety [21] and thus has the potential to lead to an increase in medical errors and diminished patient outcomes [21]. Healthcare professionals experiencing burnout and compassion fatigue are more prone to medical error [83] as a result of compassion fatigue symptoms including exhaustion [14, 60] and a diminished work performance [13, 63, 83].

In addition to the potential harm to patients and families, compassion fatigue related medical error has the potential to result in legal, reputational and economic loss, for individual healthcare providers [101]. The economic impact of an institution impacted by compassion fatigue staff turnover, patient dissatisfaction and concerns regarding medical error and patient safety is institutional financial loss [64, 102–104]. Compassion is valued by patients and healthcare professionals alike and both patients and professionals raise concerns regarding a widespread and escalating lack of compassion in healthcare systems [30, 101].

4.4 Detection and assessment of compassion fatigue

Compassion fatigue is commonly measured using the Professional Quality of Life Scale (ProQOL) [105, 106]. The self-score scale is a freely available to measure the negative and positive effects of caring and helping others who have experiences significant trauma or suffering.

The Compassion Fatigue Self-Test (CFST) was originally developed to measure compassion fatigue [107]. The CFST measures the level of risk of an individual to developing compassion fatigue. The scale included 40 items, divided into two subscales, compassion fatigue and job burnout; 23 items measure compassion fatigue and 17 items burnout. Using a five-point scale, respondents are asked to indicate how frequently a situation or particular characteristic is true of themselves (1 = rarely/never, 2 = at times, 3 = not sure, 4 = often, 5 = very often). On the subscale compassion fatigue, scores of 26 or below, indicate being at an extremely low risk, a score between 27 and 30, low risk, between 31 and 35 moderate risk, scores between 36 and 40 high

risk and scores between 41 and above, indicate an extreme high risk of compassion fatigue. Scores on the subscale for burnout below 36 indicated an extremely low risk, between 37 and 50 moderate risk, 51–75 indicates high risk, and scores between 76 and 85 indicated an extremely high risk of burnout. The reported internal consistency alphas are reported to be between .86 to .94 [108]. The scale has been widely used in a variety of settings and has adequate reliability and validity [69]. The measure was specifically developed to measure both direct and indirect trauma making it a widely applied measure [108].

The CFST scale was revised and re-developed [106] into the Professional Quality of Life (ProQOL). The revised scale included an additional subscale to measure compassion satisfaction. The three subscales total 30 items, using a six-point scale (0 = never, 1 = rarely, 2 = a few times, 3 = somewhat, 4 = often, 5 = very often). Respondents are asked about their thoughts, feelings and behaviour at work. The first of the three sub-scales measures compassion satisfaction, a higher score on this scale represents a greater satisfaction as a caregiver and helping others. The second subscale, measures burnout and feelings of hopelessness at not being able to do a good job, and the third subscale measures compassion fatigue/secondary traumatic stress. A higher score on this subscale represents high levels of compassion fatigue/secondary traumatic stress. Each subscale includes 10 items, and the subscale scores cannot be combined to calculate a total score. The ProQOL scale improved on the psychometric properties of the CFST scale [105, 106]. The scale with the additional subscale measuring compassion satisfaction incorporates the more positive and psychologically protective aspect of caring, capturing the rewarding and gratifying aspects of caring [105, 106]. The Cronbach's α values reported by Stamm for these scales were .82 for compassion satisfaction, .71 for burnout, and .78 for compassion fatigue [105]. The ProQOL is free to use and is readily available, as are guidelines for interpreting the results from the scale.

4.5 Management of compassion fatigue in healthcare professionals

Figley [70] believed to manage compassion fatigue in health professional a multifaceted approach is required that includes prevention, assessment and minimising the consequences. The impacts of compassion fatigue are far reaching for both the individual health professional and organisations. Helping protect healthcare professionals from developing compassion fatigue and managing those experiencing high levels of job burnout and secondary traumatic stress can be done through self-care, evidence-based interventions and creating organisations that are better able to support and protect their workers. By protecting health professionals ensures high quality patient care. Over the past few decades' interventions have been developed to help reduce symptoms of compassion fatigue. Self-care techniques that can be used to help reduce the risk of developing compassion fatigues and managing the risks of providing compassionate care to patients and clients have been developed and promoted among health care professionals. Organisations also play a role in helping reduce the risk to their workers through better training, ongoing support and creating a support environment that recognises the risks to their staff.

4.5.1 Interventions for compassion fatigue

Interventions have been developed to both prevent and manage compassion fatigue in healthcare professionals. The strategies have included education

interventions and developing skills such as resilience [109]. The Accelerated Recovery Program (ARP) is a program developed to reduce compassion fatigue, including secondary traumatic stress and burnout in healthcare professionals. The ARP was originally developed in 1997 [110], based on Figley's work on compassion fatigue (1995). The main aim of the program is to build resilience skills to prevent compassion fatigue. The program duration is 5 weeks, consisting of a weekly 90–120-minute training sessions. A full assessment is undertaken in the first session, along with a discussion exploring the symptoms participants are experiencing. In the second session treatment goals and a timeline is discussed using self-visualisation techniques. The third session focuses on reframing and reprocessing the trauma experienced using eye movement desensitisation and reprocessing therapy and reviewing self-regulation strategies for managing situations. The fourth session incorporates video-dialogue techniques to enable the individuals to supervise themselves through the development of externalisation techniques. In the final session, closure and aftercare are addressed with the use of Pathways to recovery that include skill acquisition; self-care; connection with others; and internal conflict resolution. The program works by developing a person's self-awareness of compassion fatigue and practicing regular self-care activities [110]. The ARP primarily focused on mental health and trauma workers [110] but its potential to be effective in reducing compassion fatigue among nurses and other healthcare profession is growing [24]. Evidence supports the use of the ARP to reduce compassion fatigue among health care professionals [24, 111, 112]. An adaptation of the ARP that reduced the training into a single four-hour session reported a similar significant reduction in compassion fatigue [113].

The Compassion Fatigue Resiliency program (CFRP) was based on the concepts of the ACP [110]. The program is a five-week formalised program to educate participants about compassion fatigue, the factors that contribute to it and the effects of chronic stress. The program interventions aim to reduce the effects of compassion fatigue with participants taking part in small group activities that allow them to build resilience through self-regulation, intentionality, self-validation, connection and self-care.

Evidence supports the effectiveness of the CRRP to reduce secondary traumatic stress by providing nurses with the ability to manage intrusive thoughts [24]. The program aids greater relaxation enabling individuals to better manage perceive threats, enabling them to manage chronic stress through self-regulation [114]. The benefits of the CFRP have been reported for healthcare providers in reducing the symptoms of compassion fatigue [115–117].

To improve the resilience of military healthcare professionals and reduce compassion fatigue the Army's Care Provider Support Program (CPSP) was developed. During one-hour sessions, healthcare providers are educated to be able to assess themselves for compassion fatigue and identify when they need to take action. The program activities focus on developing self-awareness through group discussion and interactive participation, along with providing education on stress and resilience. Support for the intervention significantly reducing burnout was demonstrated by Weidleich et al. [118]. However, although a decrease in secondary trauma was reported this was not significant [118].

Overall, the usefulness of formal intervention programs developed to target reducing compassion fatigue have been reported in a number of healthcare professionals. Although, there is only limited evidence to support the effectiveness of the CPSP. Despite the evidence to support the use of these intervention programs provided in this section, due to the nature of health care settings it is not always practical or cost effective to run these programs for staff. Staff would be expected to attend these

programs in their own time and the financial impact to organisations with other competing costs make these types of interventions unfeasible.

4.5.2 Self-care

Organisational resources may not be available or sufficient to address compassion fatigue in employees, therefore promoting self-care can be an effective way to support staff. Self-care interventions are commonly prescribed for health professions experiencing compassion fatigue. Successfully managing compassion fatigue can be done by developing strategies that enhance awareness and provide thoughtful self-care [119]. There are numerous self-care strategies that can be adopted and utilised by healthcare professionals.

Strategies and techniques that can be used to reduce the risk of compassion fatigue involve looking after general wellbeing, including diet, exercise and sleep. Evidence supports maintaining a healthy diet and getting the recommended amount of physical exercise help regulates mood [120] and reduce the risk of compassion fatigue [121]. Regular sleep also plays an important role in regulating mood. Sleep deprivation is associated with decrease cognitive performance and increases the risk of low mood such as anxiety and anger [122].

Nurturing the self can be done using a number of different techniques. Developing and practicing self-compassion can increase a person psychological wellbeing and assist professionals to better respond to the difficulties experienced in their jobs [123, 124]. Self-care interventions developed aim to help healthcare professionals achieve work-life balance by developing coping skills to maintain both emotional and physical health [125], along with maintaining healthy social networks and participating in activities to promote relaxation such as meditation and mindfulness [126, 127]. Other self-care activities that can be adopted to help to support emotional wellbeing involve creative writing [128]. Strategies have included the use of writing poems to explore difficulties with emotional connection [129], or the use of creative cafes to reaffirm the core values involved in nursing [130].

4.5.3 Peer support programs

Peer support programs can be effective strategies to support healthcare professionals to help mitigate compassion fatigue. Encouraging individuals to utilise their social support networks has a protective quality, by providing opportunities to process traumatic experiences at work [131]. Chambers [132] developed the Care for Caregivers program for physicians, nurses and other frontline staff. The staff were trained in peer support techniques that covered active listening, normalising emotions, reframing situations, sharing stories and offering ideas of coping mechanisms. The program was reported as being well utilised by staff members, especially those dealing with patients experiencing trauma or patient death. Within 2 years of the program running staff surveys reported an increase in feeling adequately supported by the hospital from 16% to 86%, helping change the workplace culture to being more emphatic [132].

4.5.4 Protection through training

Preventing healthcare from the risks of developing compassion fatigue can be included in training programs. There are ways in training healthcare professionals

to equipped them with strategies to help protect them from developing compassion fatigue. For example, trauma therapists utilising evidence-base practices when treating their clients had significantly decreased amounts of compassion fatigue and burnout compared to specialists not using evidence-based practices [133]. This demonstrates the use of evidence-based practices to prevent the negative outcomes of compassion fatigue therefore improving both the therapists and clients experience of therapy [133, 134]. A study by Deighton [135] reported the exposure to the clients traumatic event was not as important in therapists developing compassion fatigue as the therapist's t ability to help the client work through their trauma [135]. Being able to identify possible strategies to be better equipped to deal with exposure to clients' traumas can reduce the impact on healthcare professionals.

4.5.5 Culture change in healthcare facilities

Organisations can help mitigate the effects of compassion fatigue experienced by their employees. Organisations need to assess whether and to what extent compassion fatigue is a concern of their workers to be able to start to address the problem [136]. Prevention is recommended as the first line of defence against compassion fatigue [137]. Organisations should provide regular education and training around the importance of building employees self-care routines [138]. The Hospital, University Pennsylvania, is an example of an organisation that has provided their own wellness programs to support their staff. A Centre for Nursing Renewal was developed to minimise the ill effects of compassion fatigue and promote wellness among its staff [139]. The centre offered relaxation, meditation, yoga, group exercise classes, along with other classes and spaces to support nurses emotional and physical wellbeing. The centre assisted in creating a culture where nurse leaders were increasing awareness of nurses experiencing compassion fatigue and burnout and could therefore encourage staff to engage in discussion and renewal practices such as exercise, talking, reflection and getting adequate rest [139].

Staff wellness programs and initiatives have been implemented and trialled in other health care providers organisations. These programs range in the types of resources provided, include from professional counselling, employee health screening, role modelling, mentor program, o providing healthy snacks and relaxation. These types of programs offered by organisations and led by trained professional can help reduce compassion fatigue [119, 128]. These include employee health screening, role modelling, mentor program and staff retreats.

Staff wellness programs and initiatives have been implemented and trialled in other organisations. These programs range in the types of resources provided and included professional counselling, employee health screening, role modelling, mentor program, staff retreats, providing healthy snacks and relaxation. These types of programs were offered by organisations and led by trained professional can help reduce compassion fatigue [116, 125].

More practical strategies that could be provided from an organisational level include providing adequate staffing levels, having good leadership support and experienced staff [140]. By creating workplaces where it is encouraged to acknowledge that providing emphatic care to patients in difficult situations can cause compassion fatigue is a response of caring, can help to address the phenomenon [66]. At an organisational level demonstrating compassion is genuinely appreciated through celebrating staff acts of compassion [136] can help make staff feel valued and supported. Providing staff with personal development opportunities promoting psychological

wellbeing [141], along with debriefing after stressful events could promote healing [140]. Organisations can play a major role in supporting staff provide the best patients care in a safe and nurturing environment.

5. Limitations of this review

While every attempt was made to search the appropriate databases for articles systematically, it is important to note that this is not a systematic review. The search was limited to three major databases: MEDLINE (Ovid), APA PsycINFO (EBSCOhost), and CINAHL Plus using the Boolean/Phrase (Empathy AND ("Compassion Fatigue" OR "Vicarious Trauma") AND Health). Two main limitations influenced the studies identified by the database search; the first was not including the term "Secondary Traumatic Stress" as an alternative to "Vicarious Trauma" in the search terms, and the second was limiting the search to literature published between 2003 and 2022 and missing essential articles published in the 90s. These dates were initially selected due to the escalation in volume of relevant publications during that timeframe. Fortunately, these limitations were identified by the authors during the review process and were corrected by including all relevant secondary sources which retrieved the essential articles before 2003 in addition to studies examining Secondary Traumatic Stress.

6. Conclusion

Empathy and compassion are fundamental aspirations for HCPs as they provide them with job satisfaction, a sense of value, as well as greatly benefiting their patients. However, caring and supporting people in distress can, over time, lead to compassion fatigue which negatively impacts the healthcare professional, the patient, the organisation, and the healthcare system. Although there are clear risk factors, identifying tools and effective strategies to support and manage those experiencing compassion fatigue, compassion fatigue in HCPs continues to grow reaching alarming levels over the last decade. Further research is needed to quantify the escalation and impact of compassion fatigue, and in a broader array of healthcare professionals. Exploration of the unique impact of loss of compassion beyond the experience of burnout is also an area requiring an enhanced understanding.

We propose that organisations implement regular screening and targeted support for at-risk individuals. More practical strategies could be provided from an organisational level to prevent the development of compassion fatigue in HCPs and support staff to provide the best patient care in a safe and nurturing environment. Ensuring a positive work culture, which includes peer support programs, is a managerial responsibility. Evidence supports the use of formal intervention programs such as CFRP and the ARP to be effective in reducing compassion fatigue, yet these programs required the HCP to commit a substantial amount of time, usually outside of their working day. For the benefits of these programs to reach HCP, shorter programs preferably accessible during work hours could be incorporated. Future research should focus on identifying components of these programs that could be adapted into modified shorter training sessions that could become part of ongoing professional development.

Crucially, we propose that ensuring adequate staffing levels be a key responsibility of management and, therefore, we advise the meticulous implementation of quality assurance, evaluation, and formal reporting of staffing ratios.

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Conflict of interest

The authors declare no conflict of interest.

Thank you

Nomenclature and abbreviations

HCP   healthcare professionals or providers
PTSD   post-traumatic stress disorder
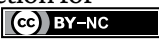STS   secondary traumatic stress
ST   secondary traumatization

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References

[1] Roney LN, Acri MC. The cost of caring: An exploration of compassion fatigue, compassion satisfaction, and job satisfaction in pediatric nurses. Journal of Pediatric Nursing. 2018;**40**:74-80

[2] Kinman G, Grant L. Enhancing empathy in the helping professions. In: Psychology and neurobiology of empathy. Nova Biomedical Books; 2016. pp. 297-319

[3] Cole-King A, Gilbert P. Compassionate care: The theory and the reality. Journal of Holistic Healthcare. 2011;**8**(3):30

[4] Hein G, Singer T. I feel how you feel but not always: The empathic brain and its modulation. Current Opinion in Neurobiology. 2008;**18**(2):153-158

[5] Hoffman ML. Chapter 4—Varieties of empathy-based guilt. In: Bybee J, editor. Guilt and Children. San Diego: Academic Press; 1998. pp. 91-112

[6] Blumgart HL. Caring for the patient. The New England Journal of Medicine. 1964;**270**:449-456

[7] Osler W. Aequanimitas: With Other Addresses to Medical Students, Nurses and Practitioners of Medicine. Philadelphia: P. Blakiston's Son & Co.; 1920. p. 475

[8] Markakis K, Frankel R, Beckman H, Suchman A. Teaching empathy: It can be done. Annual Meeting of the Society of General Internal Medicine; April 29–May 1; San Francisco, California. 1999

[9] Halpern J. What is clinical empathy? Journal of General Internal Medicine. 2003;**18**(8):670-674

[10] Stepien KA, Baernstein A. Educating for empathy. A review. Journal of General Internal Medicine. 2006;**21**(5):524-530

[11] de Waal FB. The antiquity of empathy. Science. 2012;**336**(6083):874-876

[12] Radey M, Figley CR. The social psychology of compassion. Clinical Social Work Journal. 2007;**35**(3):207-214

[13] Joinson C. Coping with compassion fatigue. Nursing (Jenkintown, Pa). 1992;**22**(4):116-121

[14] Figley CR. Compassion Fatigue: Coping with Secondary Traumatic Stress Disorder in those Who Treat the Traumatized. New York: Brunner/Mazel; 1995

[15] Figley CR. Compassion fatigue: Psychotherapists' chronic lack of self care. Journal of Clinical Psychology. 2002;**4**(11):1433-1441

[16] Adams RE, Boscarino JA, Figley CR. Compassion fatigue and psychological distress among social workers: A validation study. American Journal of Orthopsychiatry. 2006;**76**(1):103-108

[17] Bourassa DB. Compassion fatigue and the adult protective services social worker. Journal of Gerontological Social Work. 2009;**52**(3):215-229

[18] Cavanagh N, Cockett G, Heinrich C, Doig L, Fiest K, Guichon JR, et al. Compassion fatigue in healthcare providers: A systematic review and meta-analysis. Nursing Ethics. 2020;**27**(3):639-665

[19] Peters E. Compassion fatigue in nursing: A concept analysis. Nursing Forum (Hillsdale). 2018;**53**(4):466-480

[20] Sorenson C, Bolick B, Wright K, Hamilton R. Understanding compassion fatigue in healthcare providers: A review

of current literature. Journal of Nursing Scholarship. 2016;**48**(5):456-465

[21] Bleazard M. Compassion fatigue in nurses caring for medically complex children. Journal of Hospice and Palliative Nursing: JHPN: The Official Journal of the Hospice and Palliative Nurses Association. 2020;**22**(6):473-478

[22] Osofsky JD. Perspectives on helping traumatized infants, young children, and their families. Infant Mental Health Journal. 2009;**30**(6):673-677

[23] Katz A. Compassion in practice: Difficult conversations in oncology nursing. Canadian Oncology Nursing Journal. 2019;**29**(4):255-257

[24] Potter P, Deshields T, Berger JA, Clarke M, Olsen S, Chen L. Evaluation of a compassion fatigue resiliency program for oncology nurses. Oncology Nursing Forum. 2013;**40**(2):180-187

[25] Kinman G, Grant L. Emotional demands, compassion and mental health in social workers. Occupational Medicine. 2020;**70**(2):89-94

[26] Lemieux-Cumberlege A, Taylor EP. An exploratory study on the factors affecting the mental health and well-being of frontline workers in homeless services. Health & Social Care in the Community. 2019;**27**(4):e367-ee78

[27] Pietrantoni L, Prati G. Resilience among first responders. African Health Sciences. 2008;**8**(Suppl. 1):S14-S20

[28] Tehrani N. Compassion fatigue: Experiences in occupational health, human resources, counselling and police. Occupational Medicine. 2010;**60**(2):133-138

[29] Turgoose D, Glover N, Barker C, Maddox L. Empathy, compassion fatigue,

and burnout in police officers working with rape victims. Traumatology. 2017;**23**(2):205-213

[30] Xie W, Chen L, Feng F, Okoli CTC, Tang P, Zeng L, et al. The prevalence of compassion satisfaction and compassion fatigue among nurses: A systematic review and meta-analysis. International Journal of Nursing Studies. 2021;**120**:103973

[31] Anzaldua A, Halpern J. Can clinical empathy survive? Distress, burnout, and malignant duty in the age of Covid-19. Hastings Center Report. 2021;**51**(1):22-27

[32] Becker J, Dickerman M. Impact of narrative medicine curriculum on burnout in pediatric critical care trainees. Critical Care Medicine. 2021;**49** (1 Suppl. 1):473

[33] Carver ML. Another look at compassion fatigue. Journal of Christian Nursing: A Quarterly Publication of Nurses Christian Fellowship. 2021;**38**(3):E25-EE7

[34] Ruiz-Fernández MD, Ramos-Pichardo JD, Ibáñez-Masero O, Cabrera-Troya J, Carmona-Rega MI, Ortega-Galán ÁM. Compassion fatigue, burnout, compassion satisfaction and perceived stress in healthcare professionals during the COVID-19 health crisis in Spain. Journal of Clinical Nursing. 2020;**29**(21-22):4321-4330

[35] Zhang YY, Han WL, Qin W, Yin HX, Zhang CF, Kong C, et al. Extent of compassion satisfaction, compassion fatigue and burnout in nursing: A meta-analysis. Journal of Nursing Management. 2018;**26**(7):810-819

[36] Green BN, Johnson CD, Adams A. Writing narrative literature reviews for peer-reviewed journals: Secrets of the

trade. Journal of Chiropractic Medicine. 2006;**5**(3):101-117

[37] DiTullio M, MacDonald D. The struggle for the soul of hospice: Stress, coping, and change among hospice workers. American Journal of Hospice and Palliative Medicine®. 1999;**16**(5):641-655

[38] Keidel GC. Burnout and compassion fatigue among hospice caregivers. American Journal of Hospice and Palliative Medicine®. 2002;**19**(3):200-205

[39] Payne N. Occupational stressors and coping as determinants of burnout in female hospice nurses. Journal of Advanced Nursing. 2001;**33**(3):396-405

[40] O'Halloran TM, Linton JM. Stress on the job: Self-care resources for counselors. Journal of Mental Health Counseling. 2000;**22**(4):354

[41] Jenaro C, Flores N, Arias B. Burnout and coping in human service practitioners. Professional Psychology: Research and Practice. 2007;**38**(1):80

[42] Bride BE, Figley CR. The fatigue of compassionate social workers: An introduction to the special issue on compassion fatigue. Clinical Social Work Journal. 2007;**35**(3):151-153

[43] Figley CR. Compassion Fatigue: Toward a New Understanding of the Costs of Caring. Philadelphia, PA, US: Brunner/Mazel; 1995

[44] Rourke MT. Compassion Fatigue in Pediatric Palliative Care Providers. Pediatric Clinics of North America. 2007;**54**(5):631-644

[45] Pfifferling J-H, Gilley K. Overcoming compassion fatigue. Family Practice Management. 2000;**7**(4):39

[46] Arkan B, Yılmaz D, Düzgün F. Determination of compassion levels of nurses working at a university hospital. Journal of Religion and Health. 2020;**59**(1):29-39

[47] Zeidner M, Hadar D, Matthews G, Roberts RD. Personal factors related to compassion fatigue in health professionals. Anxiety, Stress & Coping: An International Journal. 2013;**26**(6):595-609

[48] Lynch SH, Shuster G, Lobo ML. The family caregiver experience – Examining the positive and negative aspects of compassion satisfaction and compassion fatigue as caregiving outcomes. Aging & Mental Health. 2018;**22**(11):1424-1431

[49] Goldblatt H, Buchbinder E. Challenging Gender Roles. Journal of Social Work Education. 2003;**39**(2):255-275

[50] Gerson JI. The Development of Empathy in the Male Psychotherapist: A Researched Essay. Ohio, United States of America: The Union Institute; 1996

[51] Kogan I. The role of the analyst in the analytic cure during times of chronic crises. Journal of the American Psychoanalytic Association. 2004;**52**(3):735-757

[52] Batten SV, Orsillo SM. Therapist reactions in the context of collective trauma. The Behavior Therapist. 2002;**25**(2):36-40

[53] Baum N. Trap of conflicting needs: Helping professionals in the wake of a shared traumatic reality. Clinical Social Work Journal. 2012;**40**(1):37-45

[54] Ledoux K. Understanding compassion fatigue: Understanding compassion. Journal of Advanced Nursing. 2015;**71**(9):2041-2050

[55] Tanner D. 'The love that dare not speak its Name': The role of compassion in social work practice. British Journal of Social Work. 2020;**50**(6):1688-1705

[56] Coetzee SK, Klopper HC. Compassion fatigue within nursing practice: A concept analysis. Nursing & Health Sciences. 2010;**12**(2):235-243

[57] Gilmore C. Compassion fatigue-what it is and how to avoid it. Kai Tiaki: Nursing New Zealand. 2012;**18**(5):32

[58] Stewart DW. Casualties of war: Compassion fatigue and health care providers. Medsurg Nursing. 2009;**18**(2):91-94

[59] Walker LO, Avant KC. Strategies for Theory Construction in Nursing. Prentice Hall Upper Saddle River, NJ: Pearson; 2005

[60] Wynn F. Burnout or compassion fatigue? A comparative concept analysis for nurses caring for patients in high-stakes environments. International Journal for Human Caring. 2020;**24**(1):59-71

[61] Zhang Y-Y, Zhang C, Han X-R, Li W, Wang Y-L. Determinants of compassion satisfaction, compassion fatigue and burn out in nursing: A correlative meta-analysis. Medicine (Baltimore). 2018;**97**(26):e11086

[62] Sukut O, Sahin-Bayindir G, Ayhan-Balik CH, Albal E. Professional quality of life and psychological resilience among psychiatric nurses. Perspectives in Psychiatric Care. 2022;**58**(1):330-338

[63] Coetzee SK, Klopper HC. Compassion fatigue within nursing practice: A concept analysis: Concept analysis of compassion fatigue. Nursing & Health Sciences. 2010;**12**(2):235-243

[64] Stamm R, Lambert J, Garritano N, Miller J, Donnellan A. Advanced practice registered nurse subspecialty compassion satisfaction and compassion fatigue. The Journal for Nurse Practitioners. 2022;**18**(3):310-315

[65] Slatten LA, Carson KD, Carson PP. Compassion fatigue and burnout: What managers should know. The Health Care Manager. 2020;**39**(4):181-189

[66] Harris C, Griffin MTQ. Nursing on empty: Compassion fatigue signs, symptoms, and system interventions. Journal of Christian Nursing : A Quarterly Publication of Nurses Christian Fellowship. 2015;**32**(2):80-87

[67] Meadors P, Lamson A, Swanson M, White M, Sira N. Secondary traumatization in pediatric healthcare providers: Compassion fatigue, burnout, and secondary traumatic stress. Omega: Journal of Death and Dying. 2009;**60**(2):103-128

[68] Peebles-Kleiger MJ. Pediatric and neonatal intensive care hospitalization as traumatic stressor: Implications for intervention. Bulletin of the Menninger Clinic. 2000;**64**(2):257-280

[69] Jenkins SR, Baird S. Secondary traumatic stress and vicarious trauma: A validational study. Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies. 2002;**15**(5):423-432

[70] Figley CR. Treating Compassion Fatigue. Routledge; 2002

[71] Figley CR. Compassion Fatigue: Coping with Secondary Traumatic Stress Disorder in those Who Treat the Traumatized. Routledge; 2013

[72] Sinclair HA, Hamill C. Does vicarious traumatisation affect

oncology nurses? A literature review. European Journal of Oncology Nursing. 2007;**11**(4):348-356

[73] Simon CE, Pryce JG, Roff LL, Klemmack D. Secondary traumatic stress and oncology social work: Protecting compassion from fatigue and compromising the worker's worldview. Journal of Psychosocial Oncology. 2005;**23**(4):1-14

[74] Beck CT. Secondary traumatic stress in nurses: A systematic review. Archives of Psychiatric Nursing. 2011;**25**(1):1-10

[75] Osland EJ. An investigation into the professional quality of life of dietitians working in acute care caseloads: Are we doing enough to look after our own? Journal of Human Nutrition and Dietetics: The Official Journal of the British Dietetic Association. 2015;**28**(5):493-501

[76] Rayner S, Davis C, Moore M, Cadet T. Secondary traumatic stress and related factors in Australian social workers and psychologists. Health & Social Work. 2020;**45**(2):122-130

[77] Hubbard GB, Beeber L, Eves E. Secondary traumatization in psychiatric mental health nurses: Validation of five key concepts. Perspectives in Psychiatric Care. 2017;**53**(2):119-126

[78] Rogers ME. Nursing science and the space age. Nursing Science Quarterly. 1992;**5**(1):27-34

[79] Huang Y-H, Kim H, Le M, Martinez J, Martin J, Maghen E, et al. Predictors and risk factors of compassion satisfaction, burnout, and compassion fatigue among OTs. The American Journal of Occupational Therapy. 2019;**73**(4_Supplement_1):7311505161-p1

[80] Perry B, Toffner G, Merrick T, Dalton J. An exploration of the experience of compassion fatigue in clinical

oncology nurses. Canadian Oncology Nursing Journal. 2011;**21**(2):91-97

[81] Aron EN, Aron A, Jagiellowicz J. Sensory processing sensitivity: A review in the light of the evolution of biological responsivity. Personality and Social Psychology Review. 2012;**16**(3):262-282

[82] Pérez-Chacón M, Chacón A, Borda-Mas M, Avargues-Navarro ML. Sensory processing sensitivity and compassion satisfaction as risk/protective factors from burnout and compassion fatigue in healthcare and education professionals. International Journal of Environmental Research and Public Health. 2021;**18**(2):611

[83] Jenkins B, Warren NA. Concept analysis: Compassion fatigue and effects upon critical care nurses. Critical Care Nursing Quarterly. 2012;**35**(4):388-395

[84] Benoit LG, Veach PM, LeRoy BS. When you care enough to do your very best: Genetic counselor experiences of compassion fatigue. Journal of Genetic Counseling. 2007;**16**(3):299-312

[85] Thomas RB, Wilson JP. Issues and controversies in the understanding and diagnosis of compassion fatigue, vicarious traumatization, and secondary traumatic stress disorder. International Journal of Emergency Mental Health. 2004;**6**(2):81-92

[86] Lynch SH, Lobo ML. Compassion fatigue in family caregivers: A Wilsonian concept analysis. Journal of Advanced Nursing. 2012;**68**(9):2125-2134

[87] Rawal S, Strahlendorf C, Nimmon L. Challenging the myth of the attrition of empathy in paediatrics residents. Medical Education. 2020;**54**(1):82-87

[88] Turgoose D, Maddox L. Predictors of compassion fatigue in mental health

professionals: A narrative review. Traumatology. 2017;**23**(2):172-185

[89] Mendenhall TJ. Trauma-response teams: Inherent challenges and practical strategies in interdisciplinary fieldwork. Families, Systems & Health. 2006;**24**(3):357-362

[90] Lee H-F, Kuo C-C, Chien T-W, Wang Y-R. A meta-analysis of the effects of coping strategies on reducing nurse burnout. Applied Nursing Research. 2016;**31**:100-110

[91] Howard H, Navega N. Pivotal events: 'I'm not a normal person anymore'—Understanding the impact of stress among helping professionals. Best Practices in Mental Health: An International Journal. 2018;**14**(2):32-47

[92] Sansbury BS, Graves K, Scott W. Managing traumatic stress responses among clinicians: Individual and organizational tools for self-care. Trauma (London, England). 2015;**17**(2):114-122

[93] Jo M, Na H, Jung Y-E. Mediation effects of compassion satisfaction and compassion fatigue in the relationships between resilience and anxiety or depression among hospice volunteers. Journal of Hospice and Palliative Nursing: JHPN: The Official Journal of the Hospice and Palliative Nurses Association. 2020;**22**(3):246-253

[94] Mason VM, Leslie G, Clark K, Lyons P, Walke E, Butler C, et al. Compassion fatigue, moral distress, and work engagement in surgical intensive care unit trauma nurses: A pilot study. Dimensions of Critical Care Nursing. 2014;**33**(4):215-225

[95] Showalter SE. Compassion fatigue: What is it? Why does it matter? Recognizing the symptoms, acknowledging the impact, developing

the tools to prevent compassion fatigue, and strengthen the professional already suffering from the effects. American Journal of Hospice & Palliative Medicine. 2010;**27**(4):239-242

[96] Lombardo B, Eyre C. Compassion fatigue: A nurse's primer. Online Journal of Issues in Nursing. 2011;**16**(1):3

[97] McHugh MD, Kutney-Lee A, Cimiotti JP, Sloane DM, Aiken LH. Nurses' widespread job dissatisfaction, burnout, and frustration with health benefits signal problems for patient care. Health Affairs. 2011;**30**(2):202-210

[98] Nimmo A, Huggard P. A systematic review of the measurement of compassion fatigue, vicarious trauma, and secondary traumatic stress in physicians. Australasian Journal of Disaster and Trauma Studies. 2013;**2013**(1):37

[99] Circenis K, Millere I. Compassion fatigue, burnout and contributory factors among nurses in Latvia. Procedia, Social and Behavioral Sciences. 2011;**30**:2042-2046

[100] Rushton CH, Batcheller J, Schroeder K, Donohue P. Burnout and resilience among nurses practicing in high-intensity settings. American Journal of Critical Care. 2015;**24**(5):412-420

[101] Brito-Pons G, Librada-Flores S. Compassion in palliative care: A review. Current Opinion in Supportive and Palliative Care. 2018;**12**(4):472-479

[102] Pereira-Lima K, Mata DA, Loureiro SR, Crippa JA, Bolsoni LM, Sen S. Association between physician depressive symptoms and medical errors: A systematic review and meta-analysis. JAMA Network Open. 2019;**2**(11):e1916097-e

[103] Willard-Grace RMPH, Knox MMPH, Huang BBA, Hammer HMD, Kivlahan CMDM, Grumbach KMD. Burnout and health care workforce turnover. Annals of Family Medicine. 2019;**17**(1):36-41

[104] Moss M, Good VS, Gozal D, Kleinpell R, Sessler CN. An official critical care societies collaborative statement: Burnout syndrome in critical care health care professionals: A call for action. American Journal of Critical Care. 2016;**25**(4):368-376

[105] Stamm BH. The ProQOL Manual: The Professional Quality of Life Scale: Compassion Satisfaction, Burnout & Compassion Fatigue/Secondary Trauma Scales. Baltimore, MD: Sidran; 2005

[106] Stamm BH. Measuring Compassion Satisfaction as Well as Fatigue: Developmental History of the Compassion Satisfaction and Fatigue Test. Treating Compassion Fatigue. Psychosocial Stress Series, no. 24. New York, NY, US: Brunner-Routledge; 2002. pp. 107-119

[107] Figley CR. In: Figley CR, editor. Compassion Fatigue: Coping with Secondary Traumatic Stress Disorder in Those Who Treat the Traumatized. Vol. xxii. Philadelphia, PA, US: Brunner/Mazel; 1995. 268-xxii p

[108] Bride BE, Radey M, Figley CR. Measuring compassion fatigue. Clinical Social Work Journal. 2007;**35**(3):155-163

[109] Sinclair S, Raffin-Bouchal S, Venturato L, Mijovic-Kondejewski J, Smith-MacDonald L. Compassion fatigue: A meta-narrative review of the healthcare literature. International Journal of Nursing Studies. 2017;**69**:9-24

[110] Gentry JE, Baranowsky AB. Treatment Manual for Accelerated Recovery from Compassion Fatigue. Toronto, Ontario, Canada: Psych Ink Resources; 1998

[111] Robinson LK, Sterling L, Jackson J, Gentry E, Araujo F, LaFond C, et al. A secondary traumatic stress reduction program in emergency room nurses. SAGE Open Nursing. 2022;**8**:23779608221094530

[112] Rajeswari H, Sreelekha BK, Nappinai S, Subrahmanyam U, Rajeswari V. Impact of accelerated recovery program on compassion fatigue among nurses in South India. Iranian Journal of Nursing and Midwifery Research. 2020;**25**(3):249

[113] Flarity K, Gentry JE, Mesnikoff N. The effectiveness of an educational program on preventing and treating compassion fatigue in emergency nurses. Advanced Emergency Nursing Journal. 2013;**35**(3):247-258

[114] Cohen-Katz J, Wiley SD, Capuano T, Baker DM, Shapiro S. The effects of mindfulness-based stress reduction on nurse stress and burnout, part II: A quantitative and qualitative study. Holistic Nursing Practice. 2005;**19**(1):26-35

[115] Pfaff KA, Freeman-Gibb L, Patrick LJ, DiBiase R, Moretti O. Reducing the 'cost of caring' in cancer care: Evaluation of a pilot interprofessional compassion fatigue resiliency programme. Journal of Interprofessional Care. 2017;**31**(4):512-519

[116] Aycock N, Boyle D. Interventions to manage compassion fatigue in oncology nursing. Clinical Journal of Oncology Nursing. 2009;**13**(2):183-191

[117] Meadors P, Lamson A. Compassion fatigue and secondary traumatization: Provider self care on intensive care units for children. Journal of Pediatric Health Care. 2008;**22**(1):24-34

[118] Weidlich CP, Ugarriza DN. A pilot study examining the impact of care provider support program on resiliency, coping, and compassion fatigue in military health care providers. Military Medicine. 2015;**180**(3):290-295

[119] Nolte AG, Downing C, Temane A, Hastings-Tolsma M. Compassion fatigue in nurses: A metasynthesis. Journal of Clinical Nursing. 2017;**26**(23-24):4364-4378

[120] Penedo FJ, Dahn JR. Exercise and well-being: A review of mental and physical health benefits associated with physical activity. Current Opinion in Psychiatry. 2005;**18**(2):189-193

[121] Neville K, Cole DA. The relationships among health promotion behaviors, compassion fatigue, burnout, and compassion satisfaction in nurses practicing in a community medical center. The Journal of Nursing Administration. 2013;**43**(6):348-354

[122] National Sleep Foundation. Sleep-Wake Cycle: Its Physiology and Impact on Health. 2006

[123] Neff KD, Kirkpatrick KL, Rude SS. Self-compassion and adaptive psychological functioning. Journal of Research in Personality. 2007;**41**(1):139-154

[124] Hall CW, Row KA, Wuensch KL, Godley KR. The role of self-compassion in physical and psychological well-being. The Journal of Psychology. 2013;**147**(4):311-323

[125] Houck D. Helping nurses cope with grief and compassion fatigue: An educational intervention. Clinical Journal of Oncology Nursing. 2014;**18**(4):454-458

[126] Hevezi JA. Evaluation of a meditation intervention to reduce the effects of stressors associated with compassion fatigue among nurses. Journal of Holistic Nursing. 2016;**34**(4):343-350

[127] Owens RA, Alfes C, Evans S, Wyka K, Fitzpatrick JJ. An exploratory study of a 3-minute mindfulness intervention on compassion fatigue in nurses. Holistic Nursing Practice. 2020;**34**(5):274-281

[128] Warren J, Morgan MM, Morris LB, Morris TM. Breathing words slowly: Creative writing and counselor self-care—The writing workout. Journal of Creativity in Mental Health. 2010;**5**(2):109-124

[129] Groninger H. Palliative medicine fellows attend to compassion fatigue using John Stone's 'talking to the family'. Perspectives on Medical Education. 2015;**4**(2):83-85

[130] Winch S, Henderson AJ, Kay M, Burridge LH, Livesay GJ, Sinnott MJ. Understanding compassion literacy in nursing through a clinical compassion café. The Journal of Continuing Education in Nursing. 2014;**45**(11):484-486

[131] Killian KD. Helping till it hurts? A multimethod study of compassion fatigue, burnout, and self-care in clinicians working with trauma survivors. Traumatology. 2008;**14**(2):32-44

[132] Chambers RS. Developing a peer support program to mitigate compassion fatigue in health care: A quality improvement project. Iowa Nurse Reporter. 2021;**4**(4):19

[133] Craig CD, Sprang G. Compassion satisfaction, compassion fatigue, and burnout in a national sample of trauma treatment therapists. Anxiety, Stress

& Coping: An International Journal. 2010;**23**(3):319-339

[134] Kadambi MA, Ennis L. Reconsidering vicarious trauma: A review of the literature and its' limitations. Journal of Trauma Practice. 2004;**3**(2):1-21

[135] Deighton RM, Gurris N, Traue H. Factors affecting burnout and compassion fatigue in psychotherapists treating torture survivors: Is the therapist's attitude to working through trauma relevant? Journal of Traumatic Stress. 2007;**20**(1):63-75

[136] Hofmann PB. Addressing compassion fatigue. The problem is not new, but it requires more urgent attention. Healthcare Executive. 2009;**24**(5):40-42

[137] Tjeltveit AC, Gottlieb MC. Avoiding the road to ethical disaster: Overcoming vulnerabilities and developing resilience. Psychotherapy: Theory, Research, Practice, Training. 2010;**47**(1):98

[138] Paiva-Salisbury ML, Schwanz KA. Building compassion fatigue resilience: Awareness, prevention, and intervention for pre-professionals and current practitioners. Journal of Health Service Psychology. 2022;**48**(1):39-46

[139] Romano J, Trotta R, Rich VL. Combating compassion fatigue: An exemplar of an approach to nursing renewal. Nursing Administration Quarterly. 2013;**37**(4):333-336

[140] Al-Majid S, Carlson N, Kiyohara M, Faith M, Rakovski C. Assessing the degree of compassion satisfaction and compassion fatigue among critical care, oncology, and charge nurses. The Journal of Nursing Administration. 2018;**48**(6):310-315

[141] Why emergency nurses are said to succumb to "burnout" while other nurse specialties are said to succumb to "compassion fatigue"; is there a difference? Journal of Emergency Nursing. 2019;**45**(1):4-5

Chapter 2

Perspective Chapter: Having Heart – The Different Facets of Empathy

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Abstract

This chapter discusses the history of the various definitions of empathy and states two widely accepted current definitions for affective and cognitive empathy. The neural basis of different or overlapping cortical regions used by affective or cognitive empathy as well as sympathy/compassion are summarized, with the ventromedial prefrontal cortex as a probable common denominator for these emotions. Longitudinal studies of allopathic and osteopathic medical students confirm that women have higher affective and cognitive empathy scores than men, via the use of the Balanced Emotional Empathy Scale (BEES) and the Jefferson Scale of Empathy (JSE), respectively. During undergraduate medical education, BEES and JSE scores drop after the completion of the first basic science year and after the first year of clinical rotations. Students with higher empathy scores tend to enter primary care residencies, whereas students with lower scores are more likely to enter technical or procedure-oriented specialties. The ability to partially blunt an affective empathic response to an emotionally charged patient situation helps to ensure the health care provider can devote all their attention to the patient vs. the provider being caught up in their own emotions. Affective blunting may also be helpful in preventing burnout, especially among women health care workers.

Keywords: cognitive empathy, vicarious empathy, affective empathy, allopathic medical students, osteopathic medical students, residency selection, balanced emotional empathy scale (BEES), Jefferson scale of empathy (JSE), sympathy, compassion

1. Introduction

The study of "empathy" is complex, since this emotion is multifaceted and conflated with the terms sympathy and compassion. Accordingly, this chapter reveals how the word empathy has been defined over the past 100 years, and how researchers have explained empathy from a social point of view and, more recently, how it applies to the health professions. Accordingly, recently developed survey instruments that measure affective and cognitive empathy have been used to study empathy in individuals in the medical field. These scales also confirm the sociological evidence showing women have increased empathic behavior as compared to men. To determine

the different types of empathy and associated emotions, numerous neuroimaging or lesions studies have parsed out the various central nervous system (CNS) regions that are used by cognitive or affective empathy, and sympathy/compassion. Other portions of the chapter show how affective and cognitive empathy scores change as allopathic or osteopathic medical students go through their 4 years of medical training. These empathy scores also help to reveal what residency specialty those students will most likely enter. Finally, information is provided how empathy is related to burn out by health care professionals.

2. Definitions of empathy

In a review on empathy, Engelen and Röttger-Rössler [1] stated, "Almost anybody writing in the field would declare that there is no accepted standard definition of empathy—either among the sciences and humanities or in the specific disciplines." Ergo, there have been multiple definitions of empathy over the past century [2, 3]. At this point in time, it is generally accepted that empathy can be divided into two broad categories: affective or vicarious empathy and cognitive or role-taking empathy. This leads to the dilemma on whether these two aspects of empathy, i.e. understanding what another is thinking vs. understanding what the other is feeling, are separate or not, since the first is a cognitive function intimately relying on Theory of Mind (ToM) as part of the process [4, 5], whereas the latter is a more archaic emotional function that uses phylogenetically older parts of the CNS. Both of these aspects of empathy depend on the person recognizing, or identifying, the other person is equal in some respect, i.e. the person being viewed needs to be considered as yourself in whatever particular situation the other person is in.

Originally, the English word empathy was translated from the German word "Einfühlung" which means "feeling into." This German word was used to describe the feelings one gets by observing things of beauty, e.g. artwork and nature, and appreciating their esthetics. The translation into "empathy" (from the ancient Greek *empatheia* (passion); composed of "en" (in) and "pathos" (feeling)) was coined by psychologist Edward Titchener in 1909 [6]. Titchener was familiar with, and influenced by, the work of David Hume who stated, "the minds of men are mirrors to one another" [7, 8]. As time advanced, various researchers, e.g. Lockwood [9], basically defined "empathy" as being able to vicariously experience and understand the affect another person is emoting. Therefore, Einfühlung is not only an emotional, cognitive state, where you understand what another feels, but it also evokes an affective, autonomic reaction within a person, a "gut feeling" if you will, by feeling what the other person is experiencing.

Engelen and Röttger-Rössler [1] define empathy as, "A social feeling that consists in feelingly grasping or retracing the present, future, or past emotional state of another." In their definition, empathy is a vicarious emotion where the ability to separate feeling from comprehending is not clearcut. In 2012, H. Walter [10] probably proposed the most complex definition of empathy. He suggests that affective empathy is, "(a) An affective state that is (b) elicited by the perceived or imagined, or inferred state of the affective state of another; (c) is similar (isomorphic) to the other's affective state; (d) is oriented toward the other; and (e) includes at least some cognitive appreciation of the other's affective state comprising perspective-taking, self—other distinction, and knowledge of the causal relation between the self and the other's affective state." Walter also indicates that cognitive empathy "Refers to the ability to *understand* the feelings of others without necessarily implying the empathizer is in an

affective state." (Italics via Walter.) For further historical insights about the study of empathy, see these other excellent reviews [11–13].

3. The development of empathy survey instruments

The use of empathy throughout the development of human cultures promotes harmonious social interactions [11]. Since effective patient care is largely dependent on social interactions between the physician and the patient, its importance in the health professions became an issue of concern and considerable research over the past four decades. In this regard, social scientists took an interest in studying empathy and contributed their own definitions and measurement scales. In 1983, M.H. Davis [14] defined empathy using a multidimensional approach, i.e. both the affective and cognitive components, as the "reactions of one individual to the observed experiences of another." In 1980, he developed the widely used Interpersonal Reactivity Index (IRI) which parses out four aspects of what he defines as the social aspects of empathy, i.e. social functioning, self-esteem, emotionality, and sensitivity to others [15]. Consequently, the IRI scale examines perspective-taking, which assesses the tendencies to spontaneously adopt the psychological viewpoint of others; Fantasy, which assesses the tendency to transpose themselves imaginatively into the feelings and actions of fictional characters in books, movies, and plays; Empathic Concern assesses other-oriented feelings of sympathy and concern for unfortunate others; and Personal Distress measures self-oriented feelings of personal anxiety and unease in tense interpersonal settings.

A large advancement in the field of cognitive empathy took place in 2002, when Dr. M. Hojat and colleagues [16] developed an excellent definition of what they term as "clinical empathy." This definition of cognitive empathy is used in the context of health care professions education and patient care as, "A predominantly *cognitive* (rather than an affective or emotional) attribute that involves an *understanding* (rather than a feeling) of pain and suffering of the patient combined with a capacity to *communicate* this understanding and with an *intention to help*." The four key terms in this definition are italicized by Hojat and colleagues to underscore their significance in the construct of patient care. Since that time, it has been accepted, almost worldwide, as the definitive definition of the use of cognitive empathy in health professions. This definition was the result of their development of the widely used "Jefferson Scale of Physician Empathy" [17]. (Note: The name has now been shortened to the "Jefferson Scale of Empathy" (JSE)).

Before Hojat's seminal work on empathy, Hogan, in 1969, developed his scale that measures the cognitive aspects of empathy [18]. He defined empathy as, "The intellectual or imaginative apprehension of another's condition or state of mind." Even earlier, in 1949, Dymond devised an empathy scale and defined cognitive, role-taking empathy as, "An empathic person can imaginatively take the role of another and can understand and accurately predict that persons' thoughts, feelings and actions" [19]. In contrast to scales examining cognitive empathy, or a combination of cognitive and affective empathy, in 1996, A. Mehrabian developed the Balanced Emotional Empathy Scale (BEES) that measures the affective aspect of empathy [20]. He defined emotional, i.e. affective or vicarious empathy, via work by Stotland [21], as, "a vicarious emotional response to the perceived emotional experiences of others." In the context of personality measurement, it describes individual differences in the tendency to have emotional empathy with others [20, 22, 23]. Therefore, the BEES measures both components of emotional empathy, i.e. the vicarious experience of others' feelings as well as the positiveness, adaptability, and affiliative aspects of a person in a balanced way [20].

4. Compassion and sympathy

"Compassion" is another word frequently used by health care professionals, and measurement scales have been developed [24]. In this regard, the definition of clinical empathy by Hojat and colleagues encompasses the meaning of compassion. Compassion, which etymologically means "to suffer with" [25], can be defined as, "A deep awareness of the suffering of another coupled with the wish to relive it." and is incorporated within Hojat's phrase "*intention to help*" [16]. Yet Post and colleagues and others [2, 26] argue that compassionate care is an intensification of the affective dimension of empathy regarding patient suffering. Therefore, it would seem difficult to have compassion for another being that is suffering without having some kind of effect upon the observer of the suffering individual.

"Sympathy" is another term frequently used by the general population as well as some health care professionals and social scientists, and scales have been devised to measure it [27]. Decety and Chaminade [28] define sympathy as, "The affinity, association, or relationship between persons wherein whatever affects one similarly affects the other." Also, sympathy and pity are not the same. Whereas pity is feeling sorry for another, sympathy infers that you have a favorable impression of the other person. Both pity and sympathy seem to occur among individuals or groups with whom the observer is familiar, but it is not evoked from others who are not considered as a part of your group or whom you cannot identify with [1]. Studies by Post and colleagues [2] and Sinclair et al. [29] indicate that the use of sympathy by health care workers or friends of patients invokes a negative emotional reaction from the patient who discerns a sense of pity or misfortune accompanied by the feeling that they are being treated unfairly. Later in the chapter we'll see that while some researchers equate affective empathy to sympathy [30], this is not entirely correct. The distinction between empathy and sympathy has been described by Hein and Singer as "feeling as and feeling for the other," respectively [31]. Indeed, the development of the Adolescent Measure of Empathy and Sympathy (AMES) by Vossen and colleagues [32] shows that sympathy is more closely related to cognitive empathy vs. affective empathy, and that affective empathy and sympathy appear to be two different emotions. Therefore, sympathy, in contrast to compassion, does not necessarily evoke a need to help another individual in distress.

Recall, that the original definition of Einfühlung states that it can be induced by a feeling of awe or joy by viewing something that is esthetically beautiful to the beholder. This seems distant and somewhat unrelated to how the intertwined terms of affective and cognitive empathy, and sympathy and compassion are used today. This stresses the importance of each researcher to carefully define what they are studying so that equitable comparisons can be made among studies. For additional definitions of empathy, see the thorough review by Cuff and colleagues [3].

In summary, this chapter will use the definitions proposed by Mehrabian [20] for affective empathy, "A vicarious emotional response to the perceived emotional experiences of others." Cognitive empathy will be used as it relates to health care professionals, so the definition by Hojat and colleagues [16] for what they term as "clinical empathy" will be used: "A predominantly *cognitive* (rather than an affective or emotional) attribute that involves an *understanding* (rather than a feeling) of pain and suffering of the patient combined with a capacity to *communicate* this understanding and with an *intention to help*."

5. The neural basis of empathy

Studies using the JSE [17] to measure cognitive empathy or the BEES [20] to measure affective empathy show sex differences with women having higher JSE or BEES scores than men. For representative studies, see the following references [16, 20, 33–37]. These empathic sex differences have a neural basis. Briefly, during the emergence of humans, prosocial behavior, including empathy, gave an evolutionary advantage to those who possessed this trait. Additionally, paramount in the development of empathy was the ability for humans to distinguish "self" from "other." For through reviews on these concepts, see [11, 38, 39]. Commensurate with self-other distinction, the ability to respond to pain or distress in others evoked the more phylogenetically archaic/emotional brain to provide a "low-road," i.e. a bottom-up, vicarious response that evoked the desire to help the one in distress [10]. This was particularly true in females who needed to care for their helpless infants when they were perceived as being in distress. Indeed, this affective empathic trait is phylogenetically preserved across many species of animals because they all possess the archaic neural structures necessary for an affective emotional response to others in pain [38, 40]. These cortical areas, e.g. the inferior frontal gyrus, insular cortex, and parts of the cingulate gyrus, are known to be cytoarchitecturally more primitive (as defined by Broadmann areas) and are the first to mature in the human cerebral cortex [41]. It is important to note that an affective empathic response activates what is called the "pain axis" within the CNS [42, 43]. As such, the pain axis utilizes the phylogenetically older regions of the CNS, e.g. the amygdala, anterior insular cortex, and various regions of the cingulate cortex. For a more thorough review, see [44].

After the development of the low road vicarious empathic response, a "high-road," i.e. a top-down empathic response, developed which utilized higher cognitive functions, including ToM that is closely related to cognitive empathy [4, 5, 10]. Thus, cognitive empathy uses cortical regions that developed later in primate phylogeny and includes the ventromedial prefrontal cortex, the temporoparietal junction, and the posterior aspect of the superior temporal sulcus [10, 12, 41].

5.1 Theory of mind and empathy

In a review by Walter [10], his figure 1 illustrates the CNS components that are involved with the "high road" (i.e. top-down, cognitive empathy) and the "low road" (i.e. bottom-up, affective empathy) and how these relate to cognitive ToM; with ToM being important in self-other distinction and the ability to represent and understand the mental states of others [4, 5]. During an empathic response, the affective/vicarious aspects of empathy arrive in the CNS before cognitive empathy is recruited. Intervening between affective and cognitive empathy is the use of ToM to put a self-other distinction on the experience. In brief, Walter proposes that the "lynch pin" between ToM and affective empathy is the use of the ventromedial prefrontal cortex involved with cognitive empathy. Other CNS regions are also implicated, ToM primarily uses the dorsomedial prefrontal cortex (supplemented by the superior temporal sulcus and the temporoparietal junction), while the affective aspects of empathy utilize the anterior insula and the medial cingulate cortex (supplemented by the inferior frontal gyrus, amygdala, and the secondary somatosensory cortex). For another more recent meta-analysis of ToM and empathy, see Schurz et al. [5].

5.2 CNS regions used by affective or cognitive empathy and sympathy/compassion

Table 1 reviews the regions of the CNS that play a role in affective empathy, cognitive empathy, and sympathy/compassion. The studies (see the references within **Table 1**) used either fMRI, transcranial magnetic stimulation, positron emission tomography (PET) scans, or various CNS lesions. Each of these methods has its own documented drawbacks, but collectively, the data show an overlap in regions that are consistently activated with each of the aforementioned emotional states. Note, that many of the studies are meta-analyses evaluating and summarizing numerous studies.

Affective/vicarious empathy	
Cortical region	**Studies referenced**
Right & left anterior insular cortex	[**10, 45–49**]	[*41, 50, 51*]	[12]
Anterior and mid-cingulate gyrus	[**10, 45–47, 49**]	[*50*]	[12]
Inferior frontal gyrus	[**46, 48, 49**]	[*41, 50,51*]
Right temporal pole	[*41, 50, 51*]
Right ventromedial prefrontal cortex	[*51, 52*]
Dorsolateral prefrontal cortex	[*52*]
Dorsomedial prefrontal cortex	[*50*]
Right dorsal anterior cingulate cortex	[**48, 49**]
Supplementary motor area	[**48**]
Right orbitofrontal cortex	[*50*]
Cognitive/role-taking empathy	
Cortical region	**Studies referenced**
Ventromedial prefrontal cortex	[**10, 45, 53**]	[*41, 51, 52*]
Superior temporal gyrus/cortex	[**10, 45, 53**]	[*41*]	[12, 54]
Temporoparietal junction	[**10, 45, 46, 53**]	[*41, 50*]
Medial prefrontal cortex	[**10, 46, 53**]	[12, 54]
Temporal poles	[**53**]	[12, 54]
Orbitofrontal cortex	[**48**]	[54]
Dorsal anterior medial cingulate cortex	[**48**]
Posterior cingulate cortex	[**10, 53**]
Anterior insula	[**48**]
Supplementary motor area	[**48**]
Inferior frontal cortex	[54]
Sympathy/compassion	
Cortical region	**Studies referenced**
Ventral tegmental area	[**46**]
Striatum	[**46**]
Nucleus accumbens	[**46**]
Amygdala	[28, 55]
Lateral or medial orbitofrontal cortex	[**46**]

Sympathy/compassion	
Cortical region	**Studies referenced**
Ventromedial anterior cingulate cortex	[**46**] | [55]
Posterior medial frontal cortex	[56]
Inferior frontal gyrus	[28]
Right superior frontal gyrus	[28]
Ventromedial prefrontal cortex	[28]
Right temporal pole	[28]
Anterior insula	[55]

Bold font = *Meta-analysis.*
Italic font = *Lesion study.*
Regular font = *fMRI, PET scan, or transcranial magnetic stimulation.*

Table 1.
CNS regions implicated in affective or cognitive empathy and sympathy/compassion.

Regarding affective empathy, meta-analyses and lesion studies show that the right and left anterior insular cortex, the anterior and medial cingulate cortex, and the inferior frontal gyrus are heavily recruited. Several other lesion studies show that the ventromedial prefrontal cortex and the right temporal pole are also implicated in the affective aspect of empathy. The only region that was exclusive for affective empathy was the dorsolateral prefrontal cortex that was implicated in a lesion study [52].

The most frequently activated regions involved with cognitive empathy via meta-analyses or lesion studies include the ventromedial prefrontal cortex (which may overlap with the medial prefrontal cortex), the posterior superior temporal gyrus, and the temporoparietal junction that is involved with ToM [4]. Regions exclusive for cognitive empathy were those areas involved with ToM, i.e. temporoparietal junction and the posterior superior temporal gyrus. Another potential exclusive region was the posterior cingulate cortex which blends into the precuneus of the parietal lobe [10].

With the above being said, most of the cognitive empathy regions that overlap with affective empathy areas comes from a meta-analyses study [48] that mentions the left anterior insular cortex, anterior and middle cingulate cortex, and the supplementary motor cortex. Two lesion studies [51, 52] also show overlap via the ventromedial prefrontal cortex. A single fMRI study [54] indicates an overlap with the inferior frontal gyrus.

Two studies [28, 46] examined regions of the CNS activated by sympathy/compassion using a meta-analyses of fMRI data or PET scans. Although there is overlap with regions involved with both affective and cognitive empathy, there are also many regions involved with the CNS reward system that are exclusive to sympathy/compassion. These reward areas include the ventral tegmental area, the striatum, nucleus accumbens, and the amygdala. Overlap occurs with regions implied for affective empathy via the inferior frontal gyrus, parts of the cingulate cortex, the temporal poles, and the ventromedial prefrontal cortex. Cognitive empathy and sympathy/compassion overlap in the temporal poles, the orbitofrontal cortex, and the medial and ventromedial prefrontal cortex.

When examining affective vs. cognitive empathy vs. sympathy/compassion, there are two regions that seem to be involved in all three; these are the ventromedial prefrontal cortex and the temporal poles. However, the implication of the right temporal pole for affective empathy came from three lesion studies [41, 50, 51], whereas their

involvement with cognitive empathy was via two fMRI studies [12, 54], and their involvement with sympathy/compassion was from a single study using a PET scan [28]. The fMRI study by Singer [12] examined both cognitive and affective empathy, but the superior temporal pole was only activated via cognitive empathy. The study by Schulte-Rüther and colleagues [54] only examined cognitive empathy. Therefore, the involvement of the right superior temporal pole with affective empathy must be viewed with caution, since lesion studies can, by nature, involve more areas of the cerebral cortex than the more "focused" studies using fMRI or PET scans. This leaves the prefrontal cortex, especially the right ventromedial region, as the only area being involved in affective and cognitive empathy as well as sympathy/compassion, since it is implicated in lesion studies [51, 52] (both of which used the BEES to show a decline in affective empathy scores due to the lesions), meta-analyses [10, 45], fMRI, and PET scans [28, 55].

In contrast to the above, a robust multi-level kernel density analysis (MKDA) study by Fan and colleagues [48] does not include the ventromedial prefrontal cortex as a region that is activated by both cognitive and affective empathy. Instead, Figure 3 by Fan et al. [48] shows that the left anterior insula was the only region to be activated by both types of empathy (sympathy/compassion was not examined). The right anterior insula was activated by affective empathy, while the left anterior mid-cingulate cortex was activated by cognitive empathy. Other regions that were involved with affective empathy (with an uncorrected MDKA threshold) are the right dorsal anterior cingulate cortex, the right dorsomedial thalamic nucleus, and the midbrain (most likely involving the periaqueductal gray). For cognitive empathy, the left medial orbitofrontal cortex and the left dorsomedial thalamic nucleus were involved. Their description of a core empathy network shows how the exteroceptive (affective) as well as the interoceptive (cognitve) aspects of empathy are interrelated [48]. The bottom-up, affective empathy areas use CNS networks that are involved with more primitive CNS regions involved with pain, disgust, and fear, whereas the cognitive aspects of empathy are using phylogenetically and cytoarchitecturally more recently developed CNS regions for a top-down empathic response.

In summary, mapping the CNS regions used by affective and cognitive empathy and sympathy/compassion is much like a Venn diagram with many sites potentially overlapping for all three emotions. Yet, each of these emotions have distinct regions that are reported to be activated using a variety of techniques, including lesion studies. Affective empathy activates the anterior insular cortex, the anterior and medial cingulate cortex, and the inferior frontal gyrus. Cognitive empathy, which uses areas involved with ToM, activates the ventromedial prefrontal cortex, the superior temporal cortex, the temporoparietal junction, and the medial prefrontal cortex. Sympathy/compassion is associated with the reward system and activates the ventral tegmental area, the striatum, amygdala, nucleus accumbens, and the medial orbitofrontal cortex. In many studies, it appears that the ventromedial prefrontal cortex is involved in all three emotions, and as Walter [10] suggests, it may be the common denominator among these emotions. In an imagined situation where a person is exposed to an emotionally charged setting, e.g. caring for a severely injured person in the Emergency Department, affective empathic responses enter the CNS of the health care provider first, these are modified by higher cortical regions involved with ToM, and then a cognitive empathic response is elicited.

6. Varied other factors can influence empathy

Studies have shown that many things can modify the empathy of an individual. Although an in-depth discussion of these factors is beyond the scope of this chapter, some of these can be briefly mentioned. Reviewed in a previous work [44] is how various CNS regions, especially those involved with the pain axis, are anatomically different between the sexes. In addition to anatomical sexual dimorphism, there is a sexually dimorphic recruitment of empathy-related cortical areas within the CNS, e.g. the amygdala, superior temporal sulcus, temporoparietal junction, and the inferior frontal gyrus [54, 57]. Walter [10] and others [58, 59] discuss the genetic aspects of empathy, especially in regard to the phylogenetically ancient hormones/neurotransmitters oxytocin and vasopressin, as well as reviewing how various genes and the environment may be implicated in empathic responses. Derntl et al. [60] reveal how trait empathy changes with the menstrual cycle; and another study shows how gonadal hormones influence empathy [61]. Schulte-Rüther et al. also show sex differences in how empathy is processed [62].

A study by Thirioux and colleagues [63] shows the time course of how various higher CNS regions are recruited in relation to cognitive empathy and sympathy, and how they relate to the mirror neuron system and the mentalizing/ToM network. Other studies show that as children develop, there are changes in which regions are used for cognitive and affective empathy as well as how strongly they are activated. In brief, younger-aged people use a more bottom-up response to an emotionally charged situation, and as they age, a more top-down approach is utilized as the cerebral cortex, especially the prefrontal cortex, matures after the teenage years [64, 65]. In a chapter by Newton [44], studies are reviewed that show how physicians empathically respond to noncompliant patients and to patients who are disparate from themselves. Finally, even an over-the-counter drug as ubiquitous as acetaminophen can reduce a person's affective empathy for seeing another person in physical or social pain [66].

7. Affective and cognitive empathy among allopathic and osteopathic medical students

Newton [35] and Newton and colleagues [34, 67, 68] have performed a series of longitudinal studies examining how cognitive and/or affective empathy changes as allopathic or osteopathic medical students go through their 4 years of undergraduate medical education. These studies used the BEES and the JSE surveys to determine affective and cognitive empathy scores, respectively [17, 20]. These data were then compared to a population norm established by Mehrabian [20] and verified by Newton et al. [34], or to a recently published nationwide norm of osteopathic medical students in the US [33]. The longitudinal studies by Newton and colleagues also examined the residency specialty the students desired as they went through their 4 years of training, as well as their residency choice for their first postgraduate year after obtaining their medical degree.

The longitudinal empathy study performed at an allopathic school (University of Arkansas for Medical Science (UAMS)) showed that affective empathy, i.e. BEES scores, significantly dropped after the completion of the first year of basic science courses, as well as, unexpectedly, significantly dropping after the completion of their first year of clinical rotations [34, 69]. BEES scores did not significantly change after

students completed their second basic science year. It was proposed this was most likely due to the students knowing they passed the first year, so there was a probable decrease in anxiety and/or they had refined their study techniques.

These data also confirmed the sexually dimorphic aspect of affective empathy with BEES scores of women being significantly higher than male scores [20, 34, 68]. Regarding desired specialty choice while in medical school, 23 residency specialties were segregated by Newton and colleagues [69] into "Core" and "Non-Core" groups. Core specialties are those that are generally considered as primary care specialties, i.e. those with a large amount of patient contact and continuity of care. The Core specialties are family medicine, internal medicine, pediatrics, Ob/Gyn, and psychiatry. Eighteen Non-Core specialties are more procedure or technically-oriented and have little or no patient contact or continuity of care, e.g. diagnostic radiology, emergency medicine, anesthesiology, or any of the surgical specialties. Men or women who desired to enter the Core specialties were better able to maintain their BEES scores vs. those allopathic students who desired Non-Core specialties [69]. Women who desired the Non-Core specialties had a 17.3% drop in BEES scores after completing their first year of clinical rotations, with some of them having BEES scores which approached the male norm. The greatest 4-year decline was for men in Non-Core specialties (38.7%) with women BEES scores in Non-Core specialties dropping by 29.3% over their 4 years of undergraduate medical training. Women desiring Core specialties had the smallest 4-year decline in BEES scores (13.0%), suggesting they were better able to maintain their affective empathy. (Note: only affective empathy was studied at UAMS since the JSE had not yet been developed).

Since the development of the JSE in 2001 [17], Newton and Vaskalis [67, 68] have completed data collection for another 7-year longitudinal empathy study examining both affective and cognitive empathy in osteopathic medical students at the Campbell University Jerry M. Wallace School of Osteopathic Medicine (CUSOM). These data have been presented in abstract form at the International Association of Medical Science Educators (IAMSE) annual meeting in 2015–2018 and 2022. [67, 68, 70]. (Manuscripts in preparation.) One of the main hypotheses of the CUSOM longitudinal study was to determine if osteopathic education, with its strong emphasis on the osteopathic philosophy of "mind, body and spirit" [71], combined with an emphasis on effective patient-physician communication skills, would result in a moderation of the drop in BEES scores with commensurate increases in JSE scores. Importantly, it is now possible to compare the CUSOM JSE data to students at other osteopathic schools since the publication of the ongoing nationwide Project on Osteopathic Medical Education and Empathy (POMEE) study data by Hojat and colleagues [33].

The osteopathic data from the Newton and Vaskalis studies [67, 68, 70] follow the same trends as what Newton and colleagues found with the allopathic students [34, 69]. Women have higher BEES and JSE scores than men, women entering into Core specialties better maintain their BEES and JSE scores than women who enter the Non-Core specialties, and male BEES and JSE scores tend to have larger drops in scores than those seen in women. Once again, the largest drops in BEES and JSE scores occurred after the completion of the first basic science year and the completion of the first clinical rotation year. The timing of the drops in CUSOM JSE scores closely match the reductions seen in JSE scores at other allopathic and osteopathic medical schools, e.g. see [72–75].

7.1 BEES and JSE scores vs. residency specialty match

The UAMS Longitudinal Empathy Study showed the different residencies selected by allopathic graduates as determined by their BEES scores [76]. Out of the 23

possible types of residency specialties, 15 had seven or more students who entered each of those specialties. (Eight additional specialties were not selected by enough students to establish statistical power.) The BEES scores of the male or female students who entered into the Core residencies placed the five Core residencies in the top six positions. In descending order, they were Ob/Gyn, pediatrics, psychiatry, family medicine, and internal medicine. Anesthesiology was in the fifth position out of the 15 residencies selected. All of the BEES scores for the Core specialties were designated by Mehrabian [20] as "Average" (50th percentile) when compared to the population norm. (See table 1 for the Mehrabian designations in [35].) At the bottom of the 15 specialties were those male or female students who selected pathology or orthopedic surgery. Both specialties were ranked at the 16th percentile when compared to a normal population and had "Moderately Low" BEES scores. These data indicate that students with higher BEES scores preferentially entered the Core specialties that have considerable patient contact and continuity of care. Conversely, those students with lower BEES scores tended to enter the more technically oriented, Non-Core specialties with little or no patient contact or continuity of care.

BEES scores for osteopathic residency choice [35] resemble what was found in the allopathic study [76]. In the osteopathic longitudinal study, only 11 of the possible 23 residency specialties were selected by eight or more students. The top four positions, in descending order, were occupied by the Core specialties of pediatrics, family medicine, internal medicine, and Ob/Gyn. All of these were designated as "Average" according to Mehrabian [20], with the exception of men entering pediatrics where their combined BEES score was ranked at the 69th percentile and designated as "Slightly High." In contrast to the allopathic data, psychiatry was eighth out of 11 slots and was designated as "Slightly Low" (31st percentile). The bottom two rankings were for anesthesiology and diagnostic radiology, both at the 16th percentile and had "Moderately Low" BEES scores. It is currently unknown why the BEES scores for allopathic students entering into anesthesiology placed the specialty in the fifth slot (out of 15) vs. the BEES scores for the osteopathic students that placed anesthesiology in the 10th slot out of the 11 possible selections. This was the largest discrepancy found for residency choice between the allopathic vs. the osteopathic graduates.

JSE scores were slightly different for those residency specialties entered by the osteopathic graduates [35]. The five Core specialties were in the top 6/11 positions: In descending order, they were pediatrics, family medicine, Ob/Gyn, psychiatry, and internal medicine. Orthopedics (only selected by men) and anesthesiology were the bottom two positions. What is concerning is that when compared to the POMEE norms for third- and fourth-year osteopathic students [33], only women CUSOM graduates who entered into psychiatry had a percentile score that was above the 50th percentile (59th); all other percentiles for the men and women in Core specialties were between the 29–44th percentiles. Percentile JSE scores for the bottom two selected specialties were even lower and were between 12th and 21st percentiles. So, overall, only 10 women out of a cohort of 345 CUSOM graduates had JSE scores that were above the 50th percentile when compared to the POMEE norm.

8. Is it possible to blunt affective empathy while increasing cognitive empathy?

One goal for any program that teaches health professionals should be to empower the students with the ability to have a certain amount of detached affective empathy. This

is where the affective response is blunted so that the health care provider can attend to the patient without allowing the visceral reaction to an emotionally charged situation mentally distract them from providing effective care [44]. Yet, over blunting affective empathy can lead to the development of a health professional who has inadequate social skills and will appear and act in a distant, detached manner from the patient. In this regard, it has been shown that establishing an empathic bond of trust with patients leads to a lower incidence of malpractice suits, increased patient compliance, and better health outcomes [77–81]. Ergo, the converse would be detrimental to patient satisfaction and compliance. Therefore, being able to adequately quell the affective response allows the health care provider to respond in a calm, reassuring fashion to the patient by using ToM and cognitive empathy, thereby establishing a bond of trust with the patient.

In reference to the above, a further analysis of the data from the CUSOM longitudinal study plotted BEES scores vs. JSE scores [70]. Scatter plots were used (**Figure 1**) to determine which students raised or maintained their cognitive empathy, via JSE scores, while decreasing their BEES (Those points enclosed in the box). JSE scores had to be at or above the 75th percentile for the CUSOM cohort, while BEES scores had to decrease by −0.50 to −1.49 s.d. off the population norm established by Mehrabian [20]. BEES scores in this range would be considered as "Slightly Low" to "Moderately Low". Decreasing BEES scores by ≥ −1.5 s.d. would place those students in the "Very Low" (7th percentile) to "Very Extremely Low" (0.6th percentile) portion of the population. These latter students would correspond to the scatter plot points to the far left and lower left in **Figure 1**. The BEES scores between −25 and − 75 suggest these individuals would have a very low affective response and may be perceived by patients as a callous, indifferent health care provider. In a similar fashion, those individuals who have BEES scores >80, i.e. ≥ +1.5 s.d., (top 7% of a normal population) may have an affective response that is too great and result in ineffective patient care. These students are represented by the upper right data points in **Figure 1**. In conclusion, only a small subset of students just before graduation (points enclosed in the box in **Figure 1**.) met
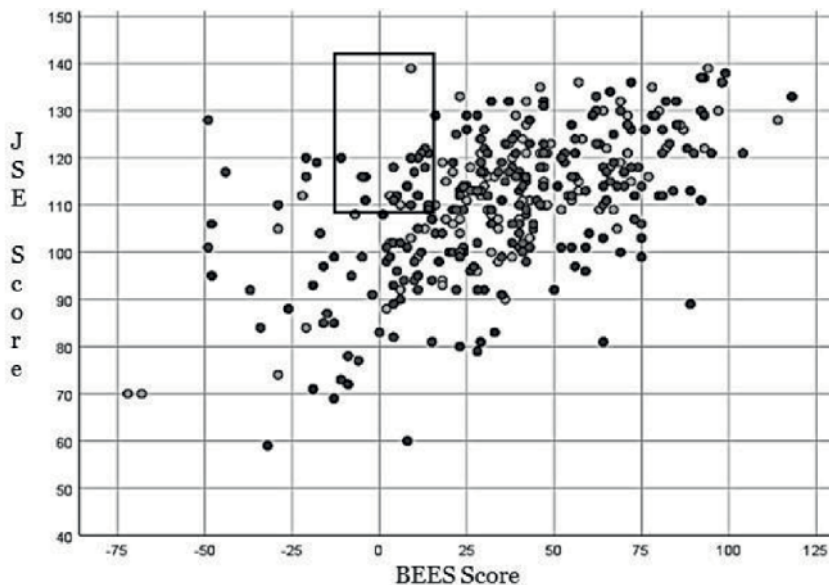
Figure 1.
Scatter plot of the CUSOM graduating classes of 2017–2019.

the criteria of blunting affective empathy while raising or maintaining their cognitive empathy scores.

When examining all five data collection points, only 20/169 men and 21/176 women, i.e. < 12% of the cohort, qualified as blunting affective empathy while raising or maintaining cognitive empathy scores [70]. Furthermore, when examining the data from the first year through the end of the fourth year, 32 students qualified at only one of the five data collection time points, eight at two time points, and only one person qualified for four of the possible five time points. Out of the 41 qualifying osteopathic students, 24 entered Core residencies, while 17 selected Non-Core residencies. These data are disturbing in that the efforts to teach effective communication skills, via standardized patient encounters, osteopathic manipulation labs, mock mass-casualty incidents, and didactic sessions dealing with subjects such as end-of-life, giving bad news, spirituality, or even a session on empathy, did not have a substantial impact on the student empathy scores.

9. Empathy and burnout

It is possible that the large number of CUSOM students who have high BEES scores put themselves at risk of burnout, since it takes considerable cognitive effort to control affective empathic responses [82–84]. Many of the students/graduates with higher BEES and JSE scores prefer to enter into the Core, people-oriented, specialties [35, 76, 85]. Thus, having an increased amount of affective and cognitive empathy takes a toll on the health care provider, especially women, who have a greater rate of burnout than men [86–88]. Many women osteopathic graduates prefer to enter the Core specialties, especially pediatrics, Ob/Gyn, and family medicine at a rate of almost twice that of men [35, 85]. For the allopathic students at UAMS, only pediatrics and Ob/Gyn were predominated by women, once again at an almost 2:1 margin. Any allopathic or osteopathic student with blunted BEES scores may be better able to perform in the Non-Core, technical, or procedure-oriented specialties without an increased rate of burnout, with the caveat of not becoming too hardened. As an example, it has been shown that physicians who, by necessity, induce pain in their patients during a procedure blunt their affective response to the pain they are causing in their patients [89, 90]. This allows them to concentrate on the patient vs. thinking about the pain they are causing. For a more detailed discussion, see [44].

10. Conclusions

This chapter points out that over the years, there have been many definitions of empathy, and some of them incorporate sympathy or compassion into the definitions. Over the past few decades, there has been a consensus there are two basic types of empathy: an affective or vicarious empathy and a cognitive or role-taking empathy. Each of these two types of empathy employ some unique CNS regions which makes each type distinct. However, like a Venn diagram, there is overlap in many of the regions, and this may be due to the type of imaging being used, e.g. fMRI, PET scans, transcranial magnetic stimulation, and/or the empathy- or sympathy-inducing scenarios being used by the investigators. Other studies have used patients with various CNS lesions to determine regions used by empathy. Although some authors feel that sympathy/compassion is the same as affective empathy, various studies show that

"reward" regions of the CNS were consistently, uniquely activated when the subject is in a sympathy study. Consequently, this author feels that sympathy is not the same emotion as vicarious/affective empathy. One region that was recruited by both affective and cognitive empathy, as well as sympathy/compassion, was the ventromedial prefrontal cortex. Thus, this region may be a key moderator of emotional responses.

Virtually, all studies show that women have significantly higher affective (BEES) and cognitive (JSE) empathy scores. Longitudinal studies by the author and colleagues at an allopathic and osteopathic medical school indicate that both affective and cognitive empathy drops after the completion of the first basic science year of study and after the first clinical rotation year. These studies also show that those students with higher BEES and/or JSE scores preferentially enter into the Core, people-oriented, specialties (i.e. family and internal medicine, pediatrics, Ob/Gyn, and psychiatry), while those students with lower empathy scores tend to gravitate toward the Non-Core, technical or procedure-oriented, specialties, e.g. diagnostic radiology, emergency medicine, anesthesiology, and surgical specialties.

Finally, the osteopathic longitudinal empathy study shows that educational efforts to boost effective communication skills and to partially blunt affective empathy are currently inadequate [70]. However, several other researchers are attempting to enhance cognitive empathic communication skills [91–94] to increase patient satisfaction and compliance [95]; while others ask for additional neuroscience studies to help improve medical student empathy [96, 97]. Nevertheless, medical students or recent graduates who have high BEES and JSE scores may be at risk for increased rates of burnout, especially women. As stated in a previous chapter [44], "Physicians walk a fine empathic line to ensure they can relate to the patient without becoming too hardened themselves."
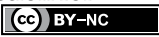
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References

[1] Engelen E-M, Röttger-Rössler B. Current disciplinary and interdisciplinary debates on empathy. Emotion Review. 2012;**4**:3-8. DOI: 10.1177/1754073911422287

[2] Post SG, Ng LE, Fischel JE, Bennett M, Biley L, et al. Routine, empathic and compassionate patient care: Definitions, development, obstacles, education and beneficiaries. Journal of Evaluation in Clinical Practice. 2014;**20**:872-880. DOI: 10.1111/jep.12243

[3] Cuff BMP, Brown SJ, Taylor L, Howat DJ. Empathy: A review of concept. Emotion Review. 2016;**8**(2):144-153. DOI: 10.1177/1754073914558466

[4] Dvash J, Shamay-Tsoory SG. Theory of mind and empathy as multidimensional constructs. Neurological foundations. Topics in Language Disorders. 2014;**34**(4):282-295. DOI: 10.1097/TLD0000000000000040

[5] Schurz M, Radua J, Tholen MG, Maliske L, Margulies DS, et al. Toward a hierarchical model of social cognition: A neuroimaging meta-analysis and integrative review of empathy and theory of mind. Psychological Bulletin. 2021;**147**(3):293-327. DOI: 10.1037/bul0000303

[6] Titchener EB. A Text-Book of Psychology, Part 1. New York: MacMillan Co.; 1909. DOI: 10.1037/12224-000

[7] Hume D. A Treatise of Human Nature. Reprint ed. Penguin Classics; 1986. ISBN-13: 978-0140432442

[8] Stueber K. Empathy. In: Zalta EN, editor. The Stanford Encyclopedia of Philosophy. Fall 2019 ed. 2019. Available from: https://plato.stanford.edu/archives/fall2019/entries/empathy/. [Accessed: June 22, 2022]

[9] Lockwood PL. The anatomy of empathy: Vicarious experience and disorders of social cognition. Behavioural Brain Research. 2016;**311**:255-266. DOI: 10.1016/j.bbr.2016.05.048

[10] Walter H. Social cognitive neuroscience of empathy: Concepts, circuits and genes. Emotion Review. 2012;**4**:9-17. DOI: 10.1177/1754073911421379

[11] Singer T, Lamm C. The social neuroscience of empathy. Annals of the New York Academy of Sciences. 2009;**1165**:81-96. DOI: 10.111/j.1749-6632.2009.04418x

[12] Singer T. The neuronal basis and ontogeny of empathy and mind reading: Review of literature and implications for future research. Neuroscience & Biobehavioral Reviews. 2006;**30**:855-863. DOI: 10.1016/j.neubiorev. 2006.06.011

[13] Batson CD. These things called empathy. In: Decety J, Ickes W, editors. The Social Neuroscience of Empathy. Cambridge, MA: MIT Press; 2009

[14] Davis MH. Measuring individual differences in empathy: Evidence for a multidimensional approach. Journal of Personality and Social Psychology. 1983;**44**(1):113-126. DOI: 10.1037/0022-3514.44.1.113

[15] Davis MH. A multidimensional approach to individual differences in empathy. JSAS Catalog of Selected Documents in Psychology. 1980;**10**:85

[16] Hojat M, Gonnella JS, Nasca TJ, Mangione S, Vergare M, Magee M. Physician empathy: Definition, components, measurement, and relationship to gender and specialty.

American Journal of Psychiatry. 2002;**159**(9):1563-1569. DOI: 10.1176/appi.ajp.159.9.1563

[17] Hojat M, Mangione S, Nasca TJ, Cohen MJ, Gonnella JS, et al. The Jefferson Scale of physician Empathy: Development and preliminary psychometric data. Educational and Psychological Measurement. 2001;**61**(2):349-365. DOI: 10.1177/00131640121971158

[18] Hogan R. Development of an empathy scale. Journal of Consulting and Clinical Psychology. 1969;**33**(3):307-316. DOI: 10.1037/h0027580

[19] Dymond RF. A scale for measurement of empathic ability. Journal of Consulting Psychology. 1949;**13**(2):127-133. DOI: 10.1037/h0061728

[20] Mehrabian, A. Manual for the Balanced Emotional Empathy Scale (BEES). 1996 (Newton received permission for use for educational purposes in 1996. It is no longer available from Dr. Albert Mehrabian)

[21] Stotland E. Exploratory investigations of empathy. In: Berkowitz L, editor. Advances in Experimental Social Psychology. Vol. 4. New York: Academic Press; 1969. pp. 271-314. DOI: 10.1016/S0065-2601(08)60080-5

[22] Mehrabian A, Epstein N. A measure of emotional empathy. Journal of Personality. 1972;**40**(4):525-543. DOI: 10.1111/j.1467-6494.1972.tb00078.x

[23] Mehrabian A. Relations among personality scales of aggression, violence, and empathy: Validational evidence bearing on the risk of eruptive violence Scale. Aggressive Behavior: Official Journal of the International

Society for Research on Aggression. 1997;**23**(6):433-445. DOI: 10.1002/(SICI)1098-2337(1997)23:6<433::AID-AB3>3.0.CO;2-H

[24] Gu J, Baer R, Cavanagh K, Kuyken W, Strauss C. Development and psychometric properties of the Sussex-Oxford compassion scales (SOCS). Assessment. 2020;**27**(1):3-20. DOI: 10.1177/1073191119860911

[25] Hoad TF. Concise Oxford Dictionary of English Etymology. New York: Oxford University Press; 1996. DOI: 10.1093/acref/9780192830982.001.0001

[26] Chochinov HM, Hassard T, McClement S, Hack T, Kristjanson LJ, et al. The patient dignity inventory: A novel way of measuring dignity-related distress in palliative care. Journal of Pain and Symptom Management. 2008;**36**(6):559-571. DOI: 10.1016/j.jpainsymman.2007.12.018

[27] Lee SA. Measuring individual differences in trait sympathy: Instrument construction and validation. Journal of Personality Assessment. 2009;**91**(6):568-583. DOI: 10.1080/00223890903228620

[28] Decety J, Chaminade T. Neural correlates of feeling sympathy. Neuropsychologia. 2003;**41**(2):127-138. DOI: 10.1016/S0028-3932(02)00143-4

[29] Sinclair S, Beamer K, Hack TF, McClement S, Bouchal SR, et al. Sympathy, empathy, and compassion: A grounded theory study of palliative care patients' understandings, experiences, and preferences. Palliative Medicine. 2017;**31**(5):437-447. DOI: 10.1177/0269216316663499

[30] Hojat M. Empathy in Health Professions Education and Patient Care. New York: Springer; 2016. pp. 10-15. DOI: 10.1007/978-3-319-27625-0

[31] Hein G, Singer T. I feel how you feel but not always: the empathic brain and its modulation. Current Opinion in Neurobiology. 2008;**18**:153-158. DOI: 10.1016/j.comb.2008.07.012

[32] Vossen HGM, Piotrowski JT, Valkenburg PM. Development of the adolescent measure of Empathy and sympathy (AMES). Personality and Individual Differences. 2015;**74**:66-71. DOI: 10.1016/j.paid.2014.09.040

[33] Hojat M, Shannon SC, DeSantis J, Speicher MR, Bragan L, Calabrese LH. National norms for the Jefferson Scale of Empathy: A nationwide project in osteopathic medical education and empathy (POMEE). The Journal of the American Osteopathic Association. 2019;**119**(8):520-532. DOI: 10.7556/jaoa.2019.091

[34] Newton BW, Barber L, Clardy J, Cleveland E, O'Sullivan P. Is there hardening of the heart during medical school? Academic Medicine. 2008;**83**(3):244-249. DOI: 10.1097/ACM.0b013e3181637837

[35] Newton BW. Having heart: Affective and cognitive empathy scores vs. residency specialty match at an osteopathic medical school. Medical Science Educator. 2022;**32**:423-436. DOI: 10.1007/s40670-022-01526-9

[36] Dehning S, Girma E, Gasperi S, Meyer S, Tesfaye M, Siebeck M. Comparative cross-sectional study of empathy among first year and final year medical students in Jimma University Ethiopia: Steady state of the heart and opening of the eyes. BMC Medical Education. 2012;**12**:34. DOI: 10.1177/00131640121971158

[37] Dehning S, Gasperi S, Krause D, Meyer S, Reiß E, et al. Emotional and cognitive empathy in first-year medical students. ISRN Psychiatry. 2013:801530. DOI: 10.1155/2013/801530

[38] Decety J, Bartal IB-A, Uzefovsky F, Knafo-Noam A. Empathy as a driver of prosocial behaviour: Highly conserved neurobehavioural mechanisms across species. Philosophical Transactions of the Royal Society B: Biological Sciences. 2016;**371**:20150077. DOI: 10.1098/rstb.2015.0077

[39] Chen C, Martinez RM, Cheng Y. The developmental origins of the social brain: Empathy, morality, and justice. Frontiers in Psychology. 2018;**9**:2584. DOI: 10.3389/fpsyg.2018.02584

[40] Dulac C, O'Connell LA, Wu Z. Neural control of maternal and paternal behaviors. Science. 2014;**345**:765-770. DOI: 10.1126/science.1253291

[41] Shamay-Tsoory SG, Aharon-Peretz J, Perry D. Two systems for empathy: A double dissociation between emotional and cognitive empathy in inferior frontal gyrus versus ventromedial prefrontal lesions. Brain. 2009;**132**:617-627. DOI: 10.1093/brain/awn279

[42] Rainville P. Brain mechanisms of pain affect and pain modulation. Current Opinion in Neurobiology. 2002;**12**:195-204. DOI: 10.1016/S0959-4388(02)00313-6

[43] Singer T, Seymour B, O'Doherty J, Kaube H, Dolan RJ, Frith CD. Empathy for pain involves the affective but not sensory components of pain. Science. 2004;**303**:1157-1162. DOI: 10.1126/science.1093535

[44] Newton BW. Walking a fine line: is it possible to remain an empathic physician and have a hardened heart? Frontiers in Human Neuroscience. 2013;**11**(7):233. DOI: 10.3389/fnhum.2013.00233

[45] Lamm C, Decety J, Singer T. Meta-analytic evidence for common and distinct neural networks associated with directly experienced pain and empathy for pain. NeuroImage. 2011;**54**:2492-2502. DOI: 10.1016/j.neuroimage.2010.10.014

[46] Lamm C, Rütgen M, Wagner IC. Imaging empathy and prosocial emotions. Neuroscience Letters. 2019;**693**:49-53. DOI: 10.1016/j.neulet.2017.06.054

[47] Singer T, Klimecki OM. Empathy and compassion. Current Biology. 2014;**24**(18):R875-R878. DOI: 10.1016/j.cub.2014.06.054

[48] Fan Y, Duncan NW, de Greck M, Northoff G. Is there a core neural network in empathy? An fMRI based quantitative meta-analysis. Neuroscience and Biobehavioral Reviews. 2011;**35**:903-911. DOI: 10.1016/j.neubiorev.2010.10.009

[49] Bernhardt BC, Singer T. The neural basis of empathy. Annual Review of Neuroscience (Palo Alto, CA). 2012;**35**:1-23. DOI: 10.1146/annurev-neuro-062111-150536

[50] Hillis AE. Inability to empathize: Brain lesions that disrupt sharing and understanding another's emotions. Brain. 2014;**137**:981-997. DOI: 10.1093/brain/awt317

[51] Driscoll DM, Dal Monte O, Solomon J, Krueger F, Grafman J. Empathic deficits in combat veterans with traumatic brain injury: A voxel-based lesion-symptom mapping study. Cognitive and Behavioral Neurology. 2012;**25**(4):160-166. DOI: 10.1097/WNN.0b013e318280cf4e

[52] Shamay-Tsoory SG, Tomer R, Berger BD, Aharon-Peretz J. Characterization of empathy deficits following prefrontal brain damage: The role of the right ventromedial prefrontal cortex. Journal of Cognitive Neuroscience. 2003;**15**(3):324-337. DOI: 10.1162/089892903321593063

[53] Molenberghs P, Johnson H, Henry J, Mattingley JB. Understanding the minds of others: A neuroimaging meta-analysis. Neuroscience and Biobehavioral Reviews. 2016;**65**:276-291. DOI: 10.1016/j.neubiorev.2016.03.020

[54] Schulte-Rüther M, Markowitsch HJ, Fink GR, Piefke M. Mirror neuron and theory of mind mechanisms involved in face-to-face interactions: A functional magnetic resonance imaging approach to empathy. Journal of Cognitive Neuroscience. 2007;**19**(8):1354-1372. DOI: 10.1162/jocn.2007.19.8.1354

[55] Hou X, Allen TA, Wei D, Huang H, Wang K, et al. Trait compassion is associated with the neural substrate of empathy. Cognitive, Affective, & Behavioral Neuroscience. 2017;**17**:1018-1027. DOI: 10.3758/s13415-017-0529-5

[56] Holbrook C, Iacoboni M, Gordon C, Proksch S, Makhfi H, Balasubramaniam R. Posterior medial frontal cortex regulates sympathy: A TMS study. Social Neuroscience. 2021;**16**(6):595-606. DOI: 10.1080/17470919.2021.1980097

[57] Derntl B, Finkelmeyer A, Eickhoff S, Kellermann T, Falkenberg DI, et al. Multidimensional assessment of empathic abilities: Neural correlates and gender differences. Psychoneuroendocrinology. 2010;**35**:67-82. DOI: 10.1016/j.psyneuen.2009.10.006

[58] Knafo A, Uzefovsky F. Variation in empathy: the interplay of genetic and environmental factors. In: Legerstee M, Haley DW, Bornstein MH, editors. The

Infant Mind: Origins of the Social Brain. New York, NY: The Guilford Press; 2013. pp. 97-120

[59] Wu N, Li Z, Su Y. The association between oxytocin receptor gene polymorphism (OXTR) and trait empathy. Journal of Affective Disorders. 2012;**138**:468-472. DOI: 10.1016/j.jad.2012.01.009

[60] Derntl B, Hack RL, Kryspin-Exner I, Habel U. Association of menstrual cycle phase with core components of empathy. Hormones and Behavior. 2013;**63**(1):97-104. DOI: 10.1016/j.yhbeh.2012.10.009

[61] Pascual-Sagastizbal E, Azurmendi A, Sánchez-Martín JR, Braza F, Carreras MR, et al. Empathy, estradiol and androgen levels in 9-year-old children. Personality and Individual Differences. 2013;**54**(8):936-940. DOI: 10.1016/j.paid.2013.01.019

[62] Schulte-Rüther M, Markowitsch HJ, Shah NJ, Fink GR, Piefke M. Gender differences in brain networks supporting empathy. NeuroImage. 2008;**42**(1):393-403. DOI: 10.1016/j.neuroimage.2008.04.180

[63] Thirioux B, Mercier MR, Blanke O, Berthoz A. The cognitive and neural time course of empathy and sympathy: An electrical neuroimaging study on self-other interaction. Neuroscience. 2014;**267**:286-306. DOI: 10.1016/j.neuroscience.2014.02.024

[64] Kim EJ, Son J-W, Park SK, Chung S, Ghim H-R, et al. Cognitive and emotional empathy in young adolescents: An fMRI study. Journal of the Korean Academy of Child and Adolescent Psychiatry. 2020;**31**(3):121-130. DOI: 10.5765/jkacap.200020

[65] Cheng Y, Chen C, Decety J. How situational context impacts empathic responses and brain activation patterns. Frontiers in Behavioral Neuroscience. 2017;**11**:165. DOI: 10.3389/fnbeh.2017.00165

[66] Mischkowski D, Crocker J, Way BM. From pain killer to empathy killer: Acetaminophen (paracetamol) reduces empathy for pain. Social Cognitive and Affective Neuroscience. 2016;**11**(9):1345-1353. DOI: 10.1093/scan/nsw057

[67] Newton BW, Vaskalis ZT. A longitudinal study of affective and cognitive empathy of an osteopathic class of 2017. Medical Science Educator. 2017;**27**(suppl. 1):S29

[68] Newton BW, Vaskalis ZT. The affective and cognitive empathy profile of an osteopathic graduating class of 2017. Medical Science Educator. 2018;**28**(suppl. 1):S21-S68

[69] Newton BW, Savidge MA, Barber L, Cleveland E, Clardy J, et al. Differences in medical students' empathy. Academic Medicine. 2000;**75**(12):1215. DOI: 10.1097/00001888-200012000-00020

[70] Newton BW, Vaskalis ZT. Divergence of affective and cognitive empathy scores of a small subset of osteopathic medical students. Medical Science Educator. 2022;**32**(suppl. 1):S15-S112

[71] Zegarra-Parodi R, Esteves JE, Lunghi C, Baroni F, Draper-Rodi J, Cerritelli F. The legacy and implications of the body-mind-spirit osteopathic tenet: A discussion paper evaluating its clinical relevance in contemporary osteopathic care. International Journal of Osteopathic Medicine. 2021;**41**:57-65. DOI: 10.1016/j.ijosm.2021.05.003

[72] Hojat M, Mangione S, Nasca TJ, Rattner S, Erdmann JB, et al. An empirical study of decline in

empathy in medical school. Medical Education. 2004;**38**(9):934-941. DOI: 10.1111/j.1365-2929.2004.01911.x

[73] Hojat M, Vergare MJ, Maxwell K, Brainard G, Herrine SK, et al. The devil is in the third year: A longitudinal study of erosion of empathy in medical school. Academic Medicine. 2009;**84**(9):1182-1191. DOI: 10.1097/ACM.0b013e3181b17e55

[74] Park KH, Roh H, Suh DH, Hojat M. Empathy in Korean medical students: Findings from a nationwide survey. Medical Teacher. 2015;**37**(10):943-948. DOI: 10.3109/0142159X.2014.956058

[75] Calabrese LH, Bianco JA, Mann D, Massello D, Hojat M. Correlates and changes in empathy and attitudes toward interprofessional collaboration in osteopathic medical students. The Journal of the American Osteopathic Association. 2013;**113**(2):898-907. DOI: 10.7556/jaoa.2013.068

[76] Newton BW, Clardy J, Barber L, Cleveland E. Who has heart? Vicarious empathy vs. residency match. Medical Science Educator. 2014;**24**(1):45-50. DOI: 10.1007/s40670-014-0021-6

[77] Levinson W, Roter DL, Mullooly JP, Dull VT, Frankel RM. Physician-patient communication. The relationship with malpractice claims among primary care physicians and surgeons. Journal of the American Medical Association. 1997;**277**:553-559. DOI: 10.1001/jama.1997.03540310051034

[78] Roter D, Hall J, Merisca R, Nordstrom B, Cretin D, Svarstad B. Effectiveness of interventions to improve patient compliance: A meta-analysis. Medical Care. 1997;**36**:1138-1161. DOI:10.1097/00005650-199808000-00004

[79] Del Canale S, Lopuis DZ, Maio V, Wang X, Rossi G, Hojat M, et al. The relationship between physician empathy and disease complications: An empirical study of primary care physicians and their diabetic patients in Parma, Italy. Academic Medicine. 2012;**87**:1243-1249. DOI: 10.1097/ACM.0b013e3182628fbf

[80] Hojat M, Louis DZ, Markham FW, Wender R, Rabinowitz C, Gonnella JS. Physicians' empathy and clinical outcomes for diabetic patients. Academic Medicine. 2011;**86**(3):359-364. DOI: 10.1097/ACM.0b013e3182086fe1

[81] Hojat M, Louis DZ, Maxwell K, Markham F, Wender R, Gonnella JS. Patient perceptions of physician empathy, satisfaction with physician, interpersonal trust, and compliance. International Journal of Medical Education. 2010;**1**:83-87. DOI: 10.5116/ijme.4d00.b701

[82] Cameron CD, Hutcherson CA, Ferguson AM, Scheffer JA, Hadjiandreou E, Inzlicht M. Empathy is hard work: People choose to avoid empathy because of its cognitive costs. Journal of Experimental Psychology: General. 2019;**148**(6):962-976. DOI: 10.1037/xge0000595

[83] Larson E, Yao X. Clinical empathy as emotional labor in the patient-physician relationship. Journal of the American Medical Association. 2005;**293**:1100-1106. DOI: 10.1001/jama.293.9.1100

[84] Stefanello E. Your pain is not mine: A critique of clinical empathy. Bioethics. 2021;**36**(5):486-493. DOI: 10.1111/bioe.12980

[85] Hojat M, DeSantis J, Shannon SC, Speicher MR, Bragan L, Calabrese LH. Empathy as related to gender, age, race, ethnicity, academic background and career interest: A nationwide study of osteopathic medical students in the United States. Medical Education.

2020;**54**:571-581. DOI: 10.1111/
medu.14138

[86] Backović DV, Zivojinović JI,
Maksimović J, Maksimović M. Gender
differences in academic stress and
burnout among medical students in
final years of education. Psychiatria
Danubina. 2012;**24**(2):175-181

[87] Dyrbye LN, Thomas MR,
Shanafelt TD. Systematic review of
depression, anxiety, and other indicators
of psychological distress among U.S.
and Canadian medical students.
Academic Medicine. 2006;**81**(4):354-373.
DOI: 10.1097/00001888-200604000-
00009

[88] Hanselll MW, Ungerleider RM,
Brooks CA, Knudson MP, Kirk JK, et al.
Temporal trends in medical student
burnout. Family Medicine.
2019;**51**(5):399-404. DOI: 10.22454/
FamMed.2019.270753

[89] Cheng Y, Lin C-P, Liu H-L, Hsu Y-Y,
Lim K-E, et al. Expertise modulates
the perception of pain in others.
Current Biology. 2007;**17**:1708-1713.
DOI: 10.1016/j.cub.2007.09.020

[90] Decety J, Yang C-Y, Cheng Y.
Physicians down-regulate their pain
empathy response: An event-related
brain potential study. NeuroImage.
2010;**50**:1676-1682. DOI: 10.1016/j.
neuroimage.2010.01.025

[91] Riess H, Kraft-Todd G.
E.M.P.A.T.H.Y.: A tool to enhance
nonverbal communication between
clinicians and their patients. Academic
Medicine. 2014;**89**:1108-1112.
DOI: 10.1097/ACM.0000000000000287

[92] Zhou YC, Tan SR, Tan CGH, Ng MSP,
Lim KH, et al. A systematic scoping
review of approaches to teaching
and assessing empathy in medicine.

BMC Medical Education. 2021;**21**:292.
DOI: 10.1186/s12909-021-02697-6

[93] Hojat M, Axelrod D, Spandorf J,
Mangione S. Enhancing and sustaining
empathy in medical students. Medical
Teacher. 2013;**35**(12):996-1001.
DOI: 10.3109/0142159X.2013.802300

[94] Glaser KM, Markham FW,
Adler HM, McManus PR, Hojat M.
Relationships between scores on the
Jefferson Scale of physician Empathy,
patient perceptions of physician
empathy, and humanistic approaches to
patient care: A validation study. Medical
Science Monitor. 2007;**13**:CR291-CR294

[95] Kim SS, Kaplowitz S, Johnston MV.
The effects of physician empathy
on patient satisfaction and
compliance. Evaluation & the Health
Professions. 2004;**27**(3):237-251.
DOI: 10.1177/0163278704267037

[96] Preusche I, Lamm C. Reflections on
empathy in medical education: What
can we learn from social neurosciences?
Advances in Health Sciences Education.
2016;**21**:235-249. DOI: 10.1007/
s10459-015-9581-5

[97] Jeffrey D. Empathy, sympathy and
compassion in healthcare: Is there a
problem? Is there a difference? Does
it matter? Journal of the Royal Society
of Medicine. 2016;**109**(2):446-452.
DOI: 10.1177/0141076816680120

Chapter 3

Roundtable: Raising Empathy through Virtual Reality

Sara Ventura and Alison Jane Martingano

Abstract

Virtual reality (VR) has been described as the ultimate empathy machine; but does it deserve this reputation? Thanks to its features of embodied technology, VR can let users virtually walk in someone else's shoes. In addition, multi-sensory VR experiences can present evocative and heart-wrenching stimuli. For these reasons, VR seems to be a likely candidate to foster empathy. However, the published literature indicates that the impact of VR on empathy is complex and depends both on the type of VR and also the type of empathy being evaluated. The present chapter compares two meta-analyses which suggest that VR can elicit empathy, but the theoretical factors on which the technology has more efficacies are in contrast. In this chapter, these discordant meta-analyses are discussed, and the reasons why they find different results are theorized. We attempt to answer when and how VR could be an empathy machine. We conclude that low-tech but evocative storytelling is most likely to yield emotional empathy, and embodied experiences that encourage perspective-taking will improve cognitive empathy. Although we attempt to present the latest empirical evidence about empathy and VR, we are aware that the scientific consensus around this topic is likely to evolve in the future.

Keywords: empathy, virtual reality, meta-analysis review, body cognition

1. Introduction

Empathy plays a key role in preserving human social relationships. Empathic people are more likely to engage in prosocial behavior, and less likely to engage in aggressive behaviors. Moreover, even temporary arousal of empathy can have positive impacts on behavior in the moment [1, 2]. Empathy is composed of both emotional and cognitive factors whose integration contributes to share and understand another person's perspective. Importantly, scholars have described empathy as a muscle, and as such it should be capable of growth and even regeneration with sufficient effort [3]. Following this logic, a variety of empathy training programs have been designed to explicitly teach empathy (e.g., [3]), and in fields such as medicine, where such programs are used regularly, they generally have sizable positive effects (g = 0.63, [4] for meta-analysis). These programs are generally based on taking the perspective of someone else with the aim to feel the others emotions, to understand them, and to regulate one's own feelings [5]. Yet as most people are unlikely to enroll in explicit empathy training without incentive, psychologists have begun to explore how

engaging in other activities may improve empathy. Recent research has shown that written fiction [6], drama [7], and of course virtual reality [8, 9] show promise as empathy generators.

The most ardent supporters of Virtual reality (VR) claim it is "the ultimate empathy machine" [10]. In brief, VR is an advanced technology that allow users to be present and to interact with a three-dimensional environment [11]. There are a wide variety of VR experiences with different degrees of interaction currently available that are designed to promote social good. For example, 1000 Cut Journey allows viewers to become Michael Sterling, a Black man, and encounter racism as they try to complete everyday activities [12]. Users can interact with the experience by opening doors and picking-up objects using a controller. Other experiences, such as Clouds over Sidra, are less interactive but immerse the user in 360-video as they follow a day in the life of 12-year-old Sidra who lives in a refugee camp [13]. New VR experiences continue to be created by innovative designers the world over. In 2016, VR giant Oculus released their "VR for Good" initiative to incentivize designers to create prosocial content [14]. Not to be outdone by their leading competitor, HTC VIVE announced their $10 million "VR for Impact" program in 2017 [15]. VR has also been embraced by various charitable organizations as part of their fundraising campaigns (e.g., [13, 16–18]).

## 2. Conflicting literature on VR and empathy

Despite its popularity, experimental evidence for the empathy-building efficacy of VR generally, and 360-degree video specifically, is inconsistent. For example, although some VR experiences have led to increases in empathy [8, 19, 20], these positive effects do always exceed more traditional and low cost experiences, such as reading [9], asking people to imagine what it would be like to be in someone else's situation [21] or taking part in real world role play [22].

These conflicting results from individual research studies are compounded by two recent conflicting meta-analyses authored by ourselves. Meta-analyses normally serve to reduce confusion by reducing the impact of random errors and providing a more precise estimate of the average effect size. They even allow researchers to explore potential moderators that may explain why a result is true in some cases but not in others. However, for VR and empathy, even using meta-analysis we did not find a consensus. Using data from 43 studies Martingano et al. found that VR led to approximately a third of a standard deviation more emotional empathy (d = 0.325) but no significant increase in cognitive empathy [23]. However, using a more constrained definition of VR, Ventura et al. found that in 7 studies VR led to approximately half a standard deviation more cognitive empathy (d = 0.513) but had no significant effect on emotional empathy [24] the reversed results (see **Figure 1**). The reason, we argue, is because the impact of VR on empathy depends not just on one thing, but two interacting moderators, namely, the type of empathy and the type of VR.

2.1 The impact of Virtual Reality depends upon the type of empathy

Scholars and laypeople alike hold a variety of diverse and competing definitions of empathy [25]. In an influential paper on the topic, Daniel Batson listed eight definitions of empathy with the hope of reducing confusion by recognizing the term's complexity [26]. One of the reasons it is so difficult to define empathy
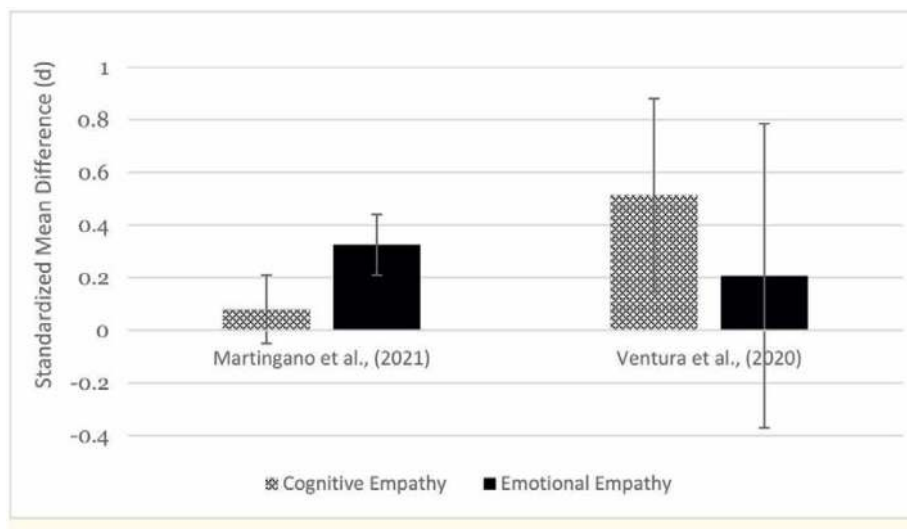
Figure 1.
Overall standardized mean differences and 95% confidence intervals for published meta-analyses on the impact of VR on empathy.

is because it is a multifaceted concept. It is not simply that researchers have not agreed on a single definition of empathy, but that empathy is not a single thing to begin with.

Although there is disagreement in the literature regarding exactly what counts as empathy, many scholars make a distinction between cognitive and emotional empathy. Emotional empathy (sometimes called affective empathy) involves experiencing emotions in response to others' emotions or expressions of emotions. On the other hand, cognitive empathy involves understanding others' thoughts and feelings without necessarily reacting emotionally [2]. This understanding is most often achieved via perspective-taking, so much so that perspective-taking is often used as a synonym for cognitive empathy. Given the definitional confusion surrounding the term empathy, in this chapter, we will discuss research and theory on empathy that is styled under many different names. Overall, cognitive and emotional empathy are best thought of as broad categories that each encompass a variety of different empathy types. Despite disagreement over which concepts are classified under each category, the distinction between emotional and cognitive empathy remains common [26, 27].

Despite our conflicting results, Martingano et al. [23] and Ventura et al. [24] both find the distinction between cognitive and emotional empathy is critical when discussing the impact of VR on empathy.

So why might VR impact emotional and cognitive empathy differently? Media scholars have argued that one of the strengths of VR is that it removes the cognitive burden normally associated with empathizing [28]. By virtually taking someone else's perspective on behalf of users, VR is doing the work of cognitive empathy for them. VR designers have made use of powerful graphics, motion-sensing technologies, and surround sound systems to place viewers in realistic environments and situations that they might find hard to imagine, such as refugee camps, homeless shelters, or the experience of racial discrimination. By doing the perspective-taking on behalf of users, it is hoped that VR can enhance empathy in people who are not otherwise motivated or able to empathize [29].

Perspective-taking is a difficult skill that requires attention and sufficient cognitive resources. Cognitive load hinders both emotion recognition [28, 30] and perspective-taking [31]. Moreover, neuroscientists have shown that the more difficult it is to predict another person's intentions, the more active the brain areas involved in cognitive empathy become. Therefore, it seems likely that cognitive empathy, like many other skills, benefits from the practice and that practice should occur within the zone of proximal development [32]. The zone of proximal development is defined as the space between what someone can do without assistance and what they can do with assistance. In other words, optimal skill development occurs a practice activity is not too difficult, but also not too easy. Practice activities known to enhance cognitive empathy include acting and creative writing, which require some little effort to recreate the mental states of fictional characters [33, 34]. The question is, does VR provide a suitable opportunity for users to practice cognitive empathy skills? In some cases, VR may be making it too easy for users by doing the perspective-taking work for them, alternatively, VR may overwhelm the senses making it too difficult for users to focus on understanding others' emotions. But importantly, in some cases, VR may provide the optimum level of support needed for users to practice and improve their perspective-taking, emotion recognition, and other cognitive empathy skills. We will discuss what features were used in the 7 studies included in Ventura and colleagues [24] meta-analysis that seemed to make them so effective at enhancing cognitive empathy in the next section and why the majority of studies included in Martingano and colleagues [23] meta-analysis were not, but first we ought to consider why VR might increase emotional empathy.

The idea that virtually taking another person's perspective would lead to emotional empathy is rooted in a long-standing assumption that perspective-taking is the mechanism by which emotional empathy occurs. This idea was borne from extensive research showing that if you ask someone to take someone else's perspective, they are more likely to feel emotional empathy towards them (e.g. [35]). However, researchers now know that people default to feeling emotional empathy for others who are suffering regardless of whether perspective taking instructions are given, and the apparent benefit of perspective-taking was actually from a dampening effect of control instructions [36, 37]. Indeed, neuroscientific evidence shows us that perspective-taking is not a required pathway to emotional empathy. Emotional empathic responses are fast, automatic, and occur spontaneously [38] even when participants are not consciously aware of what they are seeing [39]. In our daily lives, most of us are familiar with automatic emotional empathy, it's the sort that rushes over us when a refugee child is depicted on the news. VR may well arouse emotional empathy automatically if it depicts the suffering of another person, but this is unlikely to be due to the virtual perspective-taking feature and simply a result of displaying evocative stimuli. The differing results of our two meta-analyses found for emotional empathy, therefore, are likely due to the different emotionally arousing nature of the VR experiences included in each meta-analysis (see below).

2.2 The impact on empathy depends on the type of virtual reality

VR is an overarching term for a collection of computer hardware and software that immerses users in artificial environments. Both the hardware and the virtual content may impact whether a given VR experience is effective at arousing empathy. Commonly, VR experiences use a headset to display three-dimensional images and while wearing this system, a user's movements and orientation are tracked and fed

back into the system to adapt the presentation of the virtual environment. However, other hardware has been considered under the umbrella 'virtual reality'. Martingano et al. used a particularly all-encompassing definition of virtual reality that included "any computer technology that virtually simulates one or more senses (auditory, visual, olfactory, gustatory, and/or tactile simulations)". Within this definition desktop VR that plays on a normal computer screen is included as it stimulates vision and auditory senses, and so too are auditory-only simulations played on regular headphones (for example simulations of what it may be like to suffer from auditory hallucinations as a result of schizophrenia).

In contrast, the VR experiences included in Ventura et al.'s meta-analysis all used head-mounted display units making these experiences more immersive on average, benefiting from spatialized sound, stereoscopic visuals, greater image resolution, and a higher update rate. More immersive VR environments have been associated with creating a heightened feeling of presence in users [40]. Presence is the "perceptual illusion of non-mediation" [41], where a user fails to acknowledge the existence of the VR environment and responds as it were not there. More simply put, the user has a feeling of truly "being there" in the virtual environment [28]. Recent research suggests that the feeling of presence mediates the influence of VR on empathy [42]. This may be one reason why Ventura and colleagues found an overall positive impact of VR on cognitive empathy, but Martingano and colleagues did not.

In addition, to creating a sense of presence, immersive VR can also create feelings of embodiment. Developments in motion and voice detection have led to a tighter coupling of body and machine which may trigger feelings of body ownership in users [43]. VR allows users to see and hear as if they were experiencing someone else's point of view in the real world, in other words, to have an "embodied experience" [28]. In some cases, a VR experience is specifically designed to produce a "body ownership illusion" or "body-swap illusion" where users are deliberately given a virtual body that is different from their own. In Ventura's meta-analysis, 3 of the 7 studies used a body swap illusion (42.9%). However, in Martingano's meta-analysis only 7 of 43 studies (16.3%) used this illusion. Body swap illusions may be particularly effective at encouraging users to take the perspective of the person they are embodying [44], and provides another potential explanation for why Ventura found a positive impact on cognitive empathy. The utility of these illusions will be discussed more below.

3. When and how VR can increase empathy

3.1 Change the body to change the mind: the key role of body ownership

Embodied technology may be a key feature of VR that allows users to practice and improve their cognitive empathy skills. The sense of embodiment refers to the set of sensations related to having (ownership), being located in (location), and controlling (agency) a body [45]. The body contributes to the representation of ourself and, as explain by the author Blanke [46], human adults experience a 'real me' that 'resides' in 'my' body and is the subject (or 'I') of experience and thought. The multisensory bodily signals and their integrated neural representation are of fundamental importance for self-consciousness and the body is also central to our understanding of others. In general, we become aware of our bodies through exteroceptive signals such as the touch, and through interoceptive such as the heart rate and proprioceptive signals arising from within the body [47]. Then, we use the feelings from the body to sense

both our physical condition and emotional state. The perception of our body can be manipulated generating what is called the "body ownership illusion" or "body-swap illusion". The usual example is the rubber-hand illusion, during which synchronous stroking of a seen fake rubber hand and one's own unseen hand causes the rubber hand to be attributed to one's body [46]. The successful manipulations demonstrated the malleability of the mental representation of one's body, identity, and the emotions we feel.

In the past decades, several studies have demonstrated the ability of VR to induce body-swap illusions by altering the sense of embodiment. Through the advanced VR technologies such as the opt-track suit it is possible to alter the neuropsychological basis of self-experience and experiment a different "ontological self" by owning a virtual body of different race, size, and gender groups. According to Riva [48] there are three possible strategies that can be used to alter bodily self-consciousness using VR: (i) mindful embodiment, which consists in the modification of the bodily experience by facilitating the availability of its content in the working memory; (ii) augmented embodiment, which is based on the enhancement of bodily self-consciousness by altering/extending its boundaries; and (iii) synthetic embodiment, which aims to replace own body with synthetic self-consciousness (incarnation). Thanks to these characteristics, VR could facilitate cognitive empathy, specifically perspective taking, in challenging situations by offering compelling experience of what it feels like to walk in someone else's shoes [28].

3.2 Evocative stimuli to arouse emotions: creating a transformative emotional experience

Many charitable organizations and philanthropic groups interested in using VR to increase empathy are largely turning to cheaper and less technological advanced VR experiences (that are not capable of producing the body-swap illusion) such as 360-degree video [13–15]. This choice is likely financially driven: 360-degree videos are much less expensive than computer generated environments, possibly costing as low as $10 k/minute to create, whereas the same computer generated (CG) environment could cost nearly double that [49]. However, importantly, these experiences may be sufficient for their purposes of arousing emotional empathy and creating a transformative emotional experience.

A transformative experience is defined as an event in which a person's worldview is reconstructed, resulting in a shifted perspective of the world, or in the change on values and beliefs [50]. The transformative experiences induced in VR could facilitate social interaction by helping people to establish common ground and infer shared knowledge and beliefs between interactants [51]. Potentially even low-tech VR can generate high sense of engagement and social connectedness in people that naturally belong to the outgroup and therefore increase emotional empathy [23].

To do this, VR technology can be used to show emotionally evocative imagery. Particularly of children, animals, or other targets whom users can relate to, engage with, and feel connected to. This can be achieved by showing real-world footage of suffering individuals, with close-ups of emotion-laden faces, crescendo-ing music, and an invested narrator. A good example of this is, 'Clouds over Sidra', which is a documentary-style 360-video of a refugee camp depicting a young girl called Sidra who talks about her life in the camp and hopes for the future [13]. Another example is a 360-video showing female sexual harassment that has been shown to increase emotional empathy in a male sample (**Figure 2**) [52].

Figure 2.
A participant watching the 360-degree video about sexual harassment into the female perspective.

Charitable organizations have been aware of these techniques for years. Fundraising campaigns often feature vivid photographs and describe personal details about an individual and their plight. Social scientists have tested the effectiveness of such individuated appeals experimentally, with the phenomena earning itself the name *The Identifiable Victim Effect*. Identified victims have been found to evoke stronger feelings of empathic compassion than statistical victims [53] and this increased arousal mediates increased charitable giving [54]. In an important recent research study [55] demonstrated that regardless of the technology used, telling engaging narratives is key to the success of VR. This study helps to explain why more immersive VR experiences do not necessarily lead to more emotional empathy. People can engage in a narrative without surround sound or high-resolution graphics. In the same way a low-budget play can still transport us to another world, and a novel can lead us into another's psyche, a cardboard VR headset playing the right content can also generate emotional empathy. Understanding that narrative engagement is key to enhancing emotional empathy with VR also helps to explain why in some cases VR is not outperforming more low-tech solutions such as reading or watching a video [23].

4. Discussion

Science grows continuously: answers provided by previous research leads to new research questions, and so on. The present chapter represents another turn in this cycle, as we attempt to understand when and how VR increases empathy. Our discussion arises from two published meta-analysis authored by ourself that present contrasting findings on which empathy factors are better fostered by VR: emotional empathy in Martingano and colleagues [23], and cognitive empathy in Ventura and colleagues [24]. We conclude that our results are a product of two interacting moderators: the type of empathy and the type of VR in question. Emotional empathy appears to be aroused most effectively by evocative stimuli and immersive storytelling, whereas cognitive empathy appears to benefit from embodied experiences which require more technological advanced VR experiences.

However, there are limitations to the confidence in which we can make these conclusions. First of all, like all meta-analyses, the quality and precision of our estimated effects was dictated by the nature of the studies available for inclusion. Although we feel it is unlikely, it is possible that the different results obtained in Martingano and colleagues and Ventura and colleagues are simply statistical artifacts. As can be seen from **Figure 1**, the 95% confidence intervals from both meta-analyses overlap, and so it is possible that the true size of this effect is captured within these bounds. More research, as always, would help tighten these estimations and we encourage other researchers to update our work as appropriate.

Second, content matters. In much the same way that not all television shows have the same effect, not all VR experiences do. Some television shows are educational, some are funny, and some are unsuitable for minors. Therefore, in the same way it is foolish to ask whether TV in general is educational, it is also mistaken to ask whether VR in general increases empathy. Although neither of our meta-analyses deliberately selected for content, both were restricted to VR experiences that had content that was more likely to elicit empathy because articles had to measure empathy to be included. Researchers who had gone to the effort to measure empathy generally did so because they expected their VR experience would impact it. It is not very likely that researchers are going to put users in a first-person shooter VR game and then measure empathy – at least we have not seen that done! Psychological research finds that the type of media content matters for whether outcomes are aggressive or prosocial [56]. Similarly, violent VR content is unlikely to have a positive effect on empathy and may even lead to more aggressive outcomes.

Third, the users of VR matter. The personal characteristics and demographics of VR users may influence their experiences within VR [57]. For example, users' perceptions of presence can vary dramatically in similar or even identical virtual environments [58, 59]. It is therefore likely that user characteristics will also influence the utility of VR for increasing empathy. In Martingano et al.'s meta-analysis they found, for example, that the positive impact of VR on empathy was three times larger for children with Autism. Recent research also indicates that the utility of the body ownership illusion depends on user psychological traits. For example, lower scores on the traits of machismo and alexithymia were demonstrated to be facilitators for male participants to embody a female victim of sexual harassment [60].

Finally, given the interaction between the type of VR and the type of empathy aroused there is no simple "one size fits all" answer to the most empathy-enhancing VR experiences. Unfortunately, our advice on how to promote emotional empathy using VR (evocative imagery and immersive storytelling) is in almost direct contradiction to our advice on how to use VR to increase cognitive empathy (subtle, ambiguous stimuli that challenge people to tell their own story). Clinicians, parents, charities, and educators should select VR experiences with care based on the empathic outcomes they wish to evoke. In the future, it may be possible to design VR experiences that are emotionally evocative while still leaving room for users to build upon the experience using their own imagination. Indeed, we hope that the insights provided in this chapter may help take a small step in that direction, and prompt further research into this area.

Acknowledgements

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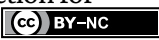1 Department of Psychology, University of Bologna, Bologna, Italy

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References

[1] Castano E. Antisocial behavior in individuals and groups: An empathy-focused approach. In: Deaux K, Snyder M, editors. The Oxford Handbook of Personality and Social Psychology. New York: Oxford University Press; 2012. pp. 419-445. DOI: 10.1093/oxfordhb/9780195398991.013.0017

[2] Davis MH. A multidimensional approach to individual differences in empathy. 1980

[3] Konrath SH, O'Brien EH, Hsing C. Changes in dispositional empathy in American college students over time: A meta-analysis. Personality and Social Psychology Review. 2011;**15**(2):180-198. DOI: 10.1177/1088868310377

[4] Teding van Berkhout E, Malouff JM. The efficacy of empathy training: A meta-analysis of randomized controlled trials. Journal of Counseling Psychology. 2016;**63**(1):32-41. DOI: 10.1037/cou0000093

[5] Lam TCM, Kolomitro K, Alamparambil FC. Empathy training: Methods, evaluation practices, and validity. Journal of Multidisciplinary Evaluation. 2011;**7**(16):162-200

[6] Kidd DC, Castano E. Reading literary fiction improves theory of mind. Science. 2013;**342**(6156):377-380. DOI: 10.1126/science.1239918

[7] Goldstein TR, Bloom P. The effects of acting training on theory of mind, empathy, and emotion regulation. Unpubl Dr Diss Bost Coll. 2010

[8] Cohen D, Landau DH, Friedman D, Hasler BS, Levit-Binnun N, Golland Y. Exposure to social suffering in virtual reality boosts compassion and facial synchrony. Computers in Human Behavior. 2021;**122**:106781. DOI: 10.1016/j.chb.2021.106781

[9] Martingano AJ, Konrath S, Brown A, Henrtize E. The limited benefits of using virtual reality 360-videos to promote empathy and charitable giving. PsyArXiv. 2021. DOI: 10.1177/08997640221125804

[10] Milk C. How virtual reality can create the ultimate empathy machine. TEDTalk [Internet]. 2015

[11] Riva G. Virtual reality in psychotherapy. Cyberpsychology and Behavior. 2005;**8**(3):220-230. DOI: 10.1089/cpb.2005.8.220

[12] Cogburn C, Ogle E, Bailenson J, Asher T, Nichols T. 1000 cut journey [Internet]. 2018. Available from: https://vhil.stanford.edu/1000cut.

[13] Arora G, Milk C. Clouds of Sidra. [Internet]. 2015. Available from: https://www.with.in/watch/clouds-over-sidra

[14] Matney L. Oculus announces VR for good initiative to help students and non-profits capture community life. [Internet]. 2016. Available from: https://techcrunch.com/2016/05/16/oculus-announces-vr-for-good-initiative-to-help-students-and-nonprofits-capture-community-life

[15] VIVE. H. HTC VIVE launches $10 million "VR for impact" program at world economic forum 2017

[16] UNICEF USA. Clouds over Sidra: An award-winning virtual reality experience. [Internet]. 2015. Available from: https://www.unicefusa.org/stories/clouds-over-sidra-award-winning-virtual-reality-experience/29675

[17] International Rescue Committee. How virtual reality lets us see the Syrian refugee crisis with fresh eyes [Internet]. 2016. Available from: https://www.rescue.org/article/how-virtual-reality-lets-us-see-syrian-refugee-crisis-fresh-eyes

[18] Frontières MS. South Sudan: Forced to live in chaos and poverty. [Internet]. 2016. Available from: https://www.youtube.com/watch?v=T1Ql-YEjNOs.

[19] Bunn W, Terpstra J. Cultivating empathy for the mentally ill using simulated auditory hallucinations. Academic Psychiatry. 2009;**33**(6):457-460. DOI: 10.1176/appi.ap.33.6.457

[20] Formosa NJ, Morrison BW, Hill G, Stone D. Testing the efficacy of a virtual reality-based simulation in enhancing users' knowledge, attitudes, and empathy relating to psychosis. Australian Journal of Psychology. 2018;**70**(1):57-65. DOI: 10.1111/ajpy.12167

[21] Jones JJ, Sommer JM. Is virtual reality uniquely effective in eliciting empathy?. 17 March 2018. DOI: 10.31235/osf.io/bgc5n

[22] Hargrove A, Sommer JM, Jones JJ. Virtual reality and embodied experience induce similar levels of empathy change: Experimental evidence. Computers in Human Behavior Reports. 2020;**2**:100038. DOI: 10.1016/j.chbr.2020.100038

[23] Martingano AJ, Hererra F, Konrath S. Virtual reality improves emotional but not cognitive empathy: A meta-analysis. Technology, Mind, and Behavior. 2021;**2**(1). DOI: 10.1037/tmb0000034

[24] Ventura S, Badenes-Ribera L, Herrero R, Cebolla A, Galiana L, Baños R. Virtual reality as a medium to elicit empathy: A meta-analysis. Cyberpsychology, Behavior and Social Networking. 2020;**23**(10):667-676. DOI: 10.1089/cyber.2019.0681

[25] Hall JA, Schwartz R, Duong F. How do laypeople define empathy? The Journal of Social Psychology. 2021;**161**(1):5-24. DOI: 10.1080/00224545.2020.1796567

[26] Batson C. These things called empathy: Eight related but distinct phenomena. In: Decety J, Ickes W, editors. The Social Neuroscience of Empathy. Cambridge: MIT Press; 2009. pp. 3-15

[27] Hall JA, Schwartz R. Empathy present and future. The Journal of Social Psychology. 2019;**159**(3):225-243. DOI: 10.1080/00224545.2018.1477442

[28] Ahn SJ, Le AMT, Bailenson J. The effect of embodied experiences on self-other merging, attitude, and helping behavior. Media Psychology. 2013;**16**(1):7-38. DOI: 10.1080/15213269.2012.755877

[29] Shin D. Empathy and embodied experience in virtual environment: To what extent can virtual reality stimulate empathy and embodied experience? Computers in Human Behavior. 2018;**78**:64-73. DOI: 10.1016/j.chb.2017.09.012

[30] Ahmed L. Knowing how you are feeling depends on what's on my mind: Cognitive load and expression categorization. Emotion. 2018;**18**(2):190-201. DOI: 10.1037/emo0000312

[31] Davis MH, Conklin L, Smith A, Luce C. Effect of perspective taking on the cognitive representation of persons: A merging of self and other. Journal of Personality and Social Psychology. 1996;**70**(4):713-726. DOI: 10.1037/0022-3514.70.4.713

[32] Vygotsky LS. Mind in Society: The Development of Higher Psychological

Processes. Cambridge: Harvard University Press; 1978

[33] Goldstein TR, Winner E. Enhancing empathy and theory of mind. Journal of Cognition and Development. 2012;**13**(1):19-37. DOI: 10.1080/15248372.2011.573514

[34] Shaffer VA, Bohanek J, Focella ES, Horstman H, Saffran L. Encouraging perspective taking: Using narrative writing to induce empathy for others engaging in negative health behaviors. PLoS One. 2019;**14**(10):e0224046. DOI: 10.1371/journal.pone.0224046

[35] Batson CD, Early S, Salvarani G. Perspective taking: Imagining how another feels versus imaging how you would feel. Personality and Social Psychology Bulletin. 1997;**23**(7):751-758. DOI: 10.1177/01461672972370

[36] McAuliffe WHB, Carter EC, Berhane J, Snihur AC, McCullough ME. Is empathy the default response to suffering? A meta-analytic evaluation of perspective taking's effect on empathic concern. Personality and Social Psychology Review. 2020;**24**(2):141-162. DOI: 10.1177/108886831988759

[37] Hodges SD, Wixwat M. No need to take what you already have: Perspective taking's effect on empathic concern for low-need targets. The Journal of Social Psychology. 2022;**162**(1):41-56. DOI: 10.1080/00224545.2021.1988499

[38] Neumann R, Strack F. "Mood contagion": The automatic transfer of mood between persons. Journal of Personality and Social Psychology. 2000;**79**(2):211. DOI: 10.1037/0022-3514.79.2.211

[39] Dimberg U, Thunberg M, Elmehed K. Unconscious facial reactions to emotional facial expressions.

Psychological Science. 2000;**11**(1):86-89. DOI: 10.1111/1467-9280.002

[40] Cummings JJ, Bailenson JN. How immersive is enough? A meta-analysis of the effect of immersive technology on user presence. Media Psychology. 2016;**19**(2):272-309. DOI: 10.1080/15213269.2015.1015740

[41] Lombard M, Ditton T. At the heart of it all: The concept of presence. Journal of Computer-Mediated Communication. 1997;**3**(2):JCMC321. DOI: 10.1111/j.1083-6101.1997.tb00072.x

[42] Barreda-Ángeles M, Aleix-Guillaume S, Pereda-Baños A. An "empathy machine" or a "just-for-the-fun-of-it" machine? Effects of immersion in nonfiction 360-video stories on empathy and enjoyment. Cyberpsychology, Behavior and Social Networking. 2020;**23**(10):683-688. DOI: 10.1089/cyber.2019.0665

[43] Biocca F. The cyborg's dilemma: Progressive embodiment in virtual environments. Journal of Computer-Mediated Communication. 1997;**3**(2):JCMC324. DOI: 10.1111/j.1083-6101.1997.tb00070.x

[44] van Loon AA, Bailenson J, Zaki J, Bostick J, Willer R. Virtual real perspect increases cogn empathy specif others. PLoS One. 2018;**13**(8):e0202442. DOI: 10.1371/journal.pone.0202442

[45] Kilteni K, Groten R, Slater M. The sense of embodiment in virtual reality. Presence Teleoperators & Virtual Environments. 2012;**21**(4):373-387

[46] Blanke O. Multisensory brain mechanisms of bodily self-consciousness. Nature Reviews. Neuroscience. 2012;**13**(8):556-571. DOI: 10.1038/nrn3292

[47] Durlik C, Cardini F, Tsakiris M. Being watched: The effect of social self-focus on interoceptive and exteroceptive

somatosensory perception. Consciousness and Cognition. 2014;**25**:42-50. DOI: 10.1016/j.concog.2014.01.010

[48] Riva G, Baños RM, Botella C, Mantovani F, Gaggioli A. Transforming experience: The potential of augmented reality and virtual reality for enhancing personal and clinical change. Frontiers in Psychiatry. 2016;**7**:164. DOI: 10.3389/fpsyt.2016.00164

[49] Fade L. VR & AR application development costs explained [Internet]. 2019. Available from: https://vrvisiongroup.com/vr-ar-application-development-costs-explained.

[50] Chen R, Joya A, Choi LN, Choi SY. An exploration of self-transcendence through solo-travel. In: Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems. New York: Association for Computing Machinery; 2017. pp. 100-105. DOI: 10.1145/3027063

[51] Gaggioli A, Riva G, Peters D, Calvo RA. Positive technology, computing, and design: Shaping a future in which technology promotes psychological well-being. In: Emotions and Affect in Human Factors and Human–Computer Interaction. London: Academic Press; 2017. pp. 477-502

[52] Ventura S, Cardenas G, Miragall M, Riva G, Baños R. How does it feel to be a woman victim of sexual harassment? The effect of 360°-video-based virtual reality on empathy and related variables. Cyberpsychology, Behavior, and Social Networking. 2021;**24**(4):258-266. DOI: 10.1089/cyber.2020.0209

[53] Kogut T, Ritov I. The identifiable victim effect: Causes and boundary conditions. In: Oppenheimer DM, Olivola CY, editors. The Science of Giving: Experimental Approaches to the Study of Charity. New York: Psychology Press; 2011. pp. 133-145

[54] Ashar YK, Andrews-Hanna JR, Yarkoni T, Sills J, Dimidjian S, Wager TD. Effects of compassion meditation on a psychological model of charitable donation. Emotion. 2016;**16**(5):691. DOI: 10.1037/emo0000119

[55] Pressgrove G, Bowman ND. From immersion to intention? Exploring advances in prosocial storytelling. Journal of Philanthropy and Marketing. 2021;**26**(2):e1689

[56] Greitemeyer T, Mügge DO. Video games do affect social outcomes: A meta-analytic review of the effects of violent and prosocial video game play. Personality and Social Psychology Bulletin. 2014;**40**(5):578-589. DOI: 10.1177/0146167215591992

[57] Taylor VJ, Valladares JJ, Siepser C, Yantis C. Interracial contact in virtual reality: Best practices. Policy Insights from the Behavioral Brain Sciences. 2020;**7**(2):132-140. DOI: 10.1177/2372732220943638

[58] Ling Y, Nefs HT, Brinkman W-P, Qu C, Heynderickx I. The relationship between individual characteristics and experienced presence. Computers in Human Behavior. 2013;**29**(4):1519-1530. DOI: 10.1016/j.chb.2012.12.010

[59] Wallach HS, Safir MP, Samana R. Personality variables and presence. Virtual Reality. 2010;**14**(1):3-13. DOI: 10.1007/s10055-009-0124-3

[60] Ventura S, Miragall M, Cardenas G, Baños RM. Predictors of the sense of embodiment of a female victim of sexual harassment in a male sample through 360-degree video-based virtual reality. Frontiers in Human Neuroscience. 2022;**16**:845508. DOI: 10.3389/fnhum.2022.845508

Chapter 4

From Empathy to the Aggression–Compassion Continuum

Neil E. Grunberg and Erin S. Barry

Abstract

Empathy is relevant to but not sufficient to fully understand relationships. Recent research has proposed that empathy is part of a continuum—from pity to sympathy to empathy to compassion—and that compassion is the key to building good relationships because it includes actions. We offer an extension of this concept to include neutrality (apathy) and add four constructs of opposition—from antipathy to animosity to hostility to aggression. We describe all nine constructs with regard to cognitive, emotional, and behavioral support or opposition. Further, we propose that it is useful to consider these constructs in terms of character, competence, context, and communication at four psychosocial levels—personal, interpersonal, team, and organizational. We believe that relationships can be best addressed with these concepts in mind and that application of the support versus oppose poles of the aggression-compassion continuum are not equivalent to good and bad.

Keywords: compassion, empathy, sympathy, pity, apathy, antipathy, animosity, hostility, aggression

1. Introduction

Over the past millennium, countless individuals have offered some version of the concept that actions are particularly important to human relationships. In the 1200s, Francisican friar Anthony of Padua is attributed with saying, "… let your words teach and your actions speak." In 1628, John Pym said, "… actions are more precious than words." In 1693, Thomas Manton wrote, "… Work and Scope … speak much louder than Words." In 1856, Abraham Lincoln said, "'Actions speak louder than words' is the maxim." Or, in modern vernacular, "Don't just talk the talk; walk the walk [1]." Yet, what we do depends on what we think and feel. Therefore, it is important to understand how thinking, feeling, and behaving relate to each other.

Psychology involves cognitions, motivations/emotions, and behaviors. Cognitions are what we perceive, think, and believe. Motivations/emotions are how we feel and underlie why we think and act as we do. Behaviors are actions that we take, for and against ourselves and others. What we think matters; what we feel matters; what we say matters; but what we actually do probably matters most, especially with regard to treatment and relationships with others.

During the twentieth century and continuing to this day, empathy has received interest and attention from counselors, educators, life coaches, spiritual leaders, political leaders, scholars, and researchers in the social sciences and neurosciences because of its relevance to all aspects of life and interactions with others. The fact that empathy is the subject of this volume exemplifies the breadth and depth of interest is this psychosocial concept.

Recently, the question has been raised whether empathy *per se* is sufficient to understand and to help improve relationships and the human condition or, instead, that actions must flow from feelings to truly matter. Hougaard and colleagues [2, 3] have proposed that empathy alone is necessary but not sufficient to optimize relationships; instead, compassion that includes actions is necessary to build better relationships. These authors further propose that empathy lies along a continuum of feeling and acting with regard to others, ranging from pity to sympathy to empathy to compassion. We agree that distinguishing among these concepts and how they relate to each other is valuable, but we believe that these concepts are a subset of a broader psychosocial continuum that ranges from aggression to compassion. In addition, we suggest that understanding the psychological constructs which exist along this broader continuum also requires consideration of four elements of each of us at four psychosocial levels [4–7]. This chapter addresses these topics.

This chapter begins with a discussion of the scholarly origins of empathy because of the substantial attention already given to this particular concept and because empathy is the focus of this volume. That discussion introduces the importance of actions beyond thoughts and feelings. Next, we present nine different psychological constructs along an aggression-compassion continuum that includes two dimensions. Each construct is defined and briefly explained. Then, we present four biopsychosocial aspects of people—character, competence, context, communication—and four psychosocial levels—personal, interpersonal, team, organizational. We relate these eight elements to the constructs of the Aggression-Compassion Continuum. Finally, we discuss how the constructs that appear on the Aggression-Compassion Continuum are distinguished from good and bad cognitions, emotions, and behaviors.

2. Scholarly origins of "empathy"

Empathy refers to cognitive and emotional responses aligned with others' thoughts and feelings. According to the Merriam-Webster Dictionary, empathy is "understanding, being aware of, being sensitive to, and vicariously experiencing the feelings, thoughts, and experience of another of either the past or present without having the feelings, thoughts, and experience fully communicated in an objectively explicit manner [8]."

Interestingly, in 1871 Charles Darwin described how humans and animals come to help others. Darwin's discussion of what he called "sympathy" included concern and actions that are more similar to what we now refer to as "empathy" and "compassion [9]." This focus on concern and actions for the welfare of others complemented Darwin's notions of competition and survival of the fittest [10].

Consistent with Darwin's Theory of Continuity of Species, primatologist Frans de Waal has noted that apes and other infrahuman species also demonstrate behaviors that involve caring for others and, perhaps, feeling the emotions of others [11]. Shortly after Darwin's [9] discussion about humans and animals helping others, the German concept of "Einfühlung"—or "feeling into"—was introduced by Robert Vischer in 1873 to explain relations of people to others and to artwork [12]. This

particular application of "feeling into" to understand other people as well as reactions to artwork was further discussed by Theodor Lipps [13, 14] (cf. Curtis and Elliott [15] for a historical overview). Edward Titchener [16] and James Ward (cf. Lanzoni [17]) translated this concept with the English word "empathy [12]."

In the twentieth century, empathy has been addressed in more detail by authors, scholars, and scientists with a wide range of interests and expertise. The study and analysis of empathy and how it relates to other psychological constructs, such as sympathy and compassion, is ongoing among psychologists and neuroscientists.

For example, author and motivational speaker Brené Brown has offered that empathy involves four qualities that distinguish it from sympathy [18–21]:

- To be able to see the world as others see it

- To be nonjudgmental

- To understand another's feelings

- To communicate your understanding of that person's feelings

Other researchers have differentiated between "emotional or affective empathy" and "cognitive empathy," where "affective empathy" involves sensations and feelings in response to others' emotions and "cognitive empathy" involves identification and understanding of others' emotions [22, 23].

Emotional empathy consists of three separate components, according to Hodges and Myers:

- Feeling the same emotion as another person

- Personal distress in response to perceiving another's plight

- Feeling compassion for another person

Cognitive empathy (or empathic accuracy) refers to how well we can perceive and understand the emotions of another [23, 24].

Psychologists Daniel Goleman and Paul Ekman have identified three components of empathy, that include cognitive and emotional (or affective) and adding "compassionate empathy"— a prelude to Hougaard and Carter's distinction between empathy and compassion [22]. With regard to these three components of empathy [11, 22, 25]:

- Emotional empathy involves sharing another's feelings and matching that person's behavioral states by "simulation"

- Cognitive empathy or perspective taking or theory of mind involves thinking about and understanding another's feelings

- Empathetic concern, or compassion, adds motivation and intent to act in order to do something about another's suffering

Denworth [26] has suggested that empathetic concern is "compassion" and includes motivation to help; i.e., to take action. Neuroscientists also are studying

empathy and compassion and are seeking to identify neural circuits and specific regions of the brain that are involved in and that distinguish between these constructs [27, 28]. Empathy requires the involvement of neural networks that underlie perception of others' emotions, ability to connect with them emotionally and cognitively, and ability to distinguish between our own and others' emotions [29].

Social neuroscientists have offered two theories of empathy: (a) Simulation Theory and (b) Theory of the Mind. Simulation Theory proposes that empathy occurs because when we see another person experiencing an emotion, we simulate that to know what it feels like. It has been suggested that this phenomenon involves "mirror neurons" that are activated when we observe and experience emotion and that the medial prefrontal cortex is primarily involved. Theory of Mind proposes that we use thought processes to explain the mental state of others. In addition, context and situation affect which of these empathetic responses occur [23, 28, 30].

With regard to compassion, Gilbert [31] has suggested that compassion arose from the evolutionary advantage of caring for others, especially offspring, kin, and in-group allies. Rasmus Hougaard [32] has proposed that compassion is better for humanity than empathy for four reasons:

- Empathy is impulsive. Compassion is deliberate.

- Empathy is divisive. Compassion is unifying.

- Empathy is inert. Compassion is active.

- Empathy is draining. Compassion is regenerative.

He also argues that: compassion can be developed; we should have more self-compassion; and that we should practice compassion daily [32].

Neff has emphasized the importance of self-compassion as well as compassion for other people [33–35]. Hougaard and colleagues [2, 3] went even further and proposed that empathy alone is not sufficient to optimize relationships. Instead, these authors emphasized that compassion is necessary to influence relationships because compassion includes actions. These authors offered a pictorial representation of a continuum of feeling and acting with regard to others, ranging from pity to sympathy to empathy to compassion. We believe that this representation is important and relevant to consider in building relationships, but that it is only part of a broader continuum and additional, related concepts.

3. The aggression-compassion continuum

Figure 1 depicts nine constructs that we believe are relevant to human relations and well-being (including self, dyads, teams, and organizations): Aggression, Hostility, Animosity, Antipathy, Apathy, Pity, Sympathy, Empathy, Compassion. The four constructs that appear in the upper right quadrant and in the manner presented in **Figure 1** are based on Hougaard and Carter [2]. The addition of the other five constructs with the particular two-dimension labels is new. We have labelled the axes differently from Hougaard and Carter [2] to capture the three key aspects of psychology: cognitions, emotions, and behaviors. The x-axis is labelled "Cognitive and Emotional"

Aggression-Compassion Continuum
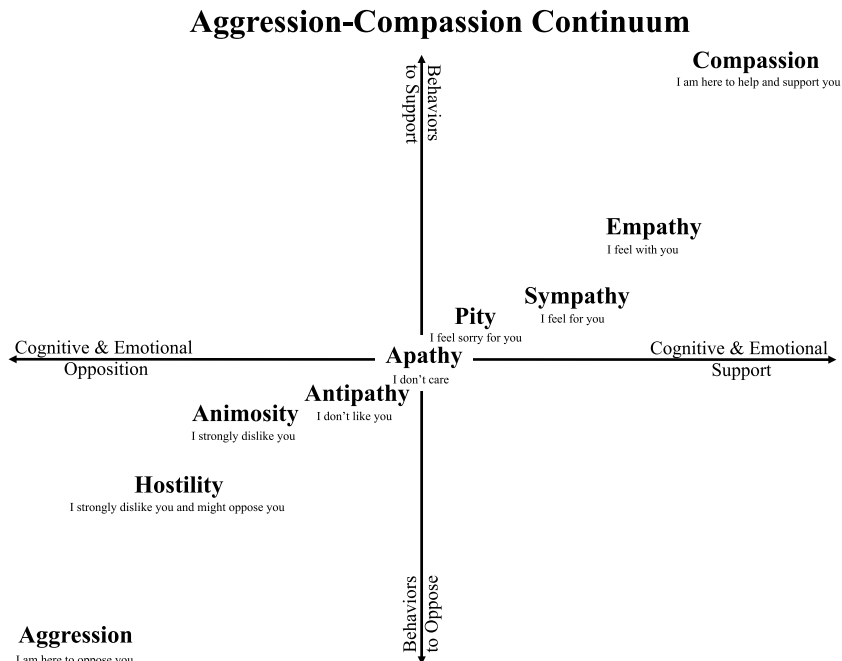
Figure 1.
Aggression-compassion continuum.

ranging from "Opposition" on the far left to "Support" on the far right; the y-axis is labelled as "Behaviors" from "Opposition" on the bottom to "Support" on the top. In addition, each construct appears in **Figure 1** in a location meant to correspond to the relative amount of each type of support or opposition. Each of the nine constructs is defined and differentiated in this section of the chapter following a comment about word meanings.

3.1 A comment about word meanings

The study of the origin of words and the way in which their meanings change (Etymology) is relevant to understand the distinctions among the concepts along the Aggression-Compassion continuum. Words with the "–ion" suffix (including Aggression and Compassion) are nouns of state, condition, or <u>action</u>. Words with the "–ity" suffix (including Pity, Apathy, Antipathy, Animosity, Hostility) are nouns of condition or quality of being. Words that include "–path" refer to "suffering" and "–pathy" refers to "one versed in" (for example, Apathy, Antipathy) [36]. Based on this information about word origins, Aggression and Compassion are appropriate poles on the Action (Behavior) axis of **Figure 1**.

3.2 The "support" quadrant of the aggression-compassion continuum

The upper right quadrant of **Figure 1** lists four psychological constructs and can be broadly categorized as the "support" quadrant because all of the constructs that appear in this quadrant provide some sort of support. The support can be cognitive and emotional; it also can be behavioral support. The four constructs that appear in this quadrant increase in amount of all types of support provided from pity to sympathy to empathy to compassion.

Pity refers to one's own cognitive response to another's negative experiences or an expression of sorrow. The Merriam-Webster Dictionary defines pity as "sympathetic sorrow for one suffering, distressed, or unhappy [37]." Pity can be summed up by, "I feel sorry for you [2, 38]."

Sympathy refers to one's own thoughts and deep feelings of concern for others. The Merriam-Webster Dictionary defines sympathy as "an affinity, association, or relationship between persons or things wherein whatever affects one similarly affects the other [39]." Sympathy involves a deeper, more personal level of concern than pity with pity as an expression of sorrow. Sympathy involves understanding from one's own perspective and does not include shared emotion with others. Sympathy can be summed up by, "I feel for you [2]."

Empathy refers to cognitive and emotional responses aligned with others' thoughts and feelings. It involves a cognitive and emotional connection that assumes the perspective and feelings of others and includes understanding why others feel as they do. According to the Merriam-Webster Dictionary, empathy involves "understanding, being aware of, being sensitive to, and vicariously experiencing the feelings, thoughts, and experience of another of either the past or present without having the feelings, thoughts, and experience fully communicated in an objectively explicit manner [8]." Empathy can be summed up by, "I feel with you [2, 40]."

Compassion refers to cognitive, emotional, and behavioral responses (or intention to act) in response to others' thoughts and feelings. The Merriam-Webster Dictionary defines compassion as "sympathetic consciousness of others' distress together with a desire to alleviate it [41]." Compassion can be summed up by, "I am here to help and support you [2, 35]."

3.3 The neutral point of the aggression-compassion continuum

Apathy refers to a lack of thoughts or feelings. The Merriam-Webster Dictionary defines apathy as a "lack of feeling or emotion; impassiveness; lack of interest or concern; indifference [42]." Apathy turns a blind eye to issues, situations, and people. It is, therefore, the "neutral" point on the Aggression-Compassion Continuum and can be summed up by, "I don't care [40]."

3.4 The "Oppose" quadrant of the aggression-compassion continuum

The lower left quadrant of **Figure 1** lists four psychological constructs and can be broadly categorized as the "oppose" quadrant because all of the constructs that appear in this quadrant provide some sort of opposition. The opposition can be cognitive and emotional; it also can be behavioral opposition. The four constructs that appear in this quadrant increase in amount of all types of opposition provided from antipathy to animosity to hostility to aggression.

Antipathy refers to dislike according to the Merriam-Webster Dictionary [43]. It includes opposition in feeling, aversion, dislike, repugnance, distaste. Antipathy can be summed up as, "I don't like you [44]."

Animosity refers to a stronger dislike. The Merriam-Webster Dictionary defines animosity as "a strong feeling of dislike or hatred; ill will or resentment tending toward active hostility; an antagonistic attitude [45]." Animosity is violent hatred leading to opposition and active enmity. Animosity can be summed up as, "I strongly dislike you [44]."

Hostility refers to dislike that is so strong that it may include intent to take action against others. The Merriam-Webster Dictionary defines hostility as "deep-seated usually mutual ill will, conflict, opposition, or resistance in thought or principle [46]." Both animosity and hostility refer to strong dislike and opposition, but hostility includes unfriendliness or opposition that can lead to actions. Hostility can be summed as, "I strongly dislike you and might oppose you [47]."

Aggression refers to taking actions to oppose, dominate, or injure others. According the Merriam-Webster Dictionary, aggression is "a forceful action or procedure especially when intended to dominate or master; the practice of making attacks or encroachments; hostile, injurious, or destructive behavior or outlook [48]." Aggression has action associated with the thoughts and feelings and can be summed up as, "I am here to oppose you [49]."

4. Psychosocial elements to consider

With regard to the nine psychological constructs on the Aggression-Compassion continuum, there may be a tendency to think about these nine psychological constructs as involving relationships only between oneself and another individual. In fact, they are relevant to four psychosocial levels: Personal, Interpersonal, Team, Organizational. These four categories have been described as part of the Leader-Follower Framework (LF2) because they refer to and help guide understanding of the individual (personal or self), relationships between two people (interpersonal), interactions within small teams, and consideration of large groups, cultures, systems (organizational). The LF2 also distinguishes among four biopsychosocial aspects of people: character (who we are), competence (what we think, feel, and do), context (when and where we are), and communication (how we express ourselves and seek understanding). Each of these topics is described below [4–7]:

Character (Who we are) refers to biological, psychological, and social aspects of each person or group (e.g., physical characteristics, demographics, personality, attitudes, beliefs, values, biases). Character includes integrity, reliability, responsibility, dependability, and moral compass, but also can include the opposite of each of these admirable qualities.

Competence (What we know and do) refers to knowledge, skills, and attitudes (KSAs) relevant to a particular role, position, task, or situation as well as to more general KSAs (e.g., critical thinking, decision-making, problem solving, open-mindedness, emotional intelligence).

Context (When and Where we are) includes physical (outside and inside us), psychological, social, and cultural environments, such as time of day, climates, nutritional state, sleep, mental and behavioral health, size of group, relationships within a group, societal practices, and belief systems. Context also includes effects of physical and mental stress or misunderstanding that can alter thoughts, feelings, and behaviors.

Communication (How we strive for understanding) includes sending and receiving information, verbally and nonverbally.

Personal refers to psychological, biological, and experiential aspects of the individual or oneself. *Personal Character* includes demographics, attitudes, values, beliefs, biases, personality, emotions, motivations, and self-awareness. *Personal Competence* includes knowledge, skills, abilities, and actions. *Personal Context* includes physical,

psychosocial, and situational environments outside and within ourself. *Personal Communication* includes abilities to take in and record information (e.g., reading, understanding, notes, reflections, how others perceive us vs how we perceive ourself).

Interpersonal refers to dyadic relationships between two people. *Interpersonal Character* includes shared or opposing cognitions and emotions. *Interpersonal Competence* includes shared or opposing actions. *Interpersonal Context* includes physical and psychosocial environments relevant to the dyad. *Interpersonal Communication* involves sharing information and understanding (or lack thereof) between the dyad.

Team is a small group of people mutually committed to common goals. *Team Character* refers to shared values and trust among the members. *Team Competence* refers to understanding the KSAs of the members. *Team Context* refers to the environments and situations in which the members exist. *Team Communication* involves shared understanding among the members.

Organizational refers to large groups of people, institutions, and systems. *Organizational Character* refers to the large group's values and mission. *Organizational Competence* refers to the large group's KSAs. *Organizational Context* refers to the large group's culture. *Organizational Communication* involves understanding among the members of the large groups.

5. Relating the LF2 elements to the constructs of the aggression-compassion continuum

We submit that all eight of the LF2 elements should be applied to better understand each of the nine constructs along the Aggression-Compassion Continuum. This type of analysis will likely reveal contributing factors to each of the constructs. Such understanding may suggest how to better work with others.

For example, consider Aggression and each of the LF2 elements. Is the reason an individual acts aggressively because of character (e.g., personality, differing values, mental health), competence (e.g., KSAs to act aggressively or the lack of KSAs to control oneself and to not act aggressively), context (e.g., hunger, tiredness, stress, situation, existential threat), or communication (e.g., the only option to convey intended meaning or lack of options to reach understanding)? Is the individual acting aggressively towards oneself (personal), one other (interpersonal), a team, or an organization/culture system? Also, is the individual acting aggressively because of personal (e.g., self-hate, frustration), interpersonal (e.g., disagreement with a single other person), team (e.g., going along with others or opposing particular others), or organizational (e.g., the culture of the larger group) reasons? A similar analysis can be applied to the other three constructs in the Opposition Quadrant of the Aggression-Compassion Continuum: Hostility, Animosity, Antipathy.

As another example, consider Apathy and each of the LF2 elements. Is the reason an individual does not care, does not express any emotions, and does not take any actions because of character (e.g., personality, perception of hopelessness, physical illness, mental illness, picking their battle), competence (e.g., lacks the KSAs to take any action relevant to the situation at hand, overwhelmed with other things on their plate), context (e.g., lack of necessary resources to act, exhaustion, overwhelming odds or opposition), or communication (e.g., lacking any way to communicate, not receiving any communication that the issue or situation is worth addressing)? Is the lack of caring directed at oneself, one other, a team, an organization? Also, is the reason that an individual does not care because of personal (e.g., lack of self-esteem,

lack of self-confidence), interpersonal (e.g., perception that no concern or action will affect the other person, that the other person will do what they want anyway, or that the other person does not matter), team (e.g., lack of respect from or connection with the team, belief that nothing can be done to affect the team), or organizational (e.g., experience or belief that there is no way to alter the organization, culture, or system) reasons? A similar analysis can be applied to the other three constructs in the Support Quadrant of the Aggression-Compassion Continuum: Pity, Sympathy, Empathy.

In addition, consider Compassion and each of the LF2 elements. Is an individual acting compassionately because of character (e.g., personality, understanding their own and others values and beliefs), competence (e.g., having the KSAs to act and perform compassionate acts), context (e.g., the needs of the recipient(s) of the compassionate acts are overwhelmingly heart-breaking, understanding of the stress with the individual, team, or organization), or communication (e.g., the recipient(s) of the compassionate acts effectively expressed need for help, the provider(s) of the compassionate acts can effectively understand and communicate with others to understand what they are saying and discuss what is needed)? Is the individual acting compassionately towards oneself (personal), one other (interpersonal), a team, or an organization/culture system? Also, is the individual acting compassionately because of personal (e.g., acting in accordance with one's own values), interpersonal (e.g., concern for that particular person), team (e.g., commitment to the team), or organizational (e.g., commitment to the particular organization) reasons?

To understand and enhance relationships, we suggest that it is useful to consider which of the LF2 elements contribute to the particular psychological state and which of these elements may be key to modulate (either to increase or to decrease) the given psychological construct. With regard to the nine constructs along the Aggression-Compassion continuum, it is important to consider that there likely is a tendency to think of each construct as relevant especially to relationships and interactions with one other person (interpersonal) or a group of people. But each construct also can be applied to oneself and to organizations. We need to act with compassion and not with aggression towards ourselves as well as consider to whom and in what context we should allow ourselves to experience and exercise each of the nine constructs. In other words, we need to maximize our emotional and social intelligence so that we are aware of motivations and emotions that accompany and underlie our own thoughts and actions as well as the motivations and emotions that accompany and underlie the thoughts and actions of others [50–53].

6. Support and oppose are positive and negative, respectively; but positive and negative do not equal good and bad

Another important point to consider is that although "Support" and "Oppose" can be considered as corresponding to "good" and "bad" poles of the Aggression-Compassion continuum, that type of identity simply is not true. Most if not all publications about pity, sympathy, empathy, compassion imply or state explicitly that these concepts and corresponding actions (in the case of compassion) are, indeed, "good." Conversely, it is implied or explicitly stated that antipathy, animosity, hostility, and aggression are "bad." Neither of these generalizations is correct.

Providing cognitive, emotional, and behavioral support— as is done when exercising the four constructs depicted in the upper right—for kindness, generosity, altruism, open-mindedness, liberty, freedom, democracy, and so on certainly would be

considered as "good." But consider, for example, what it means when one is "supporting" in thoughts, emotions, and actions bigotry, robbery, hatred, dishonesty, cruelty, slavery, authoritarianism; then, exercising and expressing pity, sympathy, empathy, and compassion for these particular thoughts and actions would be considered as "bad."

The same dichotomy of good and bad applies to the "opposing" poles of the Aggression-Compassion Continuum dimensions. Aggression, hostility, and the other constructs on the "oppose" cognitive, emotional, and behavioral poles certainly would be considered "bad" when the opposition is to kindness, generosity, altruism, open-mindedness, liberty, freedom, democracy. Conversely, opposing in thoughts, emotions, and actions bigotry, robbery, hatred, dishonesty, cruelty, slavery, authoritarianism, and so on, would be considered as "good."

So, it is important to recognize that supporting others can be good or bad. And opposing others can be for good or bad. Aggression and Compassion involve actions of opposition or support, respectfully, and, thereby, set the poles of a psychological continuum with regard to self and others, but who and what we are opposing or supporting determines what is good and bad from each of our perspectives and based on each of our values. Generalizations such as "both sides are to blame" and "there are good people on both sides," are not always true.

Additionally, it is important to recognize that the value and accompanying good or bad of each construct along the Aggression-Compassion Continuum also depends on the situation and people involved. For example, empathy can be so powerful that feeling the pain or suffering of another can be damaging to the well-intentioned empath. Also, empathy can be so absorbing that it freezes or prevents the empath from taking action to help others. Compassion, despite providing well-intentioned support, can be counter-productive if provided to someone(s) who does not want the actions of support or who needs to learn to act for themselves. A common dilemma confronts parents who act to help their children with every challenge, even when their children are not in danger and need to learn to handle their own challenges and to accept and to be resilient after experiencing their own disappointments or failures. Conversely, aggression, even when opposing dangers, can be bad if the individuals being helped want to handle the situation themselves or need to learn to handle the situation themselves.

7. Conclusion

The Aggression-Compassion Continuum includes nine psychological constructs that involve different amounts of cognitive and emotional support or opposition and different amounts of action. It is important to understand where you are along this continuum to optimize relationships with others as well as your own well-being. We believe that applying the eight elements of the Leader-Follower Framework when considering relevant points on the Aggression-Compassion Continuum also will help to enhance emotional and social intelligence.

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Conflict of interest

The authors declare no conflict of interest.

Disclaimer

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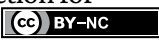
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References

[1] BookBrowse. Actions speak louder than words. n.d. Available from: https://www.bookbrowse.com/expressions/detail/index.cfm/expression_number/151/actions-speak-louder-than-words. [Accessed: June 1, 2022]

[2] Hougaard R, Carter J. Compassionate Leadership: How to Do Hard Things in a Human Way. Boston, MA: Harvard Business Review Press; 2022

[3] Hougaard R, Carter J, Afton M. Connect with Empathy, But Lead with Compassion. Brighton, MA: Harvard Business Review; 2021. Available from: https://hbr.org/2021/12/connect-with-empathy-but-lead-with-compassion [Accessed: June 1, 2022] [Online Article]

[4] Barry ES, Grunberg NE. A conceptual framework to guide leader and follower education, development, and assessment. Journal of Leadership, Accountability, and Ethics. 2020;**17**(1):127-134. DOI: 10.33423/jlae.v17i1.2795

[5] Callahan CW, Grunberg NE. Military medical leadership. In: O'Connor FG, Schoomaker EB, Smith DC, editors. Fundamentals of Military Medicine. San Antonio, TX: Borden Institute; 2019. pp. 51-66

[6] Grunberg NE, Barry ES, Callahan C, Kleber HG, McManigle JE, Schoomaker EB. A conceptual framework for leader and leadership education and development. International Journal of Leadership in Education. 2018;**22**:1-7. DOI: 10.1080/13603124.2018.1492026

[7] Price PA. Genesis and Evolution of the United States Air Force Academy's Officer Development System. DTIC Document. 2004. Available from: http://www.dtic.mil/dtic/tr/fulltext/u2/a428315.pdf. [Accessed: June 8 2015]

[8] Merriam-Webster. Empathy. In Merriam-Webster.com dictionary. n.d. Available from: https://www.merriam-webster.com/dictionary/empathy. [Accessed: June 1, 2022]

[9] Darwin C. The Descent of Man. New York: D Appleton; 1871

[10] Ekman P. Darwin's compassionate view of human nature. JAMA. 2010;**303**(6):557-558

[11] De Waal F. The Evolution of Empathy. Greater Good Magazine. 2005. Available from: https://greatergood.berkeley.edu/article/item/the_evolution_of_empathy [Accessed: June 1, 2022]

[12] Ganczarek J, Hünefeldt T, Olivetti Belardinelli M. From "Einfühlung" to empathy: Exploring the relationship between aesthetic and interpersonal experience. Cognitive Processing. 2018. pp. 141-145

[13] Lipps T. Ästhetik: psychologie des schönen und der kunst. Voss: Die ästhetische Betrachtung und die bildende Kunst; 1906

[14] Lipps T. Ästhetik: psychologie des schönen und der kunst. Voss: Grundlegung der Ästhetik; 1903

[15] Curtis R, Elliott RG. An introduction to Einfühlung. Art in Translation. 2014;**6**(4):353-376

[16] Titchener EB. Lectures on the Experimental Psychology of the Thought-Processes. New York, NY: Macmillan; 1909

[17] Lanzoni S. Empathy in translation: Movement and image in the psychological laboratory. Science in Context. 2012;**25**(3):301-327

[18] Thieda K. Brené Brown on empathy vs. sympathy. Psychology Today. 2014. Available from: https://www.psychologytoday.com/us/blog/partnering-in-mental-health/201408/bren-brown-empathy-vs-sympathy-0 [Accessed: June 1, 2022]

[19] Brown B. Daring Greatly: How the Courage to be Vulnerable Transforms the Way We Live, Love, Parent, and Lead. New York, NY: Penguin; 2015

[20] Brown B. I Thought It Was Just Me (but it isn't): Making the Journey from "What Will People Think?" to "I am Enough". New York, NY: Avery; 2008

[21] Williams JA. What Is Empathy and Why Is It Important? Heartmanity's Blog. n.d

[22] What is Empathy. Greater Good Magazine. n.d

[23] The Psychology of Emotional and Cognitive Empathy. Lesley University. n.d.

[24] Hodges SD, Myers M, Baumeister R, Vohs K. Empathy: Encyclopedia of Social Psychology. Thousand Oaks: Sage; 2007

[25] Vlismas T. What is empathy? Learn about 3 types of empathy. Altus Assessments. 2020. Available from: https://takealtus.com/2020/06/empathy-1/ [Accessed: June 1, 2022]

[26] Denworth L. The good and bad of empathy. Scientific American. 2017. Available from: https://www.scientificamerican.com/article/the-good-and-bad-of-empathy/ [Accessed: June 1, 2022]

[27] Engen HG, Singer T. Empathy circuits. Current Opinion in Neurobiology. 2013;**23**(2):275-282

[28] Armstrong K. 'I Feel Your Pain': The Neuroscience of Empathy. Association for Psychological Science; 2017. Available from: https://www.psychologicalscience.org/observer/neuroscience-empathy [Accessed: June 1, 2022]

[29] Riess H. The science of empathy. Journal of Patient Experience. 2017;**4**(2):74-77

[30] Lopez R. Empathy 101. Psychology Today. 2010. Available from: https://www.psychologytoday.com/us/blog/our-social-brains/201007/empathy-101 [Accessed: June 1, 2022]

[31] Gilbert P. The evolution and social dynamics of compassion. Social and Personality Psychology Compass. 2015;**9**(6):239-254

[32] Hougaard R. Four reasons why compassion is better for humanity than empathy. Forbes. 2020. Available from: https://www.forbes.com/sites/rasmushougaard/2020/07/08/four-reasons-why-compassion-is-better-for-humanity-than-empathy/?sh=1c463fefd6f9 [Accessed: June 1, 2022]

[33] Neff K. The motivational power of self-compassion. Self-Compassion. n.d. Available from: https://self-compassion.org/the-motivational-power-of-self-compassion/ [Accessed: June 1, 2022]

[34] Abramson A. Cultivating empathy. American Psychological Association. 2021;**52**(8):44

[35] What is Compassion. Greater Good Magazine. n.d

[36] Online Etymology Dictionary. In Online Etymology Dictionary. n.d.

Available from: https://www.etymonline.com/. [Accessed: June 1, 2022]

[37] Merriam-Webster. Pity. In Merriam-Webster.com dictionary. n.d. Available from: https://www.merriam-webster.com/dictionary/pity. [Accessed: June 1, 2022]

[38] Sympathy, Empathy, Compassion, and Pity—How are They the Same and How are They Different?. Rise. 2019. Available from: https://riseservicesinc.org/news/sympathy-empathy-compassion-pity/. [Accessed: June 1, 2022]

[39] Merriam-Webster. Sympathy. In Merriam-Webster.com dictionary. n.d. Available from: https://www.merriam-webster.com/dictionary/sympathy. [Accessed: June 1, 2022]

[40] Kisling J. The Difference between Empathy and Sympathy. n.d

[41] Merriam-Webster. Compassion. In Merriam-Webster.com dictionary. n.d. Available from: https://www.merriam-webster.com/dictionary/compassion. [Accessed: June 1, 2022]

[42] Merriam-Webster. Apathy. In Merriam-Webster.com Dictionary. n.d. Available from: https://www.merriam-webster.com/dictionary/apathy. [Accessed: June 1, 2022]

[43] Merriam-Webster. Antipathy. In Merriam-Webster.com Dictionary. n.d. Available from: https://www.merriam-webster.com/dictionary/antipathy. [Accessed: June 1, 2022]

[44] Antipathy vs Apathy—What's the difference? WikiDiff. n.d. Available from: https://wikidiff.com/antipathy/apathy. [Accessed: June 1, 2022]

[45] Merriam-Webster. Animosity. In Merriam-Webster.com Dictionary. n.d.

Available from: https://www.merriam-webster.com/dictionary/animosity. [Accessed: June 1, 2022]

[46] Merriam-Webster. Hostility. In Merriam-Webster.com Dictionary. n.d. Available from: https://www.merriam-webster.com/dictionary/hostility. [Accessed: June 1, 2022]

[47] Wikipedia. Hostility. In Wikipedia: The Free Encyclopedia. n.d. Available from: https://en.wikipedia.org/wiki/Hostility. [Accessed: June 1, 2022]

[48] Merriam-Webster. Aggression. In Merriam-Webster.com Dictionary. n.d. Available from: https://www.merriam-webster.com/dictionary/aggression. [Accessed: June 1, 2022]

[49] Difference between Hostility and Aggression. Difference Between. n.d. Available from: http://www.differencebetween.info/difference-between-hostility-and-aggression. [Accessed: June 1, 2022]

[50] Goleman D. Emotional Intelligence: Why It Can Matter More that IQ. Bantam Dell: New York, NY; 1995

[51] Goleman D. Working with Emotional Intelligence. New York, NY: Bantam Books; 1998

[52] Goleman D. Leadership: The Power of Emotional Intelligence. Northampton, MA: More than Sound; 2011

[53] Goleman D, Boyatzis RE, McKee A. Primal Leadership: Realizing the Power of Emotional Intelligence. Boston, MA: Harvard Business School Press; 2002

Chapter 5

Empathy and Dark Personalities

Anja Wertag

Abstract

Callousness or low empathy is a key feature of the so-called dark personality traits, in which the interest has been exponentially rising. The most prominent dark personality traits models are the Dark Triad, comprising three distinct, but overlapping traits: Machiavellianism, narcissism, and psychopathy, and the Dark Tetrad, with the addition of sadism. Although both theoretical conceptualizations and empirical findings point to impaired empathy as the core of dark personalities, the associations between specific forms of empathy and dark traits are not so consistent. Thus, this chapter aims to provide a critical review of existing findings on the relationship between dark personality traits and specific forms of empathy. Moreover, it aims to offer interesting insights into empathy intervention possibilities in individuals with pronounced dark traits.

Keywords: empathy, dark personality traits, Machiavellianism, narcissism, psychopathy, sadism

1. Introduction

In the past 20 years, the interest in the so-called park personality traits in the area of individual differences has been exponentially rising. What is creditable for this is the introduction of the Dark Triad of personality [1], which consists of three distinct, but conceptually and empirically overlapping traits: Machiavellianism, narcissism, and psychopathy, while relatively recently sadism was added to this constellation, forming the Dark Tetrad [2, 3]. It is important to note that, although these traits (apart from Machiavellianism) migrated from clinical literature and practice and are similar to respective personality disorders (i.e. narcissistic personality disorder and antisocial personality disorder as defined by the Diagnostic and Statistical Manual of Mental Disorders, DSM-5, by American Psychiatric Association [4], and sadistic personality disorder defined in earlier versions of DSM [5]), they refer to subclinical variants in the Dark Triad/Tetrad constellation (for a more detailed overview of Dark Triad and Tetrad traits, see [6, 7], respectively). Machiavellianism is characterized by duplicitous interpersonal style, manipulation, a cynical disregard of morality and a focus on self-interest and personal gain [8], narcissism by grandiose self-concept and attention-craving [9], and psychopathy by impulsivity and callous thrill-seeking [10], while sadism is characterized by the enjoyment of other people's suffering [11]. However, although each of the traits has its specific features, they also share a common core of callousness (i.e. low empathy) and antagonism (e.g. [12–14]).

If we look at conceptualizations of the clinical counterparts of the dark traits, it can be noticed that a lack of empathy is one of the essential features of narcissistic personality disorder. More specifically, narcissistic personality disorder refers to a pervasive pattern of grandiosity (in fantasy or behavior), need for admiration, and lack of empathy, and one of the criteria for this disorder listed in DSM-5 is "lacks empathy: is unwilling to recognize or identify with the feelings and needs of others" ([4], p. 670). The essential feature of antisocial personality disorder is a pervasive pattern of disregard for, and violation of, the wishes, rights, or feelings of others, and callousness is one of the DSM-5 criteria for this personality disorder (specifically, "lack of remorse, as indicated by being indifferent to or rationalizing having hurt, mistreated, or stolen from another" ([4], p. 659). The sadistic personality disorder was defined by a pervasive pattern of sadistic and cruel behavior and was identified in DSM-III-R as: using physical cruelty or violence to establish dominance in a relationship; humiliating others; treating, or disciplining others harshly; being amused or taking pleasure in the psychological or physical suffering of others; lying to harm others; intimidating others to get them to do what he/she wants; restricting the autonomy of close ones; and/or being fascinated by violence, weapons, injury, or torture [5]. Thus, callousness, lack of empathy, and antagonism are the defining features of each of these three personality disorders.

As noted earlier, Machiavellianism had a different etiology than the other three Dark Tetrad traits. Rather than a clinical syndrome (i.e. a personality disorder), this concept was named after the renaissance philosopher Nicolo Machiavelli and resembles a manipulative and callous character with a cynical worldview, duplicitous tactics, and strategic planning (see [15]). Moreover, it has been noted that the lack of empathy plays a causal role in determining Machiavellian behavior [16]. Analogously to the lack of empathy as the key common feature of dark traits' clinical counterparts, the common feature explaining both the theoretical and empirical overlap between the Dark Tetrad traits is callousness, or lack of empathy toward others [7].

It is important to note that, from the evolutionary perspective, dark traits are adaptive, and the lack of empathy as a central feature of the dark traits may have an evolutionary advantage, enabling the dark personalities to get ahead. For example, in accordance with frequency-dependent selection, a small number of cheaters with exploitative tendencies can flourish in a society where the majority is oriented toward cooperation [17] (see [18] for more details on the evolutionary perspective on the Dark Triad traits). Similarly, fundamental neural mechanisms explaining sadism have been postulated [19–21]. More specifically, sadism can be viewed as a physiological response to, for example, war-induced callousness: an indifference to the suffering of others could be gradually transformed by evolutionary selection into the enjoyment of cruelty, especially if victims are perceived as dangerous outgroups, and the sadistic behavior could promote fitness via the maintenance of personal and social power.

In line with theoretical conceptualizations and clinical observations, empirical findings consistently show that dark traits are related to empathy deficits [22, 23]; however, the associations between specific forms of empathy and dark traits are not so consistent. Furthermore, there are indications that there are individuals high both on empathy and dark traits [24], and that individuals with elevated dark traits can be empathic in certain circumstances [25, 26]. Thus, let us closely explore the findings on relations between dark personality traits and specific forms of empathy.

2. Dark traits and specific forms of empathy

Albeit there are different conceptualizations of empathy, there is a consensus that it comprises two components: a cognitive (i.e. the cognitive assessment of affective experiences of others) and affective one (i.e. sharing and adequately responding to affective experiences of others), which have been confirmed in neuropsychological research [27].

In line with the callous, manipulative, and exploitative nature of dark personalities, it may be assumed that individuals high on dark personality traits should have a good understanding of the affective experiences of others (i.e. have high cognitive empathy) which enables them to manipulate and exploit others, but at the same time, they should not care about the feelings of others (i.e. have low affective empathy) to behave in such a manner. Indeed, research consistently points to deficits in affective empathy in individuals with pronounced dark personality traits [23, 28–34], with psychopathy showing the strongest negative relationship with this form of empathy, followed by Machiavellianism and sadism. However, the situation is not so clear when it comes to cognitive empathy. Namely, while some studies indicate that at least one of the dark traits is linked to impaired cognitive empathy [23, 35, 36], others point to a positive relationship of at least one of the dark traits with cognitive empathy [23, 24, 32, 34], with narcissism most often being that trait.

Given the narcissistic tendency of overestimating their abilities to read and understand the emotions of others [37], a question arises is the positive link between cognitive empathy and narcissism due to this tendency. However, findings are showing that narcissism is also positively associated with emotion recognition tasks [34, 38] that are considered closely related to cognitive empathy, indicating that narcissism is in fact linked to higher cognitive empathy. The plausible explanation of this positive link is that the narcissistic need for admiration and reinforcement of their grandiose view of themselves requires a better understanding of how others see them, implying a need for a slightly superior cognitive empathy.

Similar considerations regarding the empirically observed positive link between narcissism and cognitive empathy can be found in the proposed criteria of narcissistic personality disorder in the alternative DSM-5 model for personality disorders, which states that narcissistic personality disorder can be characterized by being "excessively attuned to reactions of others, but only if perceived as relevant to self" ([4], p. 767). On the other hand, the antisocial personality disorder in this model can be characterized by a "lack of concern for feelings, needs, or suffering of others; lack of remorse after hurting or mistreating another" ([4], p. 764), indicating more serious empathic impairments associated with this disorder. Indeed, psychopathy, observed in the Dark Triad constellation, exhibits the strongest negative relations with adverse psychosocial outcomes, such as emotional deficits (i.e. lack of empathy), aggression, impulsivity, and interpersonal problems (see [39]). Comparingly, some studies on moderation between empathy and psychopathy indicated that, if trait psychopathy is high, then individuals with higher levels of cognitive empathy are more likely to engage in aggressive behavior such as trolling [31, 36]. Moreover, there are findings that the lack of cognitive empathy mediates the relationship between psychopathy and specific forms of prosocial behavior (for details see [40]), highlighting the importance of the psychopathy-empathy relationship.

As one of the characteristics of Machiavellianism is the use of strategic manipulation, it is assumed that Machiavellianism is linked to higher cognitive empathy.

However, some studies failed to find any connection between cognitive empathy and Machiavellianism (e.g. [41, 42]). One of the reasons for inconsistent findings of previous studies may lay in using different measures of empathy, reflecting somewhat different conceptualizations of this construct, such as the Interpersonal Reactivity Index (IRI [43], defining empathy as reactions of one individual to the observed experiences of another [44]), Basic Empathy Scale (BES [45], conceptualizing empathy as the understanding and sharing in another's emotional state or context), or Empathy Quotient (EQ [46], which conceptualizes empathy as the ability to recognize and understand the thoughts and feelings of others, as well as to respond to others' thoughts and feelings with appropriate emotion). Thus, Turner et al. [32] examined the relationship of Dark Triad traits with cognitive and affective empathy using multiple questionnaires for both empathy (i.e. BES, EQ, and one more independent measure) and the dark traits and through simultaneous consideration of all constructs in a single latent variable model, and on a large sample (over 1000) of participants. Their results indicated that dark traits are related more to affective than to cognitive empathy: all three dark traits were related to lower levels of affective empathy, but this relationship was weaker for narcissism, while cognitive empathy was positively related to narcissism and Machiavellianism, but unrelated to psychopathy. Results regarding sadism are following the same pattern, with sadism being more strongly related to affective than cognitive empathy [3, 31, 36].

It should be noted that, although the Dark Tetrad traits share a common core of callousness/low empathy, due to the unique features of each of the traits, the manifestation of this characteristic could be different among each trait [7], as well as the psychological processes beneath the exploitative behavior common for the dark traits [18]. More specifically, individuals high on narcissism might lack empathy for those they step on in their quest for public admiration, and the exploitation of others may be a result of their self-centeredness. Individuals high on psychopathy impulsively reach for what they want, caring little if others will get hurt along the way. Individuals high on Machiavellianism may take care while taking advantage of others and exhibit interpersonal indifference if someone interferes with their goals. Finally, individuals high on everyday sadism will seek opportunities to observe or even induce suffering in others.

Furthermore, a recent meta-analytical finding that empathy and aggression are, despite the assumptions regarding the importance of empathy for aggressive behavior, virtually unrelated [47], indicated that current conceptions of affective empathy could be too narrow, failing to capture the full range of the construct. Thus, Vachon and Lynam [48] proposed a new measure of empathy: Affective and Cognitive Measure of Empathy (ACME). ACME conceptualizes cognitive empathy as empathic accuracy (i.e. the ability to detect and understand what others are feeling), and affective empathy distinguishes between affective resonance, conceptualized as most traditional measures of affective empathy (i.e. empathic concern, sympathy, compassion, involving an emotional response in the observer congruent in valence to the target) and affective dissonance, conceptualized as the experience of a contradictory emotional response (e.g. taking pleasure in others' pain or feeling annoyed with others' happiness). In line with previous findings linking *schadenfreude* (i.e. pleasure and joy derived from another person's misfortune) with dark personality traits [49, 50], dark traits indeed generally exhibit stronger relations to affective dissonance than resonance [48, 51, 52]. The extension of the range of affective empathy from high levels of resonance (i.e. empathy) to low levels of resonance (i.e. indifference and callousness) to include the dissonant responses is especially important for the dark traits research.

Therefore, including this aspect of empathy in future research is advisable to shed more light on the relationship between dark traits and specific forms of empathy.

Another problem with research on the relationship between empathy and dark personality traits is that most of the previously described findings were obtained using exclusively self-report measures of empathy. Thus, it is advisable to also include some other empathy measures in future research, such as behavioral (e.g. picture viewing tasks and stories [53]), physiological (e.g. heart rate, electroencephalogram (EEG)), and/or neuroscientific measures (e.g. magnetic resonance imaging (MRI) and functional magnetic resonance imaging (fMRI)). Namely, including different modalities of empathy measures could provide a comprehensive approach to empathy assessment and enable finer insights into the relationship between dark traits and empathy. In fact, some of the studies [25, 26] using the multi-modal approach to empathy provided valuable insights that will be discussed in detail in the next section.

As there are sex differences in both empathy and the dark traits, with women scoring higher on especially affective empathy [54], and men scoring higher on the dark traits [39, 55], some studies further investigated gender differences in the relations between dark traits and empathy. It has been shown that empathy mediates sex differences in the Dark Triad traits, indicating that underlying sex differences in the Dark Triad traits may reflect individual differences in empathy [22, 35]. Furthermore, the relations between Dark Triad traits seem to be stronger in women than in men, especially for narcissism [22, 56], while the relationship between empathy and psychopathy seems to be stronger in men [22]. The finding that the link between the Dark Triad and limited empathy might be primarily through narcissism in women and psychopathy in men suggests different implications for the development of the dark traits and limited empathy in men and women and links to different outcomes. For example, men with limited empathy and high on psychopathy may pursue risky lifestyle and opportunism, while women high on narcissism may pursue parasitic relationship styles. Thus, it is important to take sex differences into account in future research on the relationship between dark traits and empathy, above and beyond merely controlling for sex, in order to get a better insight into the complexity of these relations.

A further problem with previous research regarding the relationship between dark personality traits and empathy is related to neglecting the multidimensionality of each of the dark traits. Namely, each of the dark traits is conceptualized as a multidimensional construct: Machiavellianism comprises a cynical worldview, manipulative behavior, and disregard for morality [8], psychopathy comprises cunningness, lack of remorse, impulsive, and antisocial lifestyle [9], and narcissism exhibitionism, interpersonal dominance, and need for attention [10], while sadism can have direct and vicarious forms (see [11]), and there are findings on different relations between different dimensions of each of the dark traits and different forms of empathy [36, 57–59]. For example, vulnerable narcissism (characterized by interpersonal coldness, hostility, egocentricity, negative emotions, need for recognition, and entitlement) was negatively related to all aspects of empathy, while grandiose narcissism (characterized by immodesty, self-assurance, exhibitionism, dominance, and aggression; see [9] for a more detailed distinction between these two forms of narcissism) was linked to higher empathy and perspective taking [59]. Similarly, there are findings indicating that Factor 2 psychopathy (characterized by erratic lifestyle and antisocial behavior) is linked to deficits in both cognitive and affective empathy, while Factor 1 psychopathy (characterized by interpersonal manipulation and shallow affectivity; for a more detailed distinction between these

two factors see [10]) was linked to higher cognitive empathy [58]. These findings corroborate the general notion that it is advisable to consider the multidimensionality of dark traits in investigating their relations with other constructs [60].

3. Can dark personalities be empathic?

As described earlier, empirical findings largely point to emphatic deficits linked to dark personality traits. However, the question is do individuals scoring high on dark personality traits lack the capacity (ability) or the disposition (trait) to empathize? Kajonius and Björkman [30] found a very strong negative relationship between Dark Triad traits and dispositional trait-based empathy, and the absence of any relationship with ability-based empathy, indicating that individuals with pronounced dark traits possess a normal ability for empathy but have a low inclination to be empathic.

One interesting paper [25] investigated whether narcissists can empathize with a person in distress in different contexts. In a series of three studies, it was shown that higher narcissism is linked to lower both self-reported empathy and emphatic autonomic arousal (i.e. heart rate) in the context of different vignettes (presented as a written text, video, or audio-recording). However, if instructed to take a perspective of the target person, individuals scoring high on narcissism were capable of reporting higher empathy for a target person and responding to another's distress with the same level of autonomic arousal as individuals scoring low on narcissism.

Similarly, another interesting study [26] used fMRI to investigate vicarious representations (i.e. neural activations in brain regions normally associated with feeling specific emotions that are triggered when witnessing the emotions of others, while witnessing what others do and sense recruits one's own motor and somatosensory cortices) in male psychopaths while watching video clips of two hands in different interactions (neutral, love, pain, and exclusion). The results showed that, although the brain areas associated with vicarious activations to hand actions (i.e. pre-motor cortices), sensations (i.e. primary and secondary somatosensory cortices), and emotions (i.e. anterior cingulate and insula cortices) were under-activated in psychopathy compared to the control group, group differences attributable to vicarious activations were significantly reduced when psychopathic participants were instructed to empathize with the actors in the videos.

Both studies indicate that, although individuals with pronounced dark traits do not seem to lack the ability to empathize, they do not have a spontaneous emphatic reaction to others' distress. Similarly, there are some indications that in Machiavellianism lack of empathy might be due to a lack of motivation to be empathic [42, 61]. It should be noted that, although these studies included only one of the dark traits, due to their common core of callousness [13, 14], empirical overlap [39], and similar nomological networks [60, 62], it could be assumed that the similar principles would work for all the traits. More specifically, it seems that the mere instruction to take the perspective of a suffering person evokes physiological emphatic responses in individuals with pronounced dark traits reducing the deficits in empathy and has the potential to move dark personalities to empathize in the same manner as individuals low on dark traits. Thus, interventions targeting perspective-taking practice, emphasizing its value, and making this skill intrinsically appealing to also enhance the motivation to be empathic seems to be a promising path to boost empathy in dark personalities.

Finally, a recent finding identified that there are individuals high both on dark traits and empathy, called the Dark Empaths [24]. On a large sample of nearly 1000 individuals, the researchers using the latent profile analysis identified four groups: standard Dark Triad group with high dark traits and low empathy, Typical group with average dark traits and empathy, Dark Empath group with higher empathy alongside high dark traits, and Empath group with low dark traits and high empathy. Dark Empaths had a greater representation of men than women, showed higher extraversion than all the other groups, and used more malicious humor and guilt induction than non-dark groups. Compared to the Dark Triad group, Dark Empaths were higher on agreeableness and grandiosity, lower on exploitativeness and interpersonal aggression, and had better well-being (i.e. lower anxiety), suggesting a more adaptive level in psychosocial functioning. However, the Dark Empath group remained more antagonistic, neurotic, stressed, and self-critical, compared to non-dark groups. Albeit compelling, these findings need to be replicated and extended to distinguish between specific forms of empathy, which is a work in progress but has the potential to shift our understanding of empathy in the context of dark traits.

4. Conclusion

Empathy deficits have been consistently linked to dark personality traits (i.e. Machiavellianism, narcissism, psychopathy, and sadism) both theoretically and empirically, and the findings point to stronger links between dark traits and deficits in affective empathy compared to cognitive empathy [32, 36]. However, due to specific features of each of the dark traits, manifestations of empathic deficits in Dark Tetrad traits may be different. Moreover, there are indicators of gender differences in links between the dark traits and empathy [22, 35, 56], indicating different developmental paths of the dark traits and limited empathy, and links to different outcomes in men and women.

The main issues in previous research on the relations between dark personality traits and empathy include problems with used measures of empathy and relying solely on self-reported measures. Thus, future research in this area should focus on combining self-report and other empathy measures (i.e. behavioral, physiological, and/or neuroscientific measures). Finally, given that individuals with pronounced dark personality traits do not lack the ability to empathize [30], but rather do not have a spontaneous emphatic reaction to others' distress [25, 26], interventions targeting perspective-taking practice seem to be a promising path to boost empathy in dark personalities.

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References

[1] Paulhus DL, Williams KM. The Dark Triad of personality: Narcissism, Machiavellianism, and psychopathy. Journal of Research in Personality. 2002;**36**(6):556-563. DOI: 10.1016/s0092-6566(02)00505-6

[2] Chabrol H, Van Leeuwen N, Rodgers R, Séjourné N. Contributions of psychopathic, narcissistic, Machiavellian, and sadistic personality traits to juvenile delinquency. Personality and Individual Differences. 2009;**47**(7):734-739. DOI: 10.1016/j.paid.2009.06.020

[3] Buckels EE, Jones DN, Paulhus DL. Behavioral confirmation of everyday sadism. Psychological Science. 2013;**24**(11):2201-2209. DOI: 10.1177/0956797613490749

[4] American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-5). Arlington, TX: American Psychiatric Association Publishing; 2013

[5] American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-III-R). Arlington, TX: American Psychiatric Association Publishing; 1987

[6] Furnham A, Richards SC, Paulhus DL. The dark triad of personality: A 10 year review: Dark triad of personality. Social and Personality Psychology Compass. 2013;**7**(3):199-216. DOI: 10.1111/spc3.12018

[7] Paulhus DL. Toward a taxonomy of dark personalities. Current Directions in Psychological Science. 2014;**23**(6):421-426

[8] Christie R, Geis FL. Studies in Machiavellianism. San Diego, CA: Academic Press; 1970

[9] Campbell WK, Miller JD. The Handbook of Narcissism and Narcissistic Personality Disorder: Theoretical Approaches, Empirical Findings, and Treatments. John Wiley & Sons, Inc.; 2011

[10] Hare RD, Neumann CS. Psychopathy as a clinical and empirical construct. Annual Review of Clinical Psychology. 2008;**4**(1):217-246. DOI: 10.1146/annurev.clinpsy.3.022806.091452

[11] Paulhus DL, Dutton DG. Everyday sadism. In: The Dark side of Personality: Science and Practice in Social, Ppersonality, and Clinical Psychology. Washington: American Psychological Association; 2016. pp. 109-120

[12] Dinić BM, Wertag A, Sokolovska V, Tomašević A. The good, the bad, and the ugly: Revisiting the Dark Core. Current Psychology. 2021. DOI: 10.1007/s12144-021-01829-x

[13] Jones DN, Figueredo AJ. The core of darkness: Uncovering the heart of the Dark Triad: The core of darkness. European Journal of Personality. 2013;**27**(6):521-531. DOI: 10.1002/per.1893

[14] Vize CE, Collison KL, Miller JD, Lynam DR. The "core" of the dark triad: A test of competing hypotheses. Personality Disorders: Theory, Research, and Treatment. 2020;**11**(2):91-99. DOI: 10.1037/per0000386

[15] Jones DN, Paulhus DL. Machiavellianism. In: Handbook of Individual Differences in Social Dehavior. New York: Guilford; 2009. pp. 93-108

[16] Mcilwain D. Bypassing empathy: A Machiavellian theory of mind and sneaky power. In: Reracholi B, Slaughter V,

editors. Individual Differences in Theory of Mind. New York: Psychology Press; 2003. pp. 13-38

[17] Mealey L. The sociobiology of sociopathy: An integrated evolutionary model. Behavioral Brain Sciences. 1995;**18**(3):523-41. DOI: 10.1017/s0140525x00039595

[18] Jones DN, Paulhus DL. Differentiating the dark triad within the interpersonal circumplex. In: Handbook of Interpersonal Psychology. Hoboken, NJ, USA: John Wiley & Sons, Inc.; 2012. pp. 249-267

[19] Dutton DG. The psychology of genocide, massacres, and extreme violence: Why normal people come to commit atrocities. Westport, CT: Praeger; 2007

[20] Nell V. Cruelty's rewards: The gratifications of perpetrators and spectators. Behavioral Brain Sciences. 2006;**29**(3):211-224. DOI: 10.1017/s0140525x06009058

[21] Taylor K. Cruelty: Human Evil and the Human Brain. Oxford, England: Oxford University Press; 2009

[22] Jonason PK, Lyons M, Bethell EJ, Ross R. Different routes to limited empathy in the sexes: Examining the links between the Dark Triad and empathy. Personality and Individual Differences. 2013;**54**(5):572-576. DOI: 10.1016/j.paid.2012.11.009

[23] Pajevic M, Vukosavljevic-Gvozden T, Stevanovic N, Neumann CS. The relationship between the Dark Tetrad and a two-dimensional view of empathy. Personality and Individual Differences. 2018;**123**:125-130. DOI: 10.1016/j.paid.2017.11.009

[24] Heym N, Kibowski F, Bloxsom CAJ, Blanchard A, Harper A, Wallace L, et al. The Dark Empath: Characterising dark traits in the presence of empathy. Personality and Individual Differences. 2021;**169**(110172):110172. DOI: 10.1016/j.paid.2020.110172

[25] Hepper EG, Hart CM, Sedikides C. Moving narcissus: Can narcissists be empathic? Personality and Social Psychology Bulletin. 2014;**40**(9):1079-1091. DOI: 10.1177/0146167214535812

[26] Meffert H, Gazzola V, den Boer JA, Bartels AAJ, Keysers C. Reduced spontaneous but relatively normal deliberate vicarious representations in psychopathy. Brain. 2013;**136**(Pt 8):2550-2562. DOI: 10.1093/brain/awt190

[27] Shamay-Tsoory SG, Aharon-Peretz J, Perry D. Two systems for empathy: A double dissociation between emotional and cognitive empathy in inferior frontal gyrus versus ventromedial prefrontal lesions. Brain. 2009;**132**(Pt 3):617-627. DOI: 10.1093/brain/awn279

[28] Giammarco EA, Vernon PA. Vengeance and the Dark Triad: The role of empathy and perspective taking in trait forgivingness. Personality and Individual Differences. 2014;**67**:23-29. DOI: 10.1016/j.paid.2014.02.010

[29] Heym N, Firth J, Kibowski F, Sumich A, Egan V, Bloxsom CAJ. Empathy at the heart of darkness: Empathy deficits that bind the dark triad and those that mediate indirect relational aggression. Frontiers in Psychiatry. 2019;**10**:95. DOI: 10.3389/fpsyt.2019.00095

[30] Kajonius PJ, Björkman T. Individuals with dark traits have the ability but not the disposition to empathize. Personality and Individual Differences. 2020;**155**(109716):109716. DOI: 10.1016/j.paid.2019.109716

[31] Sest N, March E. Constructing the cyber-troll: Psychopathy, sadism, and empathy. Personality and Individual Differences. 2017;**119**:69-72. DOI: 10.1016/j.paid.2017.06.038

[32] Turner IN, Foster JD, Webster GD. The Dark Triad's inverse relations with cognitive and emotional empathy: High-powered tests with multiple measures. Personality and Individual Differences. 2019;**139**:1-6. DOI: 10.1016/j.paid.2018.10.030

[33] Schimmenti A, Jonason PK, Passanisi A, La Marca L, Di Dio N, Gervasi AM. Exploring the dark side of personality: Emotional awareness, empathy, and the dark triad traits in an Italian sample. Current Psychology. 2019;**38**(1):100-109. DOI: 10.1007/s12144-017-9588-6

[34] Wai M, Tiliopoulos N. The affective and cognitive empathic nature of the dark triad of personality. Personality and Individual Differences. 2012;**52**(7):794-799. DOI: 10.1016/j.paid.2012.01.008

[35] Jonason PK, Krause L. The emotional deficits associated with the Dark Triad traits: Cognitive empathy, affective empathy, and alexithymia. Personality and Individual Differences. 2013;**55**(5):532-537. DOI: 10.1016/j.paid.2013.04.027

[36] March E. Psychopathy, sadism, empathy, and the motivation to cause harm: New evidence confirms malevolent nature of the Internet Troll. Personality and Individual Differences. 2019;**141**:133-137. DOI: 10.1016/j.paid.2019.01.001

[37] Ames DR, Kammrath LK. Mind-reading and metacognition: Narcissism, not actual competence, predicts self-estimated ability. Journal of Nonverbal Behavior. 2004;**28**(3):187-209. DOI: 10.1023/b:jonb.0000039649.20015.0e

[38] Konrath S, Corneille O, Bushman BJ, Luminet O. The relationship between narcissistic exploitativeness, dispositional empathy, and emotion recognition abilities. Journal of Nonverbal Behavior. 2014;**38**(1):129-143. DOI: 10.1007/s10919-013-0164-y

[39] Muris P, Merckelbach H, Otgaar H, Meijer E. The malevolent side of human nature: A meta-analysis and critical review of the literature on the dark triad (narcissism, Machiavellianism, and psychopathy). Perspectives on Psychological Science. 2017;**12**(2):183-204. DOI: 10.1177/1745691616666070

[40] White BA. Who cares when nobody is watching? Psychopathic traits and empathy in prosocial behaviors. Personality and Individual Differences. 2014;**56**:116-121. DOI: 10.1016/j.paid.2013.08.033

[41] Andrew J, Cooke M, Muncer SJ. The relationship between empathy and Machiavellianism: An alternative to empathizing–systemizing theory. Personality and Individual Differences. 2008;**44**(5):1203-1211. DOI: 10.1016/j.paid.2007.11.014

[42] Paal T, Bereczkei T. Adult theory of mind, cooperation, Machiavellianism: The effect of mindreading on social relations. Personality and Individual Differences. 2007;**43**(3):541-551. DOI: 10.1016/j.paid.2006.12.021

[43] Davis MH. A multidimensional approach to individual differences in empathy. JSAS Catalog of Selected Documents in Psychology. 1980;**10**:85

[44] Davis MH. Measuring individual differences in empathy: Evidence for a multidimensional approach. Journal of Personality and Social Psychology. 1983;**44**(1):113-126. DOI: 10.1037/0022-3514.44.1.113

[45] Jolliffe D, Farrington DP. Development and validation of the basic empathy scale. Journal of Adolescence. 2006;**29**(4):589-611. DOI: 10.1016/j.adolescence.2005.08.010

[46] Baron-Cohen S, Wheelwright S. The empathy quotient: An investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. Journal of Autism and Developmental Disorders. 2004;**34**(2):163-175. DOI: 10.1023/b:jadd.0000022607.19833.00

[47] Vachon DD, Lynam DR, Johnson JA. The (non)relation between empathy and aggression: Surprising results from a meta-analysis. Psychological Bulletin. 2014;**140**(3):751-773. DOI: 10.1037/a0035236

[48] Vachon DD, Lynam DR. Fixing the problem with empathy: Development and validation of the affective and cognitive measure of empathy: Development and validation of the affective and cognitive measure of empathy. Assessment. 2016;**23**(2):135-149. DOI: 10.1177/1073191114567941

[49] James S, Kavanagh PS, Jonason PK, Chonody JM, Scrutton HE. The Dark Triad, schadenfreude, and sensational interests: Dark personalities, dark emotions, and dark behaviors. Personality and Individual Differences. 2014;**68**:211-216. DOI: 10.1016/j.paid.2014.04.020

[50] Porter S, Bhanwer A, Woodworth M, Black PJ. Soldiers of misfortune: An examination of the Dark Triad and the experience of schadenfreude. Personality and Individual Differences. 2014;**67**:64-68. DOI: 10.1016/j.paid.2013.11.014

[51] Dinić BM, Petrović B, Jonason PK. Serbian adaptations of the dark triad dirty dozen (DTDD) and short dark triad (SD3). Personality and Individual

Differences. 2018;**134**:321-328. DOI: 10.1016/j.paid.2018.06.018

[52] Gojković V, Dostanić J, Đurić V. Structure of Darkness: The Dark Triad, the "Dark" Empathy and the "Dark". Narcissism Primenjena Psihologija. 2022;**15**(2):237-268. DOI: 10.19090/pp.v15i2.2380

[53] Neumann DL, Chan RCK, Boyle GJ, Wang Y, Rae Westbury H. Measures of empathy. In: Measures of Personality and Social Psychological Constructs. Elsevier; 2015. pp. 257-289

[54] Christov-Moore L, Simpson EA, Coudé G, Grigaityte K, Iacoboni M, Ferrari PF. Empathy: Gender effects in brain and behavior. Neuroscience and Biobehavioral Reviews. 2014;**46**(Pt 4):604-627. DOI: 10.1016/j.neubiorev.2014.09.001

[55] Neumann CS, Jones DN, Paulhus DL. Examining the short Dark Tetrad (SD4) across models, correlates, and gender. Assessment. 2022;**29**(4):651-667. DOI: 10.1177/1073191120986624

[56] Jonason PK, Kroll CH. A multidimensional view of the relationship between empathy and the Dark Triad. Journal of Individual Differences. 2015;**36**(3):150-156. DOI: 10.1027/1614-0001/a000166

[57] Al Aïn S, Carré A, Fantini-Hauwel C, Baudouin J-Y, Besche-Richard C. What is the emotional core of the multidimensional Machiavellian personality trait? Frontiers in Psychology. [Internet] 2013;4:454. DOI: 10.3389/fpsyg.2013.00454

[58] Mullins-Nelson JL, Salekin RT, Leistico A-MR. Psychopathy, empathy, and perspective taking ability in a community sample: Implications for the successful psychopathy concept.

International Journal of Forensic
Mental Health. 2006;**5**(2):133-149. DOI:
10.1080/14999013.2006.10471238

[59] Vonk J, Zeigler-Hill V, Mayhew P,
Mercer S. Mirror, mirror on the wall,
which form of narcissist knows self
and others best of all? Personality and
Individual Differences. 2013;**54**(3):396-
401. DOI: 10.1016/j.paid.2012.10.010

[60] Miller JD, Vize C, Crowe ML,
Lynam DR. A critical appraisal of the
dark-triad literature and suggestions for
moving forward. Current Directions in
Psychological Science. 2019;**28**(4):353-
360. DOI: 10.1177/0963721419838233

[61] Lyons M, Caldwell T,
Shultz S. Mind reading and
manipulation: Is Machiavellianism
related to theory of mind? Journal of
Evolutionary Psychology. 2010;**8**:261-274

[62] Blötner C, Ziegler M, Wehner C,
Back MD, Grosz MP. The nomological
network of the Short Dark Tetrad scale
(SD4). European Journal of Psychological
Assessment. 2022;**38**(3):187-197. DOI:
10.1027/1015-5759/a000655

Chapter 6

The Phyloempathic Hierarchy: Differential Human Empathy for Different Animal Species

Delroy L. Paulhus

Abstract

Empathy for animal suffering can be powerful, but it varies across animal species. In fact, some people empathize as much (or more) with the suffering of certain animals than they do with human suffering. Beginning with Paulhus and Dean, we review research comparing empathic reactions to a diverse array of animal species, as well as to selected humans. Those authors coined the term *phyloempathic hierarchy* to describe the differential empathy that humans feel toward different species. Sophisticated scaling techniques were applied to determine the unique drivers of empathic responses. Overall, four animal characteristics (the "Big Four") appeared to drive empathic responses: (1) Perceived intelligence, (2) size, (3) esthetic appeal, and (3) lack of harmfulness. Ranking high were monkeys, elephants, dogs, and cats. Younger versions of the same species (e.g., kittens vs. cats) elicited even more empathy. Sharks, cockroaches, and snakes drew the least empathy. Those results have been replicated across 40 years of research from many laboratories and many countries. This hierarchy presents a challenge to relying on empathy in decisions regarding the treatment of animals. Bottom line: The phyloempathic hierarchy resembles but deviates from the phylogenetic hierarchy.

Keywords: empathy, research ethics, anthropomorphism

1. Introduction: Love, hate, and indifference

The human tendency to affiliate with nonhuman animals[1] was explored in Edward O. Wilson's landmark book *Biophilia* [1]. His term "biophilia" was coined to capture the intricate ways in which human and animal life are intertwined. At the time, he noted that 98% of the American population hold global positive views of animals. This chapter focuses on empathy, a specific aspect of that human positivity toward animals.

Standard-bearers of that sentiment include a number of powerful activist organizations (e.g. the Humane Society, ASPCA, PETA, PHAIR): All are devoted to investigating and ameliorating lapses in the humane treatment of animals. Such lapses are usually a matter of indifferent care practices, but they trigger serious

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[1] Henceforth, I will refer to "nonhuman animals" simply as "animals."

protests nonetheless. On the other hand, blatant human fear of animals (biophobia) is also a widespread phenomenon [2]. Such hatred for certain animals (e.g. snakes & spiders) can be explained by hard-wired responses traceable to evolutionary dangers [3]. Disgust toward certain animals may have a parallel etiology [4]. Whether positive or negative, culture-specific tendencies are typically established by collecting large samples of raters and assuming a consensus. Such estimates, however, are rather subjective and ephemeral.

2. Individual differences in perceivers

From love to hate to indifference, people vary in their attitudes toward animals. That diversity of attitudes among various demographic groups was investigated at length by Kellert and colleagues [5, 6]. Education, for example, had a clear impact. More educated respondents were more protective, emotionally attached, and factually informed about animals and the natural environment. Among the college-educated, there was little difference in attitudes among science, liberal arts, social science, and education majors. SES differences were evident but far smaller. More recently, Taylor and Signal [7] confirmed that occupation and income did provide a substantial benefit for attitudes to animals.

Women generally tend to score higher on both animal empathy [8, 9] and human empathy measures [10]. Supporting the sex difference. Sueur et al. [11] reported a survey aimed at clarifying how humans project anthropomorphism toward animals. Results showed that men and older participants were less likely to attribute human-like mental states to animals. Overall, gender is one of the most reliable demographic predictors of empathy.

Not surprisingly, the largest group difference was observed when Paul [12] compared the views of animal activists with those of animal researchers. The former group believed that animals suffered more than the researchers believed and that the benefits of animal research were minimal. Because both "expert" groups have a vested interest in their views, the average citizen may find it difficult to draw conclusions.

3. Species differences

The central issue in this chapter is the degree to which people empathize with different animal species. For centuries, zoologists have used the term *phylogenetic hierarchy* to refer to the systematic variation in species complexity. Hence, a key question is whether empathy for animals tracks the phylogenetic hierarchy. If so, we may care about animals to the extent that they are similar to us on that hierarchy.

Unfortunately, most empirical research on human reactions to animals has been limited to people's likes and dislikes of a few scattered species. Hence, generalizations about human-animal empathy have been rather speculative and presumptuous. I will focus on studies that compared empathy for a diverse set of animals.[2]

The first attempt to systematize empathic reactions across the spectrum was reported by Paulhus and Dean [8]. Using a sample of 175 Columbia University students, the authors compared mean reactions across 24 animals. The criterion questions included "Which animals should not be used in medical experiments," and

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[2] Methods that ask for "favorite animals" yield slightly different results (e.g., [13]).

"Which animals could be exterminated in an ecological emergency?" The two criteria yielded similar results, which were reported at the 1977 meeting of the American Psychological Association.

The species nominations were as diverse as possible, representing seven classes (mammals, amphibians, birds, fish, insects, reptiles, worms, and snails). Using multidimensional preference scaling (MDPREF; [14]), the authors found that the most significant drivers of people's protective feelings toward animals were the (1) perceived intelligence, (2) size, and (3) esthetic appeal of the animal. Perceived harmfulness tended to diminish empathy. For short, they were dubbed the "Big Four."

As well as the 24 animal species, the authors included several human target groups: experiment volunteers, children, and convicted criminals. Although many animal species drew strong empathy, none exceeded the mean empathy awarded to any of the human groups. However, a significant number of respondents (20%) were exceptions to this rule. That is, they ranked at least one animal species higher than one human group. Typically, that choice was a puppy vs. a convicted criminal. As an analogy to the phylogenetic hierarchy, the authors proposed a novel label for differential empathy based on animal species, namely, *the phyloempathic hierarchy.*

Shortly thereafter, a broader study was undertaken by Steven Kellert [5]. Support for this research included funding from the U.S. Fish and Wildlife Agency. The study included a wider breadth of species (k = 33), a larger sample, and a more representative sample of Americans. However, the ordering of animal attitudes was virtually identical to that reported by Paulhus and Dean [8].[3] Followup studies from our lab revealed similar empathy rankings in other North American student samples, namely, the University of Georgia and the University of British Columbia [16].

The latter program of research covered the widest range of animals (k = 44). In combined results from that three-sample study, the 20 animals receiving the highest empathy ratings were as follows: Monkeys, dogs/cats, gorillas, whales, elephants, horses, bears, kangaroos, porpoises, deer, wolves/coyotes, penguins, rabbits, lions/tigers, cows, raccoons, parrots, pigs, squirrels, and seals. The 20 animals drawing the lowest empathy ratings (starting at the bottom) were as follows: Cockroaches, slugs, alligators/crocodiles, houseflies, eels, spiders, octopus, caterpillars, snakes, sharks, frogs/toads, rats, bats, and fish. Based on the 24 animals in common, we correlated those rankings with the Paulhus and Dean rankings. The rank order correlation was .98.

Between 1978 and 2014, however, some cohort changes were reported by George, Slagle, Wilson, Moeller, and Bruskotter [17]. The greatest mean differences were for traditionally maligned species (e.g. bats, sharks, vultures, wolves, and coyotes), especially wolves and coyotes. The two latter animals may have had increasing contact with humans during that interval. Nonetheless, the overall correlation for the 26 species in common with those ranked by Kellert was .95 [17].

Not every moderator uncovered by Paulhus and Dean [8] has been followed up. But there is good reason to believe that several others are likely to replicate. One is the age of the animal. When the authors added younger animals to the list, the blanket advantage for humans was compromised. Preference for younger patterns extended to (a) cats vs. kittens, and (b) deer vs. fawns. Empathic preference for younger versions is consistent with the pronounced sympathy for the suffering of human children over adults [18]. The youth effect is so strong that some raters felt more empathy for

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[3] Our earlier study was acknowledged by Kellert [6]. An even earlier study by Bart [15] was less than systematic.

puppies than for adult humans [19]. It is not clear whether all younger-older comparisons would show the same pattern. Finally, direct comparisons of empathy for human groups with animal species are few and unclear in the outcome. Some writers feel that such comparisons are logically incoherent [20].

Nonetheless, it is evident that empathy for other human beings is not unlimited. Consider the widespread support for corporal and capital punishment in many countries. And mass warfare against international enemies certainly supports the likelihood that empathy for other human animals can easily be nullified by ingroup-outgroup animosity. In fact, blatant cruelty toward other humans is a strong motivator for some individuals [21, 22]. Even more perplexing is the human capability of being empathic to some and cruel to others.

4. Unpacking the drivers

As noted earlier, Paulhus and Dean [8] uncovered several characteristics contributing independently to human empathy for animals. Statistical independence of the 'Big Four' (intelligence, size, esthetic appeal, and harmfulness) was ensured by the authors' choice of scaling method (MDPREF). Here, I draw on the subsequent literature to confirm the impact of each of these four drivers.

1. *Perceived intelligence*: Attributions of intelligence seem tightly linked to attributions of sentience (i.e., self-awareness and consciousness). A centuries-old claim is that animals in a slaughterhouse suffer little because they are unaware of their impending death. Inmates on death row, by contrast, are well-aware of imminent danger. In short, empathy attributions are undoubtedly linked to perceived similarity to humans, that is, anthropomorphism [23].

2. *Size*: Although commonly found [24, 25], this empathy driver has rarely been supported by rational arguments. The heuristic at work seems to be that larger animals must feel more pain— perhaps because their nervous systems are more elaborate or they have more pain receptors, or perhaps because their pain reactions are so apparent?

3. *Esthetic appeal*: As with judging humans [26], physical attractiveness[4] seems to confer a positive halo that enhances empathy for animals [24, 27, 28]. The higher empathy awarded to butterflies over caterpillars is a telling example, after all, they are the same species at different stages of their lifespan [8].

4. *Harmfulness*: When creatures are predatory and potentially harmful to humans (e.g., snakes and sharks), less empathy is awarded. Apparently, their "misbehavior" warrants retribution. One study reported the reverse result, that is, empathy for harmful predators [28]. That result appears to ensue from their over-inclusion of large jungle cats, which are both beautiful and harmful. Multivariate techniques are required to properly establish independent predictors [16].

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[4] Although this driver is sometimes simplified to "beauty," it appears to cover tactile appeal, including softness and fuzziness [8].

5. Implications

Empathy for the distress inflicted by animal abuse is a powerful emotion and virtually universal. Wilson [1] captured this sentiment under the label "biophilia." Subsequent empirical investigations, however, have revealed more complexity. For example, the confirmation of a phyloempathic hierarchy, highlighted in this chapter, has raised a number of challenges to a simplistic view. The fact that different animal species draw different levels of empathy requires a compromise to moral absolutism. Even the most extreme animal activists hesitate to argue that stepping on ants should be condemned as harshly as bovine slaughterhouses.

But can there be a practicable cutoff somewhere on the hierarchy—a way of deciding which animals merit enough empathy to "do no harm?" Note that three of the "Big Four" drivers of our empathy (beauty, size, and harmfulness) have dubious connections with experienced pain. Only one, perceived intelligence, has some legitimacy. Why? because it is commonly assumed that our empathy for animals should track the animal's awareness of pain (sentience).

But how to objectively determine their suffering? In some animals, we can hear cries and see other signs of pain. But with others, pain signals are undetectable, or at least, ambiguous. Does the wriggling of fish indicate their suffering? The counterargument is that reflexive behaviors (cockroaches scampering to avoid sudden light) are not foolproof pain indicators [29]. In fact, the nervous systems of some animals are not sophisticated enough to carry pain information.

Our evolutionary roots undoubtedly play a role in our distinctive reactions to different animals [3]. But so do unique personal experiences: Traumatic encounters may have lifelong effects [30, 31]. A further complication is that individual differences within species may be larger than previously thought [32]. Hence, easy generalizations about species may be specious. The pit bull that you encountered may be more aggressive than the one that I encountered.

6. Limitations and future directions

The assumption underlying this chapter is that clarification of our empathy processes can help us decide on how animals should be treated. However, not all commentators agree that empathic reactions should be paramount in such decision-making (e.g., [25, 33]). This view is consistent with a new wave of skepticism about using empathy as the ultimate arbiter of any decision-making (e.g. [34]). Instead, the alternatives favor more objective and utilitarian approaches.[5]

This alternative perspective opens up other contentious issues. Does suffering inflicted by other animals affect us as much as suffering inflicted by humans? In fact, the correlation between human and animal empathy is modest at the trait level. Shocking to some viewers is increased media coverage of animal-on-animal predation and aggression. When viewed objectively, it appears that the latter behavior is more horrifying (e.g. animals being eaten alive; dogfighting). Do those who experience distress at animal abuse show the same concern for animals that are victims of other animals?

Of course, none of these complexities excuse overt animal abuse by humans [36], even if such abuse is limited to the most malevolent human personalities [37]. Nonetheless, it is unclear how cultural, gender, and educational differences are to

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[5] Currently, the recent edited book by Sueur et al. [35] is the best source for these diverse perspectives.

be integrated into animal rights guidelines when cultural norms continue to evolve. Consider that American legislation was only recently extended to vertebrates in general, including birds, anurans, fish, and cephalopods [38]. And the U.K. government only recently declared that octopuses, crabs, and lobsters are sentient beings [39]. Nonetheless, these ethical challenges demand vigorous exploration.
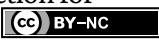
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References

[1] Wilson EO. Biophilia. Cambridge, MA: Harvard University Press; 1984

[2] Staňková H, Janovcová M, Peléšková Š, Sedláčková K, Landová E, Frynta D. The ultimate list of the most frightening and disgusting animals: Negative emotions elicited by animals in central European respondents. Animals. 2021;**11**(3):747

[3] Bennett-Levy J, Marteau T. Fear of animals: What is prepared? British Journal of Psychology. 1984;**75**(1):37-42

[4] Davey GC. The "disgusting" spider: The role of disease and illness in the perpetuation of fear of spiders. Society & Animals. 1994;**2**(1):17-25

[5] Kellert SR. American attitudes toward and knowledge of animals: An update. International Journal for Studies in Animal Problems. 1980;**1**(2):87-119

[6] Kellert SR. Affective, cognitive, and evaluative perceptions of animals. In: Altman I, Wohlwill JF, editors. Behavior and the Natural Environment. New York: Plenum; 1983. pp. 241-268

[7] Taylor N, Signal T. Attitudes to animals: Demographics within a community sample. Society & Animals. 2006;**14**(2):147-157

[8] Paulhus DL, Dean R. Scaling the Ethical Acceptability of Animal Research in Semantic Space. San Francisco: American Psychological Association; 1977

[9] Signal TD, Taylor N. Attitude to animals and empathy: Comparing animal protection and general community samples. Anthrozoös. 2007;**20**(2):125-130

[10] Lennon R, Eisenberg N. Gender and age differences in empathy and sympathy. In: Eisenberg N, Strayer J, editors. Empathy and Its Development. Cambridge, UK: Cambridge University Press; 1987. pp. 195-217

[11] Sueur C, Forin-Wiart M-A, Pelé M. Are they really trying to save their buddy? The anthropomorphism of animal epimeletic behaviours. Animals. 2020;**10**:2323

[12] Paul ES. Us and them: Scientists' and animal rights campaigners' views of the animal experimentation debate. Society & Animals. 1995;**3**(1):1-21

[13] Woods B. Beauty and the beast: Preferences for animals in Australia. Journal of Tourism Studies. 2000;**11**(2):25-35

[14] Shepard RN. A taxonomy of some principal types of data and of multidimensional methods for their analysis. In: Shepard RN, Romney RK, Nerlove SB, editors. Multidimensional Scaling: Theory and Applications in the Behavioral Sciences. New York: Seminar Press; 1972

[15] Bart WM. A hierarchy among attitudes toward animals. Journal of Environmental Education. 1972;**3**(4):4-6

[16] Paulhus DL. Animal Ethics across North America. Vancouver: Canadian Psychological Association; 1992

[17] George KA, Slagle KM, Wilson RS, Moeller SJ, Bruskotter JT. Changes in attitudes toward animals in the United States from 1978 to 2014. Biological Conservation. 2016;**201**:237-242

[18] de Waal F. Good Natured: The Origins of Right and Wrong in Humans and Other Animals. Cambridge, MA: Harvard University Press; 1996

[19] Angantyr M, Eklund J, Hansen HM. A comparison of empathy for humans and empathy for animals. Anthrozoös. 2011;**24**(4):369-377

[20] Cameron CD, Lengieza ML, Hadjiandreou E, Swim JK, Chiles RM. Empathic choices for animals versus humans: The role of choice context and perceived cost. Journal of Social Psychology. 2022;**162**(1):161-177

[21] Paulhus DL, Dutton DG. Everyday sadism. In: Zeigler-Hill V, Marcus DK, editors. The Dark Side of Personality: Science and Practice in Social, Personality, and Clinical Psychology. Washington, D.C., USA: American Psychological Association; 2016. pp. 109-120

[22] Taylor KE. Cruelty: Human Evil and the Human Brain. USA: Oxford University Press; 2009

[23] Horowitz AC, Bekoff M. Naturalizing anthropomorphism: Behavioral prompts to our humanizing of animals. Anthrozoös. 2007;**20**:23-35

[24] Frynta D, Šimková O, Lišková S, Landová E. Mammalian collection on Noah's ark: The effects of beauty, brain and body size. PLoS One. 2013;**8**:e63110

[25] Griffin AS, Callen A, Klop-Toker K, Scanlon RJ, Hayward MW. Compassionate conservation clashes with conservation biology: Should empathy, compassion, and deontological moral principles drive conservation practice? Frontiers in Psychology. 2020;**11**:17-27

[26] Forgas JP, Laham SM. Halo effects. In: Pohl R, editor. Cognitive illusions. New York: Psychology Press; 2016. pp. 286-300

[27] Knight A. "Bats, snakes and spiders, oh my!" how aesthetic and negativistic attitudes, and other concepts predict support for species protection. Journal of Environmental Psychology. 2008;**28**:94-103

[28] Landová E, Poláková P, Rádlová S, Janovcová M, Bobek M, Frynta D. Beauty ranking of mammalian species kept in the Prague zoo: Does beauty of animals increase the respondents' willingness to protect them? Science of Nature. 2018;**105**(11):1-14

[29] Sneddon LU, Elwood RW, Adamo SA, Leach MC. Defining and assessing animal pain. Animal Behaviour. 2014;**97**:201-212

[30] Rachman S. Neo-conditioning and the classical theory of fear acquisition. Clinical Psychology Review. 1991;**11**(2):155-173

[31] Webb K, Davey GC. Disgust sensitivity and fear of animals: Effect of exposure to violent or revulsive material. Anxiety, Stress and Coping. 1992;**5**(4):329-335

[32] Gosling SD. Personality in non-human animals. Social and Personality Psychology Compass. 2008;**2**(2):985-1001

[33] Paul ES, Harding EJ, Mendl M. Measuring emotional processes in animals: The utility of a cognitive approach. Neuroscience & Biobehavioral Reviews. 2005;**29**(3):469-491

[34] Bloom P. Empathy and its discontents. Trends in Cognitive Sciences. 2017;**21**(1):24-31

[35] Sueur C, Pelé M, Matsuzawa T, Georges J-Y, editors. Perceptions of

Human-Animal Relationships and their Impacts on Animal Ethics, Law and Research. Lausanne, Switzerland: Frontiers Media; 2021

[36] Dunlap JJ. Moral reasoning about animal treatment. Anthrozoös. 1989;**2**(4):245-258

[37] Kavanagh PS, Signal TD, Taylor N. The dark triad and animal cruelty: Dark personalities, dark attitudes, and dark behaviors. Personality and Individual Differences. 2013;**55**(6):666-670

[38] Hartung T. Comparative analysis of the revised directive 2010/6106/EU for the protection of laboratory animals with its predecessor 86/609/EEEEC–a t4 report. ALTEX Alternatives To Animal Experimentation. 2010;**27**:285-303

[39] Stelling T. Do lobsters and other invertabrates feel pain: New research has some answers. Washington Post. 2014

Making Sense of a Biochemistry Learning Process and Teacher's Empathy: Computer-Supported Collaborative Learning Using Emoji Symbols

Dana Sachyani and Ilana Ronen

Abstract

Teaching biochemistry concepts can be a challenging task, as it requires learners and teachers to integrate abstract concepts from chemistry and biology. Students struggle to grasp the molecular processes, as they find it difficult to visualize them. Incorporating Information Communication Technology (ICT) implementations during lessons is known to encourage learners' involvement in a collaborative learning process and is especially effective when training preservice teachers (PSTs). In the current study, we describe an example in which the teacher plays an important role in creating the Computer-Supported Collaborative Learning (CSCL) in this environment to encourage peer learning while coping with complicated material. We believe that one of the important components in guiding such peer work is the teacher's ability to sense each group's progress and to employ empathy in the classroom as a tool for coping with the difficulty and challenge of acquiring new knowledge and for creating a productive dialog between groups that disagree. In this example, the process of Information Communication Technology (ICT) implementation encouraged the preservice teachers (PSTs) to create an alternative set of symbols, which eventually served as a "language" and help them understand the biochemical processes.

Keywords: CSCL, empathy, biochemistry, PSTs, emoji's symbols, generation Z

1. Introduction

1.1 Empathy in teacher instruction

Typically, teachers use information about how students are doing to gauge the success of their instructional strategies and reflect on their own experience during teaching [1]. Teaching becomes a profession when teachers practice with a common knowledge base and apply their knowledge to effective, well-supervised practice [1].

In science education, as in other fields of education, exploring the relationship between what is learned and how it is learned [2] is central to the teaching professions. It affects lesson planning, in-class strategies, and the evaluation process. Focusing on teachers' actions and habits reveals teachers' underlying work assumptions about their joint work with students, and it allows learning the transformation of the habitual way students can use while learning [3]. As Singer and Lamm [4] have argued, being "social animals" enables us to not only communicate and interact with each other in effective and pleasant ways, but also to predict the actions, intentions, and feelings of others. Relying on this predictive type of insight activates empathy. Hence, focusing on affective communication could be an efficient way for teacher educators (TEs) to learn from and about their preservice teachers (PSTs)' affective states and attitudes, enhance their reflective and empathic in-class practices, and enable them to provide feedback that is better targeted to the group's needs during educational interactions [5]. In turn, by consciously observing the teacher educators' modeling behavior, PSTs will learn to help their future students understand what determines their affective empathic responses and develop and maintain cognitive empathic abilities as well [6].

1.2 Teaching chemistry

Over the last several years, educators involved in teaching chemistry have been wondering what kinds of changes need to be integrated into the curricula [7–9] and into the pedagogies in this field [10–12], to cater to learners in the twenty-first century, and era characterized by frequent changes and uncertainty. One of the major questions that need to be addressed is how to harness students' curiosity and motivates them to pursue a course of studies in chemistry [13].

1.3 Curiosity for learning

Curiosity is often described as the desire to seek and experience new stimuli [14]. Teachers can demonstrate to their students the relevance of the topics studied and thus create interest and pique their curiosity. This can be done by developing students' future-oriented skills and/or their intellectual abilities [15, 16]. By developing students' curiosity regarding this field, the studies can encourage them to ask themselves questions and take responsibility for their learning and, as a result, increase their motivation to learn and their achievements [17–19]. An interesting approach is the use of uncertainty as a teaching tool to develop learners' curiosity, thus disassociating from a negative affect. In this manner, uncertainty is leveraged in the learning process as a way of developing and encouraging curiosity [20].

1.4 Learning styles

To harness the curiosity of learners with different learning styles, teachers need to integrate a variety of teaching methods to make the learning environment appealing. There are various definitions for learning styles; as mentioned in Brown, the term refers to the way individuals receive and process information in a learning context [21]. Different students learn differently: some are visual learners while others are auditory or kinesthetic learners. Some students are apt to prefer one learning style over others, whereas others may enjoy a combination of various learning styles. Consequently, it is important that teachers engage the students and pique their

curiosity by applying a variety of teaching methods that address the various learning styles [22]. Students who learn better visually will benefit from the use of pictures or visual representations. Those who prefer auditory learning are likely to benefit from reading or listening to a text being read. For kinesthetic learners, the optimal conditions for learning involve physical interaction with the environment [23].

1.5 Visual learning in the sciences

The use of visual models can facilitate learning in various ways: it helps in problem-solving, can serve to close gaps in students' epistemic knowledge, and help construct and/or convey knowledge [24, 25]. Visual representations can help introduce information, as in visual scene through microscope, or help in the development of an idea, as in the use of the double helix by Watson and Crick. It can also demonstrate connections and concepts, as an example of sound waves [25, 26]. Hence, visual representations and models have a critical role in the learning as well as in the development of science [27].

Models constitute a simpler representation of the target of the discussion. This target can be an object, a material, a phenomenon, or a process [28]. When preparing a visual representation of any target, it must be assumed that there are similarities between the model and the target that create a parallelism, although there are also differences. The main role of visual representations is to clarify meaning by describing the target. Representations and models are not a precise way to develop and examine an idea. As a result, models provide an efficient and convenient mode of communication among scientists in the field of chemistry [29].
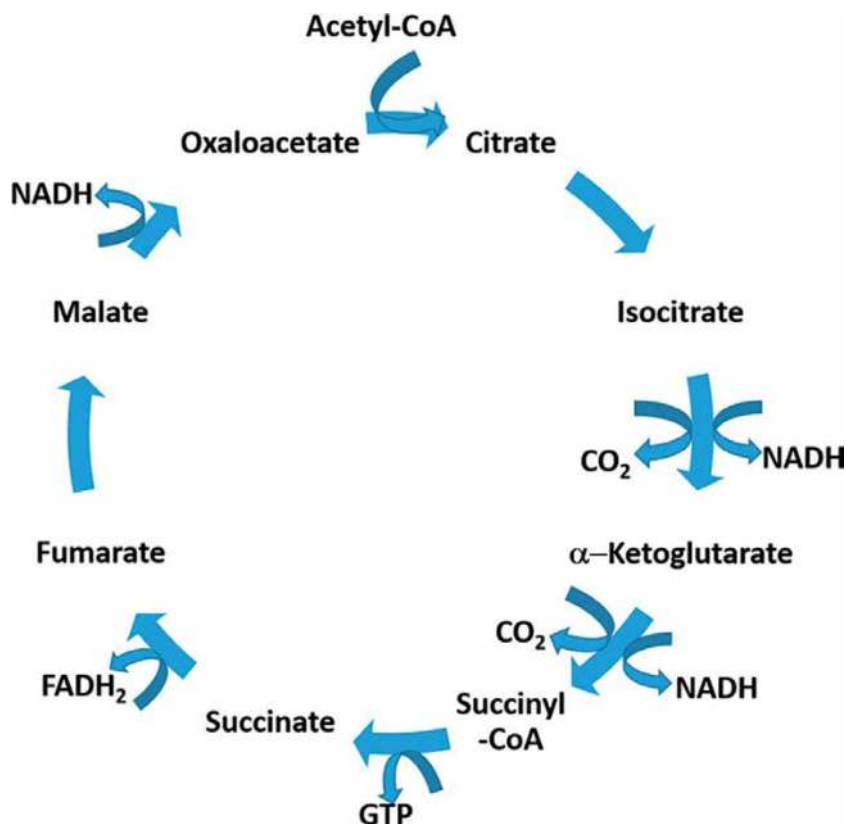
1.6 Teaching the citric acid cycle

Teaching biochemistry concepts can be a challenging task, as it requires learners and teachers to integrate abstract processes and concepts from both chemistry and biology. Students struggle to grasp these molecular and cellular processes as they find it difficult to imagine and visualize them [30, 31].

Glycolysis and the citric acid cycle (or Krebs cycle) (**Figure 1**) are major aspects in the process of cellular respiration. Students usually find it difficult to understand the chemical processes involved [32], because these include several stages that take place sequentially. While the glycol lysis is a multistaged process, the citric acid cycle is cyclical and includes 10 reactions and several enzymes that perform the chemical processes in the cell. Consequently, teachers seek approaches and a variety of creative strategies to teach these processes to twenty-first-century learners [33–35].

1.7 Peer learning

Peer learning is a way of learning (also referred to as peeragogy) that claims that learners are given an opportunity to practice knowledge sharing, responsibility, and power [36]. Peer learning is important because in contrast to the teacher is an expert in a given field, students are expert learning, and therefore, it is natural that they should be able to assist other learners in the same situation [37]. Shared learning is effective for internationalizing knowledge, promoting problem-solving, and structuring knowledge [38, 39]. However, in the process of shared learning, there are also limitations and challenges related to the variety of opinions among students and to

Figure 1.
The citric acid cycle (or Krebs cycle).

the need to negotiate in the course of the knowledge construction process [40]. In these situations, teachers play an extremely important role in monitoring and stimulating the types of interactions between students that will promote learning [41, 42].

1.8 Computer-supported collaborative learning

Computer-Supported Collaborative Learning (CSCL) is a research-based pedagogical theory. Using CSCL may help encourage and promote collaborative peer learning, because the technology supports the sharing of ideas and encourages social interaction [43].

Peer learning requires precise accompanying actions on the part of the teacher; hence, choosing to use CSCL to promote peer learning has certain advantages. The use of a technological environment allows the teacher to follow the interactions among the students and thus target the pedagogical strategies used by each group according to the group's needs [44]. Although during peer learning, the teacher is not the sole source of information used to construct knowledge; nevertheless, the teacher has other critical roles in guiding the peer learning process [41].

The following research questions were formulated:

a. How did the PSTs perceive their responses to this CSCL model and its related activities?

b. What pedagogical insights can be drawn from this experience?

2. Methodology

2.1 The action research paradigm

Action research plays an important role in improving educational practices. It requires analysis and change on both the individual and the group level [45]. Kemmis and colleagues [46] defined such participatory action as a joint commitment of all parties involved to engage in iterative cycles of collaborative planning, acting, observing, and reflecting, intended to address positive and negative inadvertent consequences of practices. A new focus on action research in the field of science education, which was recently introduced by Burmeister and Eilks [47], draws a connection between action research and teachers' professional development. Specifically, their study shifted the focus of action research in science education from curriculum development to teachers' continuous professional development by making action research a self-reflective endeavor. Thus, to promote their professional development, university teacher educators are now encouraged to perform action research on their own practices [48]. The focus of this type of self-reflective qualitative research is on the actions, thoughts, and feelings of the research participants [49].

In the current study, the participants were the first author in the role of TE, the second author in the role of the critical friend (CF), and a digital pedagogy counselor (DPC), whose role was to supervise the CSCL implementation. These three constituted the educational team. The remaining participants were the 13 PSTs who were enrolled in a course taught by the TE. The aim of the study was to answer the following question: How did the TE experience and perceive:

a. her activities involving the CSCL pedagogy,

b. the PSTs' responses to said activities, and

c. the contribution of the process to her professional development as a TE?

Based on Laudonia and colleagues' modes of action research [50], the focus of this study was on researching a specific "knowledge-generating" action, which constituted an innovation that the TE's introduced into her classroom setting. The purpose was to conduct a process that demands a collaborative style involving reciprocity, commitment, and the involvement of all participants. This collaborative learning with colleagues aims to rethink and reframe practices, an activity that takes on added significance for the continued development of the TE [47].

Action research is regarded as a practitioner-oriented inquiry into participants' work [51]; hence, in the current context, it required the PSTs' involvement [52], as well as the involvement of the professional team members, who shared the responsibility for the TE's professional development [53]. Lessons learned from each change were addressed in the coming weekly meeting.

2.2 Ethical issues

The TE was personally responsible for the teaching process, the PSTs, and the action research. At the same time, she sought to explore the development of the course, as well as her professional contribution as a TE. In a similar vein, the PSTs who agreed to take part in the research described the problems and challenges during the

course freely and openly, knowing that the information was intended solely for the purposes of the study and that their rights would be protected.

3. Results

3.1 Time is running out: what will the students retain from the course?

The discomfort experienced by the teacher educator (TE) was based on her earlier acquaintance with this group of students, who had attended her courses in chemistry over a 2-year period. However, despite this previous acquaintance, the learning was not progressing at the quality or rate that the TE had set for the class and the material was not being sufficiently internalized by the students. As a result, the TE determined that the group needed to be addressed using the different teaching method. Her aspiration to involve the students in the course material is evident in the sentence written in her journal after the first lesson: "I want the students to 'fall in love' with protein." In an attempt to make the learning experience more significant, the TE identified the need to create a sense of social involvement among the students, as such involvement takes the form of a collaborative learning community, which is known to promote reflective thinking and learning particularly in a CSCL context [54].

To this end, the TE presented a task which required each student to select a protein or a biochemical reaction and study it and present it to one's peers in class. After a few weeks, although the students had already completed this assignment, the TE recorded her sense of discomfort in her journal:

> *They still are not showing signs of curiosity or interest in the [chemical] reaction. Their learning is technical and I have not identified any desire to create a change that will lead to in-depth and significant learning. I feel like our time is running out: we are nearing the middle of the course and then the departure of the students are about to graduate. Which assignment from this course will they take with them and remember later on?*

Indeed, this assessment was accurate, as at approximately the same time frame, Student F described her experience thus: "when I was learning about the GPCR protein, I didn't discover anything special about it." Therefore, while preparing to teach the topic of cell respiration, which is known to be a complex and time-consuming segment of the curriculum [32], the TE was deliberating how to lead the students to gain a strong understanding of the topic. "The process of cell respiration is a prolonged one includes many stages and am wondering what is relevant and what is appropriate for our students. How can I encourage self-study skills that will lead to significant learning, when students are having difficulty 'seeing' the processes?"

In the weekly meeting with the group, the TE came up with the idea to use ICT applications as a possible tool for guiding the preservice teachers [55], using the framework of CSCL, which allows for visual conceptualization and is based on learners' collaborative work [56]. The TE demonstrated the use of the *CACOO* tool as a means of representing a chemical reaction: "If we write each reaction by using a square to represent the substrate, a triangle to represent an enzyme, and perhaps we should also use colors (?), I think that could be fun … much like playing a game." In fact, studies have indicated that also in the sciences, games can serve as a means to motivate learning [57].

The TE chose to teach the topic of glycolysis applying the *CACOO* to model the use of a tool to help create a sense of confidence among the students. The learning was focused on two aspects: one was the chemical process and the other was the use of the tool as shown in **Figure 2**. The figure presents the glycolysis process, as the TE created it:
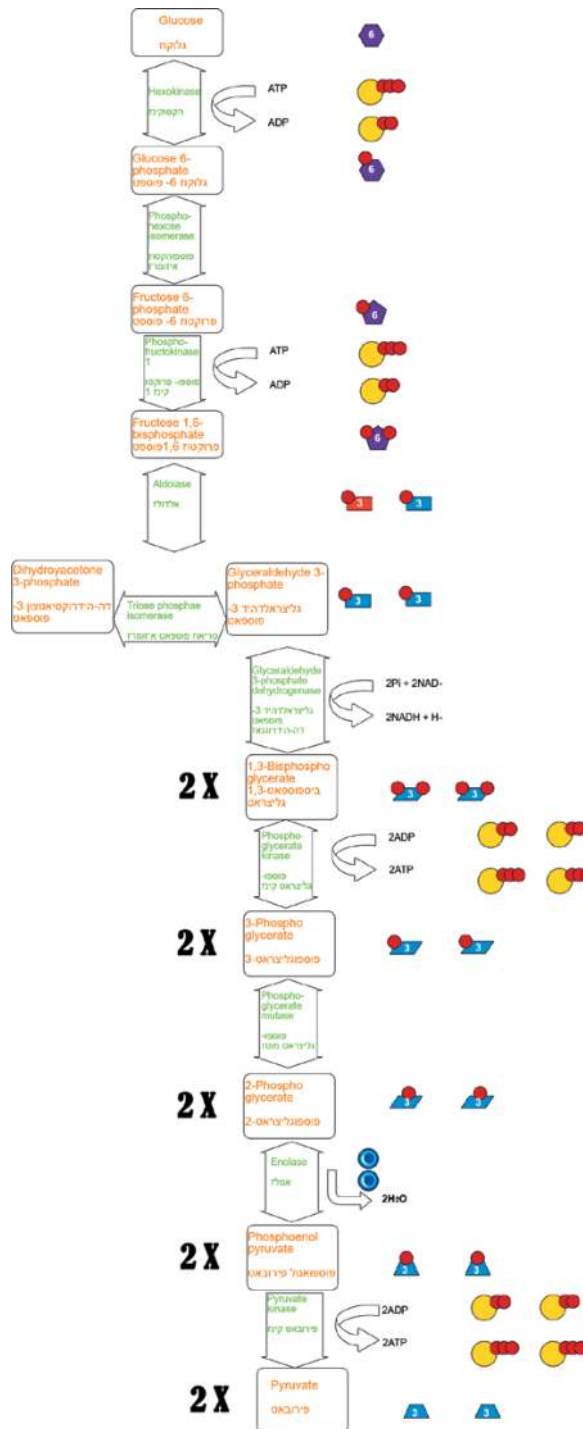
Figure 2.
The glycolysis process, as the TE created it.

> *Following our [the team's] reflective consultation, I constructed a visual represen-*
> *tation of the glycolysis, to serve as a model for teaching a chemical reaction. The*
> *representation was done in a traditional fashion, although the glucose was represented*
> *by a symbol. I used symbols that are familiar to the students and showed the develop-*
> *ment of the process using terminology that is familiar to them. My goal was to enable*
> *them to follow the process and get involved by using the new tool.*

Based on the TE's record of the students' responses, it appears that they found the process complicated and difficult to follow: "I could tell that the process seems complicated to them, but I was not worried that they word find it more difficult than other comparable processes." One of the students said, "For me, following this chemical process is very difficult … Why aren't we using a regular visual presentation?"

Given that it was necessary "To establish thematic patterns in order to picture the network of relationships among the meanings of key terms related to the process [58], the TE explained to the group that from the next lesson onward, the students would work in pairs and would use the tool themselves to learn about other similar chemical processes."

3.2 Guided peer learning: carefully testing the waters

The first stage in learning about the citric acid cycle was based on guided peer learning.

Peer learning is a pedagogical strategy with many benefits, such as aiding students to take responsibility on their own learning [59]. The TE presented the citric acid cycle to the students and an analysis of the information about the various reactions. In the weekly team meeting, the TE described her feeling of missing the point, because she continued to act as a source of information rather than as a facilitator or coach who encourages student-centered learning [60]. This was manifested in her presenting the information already analyzed and processed so as to ease the demand on the students. "In an attempt to help the students cope with the English language, I prepared a Hebrew translation of all 10 reactions; it was like bringing in a textbook [to be memorized]." The TE further explained to the students that there is a cyclical relationship among the various reactions: "I explained that it is a cyclical process and that each reaction continues … 'What comes next?'—they asked, and I answered mysteriously 'that's for me to know and for you to find out.'" According to the TE, her intent was to create a sense of curiosity to encourage learning [20].

In the lessons that follow, the TE observed the work of the pairs in the classroom and summarized her observation in her journal: "I saw that the pair of students, M and A had adopted well to this type of work. They immediately sat down to work and began reading about the reaction from information retrieved from the Internet, calling me for from time to time to answer their question or to explicate a concept. It was obvious that they were managing well both with the tool and with the chemical reactions." Varying the teaching methodologies was important, to address various learning styles and to make the learning interactive. While using a textbook is suitable to auditory learners, the use of emoji and visual representation corresponds to the style of visual learners [61].

In the weekly team meeting, the TE expressed satisfaction as you noted that each of the pairs had read the explanation about the assigned reaction and acted intuitively as they jointly used the CACOO. One student commented to her classmates: "Look at all these emojis; it's just like on the WhatsApp—I recognize these symbols." The TE noted: "It is a pleasure to watch them work! I felt proud … [to see them work

independently]. They were commenting to each other: 'NADH (a molecule in the chemical reaction) is like a gift for the cell (**Table 1**); it is not exactly energy but it is something that the cell is glad to receive, right? So let us use the gift emoji and we will represent the carbon molecules using stars.'"

Nevertheless, many of the other pairs found it difficult to independently comprehend the chemical reaction and required a great deal of help from the TE. She described it thus:

> *Despite the training wheels they received, in the form of the texts I had prepared in Hebrew explaining the reactions, they needed my help and called on me often. Although the technical adaptation to using the tool was easy, they encountered a great deal of difficulty understanding the chemical reaction. I could feel they were making an effort and I said, "You know you can do this, right? I know it seems difficult, but you have dealt with more difficult things in the past. I know because I was there and I saw how you managed."*

This is how the TE described her feeling of empathy in her journal: "I suddenly had a grasp of their difficulty; in my mind, I suddenly felt the coin drop ... T the topic is indeed complicated, but seeing them cope with the difficulty help me understand how difficult they found it. I was surprised by my sense of empathy and understanding." The process had automatically activated [her] empathy [62].

Common scientific names	Symbols
NADH	
CoA and succinyl-CoA synthetase (option 1)	
Succinyl-CoA synthetase (option 2)	
citrate	

Common scientific names	Symbols
Fumarate (option 1)	
Fumarate (option 2)	
GTP	
Alpha-ketoglutarate	

Table 1.
The common scientific names and the symbols the students created.

"I found myself walking among five pairs and explaining about the reactions, showing than which is the reactor and which is the product ... I felt like I was the bottleneck in this learning process. They needed a great deal of assistance from me and I was on my own in the classroom. With the exception of the pair M and A, the group did not succeed in working independently. They were unable to decode the reactions." Although the TE tried to provide the necessary help to all of the student pairs, one of them, F and D, approached her and stated "We are absolutely lost; we can't even understand what is written here."

3.3 Advancing one step at a time: using video clips as a tool to cope with the material

The TE's discontent produced a new idea: she recorded short video clips in which she explained the chemical reactions, serving as a mediator: "Given that the students are not making progress independently, and I am unable to all of the pairs simultaneously, I will videotape myself as I explain it. That way I will be free to circle around and be there if they still need me." The TE noticed that the video clips help the students focus on their learning. The use of a variety of learning styles, reading

the text versus learning from a video clip, is significant also in the higher education framework [63].

This served as an initial turning point: "The change was amazing. They really began to work! They were no longer stuck on some aspect but were making progress. My plan was to dedicate approximately 20 minutes of the lesson to this, but they enjoyed it so much that we extended it an additional 10 minutes. I found them working at various levels, deeply engaged in the learning process." The TE noticed that student N was truly delving into the material: "The pair N and S were able to understand the reaction with the help of the video-clip; they could see that the succinate molecule turns into fumarate. I could tell that N was truly pleased, perhaps even demonstrating creative enthusiasm, like a child eager to use a new set of crayons. I was so happy; I wanted to join in the fun." Student N said to her partner: "Let us represent the CoA molecule in the form of a briefcase that has a key (see **Table 1**, option 1 of the succinyl CoA), what do you think? The key is the enzyme that opens the briefcase, what do you say?"

By contrast, the pair of students F and D did not find the video clips helpful and still found it difficult to focus on the reaction they were assigned to study: "F and D looked lost ... Even with the video-clips they couldn't figure out what they were supposed to do." At one point, they turned to the TE and said: "We haven't succeeded in understanding any of it; we can't do anything. This is the second lesson we are spending on this task."

In the team's weekly meeting, it was suggested that the TE had not yet reached the stage needed to change the essence of her role as teacher, as [64] described it: "Transitioning from being the instructional star to being the director of learning." At the same time, however, the TE's feelings of empathy were deepening, as she described it: "I sat down next to them, looked at them, and said 'it must be very disappointing not to succeed on the second try ... What can be done about this?'" Student F asked "How do the other pairs manage?" I redirected the question back at them: "I don't know. That's a good question. What do you think?" At this point I was thinking of offering them a chance to look at the work of the other pairs, but decided not to say anything. I felt that they did not need another piece of advice from me; the only needed me listen. I could see them staring again and again at the video-clips, without managing to decipher the reaction." The students' repeated attempts and the frustration they experienced due to their lack of success led the TE to sense that what they needed was someone to listen and be attentive to them [65], rather than an additional explanation regarding the assignment.

3.4 With a little help from my friends

The TE felt the need to find a different approach. In their weekly meeting, the team came to the conclusion that it was time to demonstrate the connections between the various chemical reactions in the citric acid cycle. At this stage, the TE could encourage peer learning and peer assessment. Asking for help from peers often encourages students to practice self-regulatory skills such as self-reflection [66]. The TE's goal for the next lesson was to bring the students to understand the connections between the reactions and the meaning of a biochemical cycle. "I mentioned in the class that they should not forget that there is a cycle of connections between the reactions. Within a few moments they began to discuss this and explore each other's work." In her journal, the TE noted: "Perhaps this can be a way to help F and D?"

Soon enough, using the CACOO synchronous-collaborative tool, the students began discussing the connections among the reactions and observing each other's

work. It occurred to them that they had to relate to the reactions described by the other pairs, that it was all part of a single puzzle. The pairs began to compare their work. An open and flowing discussion developed. "They began to discuss the emoji's used to represent those molecules: How does it all come together?' Even though I had repeatedly reminded them that this was a biochemical cycle, they were not ready to understand its significance—up until this point, that is!"

In the next team meeting, the TE described the social interaction that developed, which was mediated by the use of the same digital tool. "Just like in a chemical reaction, in which each substance has a role, but each pair had produced formed part of the final product. And it is important to note that the pair that was having the most difficulty no longer had to cope alone. As student D said, 'I finally understood what the TE meant. Seeing what the other pairs had made helped me understand.'" The TE summarized this stage in her journal: "They suddenly understood that up until now they had been working on different pieces of the same cycle. Some of them accepted the visual representation of the other couples and some adamantly opposed the choices of their classmates. But it made them try to understand the logic behind each choice, make adjustments, and redesign their visual representations."

To gain an understanding of the chemical reactions and processes in the lesson, it was important to discuss the meanings in the analogies that they had created. It is evident that different students would use different analogies; however, discussing and reflecting on these differences is a critical phase [29]. Without such a discussion, the main point of the learning process is missed. Given that the chemical reactions are connected to each other in the cycle, there was an echoing of the peer learning process (that took place within the pairs) in the creation of the final product. As the product of one reaction becomes a component of the next chemical reaction, each pair of students must work with another pair of peers. The TE recognized this as a second turning point and noted: "It was a pleasure. It was interesting to hear about their experiences. I was very excited to see them working together during that lesson."

The pair of students, M and A, were involved in a dialog with another pair and realize that things did not work out in the cycle as they had expected, but they were inspired to continue exploring. Even though they had experience difficulty in the earlier stages of the learning process, they were pleasantly challenged in a later stage. At one point, M turned to her partner and said "Look at the way S and N represented the reaction; it's different from the way we did it. Let's ask them why they did it that way." That the most noticeable change was in the work of the pair F and D, who up until this point had not understood how they could describe the assigned reaction using emoji. In her journal, the TE noted the following: "They began using the work of the other pairs like crutches. I could see their eyes light up when they finally began to understand. As I passed by her, M looked directly at me and smiled. I felt that the empathy that I expressed in regard to their difficulty enabled us to have a sense of a shared experience, even without words." All of the pairs demonstrated significant progress after the collaborative assessment of their peers' products. This mutual reliance led them to "practice self-regulatory skills such as self-reflection reflection" [66].

3.5 "The oxaloacetate went straight to my heart": completing the cycle (together)

After establishing a social infrastructure that led to shared learning, the next stage was to recognize the connections among the various parts in the cycle and to "Taylor" the transitions between the reactions to render a group product. In the team's weekly

meeting, the TE shared the following: "Now there was a new problem: each pair had chosen different symbols to represent the same molecule. Will this become an issue? How will they arrive at a joint solution?" The CF noted the importance of the issue is an opportunity to discuss the universality of scientific language. As it turned out, all of the students agreed that using the picture of a lemon helped remind them of the citric acid reaction (**Table 1**): "Jokingly, one of the students acknowledged their shared understanding, as she added a lemon to the emoji representing the citric acid. This put in motion the task for that lesson, which was to understand the citric acid cycle as a complete process." The social interactions related to the topic at hand were extremely important for creating a collaborative learning process [43]. Also in the case of representing the fumarate (see **Table 1** for the two options the two different groups suggested for fumarate. The students agreed on option 1), all of the students agreed on the creative symbol selected by N, who explained her choice to her peers. The TE recorded the student's explanation in her journal:

> *"This is a trans molecule, you see? [She points to the double bond], so then I think of it as transgender." Her classmates laughed. I told him that was a unique and original idea but asked if they knew the etymology of the word transgender. They did not, so I explained that it means "someone whose gender-related feelings do not correspond to the sex they were born with and, thus, the heavy atoms around the double bond points in two different directions, whereas cisgender is the term used when the individual's feelings coincide with the sex one is born with, and thus in chemistry, cis refers to a molecule in which heavy atoms around the double bond points in the same direction." I could tell that they enjoy the explanation on the representation selected for that molecule.*

Hearing this explanation was pleasing to the students because it enabled them to understand the deeper meaning of the term "transgender." From a sociocultural perspective, education is concerned also with linguistic changes, whereby older words acquire new meanings. This aspect became part of the process of learning the language of chemistry [67].

In contrast to the last two examples on which students were quick to agree about the symbol chosen, in other cases, they found it difficult to come to an agreement. Each pair had an explanation and rationale for choosing a particular emoji and the fact that their choice also gave meaning to the chemical reaction made it a source of disagreement. This stage, the TE opted to refrain from intervening. Explaining their rationale was important for understanding the topic at hand. "It was the right moment to allow the learners to present their ideas and explain them, which is a necessary part in the process of constructing knowledge. I feel that I am ready to let go [of my central role] and instead I can stand aside and observe the learning process." During the weekly team meeting, the CF noted the important development whereby the TE transitioned from the role of initiator to functioning as an instructional manager [64]. In contrast to the earlier stage when disagreement or conflict was a source of discomfort for the TE, she now recognized that these could be a possible resource for social interaction that contributes to the cognitive organization of the newly acquired knowledge [68].

In the case of a particular disagreement regarding the symbol selected to represent succinyl CoA, the TE did intervene (see **Table 1** for the two options the two different groups suggested for succinyl CoA): "Look, we managed to come to an agreement on one representation, the transgender. Right now each pair is very attached to the representation the selected. Let's put it aside and discuss it again next week. Perhaps

by then we will think about it differently." However, the disagreement continued into the following week, as each pair considered their selection to be very logical and neither pair was willing to cede. Student N try to convince her classmates: "The CoA is like a briefcase full of money; the succinyl CoA enzyme can open the briefcase, which is why it is represented with a picture of a key. The money is the GTP (**Table 1**) that supplies the cell with energy. I do not understand why you cannot manage to see that?!" Student A responded: "The thing is, we selected the symbol of a female, which is preferred over a male, which is why the female represents a molecule with a higher level of energy. We cannot change this without it affecting the meaning of the alpha-Ketoglutarate molecule (**Table 1**)." To settle the disagreement, the TE suggested that in the final collaborative product, both symbols would be featured (**Figure 3**) and would thus serve as a reminder of the source of this disagreement. In her journal, she
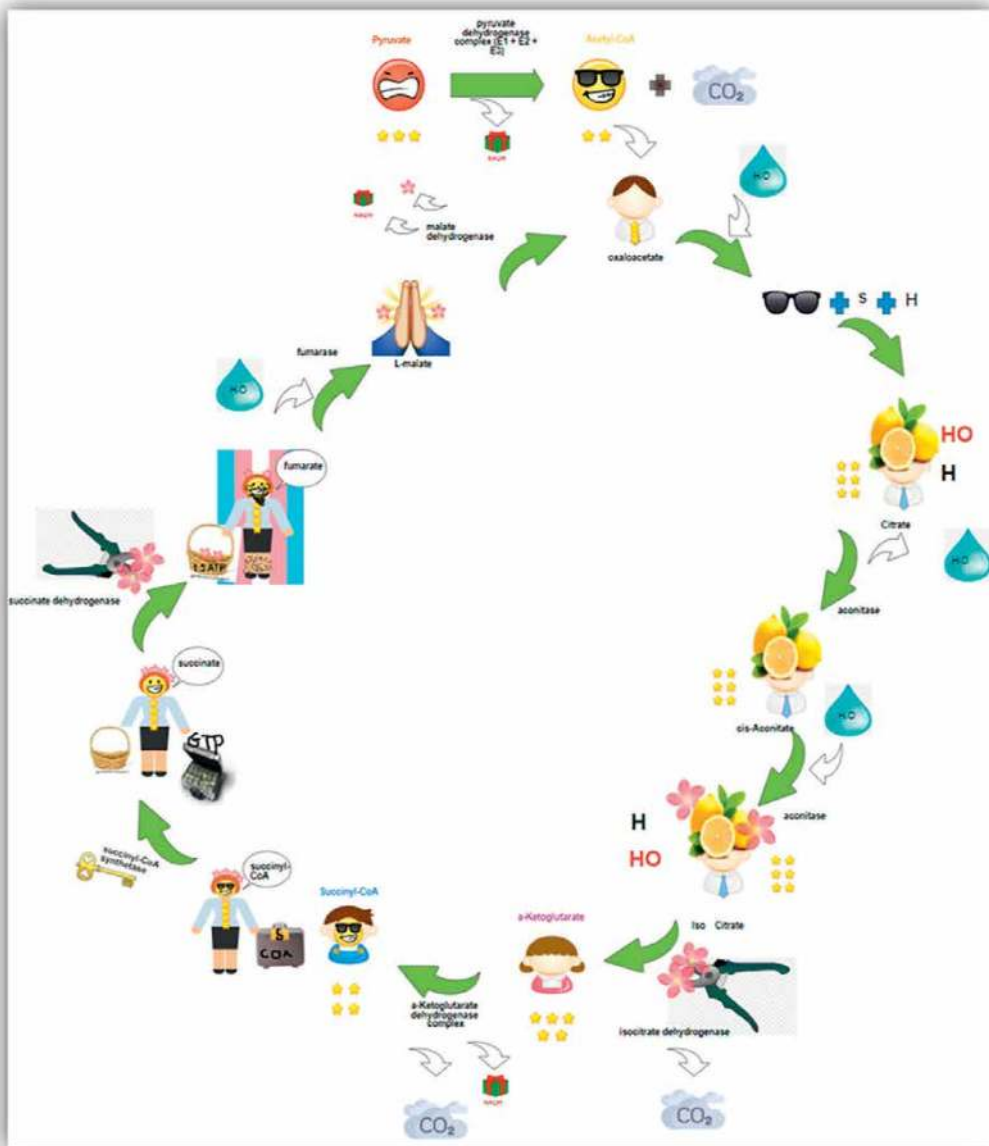

Figure 3.
The collaborative product of the group representation of the citric acid cycle.

wrote the following entry: "It was very interesting to see them discuss their positions. Without noticing, they had acquired an understanding of concepts related to energy and incorporated these into their discussion. They understood the significance of the scientific symbol and felt a deep connection to the representations and to their understanding of the connection between the symbol and what it represented. To me, this was a successful outcome."

Student M also described her feeling of success: "at first I didn't understand what we were supposed to do. We were not enthusiastic and did not want to proceed. I thought it was a waste of time. But now, after the discussion in this lesson, I understand what the intended goal was. It's wonderful! I'm going to use it in my future teaching; understanding that if I believe a certain activity is worthwhile, I will follow through, even if the learners demonstrate resistance. This was a unique experience."

However, in addition to the sense of success experienced by the TE and the majority of the students, student R described her difficulty in applying the idea of visual analogies: "I did not connect with this method. It felt like superficial learning. These are nothing but emoji's. Each symbol corresponds to one specific molecule; there is no generalization. ... Except for the Oxaloacetate [the molecule that she created]; that one went straight to my heart. It's the only one I will remember."

Indeed, a good chemical model is one that manages to describe as many cases as possible [29]. In this case, the symbols were "tailored" precisely to each molecule in its specific context and, consequently, it could not be used in other cases or contexts, or even for teaching the citric acid cycle to a different group because it would be devoid of the social context provided by this specific group. This then raises the question: what is the main purpose of using emoji?

Student B summarized the process thus: "For me, the topics that we research through independent learning are the ones that are branded in my memory. I know that I will remember this topic." Student M added: "I felt that the teachers input in the work process created a sense of empathy and motivated us to continue with the project."

4. Discussion

Life in the era of the Fourth Industrial Revolution is dynamic and constantly changing, and the task of teaching must adapt to the shifts that are characteristic of this era. Considering the future of high school graduates who are currently in the education system, we realize that they must be able to practice and adapt to conditions of uncertainty. To this end, and according to the OECD (Organization for Economic Co-operation and Development) [69], they need to acquire a broad range of skills, among them cognitive skills (e.g. critical thinking, creative thinking, and the ability to self-regulate), social and emotional skills (e.g. empathy and teamwork skills), as well as practical skills (e.g. using ICT-mediated information).

To educate graduates who correspond to this description, teachers are tasked with the important responsibility of listening to and developing their students' skills. Hence, not only must these aspects of teacher responsibility be addressed in the formal curricula of teacher education, but they should be emphasized and discussed in the early stages of the program before these learners begin to practice their teaching skills in the classroom.

In the current study, we discussed the learning process for acquiring knowledge on a topic that is considered particularly complex and difficult. The use of CSCL in

the context of studying the citric acid cycle was not incidental but rather was carefully selected by a team that included the TE, the DPC, and the CF. The incorporation of CSCL in the case presented here demonstrates the way a teacher can promote the development of learners' cognitive and practical skills in a manner that corresponds to the era of the Fourth Industrial Revolution.

In cognitive terms, the learners had to cope with complex concepts, which many students find difficult. Teachers are typically aware that teaching this subject matter in a manner that is helpful to students requires the use of a variety of learning approaches and strategies. In the case described here, students had to develop critical thinking as they studied complex chemical reactions. They needed to employ creative thinking because they were required to analyze the text that they read and the audio segment that they had heard and translate this information into a visual representation of their design. They were also required to manage their learning process independently, despite the difficulty in challenging nature of the assignment.

In practical terms, the learners were introduced to a new and hence unfamiliar digital tool and learned to use it simultaneously with their team members in a collaborative learning process, intended to promote the shared acquisition of knowledge. It would be interesting to further investigate the potential social and emotional skills that were developed and used in the course of this learning process.

4.1 Teacher empathy beyond CSCL skills

In the course of planning the task and analyzing its development in the weekly team meetings, the DPC and the CF attempted to address the manner in which the TE could emphasize the aspect of social and emotional skills. However, the TE was unprepared to introduce these aspects into her teaching. In contrast to the development of cognitive and practical skills, which was strongly emphasized in her lessons, it appears that the TE's approach was not oriented toward the social and emotional aspects. However, in light of the findings of the current study, a different picture emerged. The TE understood the orientation that the PC and CF were encouraging her to incorporate realized that the process seemed to be stuck or reached a dead end, the unconscious solution that she chose was to use empathy. The team discovered that empathy as an educational approach is the option she typically chooses to use when helping her students. At the stage when her students were struggling, she first turned to solutions that promoted the development of their cognitive or practical skills. Perhaps a more precise and appropriate solution would have been to purposely raise questions related to social-emotional skills? Given that the TE was guiding the learning process of preservice teachers, perhaps the situation called for a more direct and open discussion of these aspects in the lesson?

Following the interview that the CF held with the TE, the CF emphasized that although the use of empathy as a strategy for coping with students' difficulties was introduced only when nothing else worked, it was nonetheless an important tool in her teaching process. Its importance can be seen in the interactions with the pair of students F and D, who required her empathy and support throughout the process, as the cognitive and practical learning strategies were less effective for this pair of students. Another example of the importance of this empathic approach can be found in the process of the class discussion, when working on the final product and negotiating which symbols should be used. Steering this discussion was not an easy task for the TE. For the students, as well as for the TE, this was a peak point in the learning

process because the learners had to rationalize and justify their choices using the concepts and terminology they had learned. The focus of the discussion was on which viewpoint each pair employed to facilitate their understanding of the subject matter. After the process of working together and analyzing the particular chemical reaction, some pairs found it difficult to give up their viewpoint in favor of that used by a different pair. This created an opportunity to conduct a discussion that was highly social and emotional. After analyzing the findings of this study, the TE felt that this opportunity was not fully used for the purpose of addressing social-emotional aspects for directly addressing the use of empathy as a teaching tool. As a result, the TE is now more aware of the importance of developing social-emotional skills in general and empathy as an educational tool to be used in the classroom, especially when teaching complicated topics.

5. Summary

The importance of incorporating and discussing models in the teaching of chemistry is well known [29]. Scientists use models to compare their product with the target and find similarities and differences. This process can take the form of an empiric examination or a thought experiment. Teachers tend to use analogical models to compare the target with concrete objects and events that are familiar to the students from their everyday lives. In the case described in the current study, the modeling process included the task of independently designing the molecules and chemical reactions involved in the citric acid cycle. The advantage of this approach was in assigning the students the task of creating a model that would be helpful and meaningful to them. A possible disadvantage of this approach was that some of the representations that were created would not be clear or meaningful to learners outside of this particular group. Student R understood this shortcoming and expressed her feelings, stating that in her view, the constricted significance of the representations selected made the learning superficial.

The TE also felt that this issue should have been considered and discussed, as it is particularly significant for learners who are PSTs: What is the significance of a model that is not comprehensible to those outside the group that created? Is an educational process that renders a product that cannot be understood by those outside the particular group still meaningful or significant? Is the teaching of science different in this sense from teaching other disciplines? These are questions that the TE felt should have been addressed in the classroom.
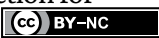
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References

[1] Darling-Hammond L. Strengthening clinical preparation: The holy grail of teacher education. Peabody Journal of Education. 2014;**89**:547-561

[2] Tomas L, Rigano D, Ritch SM. Students' regulation of their emotions in a science classroom. Journal of Research in Science Teaching. 2015;**53**(2):234-260

[3] Wickman PO. Back to the drawing board—Examining the philosophical foundations of educational research on emotions and aesthetics. In: Bellocchi A, Quigley C, Otrel-Cass K, editors. Exploring Emotions, Aesthetics and Wellbeing in Science Education Research. NY, New York: Springer; 2017. pp. 9-37

[4] Singer T, Lamm C. The social neuroscience of empathy. Annals of the New York Academy of Sciences. 2009;**1156**:81-96

[5] Decety J, Lamm C. Human empathy through the lens of social neuroscience. The Scientific World Journal. 2006;**6**:1146-1163

[6] Gerdes KE, Segal EA, Jackson KF, Mullins JL. Teaching empathy: A framework rooted in social cognitive neuroscience and social justice. Journal of Social Work Education. 2011;**47**(1):109-131

[7] Gillespie RJ. Reforming the general chemistry textbook. Journal of Chemical Education. 1997;**74**(5):484

[8] Cooper MM, Caballero MD, Ebert-May D, Fata-Hartley CL, Jardeleza SE, Krajcik JS, et al. Challenge faculty to transform STEM learning. Science. 2015;**350**(6258):281

[9] Talanquer V, Pollard J. Let's teach how we think instead of what we know. Chemical Education Research and Practice. 2010;**11**(2):74

[10] Waldrop MM. The science of teaching science. Nature. 2015;**523**(7560):272

[11] Freeman S, Eddy SL, McDonough M, Smith MK, Okoroafor N, Jordt H, et al. Active learning increases student performance in science, engineering, and mathematics. Proceedings. National Academy of Sciences. United States of America. 2014;**111**(23):8410

[12] President's Council of Advisors on Science and Technology. Engage to Excel: Producing One Million Additional College Graduates with Degrees in Science, Technology, Engineering, and Mathematics. Washington, DC: Report to the President; Executive Office of the President; 2012. https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/fact_sheet_final.pdf. [Accessed: Oct 2018]

[13] Loewenstein G. The psychology of curiosity: A review and reinterpretation. Psychological Bulletin. 1994;**116**(1):75-98

[14] Stuckey M, Eilks I. Research and practice of Chemistry's relevance in the classroom by learning about tattooing from a chemical and societal view. Chemical Education Research and Practice. 2014;**15**:156-167

[15] Newton DP. Relevance and science education. Educational Philosophy and Theory. 1988;**20**(2):7-12

[16] Harms NC, Yager RE. What Research Says to the Science Teacher. Washington: NSTA; 1981

[17] Golman R, Loewenstein G. Curiosity, information gaps, and the utility of knowledge. Information Gaps, and the Utility of Knowledge. 16 April 2015. 96-135

[18] Silvia PJ. Exploring the Psychology of Interest. UK: Oxford University Press; 2006

[19] Katz I, Assor AVI, Kanat-Maymon Y. Interest as a motivational resource: Feedback and gender matter, but interest makes the difference. Social Psychology of Education. 2006;**9**:27-42

[20] Lamnina M, Chase CC. Developing a thirst for knowledge: How uncertainty in the classroom influences curiosity, affect, learning, and transfer. Contemporary Educational Psychology. 2019;**59**. DOI: 10.1016/j.cedpsych.2019.101785

[21] Brown HD. Principles of Language Teaching and Learning. 4th ed. White Plains, NY: Longman; 2014

[22] McIntyre NH, Harvey M, Moeller M. The role of managerial curiosity in organizational learning: A theoretical inquiry. International Journal of Management. 2012;**29**(2):659-676

[23] LdPride. n.d. What are Learning Styles? 2009. Available from: http://www.ldpride.net/learningstyles.MI.htm

[24] Lynch M. The production of scientific images: Vision and re-vision in the history, philosophy, and sociology of science. In: Pauwels L, editor. Visual Cultures of Science: Rethinking Representational Practices in Knowledge Building and Science Communication. Lebanon, NH: Darthmouth College Press; 2006. pp. 26-40

[25] Latour B, Woolgar S. Laboratory Life: The Construction of Scientific Facts. Princeton: Princeton University Press; 1979

[26] Knorr CK. Epistemic Cultures: How the Sciences Make Knowledge. Cambridge: Harvard University Press; 1999

[27] Pauwels L. A theoretical framework for assessing visual representational practices in knowledge building and science communications. In: Pauwels L, editor. Visual Cultures of Science: Rethinking Representational Practices in Knowledge Building and Science Communication. Vol. 2006. Lebanon, NH: Darthmouth College Press; 2006. pp. 1-25

[28] Ingham AM, Gilbert JK. The use of analogue models by students of chemistry at higher education level. International Journal of Science Education. 1999;**13**:193-202

[29] De Jong O, Blonder R, Oversby JP. How to balance chemistry education between observing of phenomena and thinking in models. In: Eilks I, Hofstein A, editors. Chemistry Education: A Practical Guide and Textbook for Teachers, Teacher Trainees and Student Teachers. Rotterdam: SENSE; 2013. pp. 97-126

[30] American Association for the Advancement of Science. Vision and Change in Undergraduate Biology Education: A Call for Action. Washington, DC: American Association for the Advancement of Science; 2011

[31] Wright A, Provost J, Roecklein-Canfield JA, Bell E. Essential concepts and underlying theories from physics, chemistry, and mathematics for "biochemistry and molecular biology" majors. Biochemistry and Molecular Biology Education. 2013;**41**(5):302-308

[32] Songer CJ, Mintzes JJ. Understanding cellular respiration: An analysis of conceptual change in college biology. Journal of Research in Science Teaching. 1994;**31**(6):621-637

[33] Ameyaw Y. Improving teaching and learning of glycolysis and Kerbs' cycle using concept mapping technique. International Journal of Sciences. 2015;**4**:6. DOI: 10.18483/ijSci.706

[34] Ross PM, Tronson DA, Ritchie RJ. Increasing conceptual understanding of glycolysis and the Krebs cycle using role-play. The American Biology Teacher. 2008;**70**(3):163-169

[35] Loertscher J, Green D, Lewis JE, Lin S, Minderhout V. Identification of threshold concepts for biochemistry. CBE Life Sciences Education. 2014;**13**:516-528

[36] Arenas M. What is Peeragogy?. 2018. Available from: http://arenastudies.word press.com/2012/01/28/what-is-peeragogy/

[37] Longfellow E, May S, Burke L, Marks-Maran D. "They had a way of helping that actually helped": A case study of a peer-assisted learning scheme. Teaching in Higher Education. 2008;**13**(1):93-105

[38] Garrison DR, Arbaugh JB. Researching the community of inquiry framework: Revise, issues and future directions. The Internet and Higher Education. 2007;**10**(3):157-172

[39] Morgan R, Whorton J, Gunsalus C. A comparison of short-term and long-term retention: Lecture combined with discussion versus cooperative learning. Journal of Instructional Psychology. 2000;**27**(1):53-58

[40] Fuks H, Pimentel M, De Lucena CJP. RU-Typing-2-me? Evolving a chat tool to increase understanding in learning activities. International Journal of Computer-Supported Collaborative Learning. 2006;**1**(1):117-142

[41] van Leeuwen A, Rummel N, van Gog T. What information should CSCL teacher dashboards provide to help teachers interpret CSCL situations? International Journal of Computer-Supported Collaborative Learning. 2019;**14**:261-289. DOI: 10.1007/s11412-019-09299-x

[42] Gillies RM, Ashman A, Terwel J, editors. The teacher's Role in Implementing Cooperative Learning in the Classroom. New York, NY: Springer; 2008

[43] Stahl G, Koschmann T, Suthers D. In: Sawyer RK, editor. Cambridge Handbook of the Learning Sciences Computer-Supported Collaborative Learning: An Historical Perspective. Cambridge, UK: Cambridge University Press; 2006. pp. 409-426

[44] Kaendler C, Wiedmann M, Rummel N, Spada H. Teacher competencies for the implementation of collaborative learning in the classroom: A framework and research review. Educational Psychology Review. 2015;**27**(3):505-536

[45] Whitehead J. Generating living theory and understanding in action research studies. Action Research. 2019;**7**(1):85-99. DOI: 10.1177/1476750308099599

[46] Kemmis S, McTaggart R, Nixon R. Introducing critical participatory action research. In: The Action Research Planner. NY, New York: Springer; 2014. pp. 1-31

[47] Burmeister M, Eilks I. Using participatory action research to develop a course module on education for sustainable development in pre-service chemistry teacher education. Centre for Educational Policy Studies Journal. 2013;**3**:59-78

[48] Eilks I, Markic S. Effects of a long-term participatory action research project on science teachers' professional development. Eurasia Journal of Mathematics, Science and Technology Education. 2011;**7**:149-160

[49] Areljung S. Why do teachers adopt or resist a pedagogical idea for teaching science in preschool? International Journal of Early Years Education. 2018. DOI: 10.1080/09669760.2018.1481733

[50] Laudonia I, Mamlok-Naaman R, Abels S, Eilks I. Action research in science education—An analytical review of the literature. Educational Action Research. 2018;**26**(3):480-495. DOI: 10.1080/09650792.2017.1358198

[51] Feldman A, Minstrel J. Action research as a research methodology for study of teaching and learning science. In: Kelly AE, Lesh RA, editors. Handbook of Research Design in Mathematics and Science Education. Mahwah: Lawrence Erlbaum; 2000. pp. 429-455

[52] Hamilton ML, Pinnegar S. A topography of collaboration: Methodology, identity, and community in self-study of practice research. Studying Teacher Education. 2013;**9**(1):74-89

[53] Mamlok-Naaman R. Teachers' professional learning communities (PLCs): Towards adapting a transformative pedagogy to teaching. In: Eilks I, Markic S, Ralle B, editors. Building Bridges across Disciplines for Transformative Education and a Sustainable Future. Germany: Shaker & Aachen; 2018. pp. 173-181

[54] Cozza B. Transforming teaching into a collaborative culture: An attempt to create a professional development school-university partnership. The Educational Forum. 2010;**74**(3):227-241

[55] Forkosh-Baruch A-U. ICT implementation in colleges of education: A framework for teacher educators. Journal of Information Technology Education: Research. 2019;**18**:207-229. DOI: 10.28945/4312

[56] Seemiller C, Grace M. Generation Z Goes to College. San Francisco, CA: Jossey–Bass; 2016

[57] Hursen C, Bas C. Use of gamification applications in science education.

International Journal of Emerging Technologies in Learning. 2019;**14**:4-23

[58] Lemke JL. Talking Science: Language, Learning, and Values. Norwood, N.J: Ablex; 1990

[59] Keppell M, Suddaby G, Hard N. Good Practice Report: Technology-Enhanced Learning and Teaching2011. Available from: https://www.academia.edu/4405298/Good_Practice_Report_Technology-Enhanced_Learning_and_Teaching. DOI: 10.3402/rlt.v23.25728

[60] Yukhymenko MA, Brown SW, Lawless KA, Brodowinska K, Mullin G. Thematic analysis of teacher instructional practices and student responses in middle school classrooms with problem-based learning environment. Global Education Review. 2014;**1**(3):93-109

[61] Cuaresma J. Learning Style Preferences and Academic Performance of PHEM Majors at the University of the Cordilleras. Baguio City: University of the Cordilleras; 2008. Unpublished Undergraduate Thesis

[62] Ronen IK. Empathy awareness among pre-service teachers: The case of the incorrect use of the intuitive rule "Same A–Same B". International Journal of Science and Mathematics Education. 2020;**18**:183-201. DOI: 10.1007/s10763-019-09952-9

[63] Newton PM, Miah M. Evidence-based higher education—Is the learning styles "myth" important? Frontiers in Psychology. 2017;**8**:1-9. DOI: 10.3389/fpsyg.2017.00444

[64] Keiler LS. Teachers' roles and identities in student-centered classrooms. International Journal of STEM Education. 2018;**5**:34. DOI: 10.1186/s40594-018-0131-6

[65] Berkovich I, Eyal O. Educational leaders and emotions: An international review of empirical evidence 1992-2012. Review of Educational Research. 2015;**85**(1):129-167. DOI: 10.3102/0034654314550046

[66] Lim. Peer learning, self-regulated learning and academic achievement in blended learning courses. A Structural Equation Modeling Approach. 2020

[67] Markic S, Childs PE. Language and the teaching and learning of chemistry. Chemical Education Research and Practice. 2016;**17**(3):434-438

[68] Doise W, Mugny G, Perret-Clermont A. Social interaction and the development of cognitive operations. European Journal of Social Psychology. 1975;**5**(3):367-383

[69] OECD. The future of education and skills. Education. 2018:2030

Chapter 8

Empathy as a High-Performance Competency

Anthony Peter Cockerill

Abstract

This chapter explores the history, definition, use and importance of Empathy as a High-Performance Competency (H-PC). Empathy is perceived to be a people-related capability that forms part of a Developmental H-PC factor, which operationalises the democratic style of leadership. It is argued that Empathy contributes to leadership effectiveness through multi-dimensional thinking, win-win alliance formation, high-performance team working and the creation of organic organisational structures. It is suggested that four major challenges, including the resolution of humanity's greatest challenges, require leaders to have Empathy as a strength. Data are presented that indicate Empathy, and other key H-PC, are underdeveloped in modern leaders, which suggests a significant reorientation of leadership development is required.

Keywords: competency, leadership, complexity, democracy, dictatorship, high-performance teams

1. Introduction

What characteristics do good leaders have? The question has been debated throughout human history as Xenophon's "The Education of Cyrus" [1] and Suetonius' "How to be a Bad Emperor" [2] testify. In modernity, particularly since World War Two, the question has been addressed empirically. One strand of international research has focused on learnable leadership behaviours that raise organisational performance. This strand has identified 11 High-Performance Competencies (H-PC) that are classified into four factors: Thinking, Achieving, Developmental, and Directional. The Thinking and Achieving clusters are seen as task-oriented behaviours, while the Developmental and Directional clusters are considered people-oriented (see **Tables 1** and **2**). Empathy, which has had several labels including 'Interpersonal Search' and 'Perceptual Objectivity', is one of three behaviours in the Developmental cluster. The chapter explores the history, definition, use and importance of Empathy as a H-PC.

The chapter suggests that Empathy contributes to leadership effectiveness through multi-dimensional thinking, win-win alliance formation, high performance team-working and the creation of organic organisational structures. It is suggested that four major challenges, including the resolution of humanity's greatest challenges, require leaders to have strengths in Empathy. Finally, data is presented that indicate Empathy, and other key H-PC, are underdeveloped in leaders, which suggests a significant reorientation of leadership development is required.

Domain	Factor	Competency
Task	Thinking	Information Search
		Concept Formation
		Conceptual Flexibility
	Achieving	Proactive Orientation
		Achievement Orientation
People	Developmental	Empathy
		Managing Interaction
		Developmental Orientation
	Directional	Impact
		Self-confidence
		Presentation

Table 1.
H-PC domains, factors and competencies.

The chapter proceeds in six sections. First, the origins of Empathy in modern leadership behaviour research are traced; this results in a definition of Empathy and its detailed specification via a five-point behaviourally anchored rating scale. Second, H-PC assumptions about Empathy are explored. The third section considers Empathy's interaction with other H-PC's, while the fourth explores Empathy's role in high performance team development. Fifthly, Empathy's current and future importance is considered. Finally, conclusions are drawn.

2. The origins, definition, and specification of empathy as a H-PC

Empathy has been explored by four streams of leadership research into learnable behaviours that may be associated with superior organisational performance: (i) Initiating Structure and Consideration; (ii) Transformational Leadership Theory; (iii) Behavioral Complexity Theory; and (iv) Managerial Competencies. The findings of these four streams in relation to Empathy are summarized below.

i. *Initiating structure and consideration* researchers in this stream include Bales [3], Hemphill [4], Likert [5], Stodgill [6] and, Fleishman et al. [7]. The Consideration dimension encompasses several empathetic behaviours including: (a) listening to and understanding the ideas, feelings, needs and goals of subordinates; (b) using summaries to test own understanding of others' ideas; (c) giving group members ample opportunity to express their own perspective; and (d) leaders asking for opinions and suggestions. The meta-analysis of Judge et al. [8] found a significant positive relationship between Consideration and leadership performance indices.

ii. *Transformational leadership theory* has been widely propounded and discussed—most especially by House [9], Burns [10] and, Bass [11]. The 'Individualized Consideration' dimension of this theory describes

Factor	H-PC	Definition
Thinking	Information search	Gathers many kinds of information and uses a wide variety of sources to build a rich informational environment in preparation for decision making in the organisation.
	Concept formation	Builds frameworks or models or forms concepts, hypotheses or ideas based on information; becomes aware of patterns, trends and cause/effect relations by linking disparate information.
	Conceptual flexibility	Identifies feasible alternatives or multiple options in planning and decision making; holds different options in focus simultaneously and evaluates their pros and cons.
Achieving	Proactive orientation	Structures the task for the team; implements plans and ideas; takes responsibility for all aspects of the situation even beyond ordinary boundaries – and for the success and failure of the group.
	Achievement orientation	Possesses high internal work standards and sets ambitious, risky and yet attainable goals; wants to do things better, to improve, to be more effective and efficient; measures progress against targets.
Developmental	Empathy	Uses open and probing questions, summaries, paraphrasing etc. to understand the ideas, concepts and feelings of another; can comprehend events, issues, problems, opportunities from viewpoint of others.
	Managing interaction	Involves others and builds cooperative teams in which group members feel valued and empowered and have shared goals.
	Developmental orientation	Creates a positive climate where staff increase the accuracy of their awareness of their strengths and limitations; provides coaching, training & developmental resources to improve performance.
Directional	Impact	Uses various methods (e.g., persuasive arguments, modelling behaviour, inventing symbols, forming alliances & appealing to others' interests) to gain support for ideas, strategies & values.
	Self-confidence	States own 'stand' or position on issues; unhesitatingly takes decisions when required and commits self and others; expresses confidence in the future success of the actions to be taken.
	Presentation	Presents ideas clearly with ease and interest so that the other person (or audience) understands what is being communicated; uses technical, symbolic, non-verbal and visual aids effectively.

Table 2.
Definitions of the H-PC.

leaders using empathetic behaviours like 'discovering and understanding the specific needs of and ideas of individual staff members'. The criterion validity of this dimension was supported by the meta-analysis of Judge and Piccolo [12].

iii. *Behavioral complexity theory* catalyzed the leadership behaviour studies of Schroder et al. [13], Streufert & Swezey [14], Streufert et al. [15], Tetlock et al. [16] and, Suedfeld & Tetlock [17]. One validated competency in this research stream—Interpersonal Differentiation—is strongly empathetic in nature; it is defined as 'understanding the integrations and dimensions used by others in making judgments'.

iv. *Managerial Competency research* includes the seminal studies of Boyatzis [18] and Schroder [19]. The Perceptual Objectivity and Interpersonal Search dimensions of Boyatzis and Schroder respectively focus on Empathy. The former competency is defined as 'understanding another person's point of view' and the latter as 'discovering, understanding and verbalizing the concepts and ideas of others'. Validation studies by Schroder [13] and Cockerill [20] indicate that Empathy is associated with superior leadership effectiveness.

In summary, research to identify competencies that are significantly and positively correlated with organizational performance have explored behaviours that can be regarded as empathetic in nature. These include listening, asking questions to understand another's point of view, asking clarificatory questions and summarizing

Rating	Descriptor	Observed behaviour	Outcome
5	Strategic strength	Encourages others to speak freely and openly without judgement, rebuke or punishment. For example: (i) Uses self-disclosure to encourage others to speak out; (ii) Supports other when they express their innermost thoughts and feelings; (iii) Uses surveys to systematically understand the viewpoint of others; and (iv) Gathers the thoughts and feelings of others through workshops and events.	Perpetuates high performance
4	Strength	Tests own understanding of another's viewpoint. For example: (i) Uses paraphrasing to validate understanding; (ii) Summarizes a perspective and confirms it is accurate; (iii) Precisely describes a situation from another's viewpoint; and (iv) Explains and verifies how another is thinking and feeling at a given moment.	High performance
3	Adequacy	Uses non-judgemental behaviour to elicit another's viewpoint. For example: (i) Asks open questions; (ii) Asks for an elaboration or example; (iii) Probes neutrally in depth to understand another's schema and/or mindset; and (iv) Body language is non-evaluatory when another is expressing her/his views.	Average performance
2	Undeveloped	Does not actively elicit the viewpoint of others. For example: (i) Listens passively without trying to elicit the inner world of others; (ii) Expresses interest when others volunteer their views but does not actively explore or validate them; (iii) Does not ask others how they are thinking or feeling; and (iv) Ignores others when they are agitated or upset.	No effect on performance
1	Limitation	Inhibits the free and open expression of viewpoints. For example: (i) Regularly interrupts and overtalks others; (ii) Reacts judgementally (either verbally or non-verbally) when others express their ideas or views; (iii) Has difficulty summarizing the perspective of another without introducing own ideas; and (iv) Inaccurately assumes others share own perspective.	Reduces performance

Table 3.
Empathy rating scale.

the perspective of another. Based on these findings, H-PC researchers have formally defined Empathy as follows:

'A set of learnable behaviours (including the use of open and probing questions, summaries and paraphrasing) that enable an individual to accurately and non-judgmentally understand the ideas, feelings, motives, goals, perspectives and mind-sets of others.'

To accurately and reliably measure the observed empathetic skill of individuals, H-PC researchers devised a five-point behaviorally anchored rating scale for Empathy—see **Table 3**. Training and certification programmes show that the Empathy Rating Scale, like those for the other 10 H-PC, enables assessors to achieve very high levels of reliability; to pass the H-PC accreditation test, a trainee's ratings must show a minimum of 80% concordance with verified expert ratings.

Having described the origins of Empathy as a H-PC and presented the definition and rating scale used by researchers in this field, the next section explores the assumptions this research stream makes about the nature of Empathy.

3. H-PC assumptions about the nature of empathy

In H-PC research, Empathy is considered an interpersonal skill that enables individuals to comprehend accurately the conceptions of others; to see the inner and outer worlds of another, or some aspect of them, 'through that person's eyes'. The perceptions of others, it is assumed, may be very different to one's own, so comprehension requires considerable empathetic skill. That skill includes being non-evaluative for two reasons at least. First, evaluation involves the imposition of one's own judgements on the perceptions of another, which makes accurately understanding those perceptions extremely difficult, if not impossible. Second, when people experience evaluation, whether it be verbal or non-verbal, they tend to stop sharing their perceptions, which defeats the purpose of using Empathy.

Underpinning Empathy is a second H-PC research assumption: that individuals perceive themselves and their environment through the conceptual schemata they have created using cognitive processes that may function unconsciously. H-PC research is grounded in Behavioral Complexity Theory (Cockerill & Satish [21]), so it emphasizes two structural cognitive processes: differentiation and integration. Differentiation refers to the number of conceptual dimensions a person uses, whilst integration refers to the way dimensions are brought together to produce an outcome (such as an attitude, vision, goal, decision or plan). Whilst cultural socialization results in shared constructs, the distinctive cognitive processing (and experience) of every individual gives them unique conceptualisations, which must be elicited using Empathy if they are to be understood by another.

Lastly, H-PC research assumes that the unique perceptions of others may be valuable; for example, they may provide new solutions, stimulate creativity and innovation, enable better forecasting, or help mutually beneficial alliances to be forged. In essence, the use of Empathy expands the cognitive space and resources leaders are using, which provides a greater potential for synergistic value creation. By leveraging this value potential, empathetic leaders increase organisational performance. In essence, Empathy is an H-PC because it creates superior outcomes by expanding the cognitive space and resources used by leaders.

4. Empathy's interaction with the other H-PC's

Whilst the confirmatory factor analyses of Chorvat [22] and Guenole et al. [23] indicate the 11 H-PC are independent behavioural dimensions, exploratory factor analysis and real-world experience show that structural and valuable relationships exist between the HP-C. This section explores the relations most applicable to Empathy.

4.1 Empathy's relationship with the Developmental and Directional factors

At the highest level, as discussed above, the 11 H-PC can be separated into the Task and People domains; the former includes 5 H-PC that subdivide into Thinking and Achieving factors, whilst the latter contains 6 H-PC that split into the Developmental and Directional factors – see **Table 1**. Empathy, alongside Managing Interaction and Developmental Orientation, loads on the Developmental factor in the People domain. Analysis and experience suggest the Developmental and Directional factors constitute two different and fundamental styles of interpersonal interaction that build leadership effectiveness in distinctive ways.

The Developmental factor enables leaders to function in a democratic and nurturing way. Using this factor leaders build teams, help people to learn and grow and expand the cognitive space being utilized by encouraging others to share and understand each other's perspectives. The Developmental behaviours are highly demanded in organically designed organizations that require high levels of lateral integration and co-operation (Burns and Stalker [24]) and in participative situations that seek to foster imagination, creativity and innovation. When used in combination, the Developmental H-PC operationalize the democratic style of leadership.

Using the Directional factor leaders can function in a top-down, charismatic way that uses persuasion, decisiveness, confidence and high-impact presentations to inspire people and align them with pre-determined visions, policies, decisions and plans. The Directional behaviours are highly demanded in mechanistic organizations that require vertical integration and in crisis/emergency situations where clarity, confidence and rapid action are vital. When leaders use the Directional H-PC in combination, they operationalize the autocratic style of leadership.

In sum, Empathy loads on the Developmental H-PC factor, which contrasts with the Directional H-PC factor. These two people-oriented H-PC factors give behavioural expression to the democratic and autocratic leadership styles that have consumed so much attention throughout history and that vie for ascendancy in democracies and dictatorships across the globe today. The former style builds lateral integration in organisations and the former builds vertical integration.

Besides exploring H-PC relationships within factors, it is also useful to consider interactions across factors. For Empathy, the linkages it has with both Conceptual Flexibility and Impact are worth highlighting, as the next section discusses.

4.2 Empathy and conceptual flexibility

Conceptual Flexibility is the skill of keeping different perspectives or options in mind simultaneously and evaluating their pros and cons in a balanced, unbiased way. In complex situations that incorporate multiple, different perspectives, leaders must use Empathy to comprehend those viewpoints and Conceptual Flexibility to keep them in focus simultaneously. Hence, the use of these 2 H-PC in combination

enables leaders to grasp the complexity of multifaceted situations and take decisions that address them holistically. Such decisions have a high probability of success. Leaders who fail to use Empathy and Conceptual Flexibility in combination make incomplete, one-sided analyses and take narrow decisions that are not based on all the viable options. Such decisions can be derailed quickly during the implementation phase when negative, unanticipated factors kick-in; this is particularly the case when neither Empathy nor Conceptual Flexibility have been used. Hence, in real-life, there is normally a stark difference in performance outcomes between using Empathy and Conceptual Flexibility in tandem and not doing so, especially when the stakes are high.

The prevalence of the non-combined approach was highlighted by unpublished research conducted by the author at London Business School. 180 individuals, who held middle management positions in a variety of British-based businesses, participated in a two-hour, six-person, group decision making exercise. The 30 groups attended over a six-month period. In the exercise, the six participants adopted the role of different functional directors in a simulated firm; they were tasked with creating an agreed strategy that would significantly improve firm performance. Having each read a different two-page brief that described issues and potential solutions from the perspective of the function they were representing, the participants interacted as a leadership group for 90 minutes. Interdependencies between functions in the simulated firm meant participants needed to share the salient information contained in their functional perspectives to create optimal solutions. Researchers recorded how much salient information was shared by participants during the group meeting. On average, participants shared just over 20% of the salient information – the range being five to 36%. On no occasion was sufficient information elicited by participants via Empathy for them to build a holistic, optimal solution. Instead of using Empathy and Conceptual Flexibility in combination, participants used the Directional H-PC; they presented and confidently made a persuasive case for their own solution; the lack of conceptual integration meant voting was used in most cases to decide the way forward.

Work shadowing of managers and executives by H-PC researchers and practitioners indicate the simulated results are not unrepresentative of real-life – a conclusion that is supported by the summary H-PC profile presented in **Table 4**. These findings suggests that sizable performance improvements are widely available if leaders learn to use Empathy and Conceptual Flexibility together.

4.3 Empathy and Impact

Impact encompasses skills like the use of persuasive arguments, behaviour modelling, symbols and storytelling to influence others and gain support for ideas, decisions, strategies, plans, visions and values. Leaders skilled in Impact attract resources, build momentum and gain political traction. The use of Empathy with Impact takes leaders to a higher plane of effectiveness. Empathy enables leaders to understand the needs, desires, goals and visions of others; when leaders combine this information with the use of Impact, they forge mutually beneficial win-win alliances that significantly boost organisational performance. Hence, Empathy is vitally important to the many leaders who have Directional strengths because it shifts them away from a narrow, top-down autocratic style to a Socialized Directional style that incorporates multi-faceted coalitions and is better suited to the modern world.

Domain	Factor	Competency	Mean	Std Dev
Task	Thinking	Information Search	3.44	0.38
		Concept Formation	3.44	0.38
		Conceptual Flexibility	2.53	0.39
	Achieving	Proactive Orientation	2.87	0.40
		Achievement Orientation	2.39	0.43
People	Developmental	Empathy	2.73	0.63
		Managing Interaction	2.65	0.51
		Developmental Orientation	2.68	0.43
	Directional	Impact	2.81	0.43
		Self-confidence	2.87	0.31
		Presentation	3.11	0.40

Table 4.
H-PC averages (n = 1632).

In summary, this section has discussed Empathy's location in the H-PC Developmental factor and suggested that this democratically oriented factor contrasts with the autocratically oriented Directional factor. It has been argued that the Developmental and Directional factors provide leaders with two different styles of interpersonal interaction that both have situational benefits and drawbacks. Furthermore, the section has explored how leaders can synergistically use Empathy in combination with other H-PCs to achieve performance gains and to reduce the unilateral, one-sided character of the Directional factor. The next section explores the role Empathy plays in high-performance team development.

## 5. Empathy's role in high-performance team development

The modern world is increasingly characterized by innovation, complexity and dynamism, which raises the need for flexible, organic organisational designs and makes traditional mechanistic designs less relevant. Organic structures require some top-down vertical integration, but they rely most on lateral integration, which occurs within and between organizations. Besides individuals and systems, teams of various sorts (e.g., project, cross-boundary, strategy, quality control, crisis, leadership) build both lateral and vertical integration and their effectiveness contributes significantly to the performance of organic designs. As the previous section described, H-PC research in simulated and real-life organisations indicate that many teams function sub-optimally. To help address this need, Professor H M Schroder and the author designed a high-performance team development (H-PTD) methodology, which trains participants to use a cluster of the H-PC that includes Empathy. Since its creation, H-PTD has been applied in multiple, diverse organisations across the world. This section outlines H-PTD methodology and focuses on the role played by Empathy.

The origins of H-PTD can be traced to Conceptual Systems Theory (see Harvey et al. [25]), which was a forerunner of Behavioral Complexity Theory. In H-PTD, six participants attend a two-day, simulation-based workshop; a trainer describes

the H-PTD process and coaches the participants in the structured use of 4 H-PC: Empathy, Conceptual Flexibility, Managing Interaction and Developmental Orientation (hereafter, these four are called the 'team H-PC cluster').

As **Figure 1** portrays, H-PTD is based on a six-stage process of progression: Externalizing, Sharing, Comprehending, Strategizing, Deciding and Perpetuating. Progression occurs sequentially through the stages because each one is a necessary foundation for the next. In real-life, teams can, and often do, become 'arrested' at a stage, which halts progression, or they can regress from a higher to a lower stage. Progression enhances the collective cognitive and interpersonal functioning of participants. After a review of Stage 1 (Externalizing), this section concentrates on Stage 2 (Sharing) because it heavily demands the use of Empathy.

Stage 1: Externalizing. When individuals join a newly formed team, in either simulated or real-life settings, they bring along a lifetime of experiences gained from their interaction with a variety of institutions (e.g., familial, commercial, governmental, religious and international). Hence, the character of team members has been shaped by the existence and enforcement of external institutional rules – both formal (laws, rules, precedents, procedures etc.) and informal (ethics, values, social norms etc.) (North [26]). H-PTD calls Stage 1 'Externalizing' to reflect the effect environmental institutions have on individuals; to varying degrees, this effect manifests itself in in three ways. First, team members exhibit some degree of external dependency; having been moulded throughout their lives by external institutions, they are keen to discover how formal and informal authority structures affect the team; for example, they seek direction, guidance, advice and resources from authority figures. Second team members tend to be conformist; they veer away from 'rocking the boat' – from challenging or trying the change their institutional environment. Third, team members have hidden agendas; in life, they have learned it is better to keep some ambitions and goals private rather than share them openly with institutional figures. The global application of H-PTD shows externalizing behaviour to be strongest in people who are used to punitive, dictatorial regimes and weakest in people who live in supportive,
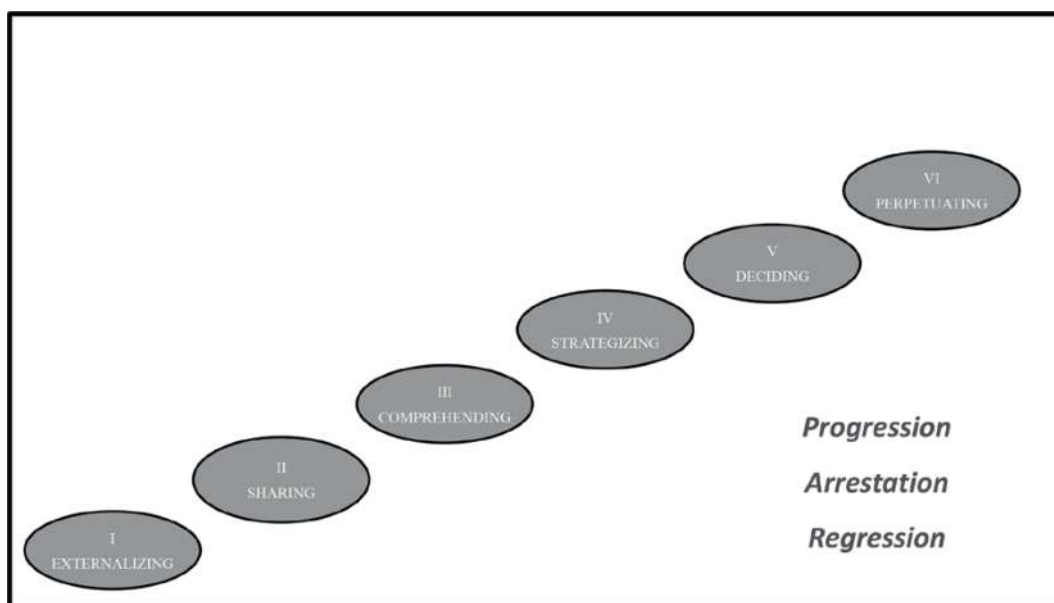
Figure 1.
The stages of high-performance team development.

democratic regimes. Typically, the former individuals find progression through the six stages of team development more challenging so, for them, achieving high team performance is more difficult. Stage 2 of H-PTD guides team members away from Externalizing behaviours and lays the foundations needed for complex analysis and action.

Stage 2: Sharing. In this stage, team members are coached in the use Empathy so they can share and understand each other's perspectives. This requires them to work independently of external authority in a non-conformist way and to become less reliant on hidden agendas by interacting openly with each other.

Workshop participants begin Stage 2 with preparation. The trainer introduces a simulated, multi-functional business organisation; each participant adopts a different functional director role, and the trainer explains they must work together, without the involvement of their boss (the CEO), to devise a way of significantly raising firm performance. The brief of each participant describes problems, issues and potential solutions that are apparent from her/his function's viewpoint. Hence, six functional perspectives exist, which each describe some functional interdependencies, but each participant only knows about the function s/he is representing. Ultimately, the functional interdependencies mean that each participant must understand all six perspectives if an optimal way forward for the firm is to be created. The trainer instructs participants to prepare a short 5-minute verbal presentation that summarizes their functional brief.

With the Stage 2 preparation phase complete, the trainer explains the following empathetic procedure that participants will use to share and comprehend all six functional viewpoints: (i) A team member, randomly selected by the trainer, will verbally present his/her functional viewpoint to the others, who will note the salient points and not interrupt the speaker; (ii) When the presentation is completed, team members can use open, probing and clarificatory questions to ensure they fully understand the presenter's perspective; no evaluations, judgements and criticisms are to be made; (iii) Once the questioning is finished, the trainer will randomly choose one of the team members to summarize the presenter's perspective; (iv) When the summary has been made, the presenter will verbally critique it to ensure it is totally accurate. The team members will modify their notes as necessary to ensure they are comprehensive; and (v) With the first team member's viewpoint shared and accurately noted by all, the procedure will be repeated for the five remaining functional viewpoints.

Before Stage 2 interaction starts, the trainer gives examples of appropriate Empathetic language that participants can use:

- *During the questioning phase:*

  ○ Please repeat the first issue you see facing the firm.

  ○ What factors are causing that issue?

  ○ Could you elaborate on...

  ○ I don't understand your point about...

  ○ Could you clarify...

  ○ Is there anything you could add about...?

- ○ When you say...What do you mean?

- *During the validation phase:*

  - ○ So, what you're saying is...?

  - ○ In other words...?

  - ○ In summary, you think...?

  - ○ Let, me see if I've understood you properly...?

Besides sharing his/her functional viewpoint, each team member, guided by the trainer, facilitates another participant through the Stage 2 process. In this way, each participant contributes a perspective and elicits one from a fellow team member. Facilitation involves giving feedback and coaching, so the Developmental Orientation H-PC is also used and enhanced in Stage 2.

When Stage 2 is complete, each participant understands all the functional perspectives and has used Empathy to strength level. In subsequent H-PTD stages, team members identify the deep, underlying issues that face the simulated firm before they devise and evaluate two holistic strategies to boost firm performance. They then decide the way forward and conduct a risk-reduction exercise to maximize the benefits and minimize the costs of the chosen strategy.

At the end of Stage 2, team members perceive the full range of challenges facing the firm; this conceptually empowers them and reduces their dependence on external authority figures for advice and guidance. In addition, team members begin to realise that conformity will lock the firm into a cycle of underperformance – especially as external institutions and authority figures are acting as negative constraints on the firm. Furthermore, the sharing of functional viewpoints in a non-judgmental way encourages openness and trust, which reduces team members' reliance on hidden agendas.

The movement of a Stage 2 team away from external dependency, conformity and hidden agendas can appear threatening to institutions and authority figures—especially if they are punitive and dictatorial. The threat level is heightened if Stage 2 team members are critical of external authority because they now appreciate the full scale of its constraining effect. For real-life teams, such circumstances mean Stage 2 can be fragile because authority figures are tempted to impose controls on the team to 'get it back into line'. When this occurs, it usually has unintended negative consequences. On the one hand, the team can regress back to Stage 1, which reduces performance and makes any subsequent progression back to Stage 2 more difficult. On the other hand, team members can rebel and try to escape from or overturn external authority – possibly in a revolutionary way. For these counterproductive reasons, there is a strong onus on developmental agents and authority figures to accept, tolerate and support Stage 2 teams and encourage their progression through to the subsequent H-PTD stages where negativity declines and productivity soars.

In summary, the design and worldwide application of the H-PTD methodology has shown that Empathy has a vitally important role to play in building teams that consistently perform beyond normal expectations. Empathy is the bedrock of Stage 2 H-PTD and it plays a vital role in this methodology's subsequent stages. Nevertheless, it is important to recognize that the use of Empathy has consequences that can appear

negative and threatening to institutional regimes especially if they are punitive and/or dictatorial. This suggest that the worldwide development of high performing teams, which innovative, dynamic and complex environments require, would be fostered by a global shift towards supportive and democratic institutions of all types.

6. The importance of developing empathy now and in the future

Four major challenges mean the worldwide demand for Empathy and the other team H-PC is high. This section highlights those challenges and presents data to explore the capacity of leaders to meet them.

First, increasing global innovation, complexity and dynamism heighten the need for organically designed structures that incorporate high levels of lateral integration within and between organisations; this, in turn, challenges leaders to build high-performance teams by using Empathy and the other H-PC in the team cluster.

Heightening global demand for Empathy and the team H-PC cluster derives from another source—economic growth. The research of Schiffbauer and Shen [27] is of interest here. It found that poor but stable nations with dictatorial regimes experience higher economic growth than democratic. However, beyond a threshold income level, the benefits of democratic regimes become apparent, and they outgrow dictatorships. Hence, as global incomes rise, driven mainly by technological innovation (see Rosenberg [28]), the demand for democratic institutions rises, which encourages the spread of organic organisational designs, high-performance teamworking and the team H-PC cluster, which includes Empathy.

Thirdly, the success of the global movement towards realising human potential through greater diversity and inclusion depends, to a significant degree, on the development and use by leaders of Empathy and the other team H-PC behaviours. These H-PC enable diverse viewpoints and capabilities to be fully understood, appreciated and used in multifarious situations and settings. Hence, the diversity and inclusion movement is another worldwide factor increasing the demand for Empathy and the team H-PC.

Empathy and the team H-PC are important from further standpoint. Humanity today is faced with a variety of global, multifaceted and interconnected issues that include climate change, income inequalities within and between nations, pandemics, pollution, and war. These issues can only be resolved through long-term international co-operation which requires leaders to use high levels of Empathy, Conceptual Flexibility, Managing Interaction and Developmental Orientation.

With these four rising demands for the team H-PC cluster in mind, it is helpful to consider the H-PC strengths and limitations of contemporary leaders. Data gathered from a state-of-the-art leadership assessment centre (LAC) over a 20-year period provides an insight into this issue. **Table 4** presents the summary H-PC profile of 1632 LAC participants who worked in a diverse range of public and private sector organisations in the US, Europe and Asia. The data show that Empathy (2.73), Developmental Orientation (2.68), Managing Interaction (2.65) and Conceptual Flexibility (2.53) all had mean ratings below 3.00 (the 'Adequacy' level) and were all rated significantly lower than the three strongest H-PC, which had ratings well above 3.00.

This data provides much food for thought. If representative, it suggests the H-PC that are probably the most needed in modernity are the least developed. Even

if leaders are incentivised to build organic structures and tackle the world's most pressing issues, they may underperform due a lack of competence. Capability rather than motivation may be the fundamental constraint, which implies there should be a fundamental reorientation of leadership development towards Empathy and the other underdeveloped H-PC.

In summary, the need for Empathy both today and in the future appears to be high. Yet LAC data indicate Empathy is underdeveloped, which probably means it is undervalued. Much greater investment in the development of Empathy amongst current and future leaders appears necessary. A policy change that applies equally to the other highly demanded yet underdeveloped team H-PC. Without such a shift in leadership development, leaders will remain ill-prepared for the major worldwide challenges they face.

7. Conclusions

Empathy has consistently been identified as an important leadership behaviour since systematic empirical studies began in the 1940's. Two meta-analyses show that leaders who use Empathy are more effective. The H-PC research stream has contributed a definition of Empathy, a five-point behaviourally anchored rating scale, and a reliable assessor training methodology. State-of-the-art ratings of observed leadership behaviour by certified H-PC assessors show significant positive correlations between Empathy and criterion measures. All these efforts support a strong ongoing focus on Empathy in leadership research and development.

Empathy is one of several H-PC that help build and maintain lateral integration in organically designed organisational structures; these flatter and more participative structures are made essential by increasing environmental innovation, dynamism and complexity and they find most support in democratic regimes.

When used in combination with the other Developmental H-PC (Managing Interaction and Developmental Orientation), Empathy operationalizes a democratic leadership style that contrasts with the more autocratically oriented Directional H-PC factor. The Developmental and Directional clusters are the two fundamental ways that leaders interpersonally interact with others. The former are is demanded most by organic structures and situations requiring creativity, imagination and innovation; the latter by mechanistic structures and crises/emergencies.

Leaders can gain much by using Empathy in conjunction with H-PC from the other factors. When combined with Conceptual Flexibility, Empathy enables leaders to grasp the complexity of multifaceted situations and take holistic decisions. When combined with Impact, Empathy permits leaders to build win-win alliances and to socialize the Directional H-PC factor, so it has greater relevance to modernity.

Empathy is vital to high performing teams, which have never been in greater demand. In the H-PTD methodology, Empathy is the core Stage 2 behaviour; it enables participants to share and understand multiple perspectives, which provides an essential stepping-stone towards superior team effectiveness.

The rise of organic organisational designs, the growing importance of democratic institutions to global economic growth, the diversity and inclusion movement and the major challenges facing humanity all indicate that the team H-PC cluster in general, and Empathy in particular, should receive greater developmental investment—especially as those H-PC seem undervalued and underdeveloped at present. Unless a

fundamental reorientation of leadership development occurs, there is a strong likelihood that leaders will remain ill-prepared, innovation and economic growth will stay sub-optimal, human potential will continue to be underpotentialised and humanity's biggest challenges will remain unresolved.
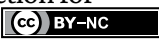
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References

[1] Xenophon. Translated by Ambler W.The Education of Cyrus – Agora Editions. Cornell University Press; 2001

[2] Suetonius Tranquillus, G. Translated by Osgood J. How to be a Bad Emperor. An ancient guide to Truly Terrible Leaders. eBook. 2020

[3] Bales RF. Interaction Process Analysis: A Method for the Study of Small Groups. Cambridge, MA: Addison-Wesley; 1949

[4] Hemphill JK. Leader Behavior Description. Columbus: Ohio State University, Personnel Research Board; 1950

[5] Likert R. New Patterns of Management. McGraw-Hill; 1961

[6] Stogdill RM. Manual for the Leadership Behavior Description questionnaire – Form XII. Fisher College of Business. Ohio State University; 1963

[7] Fleishman EA, Hunt JG. Twenty years of consideration and structure. Current developments in the study of leadership: A centennial event symposium held at Southern Illinois University at Carbondale. Southern Illinois University Press. 1973;**1**:13-26

[8] Judge TA, Piccolo RF, Ilies R. The forgotten ones? The validity of consideration and initiating structure in leadership research. Journal of Applied Psychology. 2004;**89**(1):36-51. DOI: 10.1037/ 0021-9010.89.1.36

[9] House RJ. A 1976 theory of charismatic leadership. In: Hunt JG, Larsen LL, editors. Leadership: The Cutting Edge. Southern Illinois University Press; 1977. pp. 189-207

[10] Burns JM. Leadership. Harper & Row; 1978

[11] Bass BM. Leadership and Performance beyond Expectations. The Free Press; 1985

[12] Judge TA, Piccolo RF. Transformational and transactional leadership: A meta-analytic test of their relative validity. Journal of Applied Psychology. 2004;**89**(5):755-768. DOI: https://doi.org/10.1037/0021-9010.89.5.755

[13] Schroder HM, Driver MJ, Streufert S. Human Information Processing: Individuals and Groups Functioning in Complex Social Situations. Holt, Rinehart and Winston; 1967

[14] Streufert S, Swezey RW. Complexity, Managers, and Organizations. Academic Press; 1986

[15] Streufert S, Pogash R, Piasecki M. Simulation-based assessment of managerial competence: Reliability and validity. Personnel Psychology. 1988;**41**(3):537-557. DOI: 10.1111/j.17446570.1988. tb00643.x

[16] Tetlock PE, Peterson RS, Berry JM. Flattering and un- flattering personality portraits of integratively simple and complex managers. Journal of Personality and Social Psychology. 1993;**64**(3):500-511. DOI: 10.1037/0022-3514.64.3.500

[17] Suedfeld P, Tetlock P. Integrative complexity of communications in international crises. Journal of Conflict Resolution. 1977;**21**:169-184. DOI: 10.1177/002200277702100108

[18] Boyatzis RE. The Competent Manager: A Model for Effective Performance. John Wiley & Sons; 1982

[19] Schroder HM. Managerial Competence: The Key to Excellence – A New Strategy for Management Development in the Information Age. Kendall/Hunt Publishing Company; 1989

[20] Cockerill AP. Managerial Competence as a Determinant of Organisational Performance (Unpublished Doctoral Dissertation). London Business School; 1989

[21] Cockerill AP, Satish A. Behavioral complexity theory: Seven decades and beyond. Journal of Applied Social Psychology. 2021;**51**:1151-1155. DOI: 10.1111/jasp.12838

[22] Chorvat VP. Toward the Construct Validity of Assessment Centre Leadership Dimensions: A Multitrait-Multimethod Investigation, Using Confirmatory Factor Analysis. University of South Florida; 1993. Unpublished doctoral dissertation

[23] Guenole N, Chernyshenko O, Stark S, Cockerill AP, Drasgow F. More than a mirage: A large-scale assessment Centre with more dimension variance than exercise variance. Journal of Occupational and Organizational Psychology. 2013;**86**:5-21. DOI: 10.1111/j.20448325.2012.02063.x

[24] Burns T, Stalker GW. The Management of Innovation. Tavistock Publications; 1961

[25] Harvey OJ, Hunt DE, Schroder HM. Conceptual Systems and Personality Organization. Wiley; 1961

[26] North DC. Institutions. Journal of Economic Perspectives. 1991;**5**(1):97-112

[27] Schiffbauer M, Shen L. Democracy vs. dictatorship. Comparing the evolution of economic growth under two regimes. The Economics of Transition. 2010;**18**(1):59-90

[28] Rosenberg N. Innovation and Economic Growth. OECD; 2004

The Development of an Empathy Curriculum (Empathy in Health) for Healthcare Students Using VR Technology

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Abstract

Empathy in Health is an Erasmus + funded project, which aims to design a curriculum for empathetic skill development in healthcare practitioners and home carers based on up-to-date evidence and cutting-edge technology tools. A literature review was carried out that focused on empathy in health care using VR technology. The results of the literature review helped develop a focus group guide for the purposes of the qualitative part of the need assessment exercise. The data from the focus groups were transcribed and analysed using the methodology of content analysis. The themes that emerged from the analysis of the focus groups' data lent themselves to three major working areas. These informed the development of the qualification framework, which in turn informed the development of the detailed curriculum. The Empathy in Health curriculum involves 21-hour classroom teaching, 3-hour Asynchronous Electronic Learning and 6-hour Directed Self Learning for graduate students or final year undergraduate students or Health Care Professionals. The curriculum covers understanding empathy and competencies necessary for empathy, understanding empathy in relationships and information exchanges in different health care contexts/environments, showing empathy in diverse environments and overcoming barriers/challenges to empathy.

Keywords: empathy, virtual reality, medical students, midwifery students, physiotherapy students, patient-centeredness, burnout, cultural diversity, communication skills, educational videos, role-plays, focus groups

1. Introduction

The empathetic abilities of healthcare professionals are central to achieving the best patient outcomes in all fields of medicine, in physiotherapy, and midwifery. Next to being closely linked to treatment success and outcomes, the quality of provider interaction strongly affects how patients experience their treatment and their overall hospital stay. Patients highlight that empathetic communication is essential to their experience of respectful care, but they frequently experience dissatisfying or even disrespectful communication with their healthcare/home-care providers [1, 2]. Empathetic communication between health care provider and patient is key to facilitating shared decision making and negotiation around medical options and alternatives [3], which is an important factor for reducing healthcare costs as shared decision making can reduce unnecessary procedures or re-admission to hospital [4].

Whilst the relationship between healthcare providers and patients ideally is characterized by a partnership that facilitates patients' informed decision making and also by reciprocity in the interactions. It is important to emphasize that ultimately it is the healthcare providers who are responsible and accountable for the quality of their communication with their patients.

Research suggests that student empathy can decline during their educational years [5, 6]. Scarcity of practice placements is a challenge in many healthcare educational settings and may leave students with limited experience with communicating with patients in a particular setting, contributing to difficulty in empathizing with their patients. Targeted activities have been found to enhance and sustain healthcare students' empathy [7]. It is thus of high importance to offer training and practice to healthcare students that assists them in identifying opportunities to express and communicate empathy when providing care.

2. The aim of the empathy in health project

Empathy in health is an Erasmus + funded project which aims to design a curriculum for empathetic skills development in healthcare practitioners and home-carers based on up-to-date evidence and cutting-edge technology tools. To carry out the project, a consortium was established that included the following partners: Mediterranean Management Learning (MMC), University of Nicosia Medical School, Charite University Medicine Berlin (previously Protestant University of Applied Science Berlin), University of Thessaly Physiotherapy Department, Department of Health Sciences Research Group Organization, Policy and Social Inequalities in Healthcare (OPIH), Vrije Universiteit Brussel, Omega Technology, and Cyprus Certification Company.

The objective of this research project has been to develop a certified three-day curriculum that will use a skills-based approach, educational videos, role-plays, and virtual reality scenarios to teach and empower healthcare students and home-carers to develop their empathetic skills during their encounters with patients and their carers and also their colleagues while avoiding burnout.

The aim of this curriculum is, therefore, to inform and train undergraduate and graduate healthcare students who will be future healthcare professionals with the necessary knowledge, skills, and competencies in developing and maintaining empathetic interactions. The project's task was to develop two different qualification

frameworks: one for higher education students (EQF7) and one for home-carers (EQF5). In this chapter, we will focus only on the training for higher education (EQF7).

3. Methodology

3.1 Literature review

Each partner carried out a literature review that focused on empathy in healthcare using VR technology in their respective fields of education.

The search engines that were used include Embase, Medline (PubMed), PsychInfo, CINAHL, Scopus, and Web of Science.

The results of the literature review were used to develop the theoretical framework of the project. The selected studies were divided into five subcategories:

- Conceptualization of empathy,

- Measurement of empathy,

- Training and education,

- Virtual reality,

- Interprofessional empathy.

3.2 Focus group guide

A focus group guide was developed for the purposes of the qualitative part of the needs.

Assessment exercise: It provided specific information to the focus group facilitators on how to run.

The focus groups: It also included information on the logistics (duration, number of participants, documentation) of the focus groups, and more importantly on the flow of questions and the probes to be used in order to get the necessary qualitative information (**Table 1**).

3.3 Focus groups

The objective of the focus groups' was to investigate and describe the needs for achieving an effective empathetic consultation and interaction between the healthcare professionals and the patients. In addition, it aimed to inform the development of the necessary learning outcomes for the qualification framework and the different VR scenarios.

The methodological aspects of conducting focus groups were discussed by all partners and agreed upon by the core academic group of the participating academic institutions.

Each partner carried out focus groups with healthcare professionals and patients related to their area of expertise and practice.

Questions for the focus groups with healthcare professionals	Questions for the focus groups with patients
Q1. What comes to your mind when you hear the word empathy?	Q1. What comes to your mind when you hear the word empathy?
Q2. Why do you think empathy is important in your profession or future profession? Why do you need empathy in the healthcare sector?	Q2. Why do you think empathy is important in the healthcare sector?
Q3. Can you provide examples of empathetic behaviors that you have witnessed in your everyday practice?	Q3. Can you provide examples of empathetic behaviors that you have experienced in the context of your healthcare
Q4. Can you provide examples of non- empathetic behaviors that you have witnessed in your everyday practice?	Q4. Can you provide examples of non-empathetic behaviors that you have experienced in the context of your healthcare?
Q5. What makes it difficult for you to be empathetic? What are the barriers?	Q5. What could prevent a health care professional from being empathetic?
Q6. What makes it easier for you to be empathetic?	Q6. What could make it easier for a healthcare professional to be empathetic?
Q7. What should an empathetic interaction look like in healthcare (taking into consideration the examples you have discussed above)?	Q7. What should an empathetic interaction look like in health care (taking into consideration the examples you have discussed above)?
Q8. Do you feel that the training that you had at the university has prepared you for empathetic interactions? What were the gaps in education? What else would you like to learn?	Q8. What do you think we should teach healthcare professionals in terms of empathy?
Q9. Let us go back and look at what came up at the beginning and add	Q9. Let us go back and look at what came up at the beginning and add
Q10. Anything you would like to add?	Q10. Anything you would like to add?

Table 1.
Focus groups' questions.

3.4 Qualitative analysis of focus groups

The data from the focus groups were transcribed and analyzed by at least two researchers per academic institution. The consortium applied the methodology of content analysis by Erlingsson & Brysiewicz [8]. More specifically, two researchers from each academic institution performed the following steps independently:

- Summarized the data initially to identify meaning units, condensed meaning units, and codes.

- Merged and refined categories.

- Identified themes.

Following the above steps, researchers had two options for checking categories and themes for appropriateness and consistency of coding and the naming of categories:

1. The same two researchers checked each-other's categories and themes.

2. A third researcher checked the categories and themes of the two researchers.

Disagreements in coding were discussed until all coders agreed and a final list of themes was produced.

3.5 Results

The table below outlines the number of focus groups each partner carried out and the mode of delivery of focus groups. The original intention was to carry out the focus groups face-to-face, but due to the Covid-19 pandemic, some partners had to resort to online mode. Overall, four focus groups with healthcare professionals and four focus groups with patients took place in order to develop the training for higher education (EQF7) (**Table 2**).

3.6 Themes that emerged from focus groups

The themes that emerged from the analysis of the focus groups' data lent themselves to three major working areas and are summarized below. These informed

Partner	Number of focus groups	Number of participants in each focus group	Mode of focus group delivery
University of Nicosia Medical School	1. One focus group with healthcare professionals with a background in medicine and medical students. 2. One focus group with patients and patient representatives.	1. Participants: 6 medical doctors/ 5 medical students –total 11 2. Participants: 9 patients and 2 NGO representatives –total 11	1. Online using Microsoft Teams Recorded
University of Thessaly Physiotherapy Department	1. One focus group with healthcare professionals with a background in physiotherapy. 2. One focus group with patients.	1. Participants: 3 clinical physiotherapists, 2 academics, 2 undergraduate students-total 7 2. Participants: 6 patients, 2 NGOs-total 8	Face-to-face Notes, voice recording
Protestant University of Applied Science Berlin (later Charite University Medicine)	1. One focus group with midwives/ midwifery students. 2. One focus group with women who have given birth within the last 10 months.	1. Participants:7 midwives from different clinics/1 student midwife, total 8. 2. 10 women	Face-to-face Recorded
Vrije Universiteit Brussel	1. One focus group with healthcare professionals. 2. One focus group with patients, oncology patients or ex-patients (max. 3 years after completing treatment) and individuals who were associated with patient association or NGO.	1. Participants: 6 healthcare 2. Participants: 4 patients, 3 ex-patients, 2 participants active in-patient associations - total 9.	Online using Zoom Recorded

Table 2.
Number of focus groups, participants, and mode of focus group delivery.

Themes	Categories
Work Area 1: General overview of empathy	1.1: Understanding empathy and competencies necessary for empathy.
Work Area 2: Empathy in relationships and information exchanges in different healthcare contexts/environments.	2.1: Understanding empathy in relationships and information exchanges in different healthcare contexts/environments.
Work Area 3: Showing empathy in diverse environments and overcoming barriers/challenges to empathy.	3.1: Showing empathy in diverse environments. 3.2: Challenges to empathy in healthcare and how to overcome these.

Table 3.
Themes that emerged from focus groups.

the development of the *qualification framework*, which is presented in detail in Appendix 1, which in turn informed the development of the detailed curriculum (**Table 3**).

4. Development of the empathy in health curriculum

4.1 A curriculum at EQF Level 7

This curriculum is based on the European Qualification Framework (EQF). The EQF is an 8-level framework based on learning outcomes. It is designed for all types of qualifications and serves as a translation tool between different national qualification frameworks. The main purpose of the EQF is to make qualifications more readable and understandable across countries and systems. This is important to support cross-border mobility of learners and workers and lifelong learning across Europe (see Description of the eight EQF levels).

More specifically, the curriculum is designed for Level 7 of the EQF. This means that the learning outcomes focus on students in the second cycle of higher education. This cycle typically finishes with a qualification labeled "Master" and is obtained after the successful completion of a study program with 60–120 ECTS credits. https://www.ehea.info/page-three-cycle-system.

Table 4 provides information regarding the curriculum at a glance.

4.2 The aim of the training program

Empathy is the key to effective communication between patients and health carers [9] and has been shown to positively affect health outcomes and patient satisfaction but also improve patient safety [10]. Communicating with patients is the most frequently used procedure by healthcare providers, however, communication skills training in undergraduate healthcare programs is variable and assessment of interpersonal competencies often neither reliable nor consistent [11].

The training program "Empathy in Health" aims to fill this gap in healthcare education. The focus of the program is to enable students to communicate empathetically with patients, families, and colleagues in different situations and to identify challenges and barriers to their empathetic capacities, including burnout and stress. The program is aiming to enable students to:

Total workload (30 h)	• 21 h classroom teaching • 03 h asynchronous electronic learning • 06 h directed self learning
Prerequisites for participants/target group	• Graduate students or • Final year undergraduate students or • Healthcare professionals
Working Areas/course structure	• Understanding empathy and competencies necessary for empathy (10 h) • Understanding empathy in relationships and information exchanges in different healthcare contexts/environments (10 h) • Showing empathy in diverse environments and overcoming barriers/challenges to empathy (10 h)
Training methods	• Classroom-teaching • asynchronous electronic learning • Directed self-learning
Training techniques	• Lecture • Role-play • VR videos • Educational videos
Degree	Certificate and/or 1 ECTS granted
Background reading and references	These are provided in the tutor guides

Table 4.
The curriculum at a glance.

- Understand the theory and significance of empathy in healthcare.

- Be empathetic in relationships in different healthcare contexts with a focus on enabling empathetic information exchanges.

- Show empathy in diverse environments and be able to overcome common barriers and challenges to empathy in healthcare.

4.3 Target groups

The program addresses students of midwifery, physiotherapy, and medicine. Ideally, undergraduate students in their last year and already practicing professionals enrolled in master's studies should be encouraged to participate in the training program.

It is suggested that the students participating in this training program should already have *some* exposure to/experience in patient-care in their healthcare profession. Having profession-specific knowledge and technical skills are considered to be an important prerequisite to be able to work on empathetic competence and understand concepts to improve healthcare structures to be supportive of empathetic-care provision.

However, it is also considered important to strengthen empathy in the target group *before* they finish their studies, so they enter the workforce with this important set of knowledge, skills, and competencies related to empathetic care. This should increase their ability to relate with empathy to their patients, colleagues, and themselves, increasing patient satisfaction, the quality of their care as well as their own work satisfaction. The influx of young professionals who have received special training for maintaining and expanding their empathetic skills will increase awareness of the

importance of empathy in healthcare provision and is expected to have a positive effect beyond the individual interactions on the culture in the relevant healthcare settings.

4.4 Working areas

The first part of the curriculum focuses on enabling students to understand the theory and research behind empathy, as well as the competencies necessary for building and maintaining empathetic communication through the use of interactive learning activities and constructive feedback.

In the second part of the curriculum, empathy in relationships and information exchanges in different healthcare contexts/environments are being elaborated. The curriculum focuses on the skills necessary to develop a relationship that fosters and nurtures empathy and trust and to enhance patient-centred information exchanges.

A subsequent part of the current curriculum deals with the importance of cultural competence in patients and working with colleagues from various cultural and social backgrounds. Cultural competence is a critical core component of health professionals and should be considered as a part of "best practice" in providing empathetic patient-care. Achieving cultural competence is a process that is cultivated within the individual through the acquisition of knowledge, attitudes, skills and behaviors specific to culture, language, and communication.

The last part of the curriculum focuses on enabling students to understand the complex relationship between empathy and burnout in healthcare. In response to high levels of burnout in the healthcare professions which can affect professionals' empathetic abilities, as well as affect their mental and emotional health and retention, the curriculum aims to enable students to apply methods that prevent or alleviate symptoms of burnout.

4.5 Training methodology

The course is taught in a modular structure using work areas that have been derived from initial research conducted in the project.

Each working area focuses on *one important aspect of empathy in health care*. Starting with a general introduction to empathy the students then deepen their competencies by focussing on empathetic communication and dealing with intercultural situations and threats to empathetic behavior.

With an emphasis on practical exercises that are facilitated using virtual reality techniques or role-plays, the participants experience their competence in empathy directly and receive feedback from their peers – this enables them to work on improving their empathetic abilities individually or in groups.

Knowledge is transmitted in classroom teaching via lecture and by instructing students to perform interactive exercises in pairs or triads to foster learning and practice the aimed skills. The classroom structure has been chosen because of the social aspect of empathy and the importance of nonverbal and verbal communication which is difficult to realize in a digital environment.

Congruent with the concept of a flipped classroom where theoretical aspects are first taught via asynchronous electronic learning and then discussed and practiced in the classroom. Asynchronous electronic learning in this course is used to underline the importance of empathy and motivate the students before the course starts. It is also used to assess the competencies acquired during the course by assessing exchange between peers, self-reflection, and a knowledge quiz.

Directed self learning enables the students to deepen their knowledge and conduct their own learning path. A selection of articles and books is provided, but the student is also free to do her/his own research and connect to the learning community.

Using a workload corresponding to 1 ECTS allows the integration of the program in different study programs of health professions more easily and makes it available to a broader audience. It can also be integrated as a training course in the context of lifelong learning activities.

4.6 Classroom teaching

In this course, classroom teaching has been chosen to enable students to practice their empathetic and communicative competencies with peers and the teacher via role-plays and virtual reality exercises right after a theoretical input. The classroom teaching focuses on the theory-practice transfer right away.

Theoretical content is presented using PowerPoint presentations. Following this using self-reflection exercises, group work, and experiential exercises (role-play and VR) the tutor assures that students are able to translate theory and knowledge into skills that are directly transferable to their professions. In other words, the students achieve the desired learning outcome, which is to act empathetically in their profession.

4.7 Asynchronous electronic learning

Asynchronous electronic learning describes the possibility of initiating targeted learning processes in virtual learning spaces by means of digital media, alone or in groups, synchronously or asynchronously. Access takes place online and is linked to the possibility of communicating with teachers and other learners [12].

In this course, an online learning platform provides learning content, precise exercises to prepare for classroom teaching, and the possibility to communicate with peers and teachers.

4.8 Directed self-learning

In directed self-learning students direct their own learning process to achieve the competencies of their learning project. However, it does not mean they need to realize it alone, directed self-learning can also include consultation of peers and the creation of learning networks, for example, a community of practice. This course encourages directed self-learning by providing learning content and the possibility of exchange. Altogether, 6 hours of directed self-learning are suggested.

As part of their directed self-learning students will need to engage with the literature that is provided on the online platform.

5. Training techniques

5.1 Lecture

The lecturers use a PowerPoint presentation to build a knowledge base in the three working areas (WAs).

5.2 Role-play

A role-play is used in each working area (WA) to encourage students to practice learned skills in a group, and to give and receive feedback on their empathetic behavior. The role-plays are focussing on the following:

1. Assessment and pain management in pregnant clients with a language barrier. Meeting the woman and her husband at the entry door of the birthing suite.

2. Assessing risk/performing triage when communication is difficult, cultural diversity. Newborn with weight gain challenges: sharing information and communicating risk.

3. Shared decision-making/communicating risk with a woman in the postpartum ward. Communicating risk to a client who wishes to leave the hospital against medical advice.

4. Elderly patient after hip replacement: Communicating with the angry patient after hip replacement.

5. Information gathering and giving and shared decision making with an adolescent with type I diabetes not complying with treatment.

5.3 VR videos

Three VR videos are used to enable students to practice empathy-related skills in the following areas:

1. Provision of woman-centered care during labor and birth supporting the woman to find the best way to cope with labor pain.

2. Young patient with chronic musculoskeletal pain and somatization: exploring patient's concerns and shared decision making with patient and family.

3. Young person with new diagnosis of cancer: The process of sharing bad news with a young person with a new diagnosis of cancer and overcoming social and environmental barriers to empathy.

5.4 Educational videos

In addition, educational videos are used in each working area (WA) to encourage students to practice learned skills in a group and to give and receive feedback on their empathetic behavior. The educational videos are focussing on the following:

1. Registration for birth and discussing the birth plan with the recently migrated client. Providing woman-centered care, shared decision-making, and cultural diversity.

2. Empathy and cultural diversity: Immigrant patient with a lung infection, working with an interpreter.

3. Medical consultation: An obese middle-aged patient with high cardiovascular risk (several risk factors). Communicating risk and practicing motivational interviewing techniques.

5.5 Tutor guides

For each work area, there are detailed tutor guides that will be freely available to the scientific community through our dedicated project website:
https://empathy.projectsgallery.eu/?fbclid=IwAR0ml6iunM8GB34HyyA9-FLyUOOuy_DnKG4b0gU7kKmZAepKjn9C0ctR8yH4.

All tutor guides will be available in addition to the English language in Greek, German, and Dutch.

5.6 Curriculum certification

The curriculum is in the process of ISO certification by the Cyprus Certification Company.
https://www.cycert.org.cy/.

5.7 Curriculum evaluation

During the piloting of the curriculum materials, national trainers, students, national tutors, and the certification agency gave their feedback on what worked well and which areas needed improvement. The curriculum went through different phases of revision in order to reach its finalization.

In order to assess any differences in our student's practice, the Jefferson Scale of Physician Empathy (Student Versions) [13].

A. Appendix 1: Qualification framework

Work Area Id	*1*		
Work Area	*General Overview of Empathy*		
Unit	1.1 Understanding empathy and competencies necessary for empathy		
Learning outcomes correspond to EQF	Level 7		
Learning outcomes			
Knowledge	Skills		Competencies
He/she is able to	*He/she is able to*		*He/she is able to*
1. List three different types of empathy (Affective, Cognitive, Prosocial) 2. Describe the different psychological approaches when researching empathy 3. Outline relevant research findings in relation to empathy in different health care settings (e.g. medicine, midwifery,	6. Self-reflect and self-assess his/her level or lack of empathy in daily life *Use evidence-based techniques as listed below to develop empathy during initiating a session with patients and gathering information:* 7. Demonstrate genuine interest and respect for the other party 8. Demonstrate active listening		18. Evaluate the feedback from colleagues and simulated patients on his/her level of empathy and ways of improving 19. Adapt his/her empathetic behaviour to the patient's and other health carer's needs

physiotherapy) 4. List the qualities/ competencies necessary for empathy according to published consensus statements [14] 5. Define the qualities/ competencies necessary for empathy according to published consensus statements [14, 15]	9. Use verbal and non-verbal cues in a way that facilitates/reinforces empathy 10. Use appropriate questioning techniques 11. Use clarifying techniques 12. Demonstrate sign-posting 13. Use summarizing techniques 14. Elicit patient's Ideas, Concerns, Expectations (ICE) 15. Recognise, Acknowledge and validate patient's concerns, feelings (RAV) 16. Provide support demonstrating empathy while doing so by expressing concern, understanding, willingness to help; acknowledging coping efforts and appropriate self-care; 17. Deal sensitively with delicate issues

Work Area ID	2
Work Area	*Empathy in relationships and information exchanges in different health care contexts/environments*
Unit	2.1 Understanding empathy in relationships and information exchanges in different health care contexts/environments
Learning outcomes correspond to EQF	Level 7
Learning outcomes	

Knowledge	Skills	Competencies
He/she is able to	*He/she is able to*	*He/she is able to*
20. Define patient-centred relationships 21. Describe the characteristics of a relationship that fosters and nurtures empathy and trust 22. Outline relevant research evidence on the importance of empathetic/patient-centred relationships on patient outcomes in the different health care contexts/ environments (in this part partners could focus on contexts relevant to the scenarios they developed)	24. Self-reflect and self-assess his/her level or lack of empathy in relationships and information exchanges in daily life. *Use evidence-based techniques as listed below to develop empathy during information exchanges (e.g. in obstetric and gynaecology, when sharing bad news, when caring for patients with dementia and mental health issues, etc) with patients and other health care professionals:* 25. Share his/her thinking with other party 26. Explain rationale for questions or parts of physical examination 27. Assess patient's starting point 28. Chunk and check: give information in small bites and checks for understanding by using the patient's responses as a guide to how to proceed 29. Screen: ask patient what other information would be helpful 30. Organize explanation by dividing it into discrete sections that follow a logical sequence 31. Use signposting: (e.g. There are three important things that I would like to discuss. First … . Now we move on to … ., etc.) 32. Use appropriate language without jargon	40. Evaluate the feedback from colleagues, and patients on his/ her level of empathy in relationships and information exchanges and ways of improving

23. Describe the skills necessary during information exchanges according to Calgary/ Cambridge model and refer to USA consensus statement	33. Use visual methods for conveying information 34. Check patient's/other party's understanding 35. Elicit patient's other party's ICE 36. Explore different management options with regards to treatment by ascertaining the level of involvement that patient wishes in making the decision at hand 37. Ascertain level of involvement patient/other party wishes 38. Negotiate mutually acceptable plan 39. Provide forward planning: contract with patient regarding next steps for patient and health carer (e.g. "I will enter in the system the request for your blood tests. You will need to make an appointment with the lab to have the tests done. I will call you when your results come in to discuss what needs to be done.) and Safety netting: Explain what the patient should do if things do not go according to plan

Work Area ID	3
Work Area	*Showing empathy in diverse environments and overcoming barriers/ Challenges to empathy*
Unit	3.1 Showing empathy in diverse environments
Learning outcomes correspond to EQF	Level 7
Learning outcomes	

Knowledge	Skills	Competencies
He/she is able to	*He/she is able to*	*He/she is able to*
41. Define cultural competence in multicultural and sociocultural environments and its effects on patient outcomes 42. Outline the different theoretical approaches to cultural competence 43. Outline research evidence on the importance of cultural competence on patient and working with colleagues from various cultural and social background 44. Define Interprofessional Learning (IPL) in undergraduate health care settings 45. Outline research evidence on the effectiveness of (IPL) in undergraduate health care settings	46. Self-reflect and self-assess his/ her level or lack of empathy in daily life in diverse environments. Use evidence-based techniques as listed below to develop empathy during information exchanges with patients and other health care professionals from various cultural and social background: 47. Use interpreters to eliminate linguistic barriers with adverse effects on language 48. Show genuine interest and curiosity for the cultural beliefs of the patient/ colleague 49. Demonstrate avoidance of making assumptions 50. Demonstrate avoidance of stereotyping	52. Evaluate the feedback from colleagues, and patients on his/her level of empathy and ways of improving in culturally diverse environments and with culturally diverse people 53. Adapt his/her empathetic behaviour into the patient's and other health carers' needs from culturally diverse environments

	51. Deal sensitively with issues of sexuality, unease of some physical examinations, use and abuse of alcohol and other substances, etc.

Work Area ID	3
Work Area	*Showing empathy in diverse environments and overcoming barriers/ Challenges to empathy*
Unit	3.2 Challenges to empathy in healthcare and how to overcome these
Learning outcomes correspond to EQF	Level 7
Learning outcomes	

Knowledge	Skills	Competencies
He/she is able to	*He/she is able to*	*He/she is able to*
54. Outline challenges to empathy in health care	58. Use self-reflection to recognise symptoms that he/she might be burnt out	62. Advocate and model self-caring attitudes
55. Define burnout and outline recent research evidence on the relationship between empathy and burnout	59. Use appropriate instruments/resources for testing his/her symptoms of burn-out	63. Increase self-confidence in self-caring under stressful situations
56. Identify and label evidence-based instruments for assessing burnout and stress-related conditions when working in health care	60. Practice techniques to reduce stress and burn-out	64. Model a positive, calm and mindful approach when dealing with stressful situations, e.g., in using emotional regulation and self-reflection
57. Identify and label evidence-based methods for preventing and/or treating burn out	61. Seek appropriate help	

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References

[1] Bernardo MO, Cecilio-Fernandes D, Lima ARA, Silva JF, Ceccato HD, Costa MJ, et al. Investigating the relation between self-assessment and patients' assessments of physicians-in-training empathy: A multicentric, observational, cross-sectional study in three teaching hospitals in Brazil. BMJ Open. 2019;**9**(6): e029356. DOI: 10.1136/bmjopen-2019-029356

[2] Lukasse M, Schroll AM, Karro H, Schei B, Steingrimsdottir T, Van Parys AS. Prevalence of experienced abuse in healthcare and associated obstetric characteristics in six European countries. Acta Obstetricia et Gynecologica Scandinavica. 2015;**94**(5): 508-517

[3] Pattillo RE. How are your "soft skills"? Nurse Educator. 2013;**38**(2):80-80

[4] Veroff D, Marr A, Wennberg DE. Enhanced support for shared decision-making reduced costs of care for patients with preference-sensitive conditions. Health Affairs. 2013;**32**(2): 285-293

[5] Neumann M, Edelhäuser F, Tauschel D, Fischer MR, Wirtz M, Woopen C, et al. Empathy decline and its reasons: A systematic review of studies with medical students and residents. Academic Medicine. 2011;**86**: 996-1009

[6] Ward J, Cody J, Schaal M, Hojat M. The empathy enigma: An empirical study of decline in empathy among undergraduate nursing students. Journal of Professional Nursing. 2012;**28**(1): 34-40. DOI: 10.1016/j. profnurs.2011.10.007

[7] Kelm Z, Womer J, Walter JK, Feudtner C. Interventions to cultivate

physician empathy: A systematic review. BMC Medical Education. 2014; **14**(1):219. DOI: 10.1186/1472-6920-14-219

[8] Erlingsson C, Brysiewicz P. A hands-on guide to doing content analysis. African Journal of Emergency Medicine. 2017;**7**(3):93-99. DOI: 10.1016/j. afjem.2017.08.001

[9] Halpern J. From Detached Concern to Empathy-Humanizing Medical Practice. New York: Oxford University Press; 2001

[10] Derksen F, Bensing J, Lagro-Janssen A. Effectiveness of empathy in general practice: A systematic review. The British Journal of General Practice. 2013; **63**(606):e76-e84. DOI: 10.3399/ bjgp13X660814

[11] Silverman J, Kurtz SM, Draper J. Skills for Communicating with Patients. 3rd ed. London: Radcliffe Publishing; 2013

[12] Arnold P, Kilian L, Thillosen A, Zimmer GM. Handbuch Asynchronous Electronic Learning. Vol. 4965. UTB: Lehren und Lernen mit digitalen Medien; 2018

[13] Fields SK et al. Measuring empathy in healthcare profession students using the Jefferson scale of physician empathy: Health provider–student version. Journal of Interprofessional Care. 2011;**25**(4): 287-293

[14] McCarty T, Wilson B, Sinclair N. A description of the use of a communications skills global rating scale based on the essential elements of communication Kalamazoo Consensus Statement. 2004.

[15] Von Fragstein M, Silverman J, Cushing A, Quilligan S, Salisbury H, Wiskin C, UK Council for Clinical Communication Skills Teaching in Undergraduate Medical Education. UK consensus statement on the content of communication curricula in undergraduate medical education. Medical education. 2008;**42**(11):1100-1107

Edited by Sara Ventura

Empathy - Advanced Research and Applications is a compilation of recent experimental studies and theoretical models on the concept of empathy and its implication in various aspects of social life. The book describes the multifaceted construct of empathy and presents arduous concepts in a fluent and understandable way to reach readers who may not be familiar with the subject. Through this book, readers will understand the importance of empathetic skills and the neurological and psychological mechanisms of empathy. There is even the possibility to learn and improve one's empathetic ability. Empathy is vital for society's wellness and we hope that this book serves as a springboard for future research in the field.

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