Transitional Effects of Occupational Stress Injuries on the Selves of First Responders: a retrospective analysis

Subjectively experienced distress may impact on self-construal and self-efficacy thereby affecting resiliency and the ability to cope with life challenges (Bandura, 1991; Christopher, D'Souza, Peraza, & Dhaliwal, 2010; Gusman, et al., 2002).Public safety personnel (PCP) are often exposed to ten or more potentially traumatic events yearly (Carleton, et al., 2019) with 44.5% screening positive for a mental disorder in one survey of 5,148 PCP(Carleton, et al., 2018).

In this submission, we propose to map the selves of first responders who have experienced occupational stress injuries, with the self defined here as a culturally mediated mental representation embedded in a larger totality including physical, biological, psychological, and social characteristics (Quinn, 2006). These mental representations include both subjectively held elements generally encompassed by the concept of self-construal, and objectively verifiable components as may be present in an autobiographical self (Mischel and Morf, 2003; Robertson, 2010). This research will explore how PSP such as police, firefighters, paramedics, nurses, military personnel, correctional workers and security officers differentially represent experienced occupational stress injuries and the robustness of such change.

Occupational stress injury as used here includes operational stress injuries such as post-traumatic stress disorder (PTSD), acute stress disorder (ASD), major depressive disorder (MDD), panic disorder, and substance use disorders along with stress related injuries not formally represented in diagnostic manuals (Antony, et al., 2020; Garner, Baker, & Hagelgans, 2016). These additional stress-related injuries include vicarious trauma, secondary traumatic stress, compassion fatigue (Figley, 2013; Greinacher, Derezza-Greeven, Herzog, & Nikendei, 2019; Newell & MacNeil, 2010) and moral injury (Smith-MacDonald, et al., 2020; Jinkerson, 2016).It is anticipated that the presence of operational stress injuries or other stress-related conditions will have affected the self in some visually identifiable ways.

The idea that people use culturally mediated mental representations to situate themselves in consciousness is generally accepted with the implication that the resultant "self" consists of units of culture (Donald, 2001; Harre, 1984; Sun, 2017). Having such a culturally mediated self is necessary to engage in forward planning, reflective thought, and social discourse, but unexpected life events may lead to deficits in self-construal with concomitant deficits in social or cognitive functioning (Bridges, 2001; Hubert J. M. Hermans & Hermans-Jansen, 1995; Ishiyama, 1995; Muenchberger, Kendall, & Neal, 2008).This submission proposes to qualitatively examine the effects of those stress injuries on the structure of the self in a sample of volunteers while considering the possibility of long term developmental transitions. This will assist counsellors and psychotherapists working with these populations to better understand definitional changes that may happen to clients experiencing occupational stress injuries along with resiliency factors embedded in the self that may contribute to recovery. Those resiliency factors could be found in self-construal or from other aspects of the self broadly defined to include both conscious and unconscious elements.

Using interconnected elemental units of culture displaying referent, connotative, emotive, and behavioural associations labeled "memes," this study will map the selves of 30 individuals who have experienced occupational stress injuries. A retrospective analysis will be used to estimate changes to the self that occurred due to these injuries, and the selves of these research participants will be mapped again after six months and one year to determine what changes had occurred subsequent to the initial mapping. Maps will be considered to be sufficiently representative when the participant reports "resonance" with the representation defined here as an emotive declaration that the map represents who they are at a feeling level. Such resonance has been obtained after just two sessions (Robertson, 2009; 2010).

Objectives

The purpose of this longitudinal, online, qualitative study is to explore structural changes to the selves of individuals who have experienced occupational stress injuries and to map changes to these selves during their subsequent recovery. In the structural paradigm used here, genetic, cultural, and experiential factors combine to form an implicit representation of the self under which most of us function. Our primary objective then is to make this implicit representation explicit in a sample of volunteers who have experienced occupational stress injuries. Participants and researchers will work collaboratively to identify ways in which their occupational stress injuries affected their self-representation. The memetic map represents their lived experience to be explored qualitatively along with other factors contributing to self-change. The primary research questions flowing from this process include:

1. How do people who have experienced occupational stress injuries manifest that experience in their internal self-representations?
2. What do people who have experienced occupational stress injuries recall was different about their selves before the injury?
3. In cases where difference is noted, are the changes framed as a new development or as the uncovering of something that was always true but previously unknown?
4. Do the changes in self-definition wrought by the occupational stress injuries remain indelibly part of the individual's self, or are they subject to change with time and, if so, in what directions?
5. Is there a visible difference in the self-map presentations between those who have experienced operational stress injuries as opposed to those that may be considered vicarious or secondary?
6. For those who do experience subsequent self-change, what activities do the subjects report that may be associated with such change? Do they experience a feeling of empowerment associated with self-change or do they accept change passively?
7. What resiliency factors do participants report as helping them to cope with occupational stress injuries?
8. For those who experience self-change associated with occupational stress injuries as problematic, does the experience of mapping the self help them to subjectively gain a sense of control over the direction of such change?

A qualitative study suggested combat veterans who had suffered operational stress injuries (Smith-MacDonald, et al., 2020) experienced mental illnesses, social difficulties, moral distress

and a fractured sense of self. This study will be able to provide a visual representation of such selves with the hope that such representations could aid a process of therapy and "de-fragmentation."

A survey of 5,418 public safety personnel (Carleton, et al., 2018) found that persons with a university degree or a 4 year college or higher education certificate were significantly less likely to report past-year suicidal ideations. While the presence of operational stress injuries and mental health concerns generally contribute to suicide ideation (Bilsker, Fogarty, & Wakefield, 2018; Cooper, Lezotte, Jacobellis, & DiGuiseppi, 2006; Elias, et al., 2012), it is possible that post-secondary education contributes to resiliency in public safety personnel in some ways. An objective of this research is to see if such resiliency factors may be identified in self-definition.

Context and Significance

The self maps developed in this study will be co-constructed by psychologists trained in the method of memetic self-map construction (Robertson, 2009, 2011, 2014, 2016) and by the research participants who are considered to be expert in who they are. Evolutionary change occurs to the individual self when memes that were consistent with aspects of the existent self are added to identity or when memes that are no longer consistent with what is felt to be true by the individual are subtracted. Since we expect that the self so conceptualized evolves over time (Epstein, 1994; Harre, 1998; Robertson, 2020), the researchers will be looking for examples of such change with retrospective analysis of past examples of occupational stress injuries, and in a longitudinal review to be completed at six month and one year intervals.

Research participants to this study will be asked to identify any self-change made subsequent to their occupational stress injury they consider to be transitional, defined in this study as occurring perceptively over a demarcated time frame and involving a change in self-definition. Significance, in this sense, is defined by the subjective experience of the individual. Planned transitions occur where the individual decides to be a different person in some ways as may be seen in the practice of psychotherapy (Robertson, 2011, 2014). Unplanned transitions may occur in response to crisis or trauma that tax the adaptive capacities of the individual. This study then is an exploration of the unplanned transitions of at least 30 individuals for evidence of transitions that are in the first instance unplanned but may involved both planned and unplanned later transitions as the individual continued to change. We will also examine how such transitional change has impacted on their anticipated future selves (Cornette, Strauman, Abramson, & Busch, 2009).

In summary, it is expected that this explorational study will map the effect of occupational stress injuries on self representation. The examination of these effects in relation to aspects of the individual's self previously present will allow for the generation of hypotheses with respect to resiliency and self-construction. The longitudinal aspect of this study will inform our understanding of how resiliency may be understood with respect to developmental transitions to the self. The method used to map the selves of participants will be standardized using a software program under development. In addition, the method of mapping the self used here may be used by future researchers interested in how people construct their selves.

The Development of Mapping Software

During this era of the coronavirus pandemic, software construction that allows for the digital co-construction of self-maps will ensure social distancing while allowing for the participation of volunteers from all parts of Canada with internet access. In addition, such software can assist in the standardization of procedures thus reducing the possibility of researcher idiosyncrasy. A prototype of this software program has been developed under the direction of Dr. Qing Tan of Athabasca University and it may be found at: http://meme.zta.mobi:8090/meme.html. It has been trialled by two clinicians experienced in self-mapping with clients. These clinicians made the following recommendations with respect to ensuring its efficacy with clinical populations and these changes are considered necessary in ensuring the suitability of the software to this research:

1. Add client-friendly explanations to the process of developing prioritized self-descriptive lists used to identify memes;
2. Develop a subprogram that preserves the client's words while allowing the researcher or counselor to select a referent word that may used to represent a meme with connotative, emotive and behavioural implications;
3. Add a subprogram for "Meme Definition" with four subheadings: Referent, Connotation, Affect, and Behaviour with the therapist filling in a blank space following each subheading;
4. Extend the window left so that the surface on which we can build the self-map is larger, and so that the memes on the left of the page (which have higher priority) are more easily made central. Making the ovals used to represent memes smaller is also recommended;
5. Create a box or elongated rectangle at the bottom of the self-maps that will allow the therapist or researcher to insert emotive or heritable factors that can trigger behaviours that are not properly part of the participant's cognitive self-definition;
6. Allow for directional arrows distinct from the edges used to connect memes to flow from this "menu" distinctive to clusters of memes thereby replicating how the participant may be unconsciously "triggered:"
7. Make edges connecting memes non-directional;
8. Allow researchers, clinicians and participants to zoom into certain aspects of the map when working on, for example, rumination, while retaining the capacity to "zoom out" so as to look at the map holistically;
9. Ensure that the program works with all common browsers;
10. Generate the capacity to protect each clinician file with a password to ensure confidentiality while allowing researchers appropriate access.

The self-mapping software will be upgraded to fit these specifications within the first three months of the project. This software will be open source to be used by clinicians and researchers alike.

Standardized Procedure for Data Collection

Self-map construction will be standardized through the use of a training manual outlining the self-mapping process, and the development of self-mapping software. This software will allow all self-map co-construction to be done via the internet allowing for participation from any location in Canada with computer access. The use of this software will also ensure social distancing during this period of pandemic. The co-construction of self-maps will occur remotely using digital technology.

Participant generated data will allow for the identification of memes that have connotative, affective and behavioural dimensions. In the variation to be used with this software the clinical researcher asks the participant to list and prioritize their defining roles, attributes, negative attributes, and beliefs(Robertson, 2011, 2016). Each item is examined and given a precise label and those labelled items that meet the definition of the meme are then set and ordered according to the subject's prioritization, shared characteristics or implied narrative order. Supplemental questions or probes are used to gain a fuller and richer self description.

Clinicians will have at least a master's degree in clinical or counselling psychology, and they will have experience working with victims of trauma. These clinicians will receive project-specific training in memetic self-map development including the identification of memes and the examination of memes for connotative, affective and behavioural factors serving to provide linkages. Linked memes showing pathways of thought associated with one's self-identity are shown to produce maps that reflect a cognitivist orientation, but the researchers will also need to have an understanding of non-cognitive factors such as personality and heritable factors that can influence or animate the self. The following procedure will be used in self-map construction:

1. Research clinicians will be given training on using the software in memetic self-mapping, and they will be given a secure password to use with the software with that password known only to the clinician responsible for map co-construction and the principal investigator;
2. Each research participant will be asked to generate a pseudonym that will be used to label their self-maps and any clinician notes that can be accessed by researchers;
3. Using the software provided, participants will be asked to create four lists of who they are: ten persons that encompass roles, ten things they believe to be true, ten things they like about themselves, ten things they would change about themselves if they could;
4. The participant will be asked to rank order each item on each list from the most important to least important. The clinician and participant co-construct code-names or labels representing each item;
5. The clinician explores connotative, affective and behavioural characteristics associated with each named item with the client. Those items that have all three characteristics are declared to be memes;
6. The clinician and participant then co-construct the memetic map using shared access to prepared digital technology. Memes that have been prioritized as more important by the participant are placed more centrally on their self-map. Memes sharing the same characteristics (connotative, affective or behavioural) are considered linked. Those that

lead behaviourally to other memes are also considered linked and this connection is represented by edges connecting memes;
7. Groups of memes that may act in concert when triggered (as in a script), or may present as a "mini-self" in particular contexts or otherwise present as a group are identified and given a thematic label;
8. The clinicians and participants explore personality characteristics, traumas, illnesses and other predispositions that may trigger meme clusters but are not part of the conscious self represented by memes. These are summarized and placed at the bottom of the self-map with directional edges connecting the base characteristics with associated meme clusters;
9. The self-map is reviewed for participant resonance, that is, the participant subjectively feels the map represents who they are. Each participant is asked to review the map for changes that might increase this feeling of resonance;
10. The clinician explores with the participant how their self was different before the their occupational stress injury and records participant responses;
11. The clinician explores how the participant anticipates his or her self may change in the future and records responses.

This procedure will be repeated again at six month and 12 month intervals.

Selection of Research Participants

Participants to this study will be volunteers who will self-identify as someone who has experienced an occupational stress injury. These volunteers will have responded to an invitation posted on the Canadian Institute for Public Safety and Treatment (https://www.cipsrt-icrtsp.ca/), other such websites aimed at assisting first responders, or will otherwise have responded to an invitation to participate approved by the University of Regina Research Ethics Board. Participants will be recruited only after REB approval is obtained.

The researchers will obtain written informed consent from each participant and provide training for using the software program that will be made available to them. A short, online, demographic survey will be used to provide insight into participant characteristics such as age, gender, and ethnicity.

Data Analysis

As with road maps that may accurately represent an aspect of the physical world, the self-maps described in this research represent a focused condensation of a much larger data set that nonetheless remains formidable. These self-maps focus on the cognitivist terrain while acknowledging, but paying less detailed attention to, non-cognitive factors influencing the self. While this results in a simplified version of the actual terrain, it allows for a functional look at one aspect of being. Graphically representing the huge amount of data remaining in this cognitive self allows researchers to see relationships between various aspects and to look for themes and potential meta-narratives that govern presentation. In this case, researchers will be particularly interested in identifying themes associated with occupational health injuries, and whether these themes, if present, persist.

In collaboration with the individuals affected, researchers will be able to visually discern and describe how occupational health injuries have affected self-representation of those affected at the level of representation offered by the mapping exercise. Either the health injuries experienced by the participants will have become incorporated into their self-representation, or not. If an experience has affected their self-representation, then researchers will determine whether the resultant self-representation debilitating, empowering, or neutral? In part, this question will be implied by participant recollections as to what was different about their selves before their injury.

The third research question posited has to do with the persistence of change related to occupational stress injuries. Even partial changes over the length of this study would speak to the question of whether changes in self-definition wrought by the occupational stress injuries remain indelibly part of the individual's self and how such transitional change may be set against other aspects of the self. While it is accepted that the self, as the concept is used here, is subject to change (Robertson, 2017; Schlossberg, Waters, & Goodman, 1995; Vleioras & Bosma, 2005), questions remain about the permanence and direction of that change. Researchers will be able to review the subject's anticipated developmental changes and will be able to review progress toward such changes at six month intervals.

The fourth research question referenced possible difference in the self-map presentations between those who have experienced operational stress injuries as opposed to those whose experiences are within the broader category of occupational stress injury, but not recognized as mental illness. Secondary trauma, vicarious trauma, compassion fatigue and moral injury would fall within this category. While it will not be possible to definitively answer this research question due to the limitations of the research method used, it will be possible to generate some testable hypotheses grounded in the data.

The final research question about activities associated with developmental change and any feelings of empowerment associated with such activities will be answered by the participants themselves. Researchers will be looking for universality across a diverse sample, or for exceptions that suggest diversity of response, and these responses will be reported in results section of subsequent reports and articles.

While exploratory studies are expected to generate hypotheses, and in this case hypotheses related to the transitional effects of occupational stress injury on the self, qualitative research may also be used to "determine causal relationships by establishing 1) temporal precedence, 2) constant conjunction, 3) contiguity of influence" (Miles & Huberman, 1994 pp. 146, 147). Using this method, researchers may be able to make recommendations informing clinical practise. Such recommendations emerging from the data will, of course, be subject to future testing regarding plausibility, sturdiness and validity.