



UNIVERSITY OF PADOVA

Department of Philosophy, Sociology, Education and Applied Psychology

Master's Degree Course in Clinical, Social and Intercultural Psychology

Final Dissertation

**PSYCHOLOGICAL FLEXIBILITY IN UNACCOMPANIED
REFUGEE MINORS IN CYPRUS - A NETWORK ANALYSIS**

Supervisor

PROFESSOR JOHANN ROLAND KLEINBUB

Candidate: JOHANNES FREYMAN

Student ID Number: 2040703

ACADEMIC YEAR 2023/2024

“Out beyond ideas of wrongdoing and rightdoing, there is a field.

I’ll meet you there.”

- Rumi, A Great Wagon

ABSTRACT

Background: Refugee populations, particularly Unaccompanied Refugee Minors (URM), often report poor levels of mental health. The construct of Psychological Flexibility (PF), derived from Acceptance and Commitment Therapy (ACT), appears to positively impact relevant aspects of mental health in various populations, including adolescents and refugees. **Objectives:** The present study aims to examine the structure of the PF model and the connections among its core processes, alongside the structure and connections between mental health constructs and PF in URM. **Methods:** Mental health and PF in URM (N = 101) aged 13-18 years living in different shelters in the Republic of Cyprus were assessed using the self-report measures DASS-21, Psy-Flex, CRIES-13, and KIDSCREEN-10. A Network Analysis (NA) approach was used to examine the structure and connections of the constructs. **Results:** The PF network showed an overall positive connectedness between the core PF processes, with the strongest edge between committed action and values. These core processes also showed the highest expected influence. The strongest positive connections in the mental health network were found between stress, anxiety, and depression. Stress showed the highest expected influence while PF had the lowest. A post hoc analysis using the Johnson-Neyman method suggested that increased PF decreases the rate of change in anxiety, depression, and stress levels concerning Post-traumatic stress disorder (PTSD) scores. This implies the presence of a buffering effect attributable to PF. **Conclusions:** The present study has significant implications for future clinical practice and research with URM, particularly when using ACT. Promising approaches include addressing stress symptoms and emphasizing the importance of value clarification.

CONTENTS

1 INTRODUCTION	7
1.1 Refugee Situation in the Republic of Cyprus.....	7
1.2 Mental Health of Unaccompanied Refugee Minors.....	8
2 LITERATURE REVIEW	10
2.1 Introduction to Psychological Flexibility.....	10
2.1.1 Definition	10
2.1.2 Philosophical and Theoretical Roots and ACT	11
2.1.3 Related Constructs	12
2.1.4 The Six Core Processes	13
2.1.5 The Connections between the Six Core Processes	16
2.2 Association of Psychological Flexibility with Mental Health	18
2.3 Psychological Flexibility in Selected Populations	23
2.4 Implications for the Present Study	25
3 METHODOLOGY	27
3.1 Objectives and Hypotheses	27
3.2 Participants	28
3.3 Measures.....	28
3.3.1 Psychological Flexibility (PSY-FLEX)	29
3.3.2 Post-traumatic stress disorder (CRIES-13).	29
3.3.3 Depression, anxiety, stress scales (DASS-21).	30
3.3.4 General health-related quality of life (KIDSCREEN-10).	30
3.4 Study Design and Procedure	30
3.5 Introduction to Network Analysis	31
3.6 Statistical Analysis	32

4 RESULTS	33
4.1 Psychological Flexibility.....	33
4.1.1 Descriptive Statistics	33
4.1.2 Network Analysis	34
4.2 Mental Health.....	37
4.2.1 Descriptive Statistics	37
4.2.2 Network Analysis	38
4.2.3 A Johnson-Neyman Approach	41
5 DISCUSSION	43
5.1 Psychological Flexibility.....	44
5.2 Mental Health.....	46
5.3 Limitations	50
5.4 Future Research.....	51
6 CONCLUSION	53
REFERENCES	55
APPENDIX	69

LIST OF FIGURES

<i>Figure 1</i> The Hexaflex Model of ACT for Psychological Flexibility (PF) and Psychological Inflexibility (PI)	14
<i>Figure 2</i> The Combination of Core Processes of PF expressed in a Duoflex (Hayes, 2006) and Triflex Model (Harris, 2009; Hayes, 2011)	17
<i>Figure 3</i> Network of the Core Processes of PF	35
<i>Figure 4</i> Centrality and Expected Influence Indices for the Core Processes of PF	36
<i>Figure 5</i> Network of the Mental Health Constructs	39
<i>Figure 6</i> Centrality and Expected Influence Indices for Mental Health Constructs	40
<i>Figure 7</i> Johnson-Neyman Plot for the Interaction between PTSD and Anxiety on Different Levels of PF	41
<i>Figure 8</i> Johnson-Neyman Plot for the Interaction between PTSD and Depression on Different Levels of PF	42
<i>Figure 9</i> Johnson-Neyman Plot for the Interaction between PTSD and Stress on Different Levels of PF	42
<i>Figure 10</i> Edge Stability for the Core Processes of PF	69
<i>Figure 11</i> Centrality Stability for the Core Processes of PF	70
<i>Figure 12</i> Edge Stability for Mental Health Constructs	71
<i>Figure 13</i> Centrality Stability for Mental Health Constructs	72

LIST OF TABLES

<i>Table 1</i> Mean Scores of the PF Core Processes	33
<i>Table 2</i> Pearson's Correlation Analysis of the PF Core Processes	33
<i>Table 3</i> Weights Matrix of the PF Core Processes	34
<i>Table 4</i> Centrality Measures per Variable	35
<i>Table 5</i> Mean Scores of the Mental Health Constructs	37
<i>Table 6</i> Pearson's Correlation Analysis of the Mental Health Constructs	37
<i>Table 7</i> Weights Matrix of the Mental Health Constructs	38
<i>Table 8</i> Centrality Measures per Variable	39

1 INTRODUCTION

According to the information at hand, the present study is the first of its kind to examine the mental health of Unaccompanied Refugee Minors (URM), with special attention to Psychological Flexibility (PF), using a Network Analysis (NA) approach. The current chapter provides an introduction to the contextual factors, focusing on the refugee situation in the country of assessment as well as general research on mental health in the URM population.

1.1 Refugee Situation in the Republic of Cyprus

This section aims to provide contextual information about the environment in which the present study is being developed and conducted, focusing on the numerical evolution of migration as well as the social and political responses. From a global perspective, the number of people forced to flee their homes for reasons such as persecution, conflict, violence, human rights violations, and events that seriously disrupt public order has continued to increase over the past decade (UNHCR, 2022b). Due to its geographical location on the periphery of the European Union (EU), the Republic of Cyprus plays a special role in this development and faces the challenge of managing a growing influx of unauthorized migrants and asylum seekers (Triandafyllidou, 2017). Despite the island's proximity to Middle Eastern countries, it has never received large numbers of refugees and asylum seekers in the distant past. In recent years, however, the situation has changed and the Republic of Cyprus is experiencing an increase in the number of people arriving, resulting in a backlog of asylum applications (Karakoulaki, 2019), shifting the country from being a country of emigration to becoming a destination of immigration (Demetriou, 2007). Currently, refugees and migrants mainly enter the Republic of Cyprus through two routes. One involves arriving by airplane through the northern part of the island, while the other involves arriving by boat to both the southern and northern regions, which involves various risks and dangers (Karakoulaki, 2019). The ten leading countries of origin for new asylum-seekers in the Republic of Cyprus by the end of 2022, as determined by the country's asylum service, include Syria, Nigeria, the Democratic Republic of the Congo, Pakistan, Afghanistan, Bangladesh, Cameroon, Somalia, India, and Nepal (UNHCR, 2022a). In 2022, 21,565 people applied for asylum in the Republic of Cyprus, while 29,715 applications are pending at the Asylum Service and 6,805 appeals are pending at the Administrative Court for International Protection (UNHCR, 2022a). These figures indicate a need for greater assistance and support for the integration process but at the same time strain the limited

capacities of the country's reception structures. They also suggest a continuing upward trend in the number of asylum seekers, with a significant increase expected to exceed previous years' figures, indicating that the Cypriot asylum system is heading for a crisis (Karakoulaki, 2019). In response to the high number of asylum seekers, the Cypriot government has implemented several measures, including an improved registration system, better access to procedures, improved reception conditions, increased capacity to manage and reduce the asylum backlog, and improved databases for backlog management systems (Karakoulaki, 2019). Due to the forced nature of their flight and their experiences, refugees often have specific needs that need to be met to support their integration into the host society. However, in the Republic of Cyprus, they often experience racism, exploitation, and marginalization from the Greek Cypriot community due to the language used in the media and inadequate policies that fail to promote the integration of refugees and asylum seekers (Alecou & Mavrou, 2017). According to Demetriou (2007), racist and xenophobic tendencies can be found at structural, institutional, and, political levels, making the integration of marginalized people more difficult and pointing to the need for profound changes in society.

1.2 Mental Health of Unaccompanied Refugee Minors

Unaccompanied Refugee Minors (URM) represent a highly vulnerable population (Jensen et al., 2019). The purpose of this section is to provide a brief, evidence-based overview of the mental health implications of refugee flight for this group, and to emphasize the need to promote careful and rigorous research efforts in this field. In the review by Huemer and colleagues (2009), the authors focused on mental health issues among URM, finding higher psychiatric morbidity than the general population. Compared to the general population, results showed higher levels of Post-traumatic stress disorder (PTSD) symptoms in URM, predicted and influenced by age and female gender (Huemer et al., 2009). These findings were replicated in a review by Bamford and colleagues (2021) who suggest a rising prevalence of psychiatric disorders and symptoms among URM across national and settlement contexts. In particular, the authors found consistently high levels of PTSD, depression, and anxiety, which were higher among more vulnerable groups, such as women and older refugees (Bamford et al., 2021). In addition, experiencing trauma and being unaccompanied were related to adverse mental health outcomes (Bamford et al., 2021). The persistence of these outcomes can be attributed to problems accessing mental health services (Bamford et al., 2021). Additionally, Bamford and colleagues (2021) highlight limited social support, inadequate proficiency in the language of

the host country, experiences of discrimination, and the presence of daily challenges to be crucial post-migration factors for mental health outcomes for URM. In their study, Jensen and colleagues (2014) found that levels of post-traumatic reactions, anxiety, and depression among URM remained stable over two years, indicating unique vulnerabilities and chronic trajectories of mental health problems that require ongoing monitoring. Similar results were reported by Vervliet and colleagues (2014), who found high levels of anxiety, depression, and PTSD in URM but no significant differences over time. The authors emphasize the need to reduce the impact of daily stressors on URM by improving reception and care facilities, as well as providing regular mental health screening and psychosocial and therapeutic care (Vervliet et al., 2014). In another long-term study, Jensen and colleagues (2019) measured the mental health of URM over 5 years and found a decrease in depression, while levels of anxiety, PTSD, and externalizing symptoms remained stable. In addition, the authors found a connection between older age and less change in symptoms of depression and posttraumatic stress over time, as well as daily stress being an important predictor of mental health problems (Jensen et al., 2019). In addition, experienced social support was associated with fewer mental health problems (Jensen et al., 2019). The authors emphasize the importance of therapeutic interventions as they not only address mental health issues and mitigate the effects of trauma, but also play a critical role in rebuilding trust with others, which serves multiple purposes for URM who face challenges related to acculturation and migration (Jensen et al., 2019). Acknowledging that the existing literature provides limited insight into this extremely hard-to-reach population, thus preventing comprehensive conclusions, the papers emphasize the need for research and interventions with URM and assert that their past neglect in this area has resulted in a lack of research and interventions (Bamford et al., 2021; Huemer et al., 2009). Huemer and colleagues (2009) recommend the inclusion of research on long-term outcomes, stress management strategies, and a comprehensive analysis of various psychopathological conditions. In addition, the authors emphasize the importance of developing culturally sensitive norms and establishing standardized measures applicable to diverse ethnic groups (Huemer et al., 2009). The findings regarding the mental health of URM and the insights provided by the authors form the basis of this study. The focus of this research will be to examine prevalent mental health issues such as depression, anxiety, stress, and PTSD experienced by URM. These mental health constructs will be analyzed in relation to relevant aspects of psychological well-being, such as Health-Related Quality of Life (HRQL) and PF, which will be the focus of both the present study and the following literature review.

2 LITERATURE REVIEW

2.1 Introduction to Psychological Flexibility

The purpose of this section is to provide a theoretical framework for understanding the construct of Psychological Flexibility (PF) and its relevance to the present study. To accomplish this goal, the section begins by examining several definitions of PF and exploring its roots and connection to Acceptance and Commitment Therapy (ACT). The six core processes of PF are explored in depth. In addition, the current literature on the connection between PF and other mental health constructs relevant to the present study will be discussed. Finally, studies examining PF in younger populations and refugees are reviewed to provide a foundation for the implications discussed in the following section.

2.1.1 Definition

In terms of definitions, PF has been described as a slippery construct that lacks consistency across more than 70 studies (Cherry et al., 2021). According to the authors, the difficulty in determining the exact meaning of the term can be attributed to the numerous interchangeable terms or concepts that are closely related to it (Cherry et al., 2021). PF is a comprehensive higher-level multifaceted construct that encompasses several connected core processes under one overarching term and can be seen as a fundamental aspect of mental health (Gloster et al., 2011; Kashdan & Rottenberg, 2010; Rolffs et al., 2018). Being psychologically flexible depends on the interplay between psychological content, present circumstances, and chosen values, which gives PF its higher-level nature that has led to its increased use and theoretical advances (Gloster et al., 2011). As the core target of ACT (Chin & Hayes, 2017) it involves the act of mindfully connecting with the present moment, including its thoughts and emotions, and being open to external and internal stimuli without unnecessary resistance, thereby allowing individuals to consciously act in accordance with their chosen values by maintaining or changing their behavior as appropriate to the situation (Gloster et al., 2011, 2021). Kashdan & Rottenberg (2010) extend these processes by also including abilities like adapting to situational demands, shifting mindsets, and maintaining balance among important life domains. Therefore, PF enables individuals to engage with stressors in a more adaptive manner and to develop new behavioral patterns (Gloster et al., 2017). Doorley and colleagues (2020) operationalize PF as the tendency to respond to situations in ways that facilitate the

pursuit of valued goals, and they argue that PF is particularly important in situations that are difficult and cause distress. PF is not simply defined by the mere absence of symptoms or the presence of pleasant emotions, since it is possible for someone experiencing unpleasant emotions to still exhibit PF in their response, as well as Psychological Inflexibility (PI) when experiencing pleasant emotions (Gloster et al., 2011). Compared to other CBT models, the PF model proposes that it is the psychological context surrounding cognitive and verbal activity, rather than the specific content of that activity, that plays a critical role in either producing or alleviating human suffering (Chin & Hayes, 2017). Therefore, the focus of intervention processes is not on changing the negative internal experience of thoughts, emotions, and physical sensations, but rather on transforming one's approach and response to these experiences (Hoffmann et al., 2019). The rapidly growing volume of research supports the crucial role that PF plays in maintaining healthy functioning (Doorley et al., 2020). Studies suggest that PF, along with its components, may act as a mediator of treatment outcome, with increased PF mediating or partially mediating changes in psychopathological symptoms, whereas psychological inflexibility (PI), as opposed to PF, has been associated with various markers of psychopathology. These findings are reviewed in detail in the following section.

2.1.2 Philosophical and Theoretical Roots and ACT

Until now, the majority of research on PF has been conducted within the framework of ACT (Doorley et al., 2020), which is a scientifically supported psychotherapeutic approach that integrates mindfulness and acceptance techniques with commitment and behavior change strategies aimed at cultivating PF and its core processes (Chin & Hayes, 2017). ACT uses experiential techniques such as metaphors, paradoxes, and exercises that challenge the literal function of language and emphasize its limitations in accurately describing one's direct experience (Prevedini et al., 2011). It is rooted in the functional and contextual aspects of behavior analysis and incorporates conventional behavioral principles and concepts inspired by evolutionary science. ACT is based on the epistemological framework of Contextual Behavioral Science (CBS), which emphasizes the importance of contextual philosophical beliefs, the usefulness of applying behavioral principles to language and cognition, a model that illustrates the connection between basic and applied theory and practice, and the creation of techniques that affect clinically significant processes of change (Chin & Hayes, 2017). In a contextualistic framework, the concept of scientific truth is based on its practical effectiveness rather than its abstract accuracy (Chin & Hayes, 2017). In other words, truth is tied to practical

outcomes rather than to ontological presuppositions (Prevedini et al., 2011). Chin & Hayes (2017) describe the act-in-context as the fundamental unit of analysis, where individual behavior components are considered abstractions derived from the entire purposive act. The goal is to accurately predict and effectively influence the behavior of entire organisms within a given historical and situational context, with precision, scope, and depth (Hayes, 1993).

The theoretical foundation of ACT, which applies behavioral principles of language and cognition, is Relational Frame Theory (RFT). It states that human language is based on the learned ability to relate events arbitrarily (Prevedini et al., 2011). Hayes and colleagues (2021) describe verbal events as relational operants because they derive their meaning from their connection to other verbal events. Consequently, through language, humans are able to relate all things to each other, even when there are no physical, spatial, or temporal connections between them. The ability to think abstractly enables problem-solving and creative imagination, but it can also trigger the emergence of unpleasant thoughts, feelings, and experiences, leading to avoidance (Hayes et al., 1999). Despite its tremendous influence on human evolution, normal verbal processes can make human behavior narrow, rigid, and controlled by socially constructed verbal rules, rather than based on its direct consequences (Prevedini et al., 2011). Thus, through explaining the influence of language on human successes as well as psychological problems (Hayes et al., 2014) the theory aims to derive corresponding conclusions for the therapeutic context, that find their application in ACT and the core processes of PF. According to Ruiz (2010), RFT principles propose that change efforts that target the functions of subjective experiences align better with the nature of language and cognition, compared to change efforts that focus on their content.

2.1.3 Related Constructs

While PF is a fundamental idea in ACT theory and psychotherapeutic approaches, the majority of research in this area to date has examined the opposite concept, PI (Doorley et al., 2020). Consistent with the previously reported definition of PF, PI refers to a pattern of cognition, emotion, and behavior that limits one's ability to seize opportunities in the present moment and make progress toward valued goals (Szemenyei et al., 2020). Kashdan & Rottenberg (2010) describe PI as one end of the flexibility continuum and also refer to it as rigidity, lack of contextual sensitivity, or just plain inflexibility. PI is characterized by the opposite expression of core processes (Prevedini et al., 2011). Given the long history of research on symptoms, syndromes, and deficits, the focus on inflexibility in the literature is not

surprising, as it is associated with a staggering number of psychopathologies, such as anxiety, depression, and stress, which will be discussed in the following section (Doorley et al., 2020). Levin and colleagues (2014) emphasize the importance of studying the connection of PI to specific disorders to deepen the understanding of PI as a transdiagnostic process. They further describe PI as a promising transdiagnostic process because its reduction through contextual cognitive therapies such as ACT has a positive impact on a variety of clinical problems (Levin et al., 2014).

Another construct closely related to PF and often used interchangeably is Experiential Avoidance (EA). EA describes a group of behaviors that functionally involve overly negative appraisals of private events, such as thoughts, feelings, and sensations, and an aversion to experiences (Schmalz & Murrell, 2010) as well as intentional efforts to control, modify, or escape them (Hayes et al., 1996). Plumb et al. (2004) define EA as an individual's tendency to avoid, alter, or escape unwanted thoughts, emotions, or bodily sensations. This behavior is not always pathogenic and can sometimes be an adaptive process but becomes problematic, when a person rigidly and almost exclusively relies on it, without considering situational appropriateness (Schmalz & Murrell, 2010). EA has been linked to numerous psychological disorders and appears to mediate the connection between various types of symptoms and psychological constructs (Ruiz, 2010). Several reviews have found connections between EA and both general and specific measures of psychological symptoms and problem behaviors (Hayes, 2004; Hayes et al., 2006; Kashdan et al., 2006). It is important to mention, that the Acceptance and Action Questionnaire (AAQ-II, Bond et al., 2011), which is one of the most prominent scales and an important basis for the present review of the connection between PF and mental health, actually assesses EA and PI. To reduce the complexity of the present literature review and to provide a meaningful and coherent summary of the findings, PF and PI or EA, are considered as two opposite ends of the flexibility continuum (Kashdan & Rottenberg, 2010). The absence or reduction of PI is thereby equated with the presence or expansion of PF.

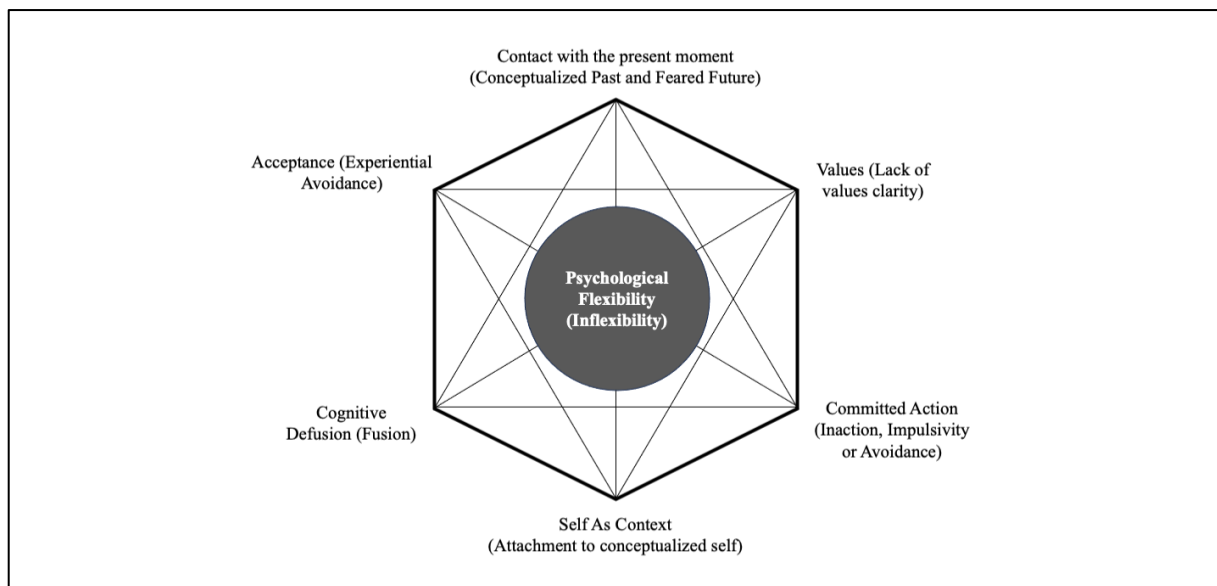
2.1.4 The Six Core Processes

According to ACT theory, PF arises from six fundamental processes. These include increasing one's ability to accept distressing experiences, utilizing cognitive defusion techniques to handle negative thought patterns, improving present-moment awareness, cultivating a self as context perspective, identifying personal values, and facilitating effective action towards achieving valued goals (Chin & Hayes, 2017). The six core processes are

typically represented graphically as a hexagon, often called the Hexaflex (Figure 1). The Hexaflex diagram shows all six processes as connected, meaning that progress in one process typically leads to changes in one or more of the other processes (Hayes et al., 2012). The theory behind the model suggests that directly attempting to reduce or eliminate distress can itself become a problem, which may seem counterintuitive to clients who live in a culture that promotes control and elimination of painful experiences. Therefore, the first steps in working with the model are to consider alternative ways of dealing with the problem, increase motivation, and create a plan for making changes (Chin & Hayes, 2017). The following is a detailed examination of the theory and practical application of the core processes of PF.

Figure 1

The Hexaflex Model of ACT for Psychological Flexibility (PF) and Psychological Inflexibility (PI)



Acceptance. Despite its etymological meaning of „taking what is offered”, acceptance in the framework of PF refers to the active, voluntary embracing of moment-to-moment experience (Chin & Hayes, 2017). This could be mistaken for a passive approach of simply enduring discomfort. It is important to clarify this misconception because passive acceptance does not lead to positive health outcomes. Instead, acceptance emphasizes the importance of consciously experiencing feelings, thoughts, and sensations as they are, without trying to suppress or avoid them. According to Hayes and colleagues (2014), the core process of acceptance must be clearly distinguished from resignation, defeat, or failure, as it provides the critical and necessary foundation for a change process.

Cognitive defusion. The core problem of human existence, based on the previously described RFT, is the fusion with one's cognitive processes, often referred to as the mind. This cognitive fusion describes the dominance of cognitive or verbal events over other sources of behavioral regulation (Chin & Hayes, 2017). An instance of such a phenomenon is when one interprets a thought such as „I am worthless” as a statement of fact that they are indeed worthless (Hayes et al., 2014). The challenge is to learn when to obey these processes and when to simply observe them. Cognitive defusion involves separating ongoing cognitive processes from their cognitive products and believing in these processes no more than what is functional. The term „defusion“ is a neologism derived from ACT.

Self as context. This core process is about recognizing that individuals themselves contain their inner experiences and can therefore view and examine them from a distance, detached from their history and conceptualized self (Hayes et al., 2014). Engaging with this viewpoint provides a safe space where experiencing life's travails and pains does not pose an existential threat (Hayes, Strosahl, et al., 2012b). According to Chin & Hayes (2017) discovering the self as a container or holder of experience and separating between self as context and self as content can therefore help develop qualities of inclusion and discrimination of experiences, and thus promote more functional behavior.

Contact with the present moment. This core process generally describes the ability to flexibly live in the here and now (Hayes et al., 2014). According to the theory, past and future are stories and constructions that exist only within cognitive processes and arise from language. Therefore, to learn from life events and benefit from therapeutic approaches, it is essential to be not only physically but also mentally present and engaged in the present moment. Practices are designed to promote flexible attention to internal and external events occurring in the present moment. (Chin & Hayes, 2017).

Values. Chin & Hayes (2017) describe values as chosen qualities of being and doing. In contrast to specific goals that can be achieved or missed, values are general ideas about how life should be (Wengenroth & Heidenreich, 2016). Therefore, they form the basis for aligning behavior with desirable scenarios. Chin & Hayes (2017) claim that relying on values to guide one's actions can be beneficial in developing adaptive behavioral patterns, as the reinforcement comes from the act of engaging in the behavior rather than external outcomes. Contrary to

feelings and thoughts that often lead people in conflicting directions and distract attention toward irrelevant processes, self-selected values can have a motivational effect on behavior and lead to a vital life (Hayes et al., 2014). Value construction exercises can help to direct individuals towards outward behaviors rather than internal experiences (Chin & Hayes, 2017). According to the authors, it is important to emphasize choosing values over deciding upon values. This distinction plays a critical role in moving from a control-based agenda to a willingness-based agenda, which allows one to engage in values even when there is a constant dysfunctional flow of reasoning associated with a problem-solving, control-based agenda. Hayes and colleagues (2014) describe the loss of values as one of the most common causes of psychological distress.

Committed action. Although ACT is strongly related to cognition and emotion, it is a therapeutic approach that aims to develop functional patterns of behavior (Hayes et al., 2014). Commitments are not promises of future action, but rather ongoing choices to construct meaningful action, moment by moment (Chin & Hayes, 2017). A common misunderstanding is the confusion of values and goals and the belief that only goal attainment leads to life satisfaction and happiness. While concrete goals can indeed be useful, PF emphasizes living within a process of committed action that allows for the ongoing embodiment of chosen values. Therefore, lapses in committed action as part of a therapeutic process are not seen as failures, but as opportunities to take responsibility for the lapse and to commit to actions consistent with chosen values.

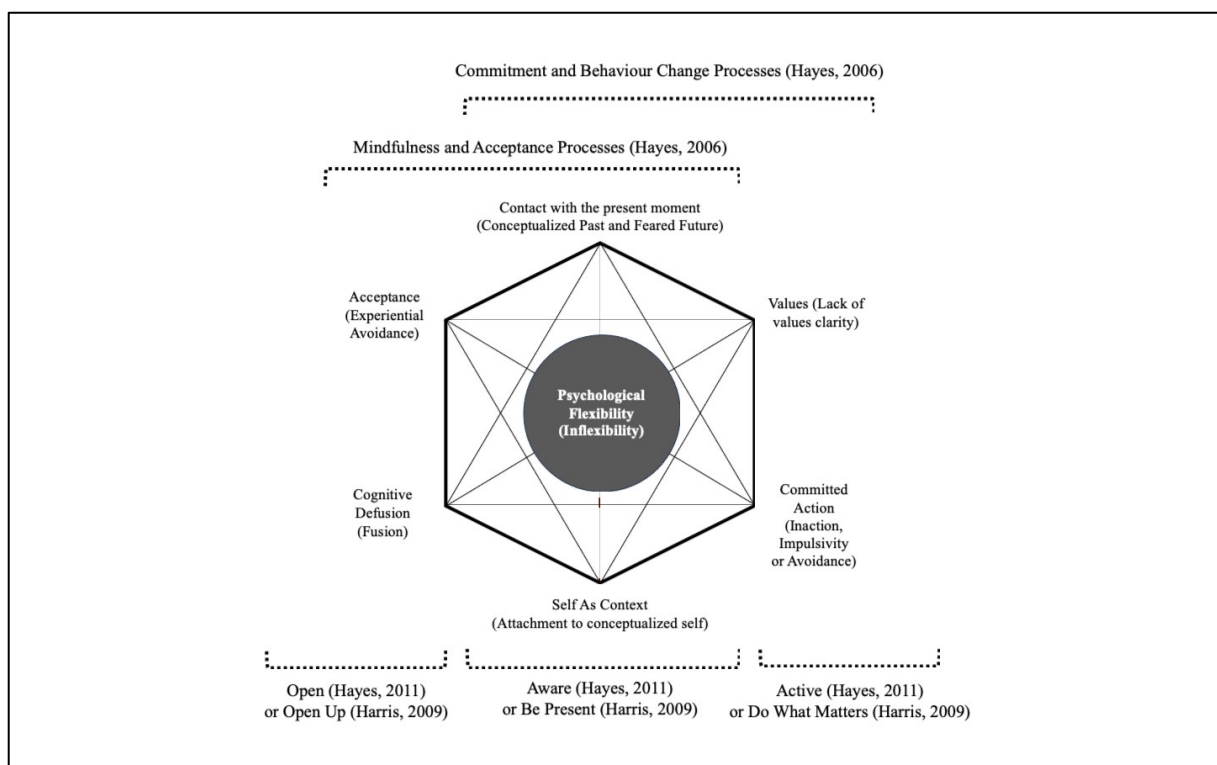
2.1.5 The Connections between the Six Core Processes

The six core processes of PF share theoretical (Hayes et al., 2012; Hayes & Strosahl, 2005) and empirical connections among each other. The purpose of this section is to provide an overview of these connections and to lay the groundwork for analyzing the connections among the core processes of PF in the specific population of Unaccompanied Refugee Minors (URM). At the current time, the available empirical studies on these structural connections are limited and have yielded inconclusive findings (Christodoulou et al., 2019). In this context, Tyndall and colleagues (2020) refer to the ongoing debate among scholars as to whether the PF model consists of six distinct processes or a smaller number of overlapping processes. Also, Christodoulou and colleagues (2023) note this difficulty. Empirical evidence suggests that certain core processes are indeed strongly related. Hayes and colleagues (2011) suggest that

within the broader model of PF, there are three pairs or dyads formed by the original six processes. Acceptance and cognitive defusion are labeled as *Open*, contact with the present moment and self as context as *Aware*, and values and committed action as *Active* (Hayes et al., 2011). Harris (2019) represents these three labels in a modified version of the Hexaflex, the Trixflex, which consists of a combination of the core processes as shown in Figure 2. Another variation of the Hexaflex is the Duoflex model, which divides PF into two overlapping sets of skills as illustrated in Figure 2 (Hayes et al., 2006). The four processes on the left are commonly categorized as mindfulness and acceptance processes, while the four on the right are viewed as Commitment and Behavior Change Processes, with contact with the present moment and self as context being part of both processes.

Figure 2

The Combination of Core Processes of PF expressed in a Duoflex (Hayes, 2006) and Trixflex Model (Harris, 2009; Hayes, 2011)



Studies found acceptance to be strongly associated with cognitive defusion (Hayes et al., 2011; Hayes & Strosahl, 2005; Levin et al., 2020; Vasiliou et al., 2022) which is coherent with their aggregation to *Being Open* (Hayes et al., 2011). Furthermore, there is evidence for a strong association between the core processes values and committed action (Trindade et al., 2015; Trompetter et al., 2015; Vasiliou et al., 2022), which supports their grouping to *Active* or *Do*

What Matters in the Triplex Model (Harris, 2019). Based on the body of literature Christodoulou and colleagues (2023) hypothesized that certain pairs of PF core processes would show stronger connections, as represented by a Network Analysis (NA). Against expectations, the authors discovered a different role of acceptance and cognitive defusion, with only the latter being a strong component in the network (Christodoulou et al., 2023). Having used different scales to assess PF as well as PI, the authors found inconsistent results regarding the connections between acceptance and cognitive defusion as well as contact with the present moment and self as context, depending on the scale that was used (Christodoulou et al., 2023). Despite theoretical and methodological explanations, this inconsistency can be interpreted as unexpected. In addition to the missing consistency of strong connections of specific core processes, the authors discovered unexpected connections such as between cognitive defusion and self as context (Christodoulou et al., 2023).

2.2 Association of Psychological Flexibility with Mental Health

PF and its core processes provide people with strategies for tolerating and using emotions, thoughts, and behaviors to achieve optimal outcomes in different situations - skills that can be seen as the essence of mental health (Kashdan & Rottenberg 2010). The authors note that the processes of flexibility are lacking in many forms of psychopathology (Kashdan & Rottenberg 2010). Several studies suggest that the absence of PF predicts psychopathology, while the presence of PF is associated with greater well-being and symptom reduction (A-Tjak et al., 2015) and can therefore be seen as a public health target (Gloster et al., 2017). This section reviews the literature on the association of PF with various mental health constructs, particularly psychopathologies. Some of the studies will be mentioned repeatedly in different sections because they measure different mental health constructs. The selection of constructs is based on their frequency in the literature and their relevance to the present study. The role of PF on specific psychopathologies and mental health constructs will be examined across populations.

Anxiety. According to the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5; American Psychiatric Association, 2013), anxiety disorders include emotional responses to real or perceived imminent threats and anticipation of future threats. These responses may include surges of autonomic arousal necessary for fight or flight, thoughts of imminent danger, escape behaviors, muscle tension, and vigilance (American Psychiatric Association, 2013). A growing body of literature supports the association between PF and

anxiety symptoms, as evidenced by several empirical studies. In a review including 14 studies with 3043 participants Ruiz (2010) found a moderately positive connection between PI and anxiety symptoms. The reported correlations between the studies ranged from $r = .16$ to $r = .76$, and the weighted correlation across all studies was found to be $r = .52$ (Ruiz, 2010). In the cross-sectional study of Tirsch and colleagues (2012), the authors find strong evidence supporting the association between PF and the existence of anxiety-related difficulties. PF was negatively correlated with the anxiety measures MCMI-III ($r = -.544$) and BAI ($r = -.451$) in 295 mental health clinic clients, indicating a higher likelihood of ongoing problematic anxiety symptoms in those who are psychologically inflexible and avoidant (Tirsch et al., 2012). In a large-scale national online survey with 1102 participants during the COVID-19 pandemic, McCracken et al. (2021) found that PI positively correlated with the measure for General Anxiety Disorder GAD-7 ($r = .66$). Furthermore, the largest amount of explained variance in anxiety was attributed to PF, with ΔR^2 explaining 30.1% of the variance, concluding that PF components account for most of the explained variance in mental health (McCracken et al., 2021). In a nonclinical sample of 494 college undergraduates, Masuda and colleagues (2012) demonstrated that PF was negatively correlated with anxiety, measured by the BS-18 ($r = -.38$), suggesting that being open to psychological experiences without trying to avoid or control them is important for managing and reducing anxiety. In their set of studies, Kashdan and colleagues (2006) discovered an association between EA and anxiety-related pathology. EA consistently predicted daily anxiety-related pathology more strongly than other strategies for regulating emotions (Kashdan et al., 2006). Their findings indicate that variations in EA are linked to higher levels of anxiety-related problems and reduced positive psychological functioning (Kashdan et al., 2006).

Depression. According to the DSM-5 (American Psychiatric Association, 2013), depressive disorders are characterized by the presence of a sad, empty, or irritable mood, along with somatic and cognitive changes that significantly affect one's ability to function. A growing body of literature supports the association between PF and symptoms of depression, as evidenced by several empirical studies. In the above-mentioned review of Ruiz (2010), the author examined 22 studies with 3323 participants and discovered a moderately positive connection between PI and anxiety symptoms. The reported correlations between the studies ranged from $r = .37$ and $r = .77$, and the weighted correlation across all studies was found to be $r = .55$ (Ruiz, 2010). In another study with 240 undergraduate students who have experienced one or more traumas, Richardson & Jost (2019) found that PF was associated with lower levels

of depression ($r = -.20$). The results further indicate a partial mediation model where PF acted as a mediator between the negative impact of Early Life Trauma (ELT) and depression (Richardson & Jost, 2019). The authors conclude, that PF plays a protective role against depression among individuals who have experienced ELT (Richardson & Jost, 2019). In another study with 740 adolescents, Puolakanaho and colleagues (2023) examined the associations between changes in PF and changes in symptoms of depression. Decreases in core processes of PF, namely acceptance and mindfulness, were connected with increases in symptoms of depression ($bD = -0.22$ to -0.43). Additionally, the authors found that lower PF mediated the increase in symptoms of depression in adolescents with negative affectivity, while higher PF mediated the decrease in symptoms in adolescents with effortful control and extraversion (Puolakanaho et al., 2023). In the above-described large-scale national online survey with 1102 participants during the COVID-19 pandemic, McCracken et al. (2021) found that PI positively correlated with the measure for depression PHQ-9 ($r = .65$). Furthermore, the largest amount of explained variance in depression was attributed to PF, with ΔR^2 explaining 27.5% of the variance (McCracken et al., 2021). In a study of 402 adolescents, PF was found to moderate the association between self-reported adverse childhood experiences (ACEs) and symptoms of depression (Hostutler et al., 2022). That is, patients with low PF exhibited a positive association between ACEs and depressive symptoms (Hostutler et al., 2022). Furthermore, Hostutler and colleagues (2022) discovered that higher scores of PI were associated with higher scores in depression ($r = .588$). In another study with 401 participants, Fonseca et al. (2020) discovered that PF has a buffering effect against the impact of major life events on depression symptoms. The study revealed that when participants have higher levels of PF, the impact of negative appraisal and cumulative major life events on depression symptoms is reduced (Fonseca et al., 2020). In addition, the results of the correlation analyses indicated a robust negative association ($r = -.57$) between PF and symptoms of depression (Fonseca et al., 2020).

Post-Traumatic Stress Disorder (PTSD). The DSM-5 (American Psychiatric Association, 2013) associates trauma- and stressor-related disorders with clinical features such as anxiety- or fear-based symptoms, as well as symptoms related to anhedonia and dysphoria, externalizing symptoms such as anger and aggression, or dissociative symptoms associated with exposure to a stressful or traumatic event. A growing body of literature supports the association between PF and trauma- and stressor-related disorders, as evidenced by various empirical studies. In a sample of 362 undergraduates Plumb and colleagues (2004) discovered through hierarchical regression analyses that PI is a predictor of the overall severity of PTSD

symptoms over and above trauma severity ($\Delta R^2 = 0.13$, $\Delta F(1, 145) = 24.22$) accounting for 13% of the unique variance in PTSD symptom severity. Furthermore, PI was correlated with PTSD symptom severity ($r = .37$). The authors conclude that EA can predict post-event psychological functioning in various populations, regardless of their life experiences (Plumb et al., 2004). These findings could be replicated within a population of 185 undergraduates, who have experienced one or more traumatic stressors. Marx & Sloan (2005) examined that EA was a predictor ($b = .29$, $t = 3.99$) of the severity of PTSD symptoms (adjusted $R^2 = .18$, $F(2,183) = 21.26$), concluding EA is an important factor related to the psychological symptoms experienced by trauma survivors. In a sample of 851 female college students, who have experienced at least one traumatic event Pickett and colleagues (2011) examined the interaction of neurobiological subsystems and EA in relation to trauma-related psychopathology. The authors found a positive connection between EA and posttraumatic stress symptoms ($r = .52$) as well as evidence for EA to be a moderator of the connection between the behavioral inhibition system sensitivity, which is related to anxiety, and posttraumatic stress symptoms, indicating clinical significance (Pickett et al., 2011). In a study of 110 adolescent females, Shenk and colleagues (2014) discovered that the development of PTSD symptoms following child maltreatment is significantly influenced by EA. The results suggest a correlation between the degree to which participants avoided distressing thoughts, emotions, memories, and bodily sensations and the severity of their reported PTSD symptoms one year later (Shenk et al., 2014). A possible conclusion is that children who exhibited PF by experiencing private events with awareness and acceptance were more resilient to abuse and less susceptible to developing PTSD symptoms (Shenk et al., 2014). Another indication for the protective effects of PF was found by Bryan and colleagues (2015), who measured its effect on emotional distress and suicidal ideation in 168 active duty Air Force convoy operators. Service members with higher levels of PF reported less severe posttraumatic stress ($B = .039$, $SE = .011$) and decreased suicide risk ($B = .035$, $SE = .010$), which suggests that PF protects returning combat military personnel against PTSD (Bryan et al., 2015). In the above-mentioned study by Richardson & Jost (2019) with 240 undergraduate students who have experienced one or more traumas, PF was also associated with lower levels of PTSD symptoms ($r = -.19$). Similar to depression the authors found PF to mediate the associations between ELT and PTSD, coming to the overall conclusion that PF plays a protective role against PTSD symptoms among individuals who have experienced ELT (Richardson & Jost, 2019). Another noteworthy discovery from the study highlights that individuals who had undergone a greater number of traumatic experiences exhibited elevated levels of PF, aligning with existing literature on psychological resilience and

posttraumatic growth (Richardson & Jost, 2019). In the context of an inpatient psychiatric unit, Schramm and colleagues (2020) examined PI in 67 adolescents during the treatment. The authors observed that changes in PI explained an additional 37% of the variance in the improvement of PTSD symptoms (full model $R^2 = 0.40$), beyond the effects of age, gender, and length of treatment, concluding that PI is an important factor to consider concerning the improvement of PTSD symptoms throughout therapy (Schramm et al., 2020).

Stress. Stress or psychological distress is a construct related to trauma and stressor-related disorders and can be used as a more general term to operationalize several psychological phenomena. In the context of the present study and with regard to the instruments used to measure stress, it can be defined as a state of sustained arousal and tension (Lovibond, 1995) including difficulty relaxing, and being easily upset agitated, irritable, and impatient (Mahamid et al., 2022). According to Puolakanaho and colleagues (2023), stress is characterized by tension, restlessness, and nervousness. A growing body of literature supports the association between PF and psychological distress, as evidenced by several empirical studies. In the above-mentioned study in a sample of 362 undergraduates by Plumb and colleagues (2004), the authors found PI to account for 31% of the variance in general psychological distress following stressful life experiences (Plumb et al., 2004). In a study of 91 individuals reporting elevated levels of work-related stress, Wersebe and colleagues (2018) found that an increase in PF during an ACT intervention was negatively associated with stress ($b = -0.63$, $SE = 0.14$) and positively with well-being ($b = 0.48$, $SE = 0.11$). A study in the context of the COVID-19 pandemic in 742 parents revealed that higher levels of PI were predictive of experiencing higher levels of COVID-19-related stressors (Daks et al., 2020). In another study from the COVID-19 pandemic, the authors discovered in a sample of 417 students that PF mediated the association between coronavirus stress and subjective well-being (Arslan & Allen, 2021). In the above-mentioned study with 740 adolescents, Puolakanaho and colleagues (2023) also examined the associations between PF changes and stress changes. Decreases in core processes of PF, namely acceptance and mindfulness, were connected with increases in symptoms of stress ($bS = -0.19$ to -0.32). Similar to the findings of depression, the authors found that lower PF mediated the increase in symptoms of stress in adolescents with negative affectivity, while higher PF mediated the decrease in symptoms in adolescents with effortful control and extraversion (Puolakanaho et al., 2023).

Health-related quality of life (HRQL). Several definitions of Health-related quality of life (HRQL) can be found in the current literature. Killewo and colleagues (2010) define HRQL as a term that describes an individual's ability to function in various aspects of life and his or her perception of overall well-being, including physical, mental, and social dimensions of health. Ravens-Sieberer and colleagues (2010) who developed the KIDSCREEN-10 that is used to measure HRQL in the present study, use the definition by the World Health Organization Quality of Life Assessment (WHOQOL, 1995) referring to HRQL as an individual's subjective perception and evaluation of their overall health and well-being, taking into account the cultural context in which they live. Compared to the constructs discussed in the previous sections, the literature has yet to support a connection between PF and HRQL. Various empirical studies have reported varying findings regarding the connection between PF and well-being (Arslan & Allen, 2022; Guerrini Usubini et al., 2021; Steenhaut et al., 2019), which can be described as a part of HRQL. However, this section will review two studies that measure the association between PF and HRQL in the context of medical pathologies. In a study of 291 HIV-infected men, Landstra and colleagues (2013) found a positive correlation between PF and HRQL at baseline ($r = .22$), concluding that possessing higher levels of PF can help individuals identify and differentiate the nuances of pleasant and unpleasant emotions, thereby promoting better mental health. In another study with 108 adolescents with type 1 diabetes, Berlin et al. (2020) found PF to be associated with higher HRQL ($r = .52$) as well as greater PI to be associated with lower HRQL ($r = -.47$). Furthermore, the authors discovered a positive association between diabetes-specific PF and HRQL, coming to the overall conclusion that adaptive attitudes and behaviors related to diabetes-specific PF may be beneficial skills to teach youths who are living with and managing type 1 diabetes (Berlin et al., 2020).

2.3 Psychological Flexibility in Selected Populations

The previous sections reviewed the empirical evidence supporting the association between PF and various mental health constructs in different populations. Reflecting the population of the present study, the current section will examine the role of PF in adolescents and refugees. As there are currently no studies combining these two populations, the evidence will be reviewed separately.

Adolescents. Several of the previously reviewed studies examined PF in adolescents discovering its association with mental health constructs, such as stress and depression (Hostutler et al., 2022; Puolakanaho et al., 2023), HRQL (Berlin et al., 2020) and PTSD (Schramm et al., 2020; Shenk et al., 2014), providing evidence for PF to play an essential role in adolescents' mental health. Existing literature proposes further associations between additional constructs that are pertinent to mental health and PF in adolescents. In their NA with 516 adolescents, Cobos-Sánchez and colleagues (2022) found a correlation between emotional dysregulation and PI ($r = .276$), pointing out the importance of PF and the emotion regulation of youth. In particular PI, cognitive fusion, and EA were found to be positively associated with difficulties in controlling impulsivity, comprehending emotions, attaining goals under distressing circumstances, rejecting negative emotions, and having limited strategies for regulating emotions (Cobos-Sánchez et al., 2022). Additionally, the authors found an increase in cognitive fusion and EA throughout adolescence, concluding that due to PI behaviors that are initially not dysfunctional or maladaptive can become psychopathological when growing older (Cobos-Sánchez et al., 2022). Above and beyond, the authors found EA as well as the PF-related processes cognitive fusion and acceptance to be core variables in the analyzed network that included emotional intelligence, difficulties in emotion regulation as well as willingness and action (Cobos-Sánchez et al., 2022). In a study with 221 female adolescents, Mendes and colleagues (2022) discovered the association between PF and social safeness ($r = .43$), self-compassion attitudes ($r = .24$), and well-being ($r = .41$). The authors highlight the potential impact of PF as an internal psychological asset that affects the connection between early affiliative memories and present feelings of social safety, along with psychological well-being (Mendes et al., 2022). Most of the above-reviewed studies assessed PI using the 17-item self-report measure Avoidance and Fusion Questionnaire for Youth (AFQ-Y; Greco et al., 2008). It is comprised of cognitive fusion and EA and its items were adapted from the Acceptance and Action Questionnaire (Hayes et al., 2004) that evaluates a similar construct in adults.

Refugees. To this point, the current literature on PF in refugees is scarce. However, the findings of two relevant studies shall be reviewed in the following section. In a clinical sample of 75 adult refugee survivors of torture, Pannu and colleagues (2022) tested PF as a resilience-promoting factor using moderation and mediation analyses. They found PF to have negative associations with all measured mental health constructs, including depression ($r = -.50$), anxiety ($r = -.54$), and PTSD ($r = -.72$). Compared to the low and moderate correlations from populations in the prior sections, these moderate and strong correlations indicate the important role PF might have in traumatized refugee survivors. Furthermore, Pannu and colleagues (2022)

discovered higher torture severity history to be associated with lower PF ($r = -.44$). The moderation analyses revealed PF to be a predictor for PTSD ($\beta = -.53$), depression ($\beta = -.41$), and anxiety symptoms ($\beta = -.49$). Furthermore, PF was found to be a mediator in the connection between torture severity and all measured mental health constructs including PTSD, depression, and anxiety (Pannu et al., 2022). The authors conclude, that the potential causal mechanism of PF between torture and mental health offers important clinical insights for the application of evidence-based treatments like ACT within a refugee population to increase PF and thereby mental health (Pannu et al., 2022). This has been done by Lakin and colleagues (2023) in a sample of 695 South Sudanese refugee women living in northern Uganda. The authors examined the role of PF as a potential mediator in the connection between involvement in a guided self-help intervention and psychological distress (Lakin et al., 2023). Their findings suggest that change in PF was a strong mediator in the connection between receiving the intervention and improving psychological distress ($b = -3.28$, 95% CI $[-4.73, 2.01]$) and that change in PF mediated 81% of the total effect (Lakin et al., 2023). The authors highlight the indication of the results towards the relevance and validity of PF across cultures and languages as well as the importance of PF as a mechanism of change in humanitarian contexts (Lakin et al., 2023).

2.4 Implications for the Present Study

The previous section included a review of several studies that examined the interplay between PF and relevant mental health constructs in different populations, revealing strong associations between PF and HRQL, as well as depression, anxiety, stress, and PTSD. Of particular importance were adolescent and traumatized adult refugee populations. However, according to the information at hand, no research has examined the role of PF in URM, making the present study the first of its kind. According to Lakin and colleagues (2023), comprehending the transdiagnostic mechanisms of change for psychological interventions, like PF, is essential to enhancing the standard of care provided in humanitarian contexts. Marx & Sloan (2005) assert that research aimed at examining the role of PF in psychological difficulties in a traumatized population may hold promise for improving treatment efforts and understanding the phenomenology of psychological problems associated with trauma. Another gap identified in the review of the current literature on the role of PF for mental health is the limited variety of analytic methods. While most studies used correlation and regression models as well as path, moderation, and mediation analyses, few studies examined the role of PF using an NA

approach, indicating the need for such a contribution to the existing literature. By identifying the direct and indirect connections among variables, an NA approach can provide a more comprehensive understanding of the connections among the core processes of PF, as well as between PF and mental health constructs. Based on the identified gaps in the literature, the aims and hypotheses of the present study are discussed in the following chapter.

3 METHODOLOGY

3.1 Objectives and Hypotheses

The present study has two main objectives. First, it aims to examine the structure of the Psychological Flexibility (PF) model and the connections among its core processes in the Unaccompanied Refugee Minors (URM) population using Network Analysis (NA) with the recently proposed comprehensive measure Psy-Flex (Gloster et al., 2021). It is hypothesized that certain pairs of PF core processes have stronger connections than other pairs. These pairs consist of values and committed action, contact with the present moment and self as context, and acceptance and cognitive defusion (Hayes et al., 2011; Hayes & Strosahl, 2005; Levin et al., 2020; Trindade et al., 2015; Trompetter et al., 2015; Vasiliou et al., 2022). It is also hypothesized that the PF core processes acceptance and cognitive defusion occupy a more central position in the network compared to others (Hayes et al., 2012; Vasiliou et al., 2022). Identifying the most important core processes of PF in URM may help to tailor future Acceptance and Commitment Therapy (ACT) interventions to more specifically address their needs and challenges. Second, the present study aims to examine the structure and connections of the constructs of anxiety, depression, stress, Post-traumatic stress disorder (PTSD), Health-Related Quality of Life (HRQL), and PF in the URM population using NA. Based on the studies reviewed in Chapter 2, it is hypothesized that PF shows strong connections with all mental health constructs and has a more central position in the network. Examining the position of PF within the network and its connections with other mental health constructs can provide valuable insight into its specific importance and potential effectiveness. This understanding may guide the adaptation of future ACT therapies to effectively address the unique clinical needs of URM. The hypotheses of the present study are as follows:

H₁: Specific pairs of core processes will display stronger connections than other pairs within the PF network. These strongly connected pairs are anticipated to consist of values and committed action, contact with the present moment and self as context, and acceptance and cognitive defusion.

H₂: The core processes acceptance and cognitive defusion will hold a more central position in the PF network compared to other core processes when examined in terms of expected influence using NA in the URM population.

H₃: PF will display strong connections with other mental health constructs, specifically anxiety, depression, stress, PTSD, and HRQL.

H₄: PF will hold a more central position in the network of mental health constructs when examined in terms of expected influence using NA.

3.2 Participants

The study involved a sample of 101 URM who sought refuge in the Republic of Cyprus. As this population is difficult to reach, convenience sampling was used to select participants. Various refugee shelters in the Republic of Cyprus were contacted and, if consent was given, all URM from these shelters were invited to participate in the study. Without the consent of the authorities, the shelter, and ultimately the individuals, the data collection could not take place. Due to the non-approval of the first two shelters, not every URM in the Republic of Cyprus had the opportunity to participate in the study. Before data collection, participants provided informed consent to participate in the study and interventions, with their personal information de-identified. The age range of participants was 13-18 years, with a mean age of 15.97 years (SD = 1.226). The exact age of one participant could not be reported. 44% (N = 44) of the sample identified as female and 56% (N = 57) identified as male. Participants represented 9 different countries of origin, including Afghanistan (N = 1), Cameroon (N = 3), Congo (N = 25), Guinea (N = 1), Ivory Coast (N = 1), Nigeria (N = 3), Sierra Leone (N = 2), Somalia (N = 58), and Syria (N = 7). Participants' educational backgrounds varied, ranging from those with no schooling (N = 44) to those who had completed some primary school (N = 20), primary school graduates (N = 10), and those who had completed some high school (N = 18) to high school graduates (N = 9). Participants in the study had varying lengths of stay in the assessment shelter, with some staying a week or less (N = 6), others staying less than a month (N = 5), 1-3 months (N = 14), 4-6 months (N = 6), 6 months to 1 year (N = 42), 1-2 years (N = 26), or more than 2 years (N = 2).

3.3 Measures

The following sections provide a brief overview of the questionnaires used to assess the relevant mental health constructs in the population. Where available, official validated translations of the questionnaires into French, Arabic, or Somali were used. In cases where

validated translations were not available, the scales were translated before the assessment by a qualified translator who was a native speaker of the respective language to ensure inclusivity and accessibility. The demographic data collected for this project includes information on gender, age, country of origin, education level, current shelter, and length of stay.

3.3.1 Psychological Flexibility (PSY-FLEX)

The Psy-Flex is a concise self-report measure developed by Gloster and colleagues (2021) that comprehensively assesses all core processes and is sensitive to the individual's context. Each of the six items relates to one of the core processes of PF reviewed earlier that are emphasized in ACT to promote PF and well-being. The wording of the items is intended to highlight the relevance of each skill in specific situations. Participants rate the items on a 5-point response scale from „very often“ to „very rarely“ and the scores are summed, with higher scores indicating greater PF. The items are designed to assess the presence of a core process in a given situation rather than its absence. All items showed satisfactory variability, suggesting their ability to capture different patterns of responses from individuals. Internal consistency for the total score in the current sample was good, with $\alpha = 0.797$.

3.3.2 Post-traumatic stress disorder (CRIES-13).

The Impact of Event Scale (IES), initially formulated by Horowitz and colleagues (1979) was designed to capture key aspects of post-traumatic experiences, including the re-experiencing of the traumatic event and the avoidance of associated emotions. To address the issue of misinterpretation of certain items by children and to include measures of arousal in the context of trauma, the CRIES-13 questionnaire was developed by Perrin and colleagues (2005) and is utilized in the present study. This questionnaire consists of four items assessing intrusion, four items assessing avoidance, and five items evaluating arousal, resulting in a total of 13 items that are answered on a 4-point response scale, ranging from „not at all“ to „often“. The overall score of the questionnaire provides an assessment of children at risk for PTSD (Perrin et al., 2005). The internal consistency for the total score in the current sample was acceptable with $\alpha = 0.774$.

3.3.3 Depression, anxiety, stress scales (DASS-21).

The questionnaire used is a brief 21-item version that is answered on a 4-point response scale ranging from "Does not apply to me at all" to "Applies to me a lot or most of the time" and is derived from a comprehensive 42-item self-report measure (Lovibond, 1995). Depression, anxiety, and stress were assessed using seven-item subscales of the DASS-21, where higher scores indicate higher levels of each construct. The DASS-21 is a widely used and validated measure for assessing these psychological constructs, with demonstrated reliability and validity in diverse populations. Internal consistency for each subscale in the current sample ranged from good to acceptable, with $\alpha = 0.809$ for anxiety (DASS-A), $\alpha = 0.761$ for depression (DASS-D), and $\alpha = 0.765$ for stress (DASS-S).

3.3.4 General health-related quality of life (KIDSCREEN-10).

The KIDSCREEN-10 serves as an abbreviated version of the KIDSCREEN questionnaire to measure HRQL in children (Ravens-Sieberer et al., 2010). Its score consists of 10 items that are answered on a 5-point response scale, ranging from „not at all“ to „extremely“. These items assess various aspects of the child's well-being, including physical activity, energy, fitness, depressive mood, emotions, feelings of stress, social opportunities, leisure time, participation in social activities, relationships with caregivers, other children, and adolescents, and the child's perception of cognitive functioning and satisfaction with school performance. The internal consistency for the total score in the current sample can be classified as questionable, with $\alpha = 0.659$.

3.4 Study Design and Procedure

The present study is part of a larger research project led by the ACThealthy Lab at the University of Cyprus. This study aimed to evaluate and adapt an ACT-based intervention targeting mental health outcomes in URM. To achieve this goal, a tailored intervention was developed based on the World Health Organization's (WHO, 2020) illustrated guide "Doing What Matters in Times of Stress". Data collection took place in April 2023 in various locations across the Republic of Cyprus, including shelters in Ammochostos (N = 26), Nicosia (N = 22), Paphos (N = 21), Larnaca (N = 20), and Limassol (N = 12). All data use and study procedures were approved by the Cyprus National Bioethics Committee (EEBK/EII/2021/44). Before the

intervention, we collected the data for analysis in the present study. To gather this data, meetings were held with the intervention groups, organized by shelter, gender, and language. Participants in these groups completed questionnaires either through Google Forms on their cell phones or through a paper version of the questionnaire. The paper version was provided to address any issues that may arise when using right-to-left languages on a phone, such as formatting difficulties. Throughout the data collection process, an interpreter was available to assist the participants by providing instructions, answering their questions, and providing additional explanations to ensure clarity on specific questionnaire items.

3.5 Introduction to Network Analysis

Network approaches encompass the identification of components within a system, referred to as network nodes, along with the examination of the connections that exist between these nodes (Borsboom et al., 2021). In psychology, NA allows the modeling of a psychological construct as a system of connected nodes (such as traits, constructs, or symptoms) connected by edges representing the pairwise correlations among them (Borsboom et al., 2021). NA offers valuable conceptual and analytical tools for describing psychopathology and studying various aspects of psychological problems, including their structure, onset, and maintenance (Contreras et al., 2019). By providing descriptive indices, NA facilitates the identification of connections between nodes, allowing for a deeper understanding of the connections within psychological phenomena (Contreras et al., 2019). In the present study, these psychological phenomena, represented as connected nodes of the network, are the six PF core processes as well as the mental health constructs of depression, anxiety, stress, PTSD, and HRQL displayed in two different networks. Descriptive indices include strength centrality, closeness centrality, betweenness, and expected influence. Strength centrality in a network refers to the number and size of the direct connections of each node (Borsboom et al., 2011). Closeness centrality measures the degree to which a node in a network is connected to all other nodes, taking into account both direct and indirect connections through other nodes (Christodoulou et al., 2023). Betweenness captures the extent to which a specific node plays a crucial role in connecting other nodes within a network by measuring the frequency of its appearance on the shortest paths between two other nodes (Christodoulou et al., 2023). Expected influence indices measure centrality while taking into account the sign of edge weights, which can be used to identify highly influential nodes in the network (Borsboom et al., 2021; Robinaugh et al., 2016). The accuracy of network estimation can be assessed by non-parametric bootstrap analysis (Epskamp

et al., 2018). It examines the sampling variability of edge weights and tests whether edge weights and centrality indices are significantly different from each other (Epskamp et al., 2018). Borsboom and colleagues (2021) suggest using NA to uncover the underlying structure of complex data when prior theories are lacking and to effectively communicate patterns of statistical association through its visualization.

3.6 Statistical Analysis

Statistical analyses were performed using JASP, a free graphical software package for statistical procedures such as NA, based on R and a suite of R packages (Love et al., 2019). The NA module is based on the R package bootnet by Epskamp and colleagues (2018). Analyses were conducted for the PF core processes and the mental health constructs, each as a separate part of the study. First, descriptive analyses were conducted. Second, a weighted, undirected NA, including the weight matrix, was conducted to analyze the connection between variables that partially controlled all other variables. Strength, closeness, and betweenness centrality were estimated using EBICglasso (Epskamp et al., 2018). An analysis of expected influence was performed to improve the accuracy of centrality indices (Robinaugh et al., 2016). In non-parametric bootstrapping, observations in the data are resampled with replacements to create new plausible datasets (Epskamp et al., 2018). In the present study, non-parametric bootstrapping with 5000 repetitions was used to assess the accuracy of network estimations and test whether edge weights and centrality indices significantly differ from each other (Epskamp et al., 2018).

4 RESULTS

4.1 Psychological Flexibility

4.1.1 Descriptive Statistics

This section presents descriptive statistics for the core processes of Psychological Flexibility (PF) among Unaccompanied Refugee Minors (URM; Table 1). The means indicate that the sample possessed all of the core processes to about the same extent, with scores ranging from the lowest for acceptance ($M = 2.941$, $SD = 1.406$) to the highest for committed action ($M = 3.554$, $SD = 1.513$). Additionally, Pearson's correlations among the PF core processes were calculated. All of the core processes showed moderate to strong positive correlations with one another, ranging from $r = .221$ to $r = .668$ (Table 2).

Table 1

Mean Scores of the PF Core Processes

	CPM	ACC	DEF	SAC	VAL	COM
Valid	101	101	101	101	101	101
Missing	—	—	—	—	—	—
Mean	3.455	2.941	3.030	3.208	3.416	3.554
Std. Deviation	1.493	1.406	1.438	1.381	1.472	1.513
Minimum	1.000	1.000	1.000	1.000	1.000	1.000
Maximum	5.000	5.000	5.000	5.000	5.000	5.000

Note. ACC = Acceptance; DEF = Cognitive Defusion; SAC = Self As Context; CPM = Contact with the Present moment; VAL = Values; COM = Committed Action

Table 2

Pearson's Correlation Analysis of the PF Core Processes

Variable	CPM	ACC	DEF	SAC	VAL
CPM	—				
ACC	.370***	—			
DEF	.343***	.382***	—		
SAC	.477***	.388***	.385***	—	
VAL	.341***	.321**	.221*	.587***	—
COM	.409***	.302**	.300**	.447***	.668***

Note. ACC = Acceptance; DEF = Cognitive Defusion; SAC = Self As Context; CPM = Contact with the Present moment; VAL = Values; COM = Committed Action, * $p < .05$, ** $p < .01$, *** $p < .001$

4.1.2 Network Analysis

Network Estimation. The network was constructed using a Gaussian Graphical Model (Lauritzen & Lauritzen, 1996) where edges represent partial correlations between PF core processes. The weights, also known as conditional independence connections, range from -1 to 1. Each edge indicates a substantial connection between two PF core processes, taking into account the influence of all other core processes in the network. In the resulting network (Figure 3), consisting of the six PF core processes, a total of 12 non-zero edges were estimated which indicated substantial connections between these PF core processes. All of the nodes showed positive connections. The strongest edges emerged between committed action and values (.563) followed by self as context and values (.393), acceptance and cognitive defusion (.340) as well as self as context and contact with the present moment (.268) as indicated in Table 3.

Table 3

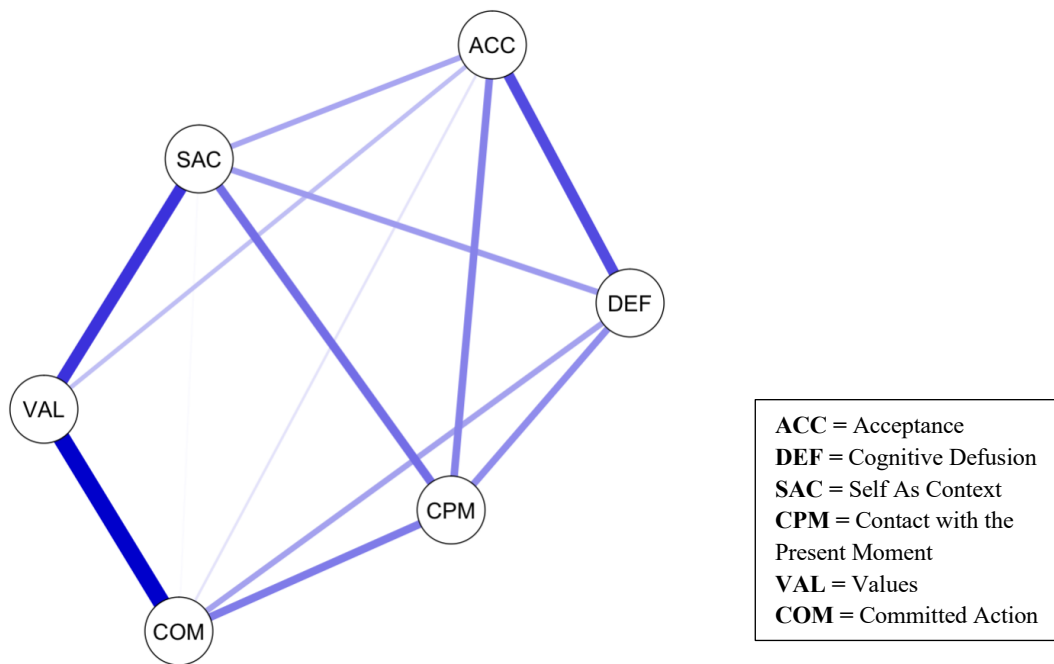
Weights Matrix of the PF Core Processes

Variable	CPM	ACC	DEF	SAC	VAL
CPM	—	.228	.207	.268	—
ACC	.228	—	.340	.160	.116
DEF	.207	.340	—	.181	—
SAC	.268	.160	.181	—	.393
VAL	—	.116	—	.393	—
COM	.241	.048	.168	.009	.563

Note. ACC = Acceptance; DEF = Cognitive Defusion; SAC = Self As Context; CPM = Contact with the Present moment; VAL = Values; COM = Committed Action

Figure 3

Network of the Core Processes of PF



Note. Edges are indicated by line thickness between nodes with thicker lines representing stronger edges. Blue lines indicate a positive connection.

Centrality Estimation. The relevance of specific mental health constructs for the network structure was assessed through centrality estimation using four different measures: strength, closeness, betweenness, and expected influence (Table 4). In a network, a node is considered more central if it has a higher degree of the respective centrality measure. The PF core processes values (EI = 1.314), committed action (EI = 0.745), and self as context (EI = 0.488) showed the highest indices of expected influence as indicated in Table 4 and Figure 4, which presents the standardized centrality indices.

Table 4

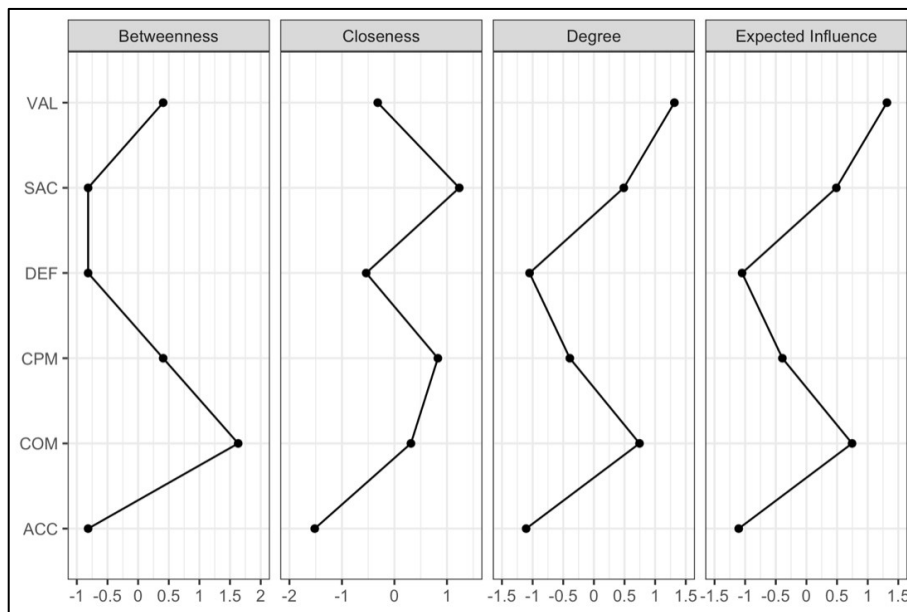
Centrality Measures per Variable

Variable	Betweenness	Closeness	Strength	Expected influence
CPM	0.408	0.827	-0.392	-0.392
ACC	-0.816	-1.518	-1.105	-1.105
DEF	-0.816	-0.538	-1.050	-1.050
SAC	-0.816	1.234	0.488	0.488
VAL	0.408	-0.318	1.314	1.314
COM	1.633	0.314	0.745	0.745

Note. ACC = Acceptance; DEF = Cognitive Defusion; SAC = Self As Context; CPM = Contact with the Present moment; VAL = Values; COM = Committed Action

Figure 4

Centrality and Expected Influence Indices for the Core Processes of PF



Note. Higher numbers indicate that the item is more central to the network. Values shown on the x-axis are standardized z-scores. ACC = Acceptance; DEF = Cognitive Defusion; SAC = Self As Context; CPM = Contact with the Present moment; VAL = Values; COM = Committed Action

Network Accuracy. Non-parametric bootstrap stability analysis was employed to compute edge stability and centrality stability, serving as a method to evaluate the accuracy, robustness, and generalizability of the network analysis findings. Edge stability measured how sample characteristics impact edge estimations. Repeatedly recalculating the edges on a fraction of the entire sample allowed for estimation of edge variability. If the estimate remained stable, values should be similar to the whole sample with low variance. However, if the bootstrap samples were dispersed, it indicated that a few participants heavily influenced the estimate, rendering the estimate unreliable. The results of the non-parametric bootstrap stability analysis showed that the network with the PF core processes had accurate estimations of edge stability, with 95% confidence intervals surrounding the edge weights (Figure 10, Appendix). Centrality stability assessed the consistency with which particular nodes were identified as the most central in the network across various subsamples of the data. Figure 11 (Appendix) illustrates that no node strength could be shown to be significantly different from each other. Furthermore, there were no significant differences detected between nodes for either betweenness or closeness.

4.2 Mental Health

4.2.1 Descriptive Statistics

This section presents descriptive statistics for the mental health constructs among URM (Table 5). According to Lovibond (1995) and Perrin and colleagues (2005), the means indicate that the sample had mild levels of stress ($M = 16.356$, $SD = 9.639$), moderate levels of anxiety ($M = 13.762$, $SD = 9.993$) and depression ($M = 17.208$, $SD = 10.210$), and high levels of Post-traumatic stress disorder (PTSD; $M = 32.168$, $SD = 12.885$). In addition, the sample showed an average PF score of 19.604 ($SD = 6.135$), and 32.257 ($SD = 6.471$) for Health-Related Quality of Life (HRQL). Additionally, Pearson's correlations among the mental health constructs were calculated (Table 6). PTSD was found to be moderately correlated with anxiety ($r = .336$), depression ($r = .382$), and stress ($r = .441$). The constructs anxiety, depression, and stress were strongly correlated with each other ($r > .7$). Negative correlations were found between PF and PTSD ($r = -.217$), HRQL and stress ($r = -.238$), and HRQL and anxiety ($r = -.297$).

Table 5

Mean Scores of the Mental Health Constructs

	ANX	DEP	STR	PTSD	HRQL	PF
Valid	101	101	101	101	101	101
Missing	—	—	—	—	—	—
Mean	13.762	17.208	16.356	32.168	32.257	19.604
Std. Deviation	9.993	10.210	9.639	12.885	6.471	6.135
Minimum	0.000	0.000	0.000	2.000	17.000	6.000
Maximum	42.000	42.000	42.000	61.000	45.000	30.000

Note. PF = Psychological Flexibility; HRQL = Health-related quality of life; PTSD = Post-traumatic stress disorder; DEP = Depression; STR = Stress; ANX = Anxiety

Table 6

Pearson's Correlation Analysis of the Mental Health Constructs

Variable	PF	PTSD	ANX	DEP	STR
1. PF	—				
2. PTSD	-.217*	—			
3. ANX	-.180	.336***	—		
4. DEP	-.146	.382***	.729***	—	
5. STR	-.092	.441***	.792***	.730***	—
6. HRQL	.052	-.008	-.297**	-.136	-.238*

Note. PF = Psychological Flexibility; HRQL = Health-related quality of life; PTSD = Post-traumatic stress disorder; DEP = Depression; STR = Stress; ANX = Anxiety, * $p < .05$, ** $p < .01$, *** $p < .001$

4.2.2 Network Analysis

Network Estimation. In the resulting network (Figure 5), consisting of the 6 mental health constructs, a total of 9 non-zero edges were estimated, which indicated substantial connections between these mental health constructs. The nodes showed positive connections between the psychopathology-related constructs PTSD, anxiety, depression, and stress. HRQL and PF showed negative connections with the constructs of psychopathology. The strongest positive edges emerged between stress and anxiety (.494), anxiety and depression (.346) as well as stress and depression (.329) as indicated in Table 7. The strongest negative edges emerged between HRQL and anxiety (-.147) as well as PF and PTSD (-.121).

Table 7

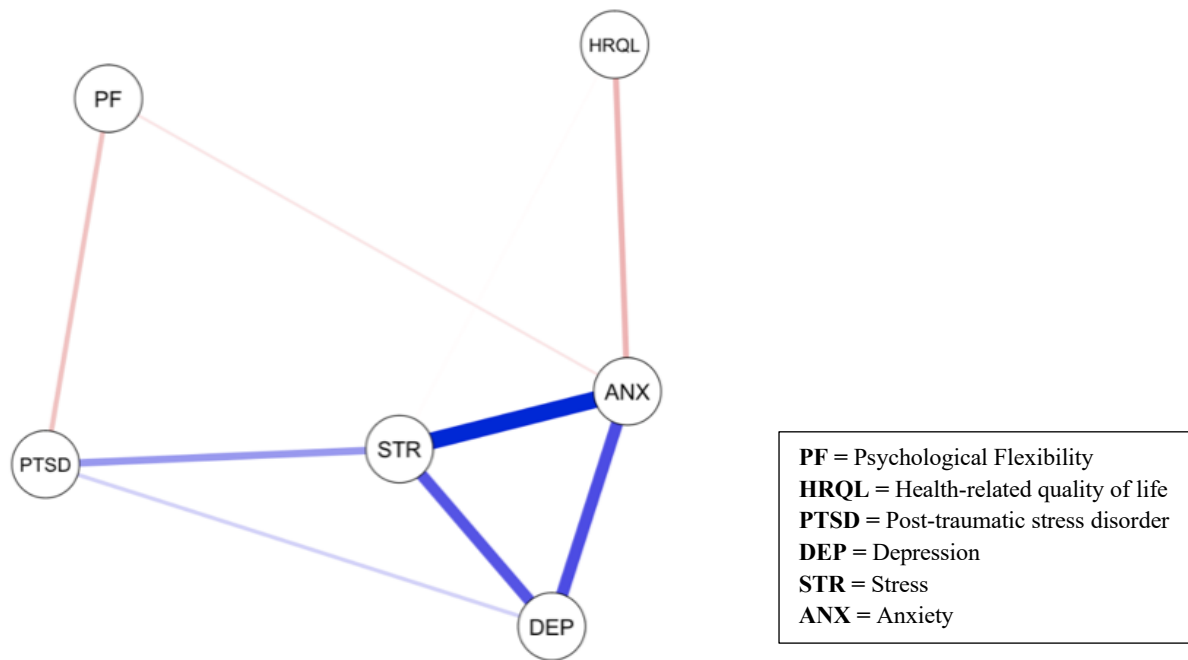
Weights Matrix of the Mental Health Constructs

Variable	PF	PTSD	ANX	DEP	STR
PF	—	-.121	-.050	—	—
PTSD	-.121	—	—	.088	.198
ANX	-.050	—	—	.346	.494
DEP	—	.088	.346	—	.329
STR	—	.198	.494	.329	—
HRQL	—	—	-.147	—	-.006

Note. PF = Psychological Flexibility; HRQL = Health-related quality of life; PTSD = Post-traumatic stress disorder; DEP = Depression; STR = Stress; ANX = Anxiety

Figure 5

Network of the Mental Health Constructs



Note. Tie strength is indicated by line thickness between nodes with thicker lines representing stronger ties. Blue lines indicate a positive connection. Red lines indicate a negative connection.

Centrality Estimation. The relevance of specific mental health constructs for the network structure was assessed through centrality estimation using four different measures: strength, closeness, betweenness, and expected influence (Table 8). In a network, a node is considered more central if it has a higher degree of the respective centrality measure. The mental health constructs stress (EI = 1.274), depression (EI = 0.772), and anxiety (EI = 0.532) showed the highest, PF the lowest (EI = -1.094) indices of expected influence as indicated in Table 8 and Figure 6, which presents the standardized centrality indices.

Table 8

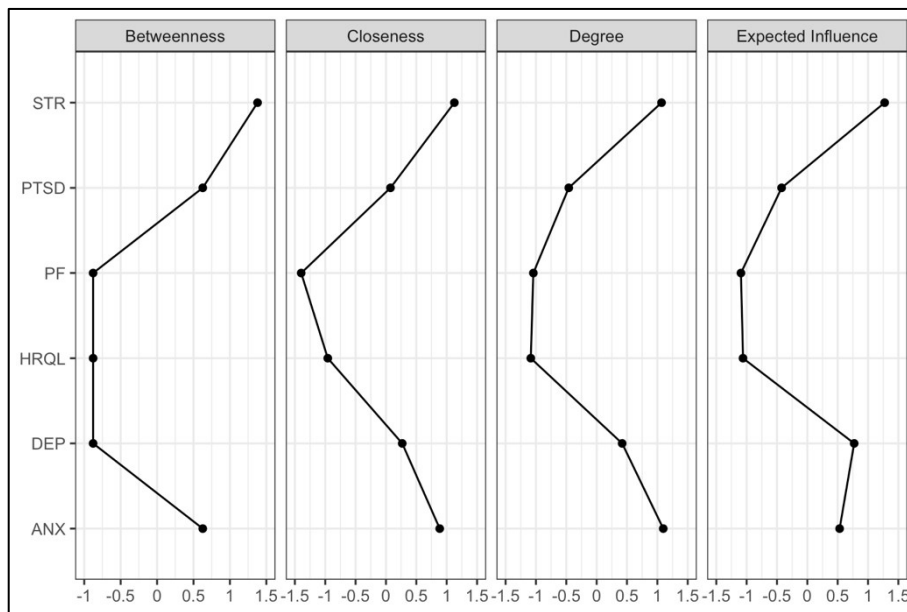
Centrality Measures per Variable

Variable	Betweenness	Closeness	Strength	Expected influence
STR	1.379	1.127	1.069	1.274
PTSD	0.627	0.075	-0.460	-0.424
PF	-0.878	-1.396	-1.043	-1.094
HRQL	-0.878	-0.959	-1.085	-1.060
DEP	-0.878	0.268	0.420	0.772
ANX	0.627	0.886	1.097	0.532

Note. PF = Psychological Flexibility; HRQL = Health-related quality of life; PTSD = Post-traumatic stress disorder; DEP = Depression; STR = Stress; ANX = Anxiety

Figure 6

Centrality and Expected Influence Indices for Mental Health Constructs



Note: Higher numbers indicate that the item is more central to the network. Values shown on the x-axis are standardized z-scores. PF = Psychological Flexibility; HRQL = Health-related quality of life; PTSD = Post-traumatic stress disorder; DEP = Depression; STR = Stress; ANX = Anxiety

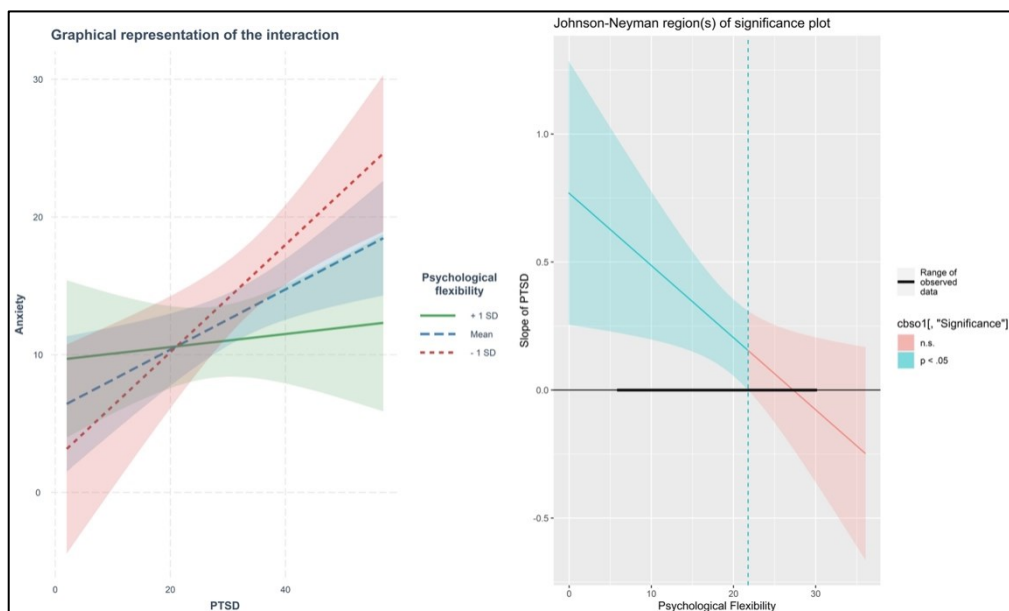
Network Accuracy. Non-parametric bootstrap stability analysis was employed to compute edge stability and centrality stability, serving as a method to evaluate the accuracy, robustness, and generalizability of the network analysis findings. Edge stability measured how sample characteristics impact edge estimations. Repeatedly recalculating the edges on a fraction of the entire sample allowed for estimation of edge variability. If the estimate remained stable, values should be similar to the whole sample with low variance. However, if the bootstrap samples were dispersed, it indicated that a few participants heavily influenced the estimate, rendering the estimate unreliable. The results of the non-parametric bootstrap stability analysis showed that the network with mental health constructs had accurate estimations of edge stability, with 95% confidence intervals surrounding the edge weights (Figure 12, Appendix). Centrality stability assessed the consistency with which particular nodes were identified as the most central in the network across various subsamples of the data. Figure 13 (Appendix) illustrates that the node strengths of eight nodes differed significantly from those of the majority in the network. There were no significant differences detected between nodes for either betweenness or closeness.

4.2.3 A Johnson-Neyman Approach

The Johnson-Neyman approach was used to supplement the statistical analyses originally planned to examine the effect of PTSD on anxiety, depression, and stress in URM and its dependence on the full range of the moderator variable PF. This approach allowed us to distinguish conditions in which moderators affect an outcome from conditions in which these effects are not significant (Rast et al., 2014). It provided more comprehensive information on how the effect of an independent variable's influence on a dependent variable depended on the full range of a moderator (Lin, 2020). The interaction terms show how different deviations from PF affected PTSD at different levels of anxiety (Figure 7, left), depression (Figure 8, left), and stress (Figure 9, left). The effect of PTSD on anxiety, depression, and stress was moderated by PF. The results showed that higher PF (+1 SD) decreased and lower PF (-1 SD) increased the slope of anxiety, depression, and stress, over PTSD scores. The Johnson-Neyman regions of significance plots in Figures 7, 8, and 9 (right) are divided by hatched lines indicating the level of PF over which, changes in PTSD did not significantly affect anxiety, depression, and stress.

Figure 7

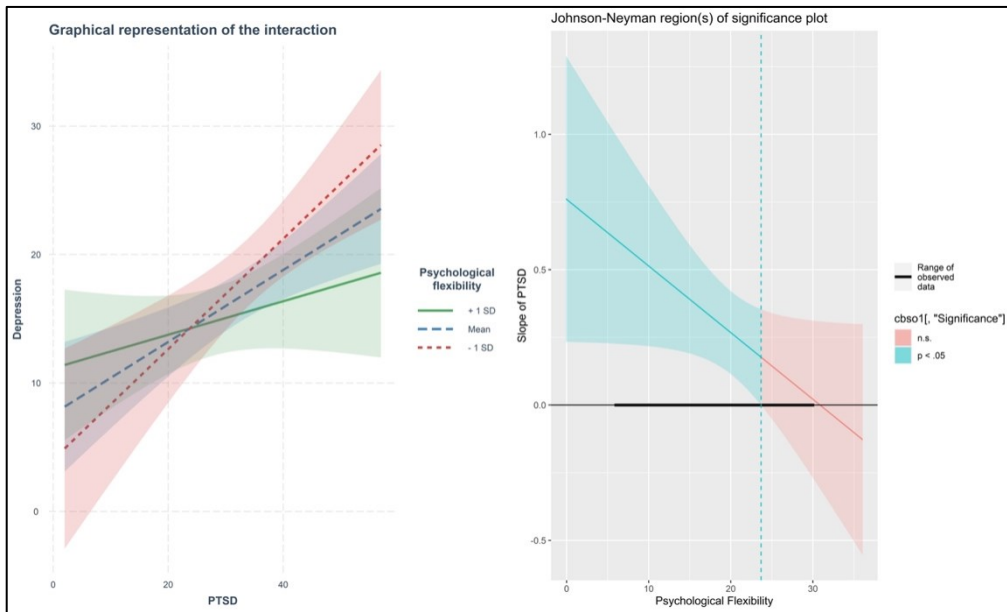
Johnson-Neyman Plot for the Interaction between PTSD and Anxiety on Different Levels of PF



Note. The left panel shows the interaction between PTSD and anxiety depending on different levels of PF. The right panel shows the differing effects of PTSD on anxiety across different levels of PF. The bands represent the 95% CI that can be used to infer statistical significance.

Figure 8

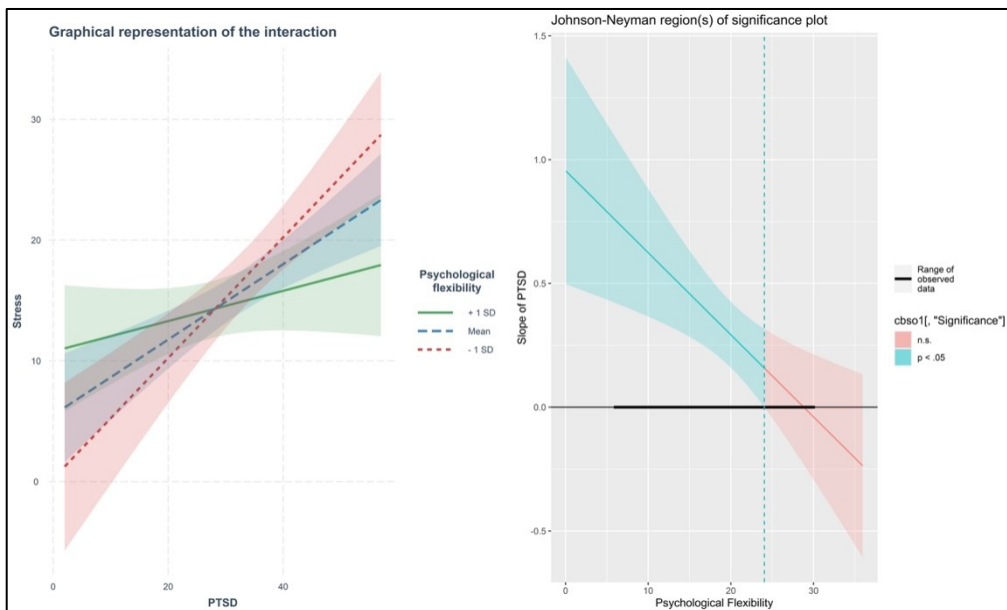
Johnson-Neyman Plot for the Interaction between PTSD and Depression on Different Levels of PF



Note. The left panel shows the interaction between PTSD and depression depending on different levels of PF. The right panel shows the differing effects of PTSD on depression across different levels of PF. The bands represent the 95% CI that can be used to infer statistical significance.

Figure 9

Johnson-Neyman Plot for the Interaction between PTSD and Stress on Different Levels of PF



Note. The left panel shows the interaction between PTSD and stress depending on different levels of PF. The right panel shows the differing effects of PTSD on stress across different levels of PF. The bands represent the 95% CI that can be used to infer statistical significance.

5 DISCUSSION

The majority of previous research on the Psychological Flexibility (PF) model has focused primarily on approaches that did not provide detailed information about the specific connections between individual core processes. Conclusions about their connections have been drawn only from theoretical assumptions (Harris, 2019; Hayes et al., 2006, 2012) or studies that either measured the impact of specific core components on mental health (Vasiliou et al., 2022), analyzed correlations among core processes (Rolffs et al., 2018), or included interventions specifically targeting different core processes (Levin et al., 2020). The results of studies, which show strong connections between specific components such as values and committed action (Trindade et al., 2015) are consistent with the theory behind models that group-specific core processes (Harris, 2019; Hayes et al., 2006, 2011, 2012). To this point, only Christodoulou and colleagues (2023) have used Network Analysis (NA) to examine the core processes of PF, with the goal of better understanding the connection between processes at the item level. While some of the expected theoretical connections, such as between values and committed action, were confirmed by the results, others were not (Christodoulou et al., 2023). Numerous studies have investigated the importance of PF in mental health, examining its connections with psychopathological constructs such as anxiety (McCracken et al., 2021), depression (Puolakanaho et al., 2023), stress (Wersebe et al., 2018) or Post-traumatic stress disorder (PTSD; Plumb et al., 2004) as well as other constructs such as Health-Related Quality of Life (HRQL; Landstra et al., 2013) supporting its crucial role in different populations. The role of PF has often been investigated in the context of Acceptance and Commitment Therapy (ACT) interventions (Ruiz, 2010). The most commonly used statistical analysis methods were correlation, mediation, moderation, and regression analyses. To date, research on the connections between PF and other mental health constructs at the network level remains scarce. Notably, only Cobos-Sánchez and colleagues (2022) have investigated the connection between PF, emotional intelligence, and emotion regulation. Thus, according to the information at hand, the present study represents the first investigation of PF within a network that includes mental health constructs such as anxiety, depression, stress, PTSD, and HRQL. Although PF has been studied in several populations, including adolescents and refugees, the present study is the first to combine these two groups. The main aims of the present study were to examine the connections between the six PF core processes as well as the connections between PF and different mental health constructs in Unaccompanied Refugee Minors (URM) in the Republic of Cyprus using an NA approach. The results are discussed in this section.

5.1 Psychological Flexibility

The use of NA offered a comprehensive examination of the individual contributions and functionalities of each PF core process within the overall model. It revealed an overall positive connectedness between the PF core processes, which is in line with ACT theory that describes theoretical connections between PF core processes (Harris, 2019; Hayes et al. 2006, 2011, 2012). One finding of the present study is that three out of the four strongest edges emerged between committed action and values (.563), acceptance and cognitive defusion (.340) as well as self as context and contact with the present moment (.268). These results are coherent with an NA conducted on the connections of specific PF core processes, measured by a battery of scales specific to the core processes in a sample of Greek-speaking Cypriots from all age groups (Christodoulou et al., 2023). These results support H₁ of the present study that these specific pairs of PF core processes have stronger connections. A possible explanation for that finding is that these core processes show meaningful theoretical connections. For example acceptance and cognitive defusion both converge on a shared process of actively experiencing thoughts and emotions instead of avoiding or suppressing them (Christodoulou et al., 2023). On the contrary, when individuals tend to experience cognitive fusion with private material, the acceptance of it is low (Hayes et al., 2012). In the literature self as context and contact with the present moment are described as distinct but highly related constructs (Hayes et al., 2012). Engagement in contact with the present moment can serve as a beneficial practical antidote to the fusion with the conceptualized self and increase simple awareness and the self as context process (Hayes et al., 2012). The connection between committed action and values was also expected in H₂ and supported by current literature. Theoretical reasoning behind this finding suggests that ACT interventions aim to enhance value clarity, which serves as a predominant reinforcer for defining and engaging in committed action (Hayes et al., 2012; Wilson, 2008). As described in Chapter 2 alternative models to the Hexaflex, including the Triflex, already consider the high connectedness between these specific core processes. Hayes and colleagues (2011) and Harris (2019) suggest grouping them as *Open, Aware, and Active* or *Open Up, Be Present, and Do What Matters*. The data from the present study also support the Triflex model in the URM population.

Another possible interpretation is that the observed findings could be attributed to measurement-related issues specific to the scales employed to assess the components of the model and do not necessarily reflect theoretical connections. The fact that the Psy-Flex measures the core processes in the order contact with the present moment, acceptance, cognitive

defusion, self as context, self as context, and committed action might lead to stronger connections in the network. One potential approach to address this issue is to explore the impact of modifying the order of items in the questionnaire and supplementing the measurement with alternative PF assessment tools. Combining or comparing the results from different measures may help mitigate the potential measurement-related issues identified in the study. Beyond the expected and theoretically coherent connections, the NA revealed another strong edge between the core processes self as context and values (.393). Even though these core processes are grouped in the Duoflex under Commitment and Behavior Change Processes (Hayes et al., 2006), this finding can be considered novel, showing limited evidence examining these processes and their relations. One potential theoretical explanation for this connection is that the adherence to constructed narratives about oneself may hinder individuals from being concerned about important life consequences and from feeling the need and ability to make value-based decisions (Hayes et al., 2012). Thus, overattachment to the rigidity of the conceptualized self can impede the ability to deliberately and flexibly gain clarity on personal values (Hayes et al., 2012). In the specific context of the URM population, the connection between self as context and values holds particular importance and warrants further attention for its clinical application. One possible interpretation of this connection is that individuals who strongly identify with a conceptualized self, based on cultural narratives from their home countries, may face challenges in flexibly deciding on new values that are better aligned with functional actions in their new cultural environment. Therefore, when working with URM populations, ACT-based interventions that prioritize reducing inflexible self-definitions and strengthening self-context perspectives may enable individuals to make flexible choices regarding potentially novel values. This assumption is further supported by the Centrality Estimation which demonstrated a substantial expected influence of self as context (EI = 0.448) on the overall PF model. Since the NA does not give insights into the causal relations between self as context and values, it can also be suggested that working on value clarity with URM could in turn increase a flexible self-perspective. This connection aligns with the principles of ACT theory, which posit that values can be freely chosen (Hayes et al., 2012). The assumption of the particular significance of values in the population of URM is supported by the findings of the Centrality Estimation. Having the highest expected influence (EI = 1.314), value clarity can be considered to have significant importance within the PF model. This result contradicts H₂ from the present study, which posits that acceptance and cognitive defusion are the most central elements of the PF network. The centrality estimation reveals that acceptance (EI = -1.105) and cognitive defusion (EI = -1.050) have the lowest expected influence of all the PF

core processes for URM, which can be considered a novel finding considering their role on PF described in the current literature (Hayes et al., 2011, 2012; Hayes & Strosahl, 2005; Levin et al., 2020; Vasiliou et al., 2022). However, literature within and outside the ACT context also emphasizes the significant influence of values, suggesting its importance on several mental health, motivational, and performance outcomes (Chase et al., 2013; Cohen & Cohen, 2013; Schwartz & Sortheix, 2018) as well as for meaning making (Frankl, 1985). Especially in religious contexts, values hold a major importance (Coyte et al., 2007). Therefore, a plausible explanation for the centrality of the PF core process values ($EI = 1.314$) may be due to the significant influence of culture and religion in the examined population. Conversations with participants, their religious symbols, and the adjustments made to surveys to accommodate prayer times and fasting rituals during Ramadan revealed that a majority of participants adhere to either Christianity or Islam. The results of the present study highlight the notable role of values and their substantial impact on the overall PF model within the population of URM. Furthermore, the PF core process of committed action demonstrates a high expected influence ($EI = 0.745$), highlighting its importance within the PF model. In the context of the URM population, this observation implies that individuals might have undergone experiences wherein proactive engagement and taking action have been essential in bringing about change and influencing their mental states. This finding is consistent with the prevailing notion that a deliberate and purposeful course of action is often required for individuals to escape distressing circumstances and seek refuge in a new environment. It is in line with current literature indicating the efficacy of behavioral therapies for refugees (Hinton et al., 2013; Paunovic & Öst, 2001; Unterhitzberger et al., 2015), as well as the overall efficacy of behavioral activation or taking action for thoughts, emotions, and feelings (Beck, 2011; Hopko et al., 2016; James, 1890). These findings support the significance of behavioral components in ACT interventions and bring attention to the notable importance of individual core processes, particularly values and committed action when working with ACT in the context of URM. In keeping with this reference, ACT claims to remain grounded in behavioral principles and firmly rooted in behaviorism (Hayes et al., 2012).

5.2 Mental Health

The use of NA offered a comprehensive examination of the individual contributions and functionalities of PF within the overall model. The present study aimed to enhance the theoretical understanding of the role that PF plays for URM and to extract practical implications

for respective settings. The NA of the present study revealed a connectedness between several mental health constructs, with the strongest positive edges emerging between stress and anxiety (.494), anxiety and depression (.346) as well as stress and depression (.329), and the strongest negative edges between HRQL and anxiety (-.147) as well as PF and PTSD (-.121). Out of five possible connections, PF appears to show only weak and moderate connections with anxiety (-.050) and PTSD (-.121) respectively, which can be considered novel considering the extensive evidence for the important role of PF on all the mental health constructs reviewed in Chapter 2. In the network, PF shows no connections with depression, stress, and HRQL, thus widely contradicting H₃ of the present study. However, the negative connection between PF and PTSD aligns with the extensive literature that emphasizes the significance of PF for individuals who have experienced trauma (Bryan et al., 2015; Marx & Sloan, 2005; Pickett et al., 2011; Plumb et al., 2004; Richardson & Jost, 2019; Schramm et al., 2020; Shenk et al., 2014). Furthermore, as shown in Table 6, the Pearson correlation between PF and PTSD is the only significant relationship observed between PF and a psychopathological construct ($r = -.271$). With a mean score of 32.168 (SD = 12.885), the PTSD levels of the current sample are deemed high, surpassing the cut-off score of 30 (Perrin et al., 2005), which was exceeded by 63% of the sample. This is consistent with the mental health of URM portrayed in Chapter 1 (Bamford et al., 2021; Huemer et al., 2009; Jensen et al., 2014, 2019; Vervliet et al., 2014). The study's findings support the crucial role of PF in the context of trauma and underscore its potential as a protective factor for individuals with traumatic experiences. However, the Centrality Estimation of the NA suggests that PF has the least expected influence (EI = -1.094) of all the network components, contradicting H₄ of this study. At this point, it is important to note that centrality does not always translate into clinical relevance and that it is critical for interpretation to consider the context of what is known about the sample (Fried et al., 2018). For example, the literature on PF in the context of PTSD suggests a negative connection with PTSD symptoms (Marx & Sloan, 2005; Pickett et al., 2011; Plumb et al., 2004; Shenk et al., 2014). In addition, there is evidence that PF may be a protective factor for individuals negatively affected by trauma (Richardson & Jost, 2019) and may account for individual differences in PTSD treatment outcomes (Schramm et al., 2020). In the context of life threats and stressors, theories like the anxiety-buffer hypothesis (ABH; Greenberg et al., 1992) suggest that certain factors like values and self-esteem could act as a buffer against detrimental psychological effects (Rossi et al., 2020). Given these findings, a Johnson-Neyman approach to PF in the context of PTSD was conducted in the present study (Figures 7, 8, and 9). It provided an additional perspective and support for the importance of PF for URM who are likely to have a history of trauma,

despite its low centrality scores. Thus, PF seems to have a buffering effect on the impact of PTSD on anxiety, stress, and depression in URM, which is in line with current literature on trauma-related symptoms in a population of undergraduate students (Richardson & Jost, 2019). The low centrality indices of PF could be attributed to several measurement-related explanations. The Psy-Flex scale used to measure PF was not adapted for use with children and adolescents and did not have a validated translation into most of the languages used. Participants in the study encountered more difficulty when responding to the Psy-Flex scale in comparison to the other scales utilized. These challenges may also be attributed to the overall low level of education of the participants and the potential cultural unfamiliarity of certain items on the Psy-Flex questionnaire. A practical implication of this finding would be to consider modifying the Psy-Flex scale for use with the adolescent population and to review the cultural appropriateness of the concepts underlying its items. In addition, introducing the concepts of ACT theory to the sample before administering the Psy-Flex may be another viable approach. Given this contextual and measurement-related information, it is, therefore, possible that PF with the lowest centrality, unrelated to most other constructs, is still one of the most important clinical features (Fried et al., 2018). Its relevance for URM can best be assessed with an intervention study targeting the core processes of PF, such as ACT.

The NA also uncovered robust connections between stress and anxiety (.494), anxiety and depression (.346) as well as stress and depression (.329). According to Lovibond (1995), the means of the scales reveal moderate levels of anxiety ($M = 13.762$, $SD = 9.993$) and depression ($M = 17.208$, $SD = 10.210$) as well as mild levels of stress ($M = 16.356$, $SD = 9.639$) as shown in Table 5, which is in line with the literature about the mental health of URM (Bamford et al., 2021; Huemer et al., 2009; Jensen et al., 2014, 2019; Vervliet et al., 2014) as described in Chapter 2. Since the study aimed to investigate PF in the URM population, the literature review in Chapter 2 focuses on examining evidence for connections between PF and mental health constructs and refrains from discussing all the links between the remaining mental health constructs in detail. However, the links between anxiety, depression, and stress have been extensively studied in diverse populations using a range of statistical techniques, including NA (Cao et al., 2023; Van den Bergh et al., 2021), often exhibiting substantial theoretical and empirical connections among symptoms. The elevated levels of anxiety, depression, and stress observed in the URM population, as well as their strong connections, are consistent with existing literature that points to the impact of forced migration and challenges in the host country as contributing factors to these mental health constructs (Bamford et al., 2021; Huemer et al., 2009; Jensen et al., 2014, 2019; Vervliet et al., 2014). In particular, the connection

between anxiety and depression posits a comorbidity that is generally supported by the literature (Aina & Susman, 2006; Gorman, 1996) and finds specific evidence in the population of children (Brady & Kendall, 1992; Szabó & Lovibond, 2006) and refugees (Lindert et al., 2009). The connection between stress and depression in adolescents and young adults is also well documented in the current literature, for example, concerning stress caused by school (Jayanthi et al., 2015), acculturation (Hovey & King, 1996), and adverse events (Rao et al., 2008), all of which may play an important role in the URM population. The strongest edge however was found between stress and anxiety (.494), which is consistent with Szabó & Lovibond's (2006) finding that these hypothetical constructs could not be distinguished in a young population. This finding suggests that the URM population's difficulty in relaxing or unwinding which can be associated with the stressful environment and daily hassles in the refugee shelter can increase experiencing physical anxiety, as indicated by a significant proportion of the items assessing anxiety. Despite the mild levels of stress ($M = 16.356$, $SD = 9.639$) in the present population, the Centrality Estimation of the NA reveals the highest expected influence ($EI = 1.274$) of stress on the overall network and thus supports its significant impact. According to Fried and colleagues (2018), central nodes may indicate special relevance for treatment. This interpretation needs to be done with great care and supplemented by contextual information about the sample, the network characteristics, and its elements (Fried et al., 2018). The current literature on the role of stress in URM and its connection to PF, as described in Chapter 2, supports the interpretation of its high expected influence as an indication of clinical relevance. Thus, although stress levels may not always be elevated among URM, they are nonetheless significantly associated with mental health and well-being. Together with this finding, the current literature on stress in URM offers several implications and practical starting points for clinical interventions. After arriving safely in the host country, URM may initially experience a sense of relief and hope, known as the honeymoon period (Colic-Peisker, 2009), but over time these initial feelings may be overshadowed by the ongoing stressors and challenges they face in their daily lives. Indeed, current evidence points to the significant impact of stress caused by everyday problems, including discrimination, stress related to legal processes, living conditions, lack of money and difficulty making friends, socio-economic factors, separation as well as challenges related to acculturation (Jensen et al., 2019; Keles et al., 2018; Li et al., 2016). These phenomena are referred to in the literature as post-migration stress (Li et al., 2016; Malm et al., 2020) and are exacerbated by memories of traumatic experiences, but also by a new and uncertain living situation in a foreign country without the support of caregivers (Jensen et al., 2019). The high centrality of stress, combined with the existing literature identifying the

factors that contribute to stress, has important implications for how to improve the mental health of URM. Firstly, it is essential to provide practical assistance in managing external stressors in the form of social and administrative support, including modifying key post-migration factors through migration and social policies (Li et al., 2016). Secondly, from a psychological perspective, it is important to address the mental health of URM by including stress-related interventions, rather than adopting a trauma-focused approach alone (Li et al., 2016). This has led to the proposition of an integrative approach to treatment by some researchers, which suggests addressing both daily stressors and traumatic experiences in a sequential manner (Miller & Rasmussen, 2010). The present study suggests that interventions such as the illustrated self-help guide „Doing What Matters in Times of Stress” by the World Health Organization (WHO, 2020) have the potential to address the specific needs of URM individuals and provide support in coping with both everyday stressors and traumatic experiences. It is particularly beneficial when utilized with URM due to its potential for cross-cultural usage. It allows individuals to grasp ACT principles through simple language, engaging formats, high accessibility, and comprehensible metaphors and illustrations, regardless of their circumstances or environment (WHO, 2020). Its efficacy has been demonstrated in various populations (Acarturk, Kurt, et al., 2022; Acarturk, Uygun, et al., 2022; Musotsi et al., 2022).

5.3 Limitations

This section examines the methodological limitations of the study. All data were based on self-report instruments. Therefore, only conscious perceptions of each construct were assessed. In addition, where official validated translations were not available, the questionnaires used in the study had to be translated into French, Arabic, and Somali. This process did not follow the recommendations for translating and adapting tests for cross-cultural assessment, which may have raised linguistic and cultural issues (Hambleton & Zenisky, 2011). One of the main challenges in translating questionnaires is to ensure that the words have their true meaning in the language into which the questionnaire is being translated. (Kalfoss, 2019). In particular, concepts from Psy-Flex items such as “I can look at hindering thoughts from a distance without having them control me” (Gloster et al., 2021), may lack these linguistic and cultural equivalents, which may have led to misunderstandings. This could be confirmed by observing participants' challenges in comprehending the Psy-Flex questionnaire, potentially arising from the cultural and linguistic ambiguity surrounding particular concepts. Another reason could be their limited exposure to questionnaires due to their lower level of education. Due to the

questionnaires' low comprehensibility, participants demonstrated a lack of motivation to complete them. This lack of motivation was expressed verbally and non-verbally through non-attendance, high distractibility, and sporadic attempts to destroy the research material. Consequently, the reliability of the results could have been negatively impacted. Using an NA approach, a significant limitation of this study is the small sample size, which resulted from significant challenges in accessing the URM population due to governmental regulations and organizational issues within the shelter. While there are no strict guidelines for sample size in NA, Epskamp & Fried (2018) recommend a minimum of $10*(N+(N*(N-1)/2))$ subjects, where N represents the number of nodes in the network. Accordingly, the sample size did not allow for splitting the sample to conduct a network comparison, limiting the analysis to a single network (Epskamp & Fried, 2018). Participants were categorized as URM based on similar characteristics, such as age group and history of refugee flight without parents. However, URM can be considered a highly diverse group with significant differences in gender, cultural and ethnic background, temperament and character, and multiple upbringing situations and motivations for leaving their country of origin, all of which affect mental health (Huemer et al., 2009). Although some of these differences have been measured, these data were not included in the NA. Another limitation is that the small sample size restricted the ability to meaningfully examine potential changes or differences in the network structure over time, despite the availability of post-data due to the intervention testing. Since only half of the sample received the intervention while the other half served as the control group, conducting a network comparison would have reduced the sample size by 50% for each network. Additionally, the limited sample size required the constriction of nodes in the NA (Epskamp & Fried, 2018). As a result, only the total scores of the scales were analyzed and the connections between different items were not examined, which could have provided more comprehensive insights into the connections and allowed for more detailed conclusions about URM's mental health.

5.4 Future Research

The findings and limitations of the present study provide valuable insights for future research in the area of ACT and URM. Although the use of NA proved to be an appropriate statistical approach, future studies with larger sample sizes would allow for more comprehensive investigations, including examining connections within a network that includes health constructs and PF at the item level, as has been done previously in different populations including refugees and children but not URM (Christodoulou et al., 2023; Cobos-Sánchez et

al., 2022; Kangaslampi et al., 2021; Pfeiffer et al., 2019; Spiller et al., 2017). Conducting the analysis at the item level will provide valuable insights into the specific connections between PF core processes, such as acceptance, and characteristics of mental health constructs, such as the inability to relax when stressed, which is consistent with present interests (Plumb et al., 2004). With larger sample sizes, future studies will also allow for network comparisons (van Borkulo et al., 2022), which will provide information about significant differences in network structure and edge strength in different groups, such as shelter upbringing, gender, cultural background, and beliefs, religion, and spirituality. These are variables that should be controlled for in future studies, as they promise to influence the core processes of PF and thus their connection to mental health constructs, as discussed in Chapter 5. To this point, network comparisons have been applied to compare different groups, such as low versus high depression (Christodoulou et al., 2023) or exposure to childhood adversity versus no exposure (Fritz et al., 2018). A larger sample size would also allow for the application of a Network Intervention Analysis (NIA; Blanken et al., 2019) as was previously done by Fishbein and colleagues (2023) in the context of ACT, who estimated a network model with the intervention condition and revisualized change scores on anxiety-related outcomes as nodes. Consistent with the focus of the present study and the specific needs of the target population, such an intervention could draw upon the principles outlined in the World Health Organization's illustrated guide "Doing What Matters in Times of Stress" (WHO, 2020). One of the most important measurement problems found in the present study was the difficulty individuals had in completing the questionnaires, especially the Psy-Flex. Future research should focus on modifying the Psy-Flex for a younger or less educated population, for example by using easy-to-understand language. In addition, Hambleton & Zenisky's (2011) principles for test translation and adaptation should be rigorously applied when using the questionnaire with URM from diverse cultural and linguistic backgrounds. To address potential remaining cultural misunderstandings of certain ACT-related constructs and ideas, an introduction to the theory of PF and its core processes for participants prior to the assessment could increase the reliability and effectiveness of related interventions.

6 CONCLUSION

The present study involved the computation of two separate networks: one examining the connections between the six core Psychological Flexibility (PF) processes, and the other between PF and mental health constructs, including anxiety, depression, stress, Post-traumatic stress disorder (PTSD), and Health-related quality of life (HRQL). In summary, the results of the first Network Analysis (NA) revealed positive connections between all six PF core processes. As hypothesized and consistent with the ACT literature, some core processes showed stronger connections, such as values and committed action (.563). Furthermore, the PF core processes values (EI = 1.314), committed action (EI = 0.745), and self as context (EI = 0.488) showed the highest indices of expected influence on the overall PF network. These findings highlight the importance of these core processes for PF in Unaccompanied Refugee Minors (URM) and suggest the need for focused attention on them when designing and implementing interventions aimed at enhancing PF. The results of the second NA revealed strong positive connections between stress and anxiety (.494), anxiety and depression (.346) as well as stress and depression (.329), and strong negative connections between HRQL and anxiety (-.147) as well as PF and PTSD (-.121). Contrary to expectations, PF did not show strong connections with all mental health constructs, nor did it have a central position in the network, as measured by expected influence. However, the context suggests that this finding does not contradict the clinical relevance of PF for URM. This suggestion is supported by findings from the Johnson-Neyman approach to PF in the context of PTSD, suggesting a buffering effect of PF. In contrast to PF, the mental health constructs stress, depression, and anxiety show the highest indices of expected influence on the overall network. Combined with the context and prior literature, these findings highlight the importance of the components of stress and depression for mental health in URM and suggest the need for focused attention on them when designing and implementing interventions aimed at improving mental health. In particular, the high importance of the stress component serves as an evidence base for testing interventions, specifically targeting stress in URM such as the illustrated guide “Doing What Matters in Times of Stress” by the World Health Organization (WHO, 2020). In addition, the literature on post-migration stress and stressors provides additional, practical starting points for clinical and, equally important, social interventions to improve stress and, in turn, the mental health and situation of URM. The present study has several implications for future research. Larger sample sizes would allow for more comprehensive investigations, including examination of item-level connections, network comparisons, and Network Intervention Analysis (NIA). Another important methodological

implication is the need to modify the Psy-Flex questionnaire for younger or less educated populations and to apply rigorous principles of test translation and adaptation. Despite the aforementioned limitations, the present study and its findings hold notable strengths that contribute to its overall value and significance. According to the information at hand, only one previous study has employed a network approach to investigate mental health in this population with a focus limited to PTSD symptomatology (Pfeiffer et al., 2019). The present study differs from this single psychopathology approach in that it examines the connections between PF and a broader range of mental health constructs. Despite the relatively modest sample size in the context of NA methodology, it is noteworthy that over 100 participants were recruited from a population that is considered hard to reach and was scientifically neglected in the past (Bamford et al., 2021; Huemer et al., 2009). By using the innovative statistical approach of NA, this study fills a significant research gap in examining the role of PF and several mental health constructs in URM. This provides a solid foundation for developing further research and clinical interventions for this population.

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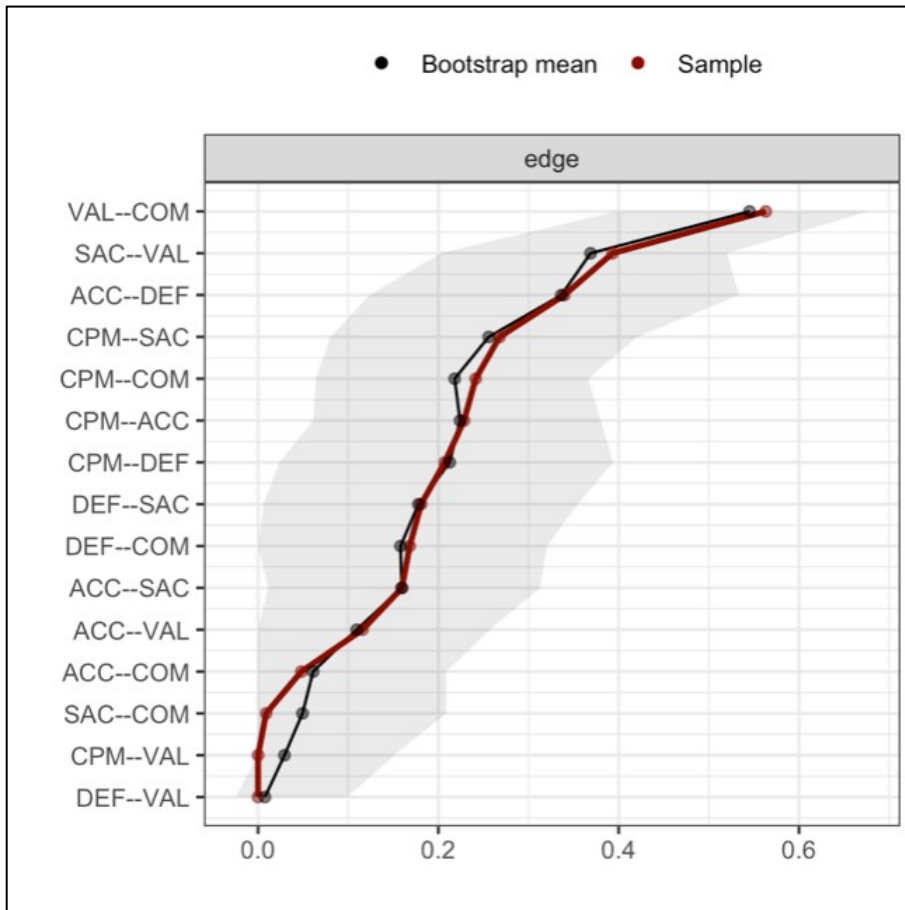
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APPENDIX

Figure 10

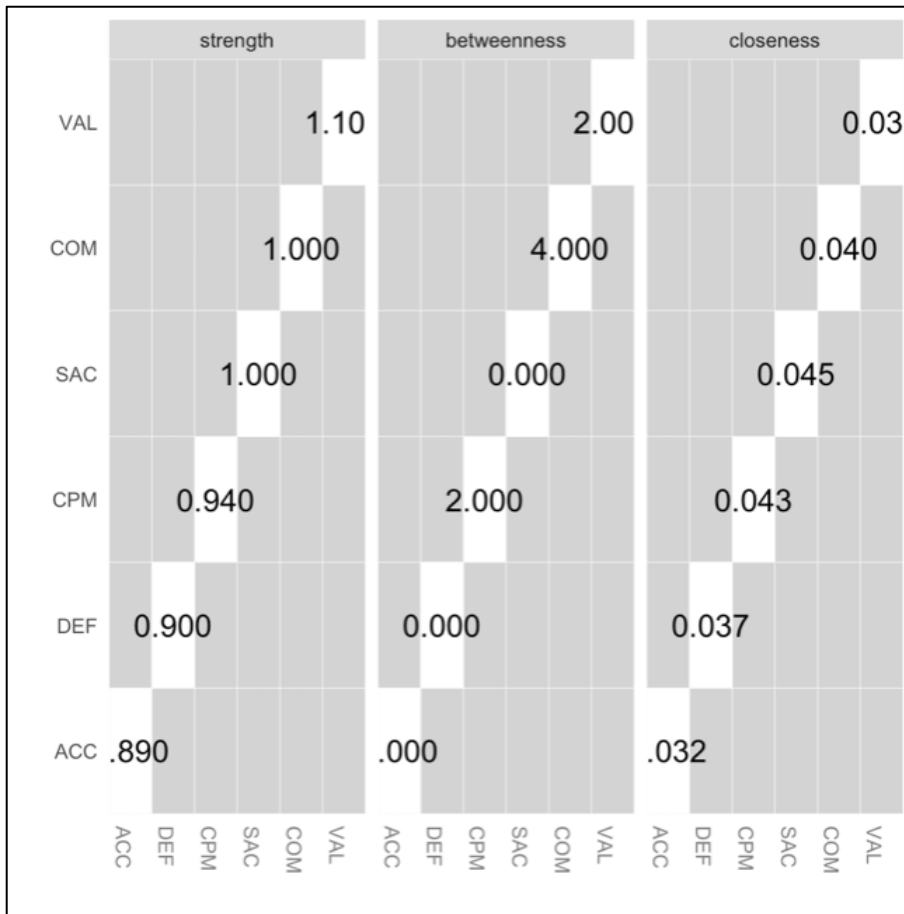
Edge Stability for the Core Processes of PF



Note. Bootstrap 95% confidence intervals for estimated edge weights for the network of 6 PF core processes. The edge weights, each horizontal line representing one edge, are represented by the red line, and the 95% confidence intervals by the grey area.

Figure 11

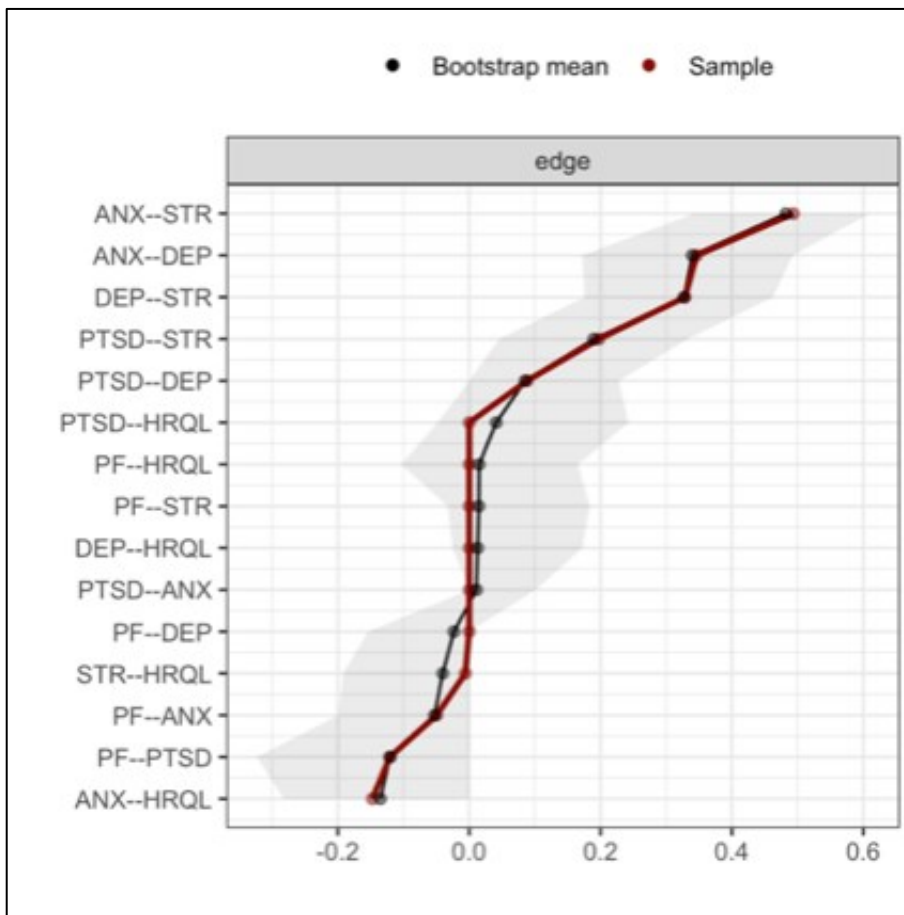
Centrality Stability for the Core Processes of PF



Note. Bootstrapped difference tests ($\alpha = 0.05$) between node strength, betweenness, and closeness of the 6 PF core processes. The grey boxes indicate nodes that do not differ significantly from one another. White boxes in the centrality plot show the value of node strength (left column).

Figure 12

Edge Stability for Mental Health Constructs



Note. Bootstrap 95% confidence intervals for estimated edge weights for the network of 6 mental health constructs. The edge weights, each horizontal line representing one edge, are represented by the red line, and the 95% confidence intervals by the grey area. PF = Psychological Flexibility; HRQL = Health-related quality of life; PTSD = Post-traumatic stress disorder; DEP = Depression; STR = Stress; ANX = Anxiety

