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EXAMINATION OF THE ACCEPTANCE AND COMMITMENT THERAPY MODEL WITH ALTERNATIVE PSYCHOMETRIC METHODS

DOCTOR OF PHILOSOPHY DISSERTATION

ANDRIA CHRISTODOULOU

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The present doctoral dissertation was submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy of the University of Cyprus. It is a product of original work of my own, unless otherwise mentioned through references, notes, or any other statements.

Andria Christodoulou

ABSTRACT IN GREEK

Εισαγωγή: Η Θεραπεία Αποδοχής και Δέσμευσης (ΘΑΔ) είναι μια ερευνητικά-υποστηριζόμενη θεραπεία για διάφορα προβλήματα ψυχικής υγείας, παρόλο που το θεωρητικό της μοντέλο, Ψυχολογική Ακαμψία/ Ψυχολογική Ευελιξία (ΨΑ/ΨΕ), δεν έχει εξεταστεί εκτενώς. Τα υφιστάμενα εργαλεία μέτρησης αντιμετωπίζουν προβλήματα ακριβούς και ολοκληρωμένης αξιολόγησης των συνιστωσών του μοντέλου. Αντίθετα, οι παραδοσιακές ψυχομετρικές προσεγγίσεις εξετάζουν την παραγοντική δομή του μοντέλου, αλλά δεν αξιολογούν επαρκώς τις αλληλεπιδράσεις μεταξύ των συνιστωσών. Ο συνδυασμός ενός ολοκληρωμένου εργαλείου (MPFI) με μια εναλλακτική στατιστική προσέγγιση, της Ανάλυσης Δικτύων, θα επιτρέψουν να αξιολογηθεί το μοντέλο ως ένα σύστημα από αλληλοσχετιζόμενες μεταβλητές. **Στόχοι:** 1) Εξέταση των εναλλακτικών θεωρητικών δομών του μοντέλου μέσω της Ανάλυσης Λανθανουσών Μεταβλητών, 2) Εξερεύνηση του ρόλου και των συσχετίσεων των συνιστωσών του μοντέλου μέσω της Ανάλυσης Δικτύων, και 3) Εύρεση ομοιοτήτων και διαφορών στη δομή και τις συνδέσεις του μοντέλου ΨΑ/ΨΕ, συγκρίνοντας δίκτυα από διαφορετικά δείγματα. **Μέθοδος:** Το πρώτο δείγμα αποτελούνταν από 501 άτομα (Μ.Ο.$_{ηλικίας}$ = 25.49), τα οποία συμπλήρωσαν διαδικτυακά τα ερωτηματολόγια MPFI και SCL-90-R, ενώ το δεύτερο δείγμα από 428 άτομα (Μ.Ο.$_{ηλικίας}$ = 27.52) και συμπλήρωσαν διαδικτυακά ένα διαφορετικό σετ εργαλείων (ερωτηματολόγια για τις έξι συνιστώσες, SCS, και PSS). Χρησιμοποιήθηκαν δεδομένα και από τα δύο δείγματα για την εξέταση των στόχων της μελέτης. **Αποτελέσματα:** Η Ανάλυση Λανθανουσών Μεταβλητών επιβεβαίωσε το μοντέλο έξι παραγόντων Hexaflex μόνο στη περίπτωση του MPFI και την διάσταση της ΨΑ, ενώ οι διαφορετικές κλίμακες κατέληξαν σε ένα μοντέλο εννέα παραγόντων. Η Ανάλυση Δικτύων δεν μπορούσε να επαληθεύσει τις έξι συνιστώσες, αλλά έδειξε ότι όλες είχαν κάποιο σημαντικό ρόλο. Οι συνιστώσες Αξιών και Δεσμευμένης Δράσης είχαν υψηλή συσχέτιση, σχηματίζοντας μια ομάδα και στα δύο είδη εργαλείων. Οι μεταβλητές Αποδοχής και Αποσύγχυσης δεν ήταν τα κεντρικότερα στοιχεία του μοντέλου και στα δυο σύνολα κλιμάκων και δειγμάτων. Η συνιστώσα Εαυτός ως Πλαίσιο είχε τον κύριο ρόλο και στις δύο περιπτώσεις, ενώ βρέθηκε να συγχωνεύεται συχνά με τη μεταβλητή Επαφή με την Παρούσα Στιγμή. Μετά τη σύγκριση δικτύων με διαφορετικά δείγματα, το μοντέλο ΨΑ/ΨΕ παρουσίασε πιο σταθερή δομή με το MPFI, σε σχέση με τα έξι ξεχωριστά ερωτηματολόγια. **Συζήτηση:** Από την έρευνα αυτή, προκύπτουν ενδιαφέροντα αποτελέσματα για το μοντέλο ΨΑ/ΨΕ, τα εργαλεία αξιολόγησης και τις στατιστικές προσεγγίσεις. Ο καινοτόμος συνδυασμός

εργαλείων, επέτρεψε να διαφανεί μέσω της Ανάλυσης Λανθανουσών Μεταβλητών και στα δυο σύνολα κλιμάκων, η ανάγκη ενός πιο λιτού μοντέλου για την εξήγηση της θεωρίας ΘΑΔ, με το μοντέλο Hexaflex να είναι ένας πιθανός υποψήφιος. Σημαντική συνεισφορά ήταν το εύρημα ότι όλες οι συνιστώσες είχαν επίδραση στο μοντέλο, όχι μόνο η Αποδοχή και Αποσύγχυση (ως κεντρικές έννοιες), όπως υποστηρίζεται στη θεωρία ΘΑΔ. Το εργαλείο MPFI ήταν ψυχομετρικά καταλληλότερο και πιο σταθερό για την ολοκληρωμένη εξέταση του μοντέλου. Οι διαφορετικές κλίμακες κατασκευάστηκαν ώστε να μετρούν συγκεκριμένες, στενά ορισμένες έννοιες, όμως χρειάζονται αναθεώρηση ώστε να συνάδουν περισσότερο με τη θεωρία ΘΑΔ. Ένα ακόμα σημαντικό εύρημα είναι ότι στη θεωρία ΘΑΔ υπάρχει ανάγκη βελτίωσης των ορισμών κάποιων συνιστωσών, ώστε να διακρίνονται καλύτερα και να μην αλληλοεπικαλύπτονται. Ο καινοτόμος συνδυασμός δύο εναλλακτικών στατιστικών αναλύσεων υποδεικνύει ότι και οι δύο προσεγγίσεις χρειάζονται για τη μελέτη του μοντέλου, καθώς παρέχουν διαφορετικού τύπου πληροφορίες για την καλύτερη κατανόηση της δομής και των συσχετίσεων των συστατικών του μοντέλου.

ABSTRACT IN ENGLISH

Background: Acceptance and Commitment Therapy (ACT) is an evidence-based treatment for a wide range of psychopathologies; however, its theoretical model of Psychological Inflexibility/ Psychological Flexibility (PI/PF) has not been sufficiently explored. There are several issues of accurate and comprehensive examination of all model's components with existing measurement instruments. Traditional psychometric approaches typically evaluate the factorial structure of the PI/PF model but cannot adequately describe the interactions among its components. The combination of an integrated tool (i.e., MPFI) with an alternative statistical approach (i.e., network analysis) will allow the assessment of the PI/PF model as a system of interconnected variables. **Objectives:** 1) Examine the alternative structures of the PI/PF model with Latent Variable Analysis, 2) Explore the role and associations of the components through Network Analysis, and 3) Search for similarities and differences in the structure and connection of the PI/PF model by comparing networks of different samples. **Method:** Sample 1 consisted of 501 individuals (M_{age} = 25.49), who completed an online battery of questionnaires (i.e., MPFI, SCL-90-R). Sample 2 consisted of 428 people (M_{age} = 27.52), who completed an online set of scales (i.e., six ACT measures, SCS, PSS). Data from both samples were used to examine the study's aims. **Results:** Latent Variable Analysis showed that the Hexaflex model was confirmed in the MPFI and the PI dimension case only, while the battery of scales resulted in a post-hoc nine-factor model. The Network Approach could not verify the six distinct components but revealed that they all played an eminent role. Values and Committed Action components were found to be strongly associated and combined in a group in both sets of measures and samples. Acceptance and Defusion were not the most central components of the model in both cases. Self-as-Context component had the key role on both sets of measures and was often found to merged with Present Moment Awareness. After comparing networks of different samples, a more stable PI/PF structure was detected for the MPFI, compared to the battery of scales. **Discussion:** This dissertation presented with interesting outcomes about the PI/PF model, multiple ACT assessment instruments, and alternative statistical approaches. The innovative combination of different sets of scales showed through Latent Model Analysis that a more parsimonious structural model is needed to explain the ACT theory, with the Hexaflex model as a likely candidate. An important contribution was the finding that all components had critical roles in the model, not just Acceptance and Defusion as supported in ACT theory. MPFI was a more

psychometrically preferred and stable tool for the comprehensive examination of the model. The different ACT scales were developed to measure distinct, narrowly defined concepts, but need revisions to correspond more closely to ACT theory. Another important outcome is the need to improve and refine the definitions of all ACT components to allow for clearer distinctions between specific pairs of components. The novel combination of alternative analyses was useful for examining the model; Latent Variable and Network Analyses provided complementary information for a more detailed understanding of the structure and associations of the PI/PF model components.

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DEDICATION

To the beautiful people in my life
who give me strength and inspiration.

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LIST OF ABBREVIATIONS

AAQ-II	Acceptance and Action Questionnaire -II
ACC	Acceptance
ACCE	Mindfulness and Acceptance skills
ACT	Acceptance and Commitment Therapy
AIC	Akaike Information Criterion
ATT	Attention
AWA	Awareness
BIC	Bayes Information Criterion
CA	Committed Action
CAMS-R	Cognitive and Affective Mindfulness Scale-Revised
CAQ-8	Committed Action Questionnaire-8
CEN	Centering
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CFQ	Cognitive Fusion Questionnaire
COM	Commitment and Behavior Change skills
DEF	Defusion
EA	Experiential Avoidance
EFA	Exploratory Factor Analysis
EGA	Exploratory Graph Analysis
FUS	Cognitive Fusion
GSI	Global Severity Index
IA	Inaction
LCPM	Lack of Contact with Present Moment
LCV	Lack of Contact with Values
MAAS	Mindful Attention Awareness Scale
MPFI	Multidimensional Psychological Flexibility Inventory
NEG	Negative
OBS	Obstruction
PF	Psychological Flexibility
PF	Present Focus
PI	Psychological Inflexibility
PMA	Present Moment Awareness
POS	Positive
PRO	Progress
PSS	Perceived Stress Scale
RFT	Relational Frame Theory
RMSEA	Root-Mean-Square Error of Approximation
SACnt	Self-as-Content

SACS	Self as Context Scale
SACxt	Self-as-Context
S-B χ^2	Sattora-Bentler chi-square
SCL-90-R	Symptoms Checklist-90-Revised
SCS	Self-Compassion Scale
SRMR	Standardized Root-Mean-Square Residual
TRA	Transcending
VAL	Values
VLQ	Valued Living Questionnaire
VQ	Valuing Questionnaire

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CHAPTER 1. INTRODUCTION

1. Preface

There is a growing research interest in strengthening the theoretical model of psychopathology development and process of change of the Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999) by refining and improving its assessment procedure. To date, a plethora of measures have been created to assess the Psychological Flexibility (PF) / Psychological Inflexibility (PI) construct and its distinct components. Some have been specifically designed for certain clinical conditions (e.g., eating disorders) or health issues (e.g., chronic pain). However, most of these tools evaluate only one (e.g., experiential avoidance/acceptance, cognitive fusion/defusion) or a combination of two components (e.g., experiential avoidance and cognitive fusion), even though the PI/PF model consists of six PI and six PF components. There is also lack of valid psychometric tools for the examination of certain PI/PF components (e.g., self-as-context). This has led to various problems in terms of holistic and effective measurement of the PI/PF components and better understanding the ACT model of psychopathology development and therapy. A possible option for solving the measurement issue is to use a comprehensive psychometric tool, which was made exclusively for the evaluation of the PI/PF construct and all its components.

Another problem with the evaluation of the PI/PF model is the psychometric procedures that have been used until today. Traditional psychometric approaches are undoubtedly useful ways of exploring and understanding the theoretical structure of a model or a psychological construct, although they seem to deal with some eminent issues. The most critical problem is that they do not account for the interaction among the components of a model or construct. Components are just perceived as independent pieces of a puzzle, whose role is to reflect an underlying construct, so when important information is omitted, it is challenging to completely comprehend the composition of a model and the function of the components within the model (Gootzeit, 2014; Scott et al., 2016; Vowles et al., 2014). Thus, there is great need to search for alternative ways to analyse psychological data by using different statistical methods and extract new knowledge about the relationships among PI/PF components and their function. A possible solution to the problem might be found in the statistical approach of network analysis (Borsboom, 2008; 2017). Network approach postulates a psychological construct as a system of interconnected variables and allows researchers to explore its structure and the relationships among its components.

ACT theory is chosen to be further explored, due to its increasing research support as an effective treatment. It has been recognized by Division 12 of the American Psychological Association and the Substance Abuse and Mental Health Services Administration as an empirically validated intervention for the treatment of a wide range of psychopathologies (e.g., depression, anxiety, psychosis, personality disorders) and health-related problems (e.g., chronic pain, drug abuse, cancer, obesity). ACT has also been widely adapted and used worldwide in adult, adolescent, and child populations with high efficacy rates (Hayes, Pistorello, & Levin, 2012; Gloster et al., 2020). The PI/PF model has empirically proven to hold an eminent role in the effective implementation of ACT treatment, contributing to increased psychological wellbeing. It is thus extremely essential for ACT to be supported by an empirically validated theoretical model of psychopathology and treatment.

The research focus on the present study was to evaluate all alternative theoretical structures of the PI/PF model, and to explore the relationships among its components, by using a comprehensive ACT measure and a battery of different ACT measures. By implementing different sets of ACT tools allowed us to compare the effectiveness of each set of tools in carefully examining the PI/PF model. In addition, standard latent variable and network analysis approaches were also used to extract useful and novel information about the structure of the PI/PF model and its components. By applying both approaches it was possible to compare the resulting PI/PF structures and discover which components are the most important in the model, more interrelated or closely together. This knowledge might contribute better to enhancing our understanding of how each ACT component functions alone or in combination with others in the PI/PF model.

2. *Psychological Flexibility/ Psychological Inflexibility model*

ACT is a third wave cognitive-behavioral therapy, which is theoretically based on the contextual theory of cognition and language known as Relational Frame Theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001). RFT is focused on the ability of individuals to learn how to relate events that are under contextual control, by using language and cognition (Hayes, 2004). The goal of ACT is to enhance people’s willingness to accept their distressing internal experiences and increase their motivation to act in a way that is fully focused on the present moment and in line with their personal values (Ciarrochi, Bilich & Godsell, 2010; Hayes et al., 2006; Hofmann & Asmundson, 2008; Rector, 2013).

Although it is a relatively recent therapeutic intervention, ACT has been successfully applied in depression (Folke et al., 2012; Forman et al., 2012; Hayes et al., 2011; Zettle & Hayes, 1986; Zettle & Rains, 1986), psychosis (Gaudiano & Herbert, 2006; Shawyer et al., 2012; White et al., 2011), anxiety (Hayes-Skelton et al., 2013; Swain et al., 2013), obsessive compulsive disorder (Twohig et al., 2010), social anxiety (England et al., 2012; Kocovski et al., 2013), trichotillomania (Woods et al., 2006), and borderline personality disorder (Gratz & Gunderson, 2006; Morton et al., 2012), with high efficacy rates in reducing psychopathology symptoms. ACT has been also implemented in health related conditions, such as pain (McCracken, 2013; McCracken et al., 2015; Wicksell et al., 2009), drug abuse (Luoma et al., 2012; Smout et al., 2010), nicotine dependence (Bricker et al., 2013; Gifford et al., 2011), headaches (Mo'tamedi et al., 2012), cancer (Rost et al., 2012), overweight/obesity (Forman et al., 2013a; 2013b; Weineland et al., 2012), and stress (Lappalainen et al., 2013; Lloyd et al., 2013), with high success rates in helping people to improve their quality of life.

According to the ACT psychopathology model, psychological suffering emerges as a result of increased *Psychological Inflexibility (PI)*, that is, the persistence to maintain values-inconsistent, rigid, and narrow behavioural patterns leading to dysfunctional behaviors (Hayes et al., 2006; 2012). Psychologically inflexible actions have been positively related with different psychological and health-related problems, such as depression, anxiety, psychosis, pain, and stress (e.g., Arch et al., 2012; Cederberg et al., 2016; Flaxman & Bond, 2010; Gaudiano, Herbert, & Hayes, 2010; Levin et al., 2014; Zettle, Rains, & Hayes, 2011). The conceptual psychopathology model of psychological inflexibility, the "Inflexahex", consists of six maladaptive components: *Experiential Avoidance, Cognitive Fusion, Self-as-Content, Lack of Contact with Present Moment, Lack of Contact with Values,* and *Inaction*.

ACT interventions aim to reverse the above PI maladaptive behavioural patterns by increasing *Psychological Flexibility* (PF; the reverse of PI). PF represents the ability of people to acknowledge and adapt to different circumstances, to change their behaviors for better functioning, and being committed to valued goals even in the presence of difficult thoughts and emotions (Kashdan & Rottenberg, 2010). Higher levels of PF were found to relate with lower stress levels, depression, anxiety, and negative emotions, and higher life satisfaction, physical and emotional welfare (Davis, Barrett, & Griffiths, 2020; Gloster, Meyer & Lied, 2017; Tyndall et al., 2020). PF comprises of six healthy skills, each reversing corresponding PI components: *Acceptance, Defusion, Self-as Context, Present Moment Awareness, Values, Committed Action.*

Acceptance (ACC), which is the main process in ACT intervention through which people are encouraged to increase their willingness and openness to all internal experiences, without avoiding or changing them (Biglan, Hayes, & Pistorello, 2008; Ciarrochi, Bilich, & Godsel, 2010; Hayes et al., 2006; 2013; Hofmann & Asmundson, 2008). Mental health problems, patient functioning, behavioral outcomes and quality of life were found to be mediated by the mechanism of acceptance (Arch et al., 2012; Bricker et al., 2013; Forman et al., 2007; Wicksell et al., 2010). In contrast, *Experiential Avoidance (EA)* is the unwillingness to stay in contact with internal experiences and any attempt to change or control them causes further difficulties and worsens people's psychological suffering (Hayes & Strosahl, 2004; Hayes et al., 1996; 2013). EA has been associated with various psychological problems, such as depression, anxiety, social anxiety, and stress (Bardeen & Fergus, 2016; Buckner et al., 2014; Rolffs et al., 2018).

Defusion (DEF) aims at changing the function - not the content - of the internal experiences and how people interact with them. In this way, thoughts and feelings can be seen as words and not as what they represent, promoting more flexible behaviors for better psychological health (Biglan, Hayes, & Pistorello, 2008; Ciarrochi, Bilich, & Godsell, 2010; Hayes et al., 2006; Hofmann, & Asmundson, 2008; Luoma, Hayes, & Walser, 2007). Improvements in quality of life, depressive symptomatology, worry, symptoms intensity, and goal progress were associated with the defusion process (Arch et al., 2012; Forman et al., 2012; Zettle et al., 2011). *Cognitive Fusion (FUS)* refers to people's tendency to regulate their behavior based on the content of their thoughts and feelings, which results in taking their thoughts literally (believability of thoughts), without noticing the process of thinking. This infective way of thinking can dominate people's life and increase their psychological inflexible actions (Ciarrochi, Bilich, & Godsell, 2010; Hayes et al., 2006; 2013). FUS has been found to be a significant predictor of depression, anxiety, stress, psychosis, and chronic pain (Bardeen & Fergus, 2016; Johns et al., 2016; Scott et al., 2016; Wicksell et al., 2008).

Self as Context (SACxt) is a process through which people are aware of their internal experiences without attaching to them, making them more available to remain in touch with a better sense of themselves (Ciarrochi, Bilich, & Godsel, 2010; Hayes et al., 2006; Biglan, Hayes, & Pistorello, 2008; Hofmann & Asmundson, 2008). SACxt was found to be positively associated with life satisfaction, social functioning, empathy and caring for others and negatively linked to depression, anxiety, and distress (Gird & Zettle, 2013; McCracken et al., 2013; McHugh et al., 2004; Villatte et al., 2008). On the other hand, *Self-as-Content (SACnt)* refers to a maladaptive process, in which people attach to the content of their thoughts and feelings, making them unable to detach and change perspectives, consequently affecting their wider sense of self and behavior (Foody et al., 2013; Hayes, Pistorello, & Levin, 2012; Hayes et al., 2013).

Present Moment Awareness (PMA) represents an ongoing process, in which people are aware and in contact with their thoughts and feelings of the present moment. This technique is conceptually related to mindfulness, which is a process that helps people to experience their private events more directly, without judging them, creating greater flexibility and more valued actions (Biglan, Hayes, & Pistorello, 2008; Ciarrochi, Bilich, & Godsell, 2010; Hayes et al., 2006; Hayes et al., 2013; Hofmann, & Asmundson, 2008). PMA was found to be positively correlated with the quality of life, social skills, patient functioning, life satisfaction, self-esteem, and depressive and anxiety symptoms reduction (Brown & Ryan, 2003; Greco et al., 2011; Feldman et al., 2007; Forman et al., 2007). In contrast, *Lack of Contact with Present Moment (LCPM)* represents a maladaptive process, in which people lose contact with the present moment leading to excessive analysis and judgment of their thoughts and feelings (Hayes et al., 2006; 2013).

Values (VAL) is a therapy process that encourages people to define the important areas in their life and choose valued goals to guide their behavior. People through this process learn to willingly experience their thoughts and feelings, while adopting behaviors that lead them to a valued way of living (Biglan, Hayes, & Pistorello, 2008; Ciarrochi, Bilich, & Godsell, 2010; Hayes et al., 2006; Hofmann & Asmundson, 2008). The VAL component was found to be positively linked to improvement in quality of life and life satisfaction and negatively associated with depression, anxiety, and stress (Lundgren et al., 2012; O'Connor et al., 2019; Smout et al., 2014; Wilson et al., 2010). In contrast, *Lack of Contact with Values (LCV)* can lead people to take actions based on restricted rules to avoid social criticism and negative feelings or to be socially accepted (Hayes, Pistorello, & Levin, 2012; Hayes et al., 2013).

The *Committed Action* (CA) mechanism assists people to commit and take action based on valued goals (Hayes et al., 2006, 2013). In addition, people are being prepared to accept and be willing to "carry" unwanted private events throughout their committed valued life path (Biglan, Hayes, & Pistorello, 2008; Ciarrochi, Bilich, & Godsell, 2010; Hayes et al., 2006; Hofmann, & Asmundson, 2008). Although, CA is a comparatively less examined component in the PI/PF model, it was found to have negative association with depressive symptomatology and to be positively related with pain acceptance, social functioning, mental and physical health (Akerblom et al., 2016; Bailey et al., 2016; Coutinho et al., 2019; McCracken, 2013; McCracken, Chilcot, & Norton, 2015).

Alternatively, *Inaction (IA)* refers to people's inability to redirect the behavior toward effective valued actions, leading to maladaptive and impulsive behaviors (Hayes, Pistorello, & Levin, 2012; Hayes et al., 2013).

There have been some attempts to explain the function of each component within the ACT model and the connections among them. EA is theoretically assumed to be the main problem in the PI/PF psychopathology model, and it seems to connect with FUS in a way that can result in psychologically rigid behaviors (Hayes & Strosahl, 2004; Hayes, 2004; Hayes, Strosahl & Wilson, 2011; Hayes et al., 2013; Levin et al., 2020). DEF was also found to be associated with several other ACT components in the PI/PF model. PMA was one of those components that seem to be related with DEF in the PI/PF therapy model, helping to reinforce psychologically flexible behaviors and actions (Hayes, 2004; Hayes et al., 2012). DEF and SACxt are also found to be alike or originate from common theoretical backgrounds, since both include the process of changing point of view or keep a distanced perspective (Kross, Ayduk, & Mischel, 2005). VAL, PMA, EA, and FUS are believed to be eminent and psychologically active components in the PI/PF model (Levin et al., 2012; Stockton et al., 2019; Tyndall et al., 2020; Vilardaga et al., 2007). VAL and ACC are also jointly examined in the ACT research, an indication of a positive connection and interaction between them in making people more psychological flexible (Branstetter-Rost, Cushing, & Douleh, 2009; Hayes et al., 2012; Levin et al., 2020).

In addition, VAL and CA are frequently used and examined together in ACT research. Certain ACT measures exist that include VAL and CA items to explore the link between people's values and their behavioral activation, in enhancing people's psychological flexibility and well-being (Trindade et al., 2016; Trompetter et al., 2013). ACC and PMA are another pair of components that are examined together in ACT research, by creating scales and treatment protocols targeting both health PF processes. ACC is assumed to be an ally of PMA, because people who are open and accept their internal experiences without negatively criticizing them, seem to be the ones who are more grounded and linked to the present and more mindful (Baer & Krietemeyer, 2006; Cardaciotto et al., 2008).

Since the inception of ACT, researchers have struggled to best define the set of components that constitute ACT and lead to PI/PF. In this effort, various alternative conceptual models have been proposed and examined to represent ACT's constituents. The first is the "Hexaflex/Inflexahex model" (as presented above; Figure 1 left panel), where PI/PF represents a higher-level construct, which includes six lower-level and

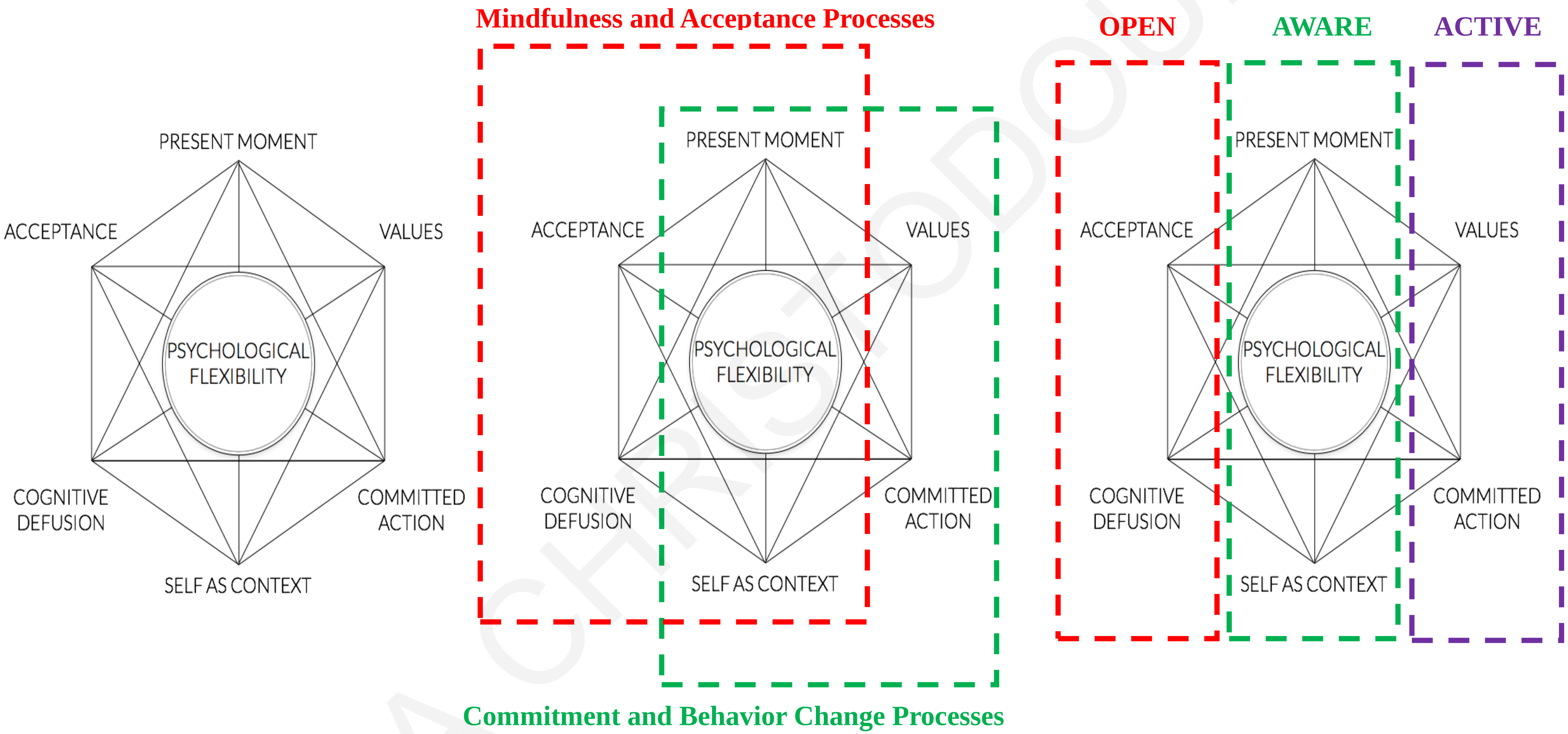


Figure 1. Alternative theoretical PI/PF models. *Left*: Hexaflex; *Middle*: Duoflex; *Right*: Triflex

interconnected components (Hayes et al., 2006). A second variant is the "Duoflex" model (Figure 1 middle panel), in which PI/PF, as a higher-level construct, is divided into two overlapping sets of skills: Mindfulness and Acceptance (ACCE), and Commitment and Behavior Change skills (COM). The ACCE process reflects four lower-order components of ACC, DEF, PMA, and SACxt, and the COM process loads on four lower-order components of VAL, IA, PMA, and SACxt (Hayes et al., 2006; 2012; 2013). A third variant is the "Triflex" model (Figure 1 rightmost panel), in which PI/PF is conceptualized as a higher-level construct reflected by three middle-level constructs: OPEN, AWARE, ACTIVE. OPEN consist of the two lower-level components of ACC and DEF, AWARE includes the SACxt and PMA, and ACTIVE reflects on VAL and CA (Harris, 2009; Hayes et al., 2011; 2012).

3. Problems with the existing ACT measures in examining the PI/PF model

Empirical studies on the structural relations among PI/PF components are limited and inconclusive, perhaps due to the scales used on those studies. One of the issues with the ACT measures is that most of them evaluate only one (e.g., EA, FUS, VAL) or a combination of two ACT components (e.g., EA and FUS, ACC, PMA), even though the PI/PF model consists six PI and six PF components. In addition, several measures have been developed for certain ACT components (e.g., EA, FUS, PMA), which have competing advantages or disadvantages. Some of them, despite being widely used and adapted in several languages, encountered problems of low construct validity, compared to similar and less commonly used measures.

For example, the most widely used scale in ACT research is the 7-item Acceptance and Action Questionnaire - II (AAQ-II; Bond et al., 2011) that briefly measures the overarching PI or alternatively the EA component. Several studies have used and endorsed the AAQ-II as a unifactorial measure of EA or PI (Bond et al., 2011; Fledderus et al., 2012; Gloster et al., 2011; Jacobs et al., 2008; McCracken & Zhao-O'Brien, 2010; Monestès et al., 2016). Furthermore, AAQ-II has been adapted in almost 25 languages, including the Greek adaptation (Karekla & Michaelides, 2017) and most of them supported the single-factor EA model, with good psychometric properties. However, AAQ-II has received serious criticism regarding its construct validity since it is a unifactorial measure that does not include items for all ACT components and it is inappropriate to assume that it captures the broader PI/PF construct (Francis et al., 2016; Rolffs et al., 2018). It is also unable to distinguish from other related concepts, like psychological distress, global negative emotionality, or neuroticism (Gamez et al., 2011; Wolgast, 2014).

Additionally, several competing scales have been constructed and used for the examination of specific ACT components (e.g., PMA and Values). For example, the PMA component was thoroughly explored by using several “Mindfulness” measures, a concept similar to the PMA. Some frequently used measures are the Mindfulness and Attention Awareness Scale (MAAS; Brown & Ryan, 2003), the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2008), the Kentucky Inventory of Mindfulness Skills (Baer et al., 2004), and the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R; Feldman et al., 2007). All of them have been used in the literature with good psychometric properties, however they are constructed on different conceptualizations of mindfulness, and validated on different types of samples. Choosing a specific scale is recommended to be based on research aims and hypotheses, because some are short and unidimensional suitable for extracting a single mindfulness score, like the MAAS, and others evaluate in more detail and in-depth the mindfulness concept including its various aspects, like the CAMS-R or FFMQ (Sauer et al., 2013).

Similar issues arise with the Values component assessment, since more than 17 scales have been created for its evaluation. Some of them are the Valued Living Questionnaire (VLQ; Wilson et al., 2010), the Bulls-Eye Values Survey (BEVS; Lundgren et al., 2012), the Valuing Questionnaire (VQ; Smout et al., 2014), the Engaged Living Scale (ELS; Trompetter et al., 2013), and the Valued Living Scale (VLS; Jensen et al., 2015). Each tool differs in the number of items included, its structural model (i.e., single- or multi-factor), the concept of values assessed, and the way it is administered (i.e., self-report, behavioral measurement). Two recent review studies on values scales (Barrett et al., 2019; Reilly et al., 2019) agreed that the VQ, ELS, VLS, and VLQ have the best psychometric properties, based on their structural validity after conducting EFA or/and CFA, internal consistency, test-retest reliability, and convergent and discriminant validity (for more details, see Barrett et al., 2019, p. 471). Therefore, the selection of one of those scales should be made primarily on the reason of use, since some of them are helpful for a quick and easy evaluation of values in research (e.g., VQ) and others are suitable for a more detailed exploration and clarification of values in clinical settings (e.g., VLQ, VLS).

Another issue with the existing ACT measures is the lack of well validated scales to explore certain ACT constructs (e.g., SACxt, FUS). For example, SACxt is believed to be an important component of the PI/PF model, but it is the least studied. Different measures created to assess SACxt, face different issues. The Experiences Questionnaire (EQ; Fresco et al., 2007) was designed to evaluate the concept of decentering, which is assumed to be similar to SACxt component, however it does not capture the construct adequately (Harris, 2013). The Self Experiences Questionnaire (SEQ; Yu et al., 2016) was a good effort to create a scale to specifically assess the concept of SACxt in chronic patients, although it needs to be further tested in other samples of general population. The Self as Context Scale (SACS; Zettle et al., 2018), was the most recent measure that was designed to explicitly evaluate the SACxt component in college students and despite its promising findings of good internal consistency and validity, it needs to be further explored in the general population.

Common problems exist with the FUS component since few studies have dealt with its assessment. A few scales were explicitly designed to explore the FUS, although they present with several limitations. The Automatic Thoughts Questionnaire – Believability (ATQ-B; Zettle et al., 2011) and the Believability of Anxious Feelings and Thoughts Questionnaire (BAFT; Herzberg et al., 2012) were originally designed to measure the believability of depressive and anxiety thoughts, respectively. Thus, they are both unsuitable to be used as a general measure of FUS. Two recent tools, the Drexel Defusion Scale (DDS; Forman et al., 2012) and the Cognitive Fusion Questionnaire (CFQ; Gillanders et al., 2014) were both exclusively constructed to explore the FUS component. The DDS used hypothetical scenarios of unpleasant situations and requested self-evaluation of people’s defusing ability, instead of asking them to assess their defusion skill based on real life events. Alternatively, the CFQ was a brief and general measure of FUS, which has been adapted in various languages (e.g., Italian, German, French, Greek) and used in different populations (e.g., children and adolescents, clinical and non-clinical), with good psychometric properties.

Some of the measures have been developed for specific clinical conditions (e.g., eating disorders) or health issues (e.g., chronic pain, diabetes management), therefore it is inappropriate to use them in general population for varied research, or clinical purposes. For example, the Committed Action Questionnaire - 8 (CAQ-8; McCracken et al., 2015) was designed to briefly evaluate the “committed action” construct with chronic pain patients. CAQ-8 was used and adapted in various languages with very good internal consistency and construct validity, but again only with chronic pain patients (Akerblom et al., 2016; Bailey et al., 2016; Sanchez-Rodriguez et al., 2019; Terhorst & Baumeister, 2020; Vasileiou et al., 2018; Wong et al., 2016). However, there have been few efforts to examine the psychometric properties of the CAQ-8 with samples of students, non-clinical and healthy people (Gagnon et al., 2017; Mazloom et al., 2020 Trindade et al., 2018). They presented promising preliminary results regarding the factorial structure and reliability of the CAQ-8 in a general population, as well.

Despite the problems with the existing ACT measures, several efforts have been made to examine the factorial structure of the PI/PF model, by using a battery of different ACT measures. Gootzeit (2014) in his doctoral dissertation, tried to explore the structure of the six-factor model (Hexaflex) but could not support it. A three-factor structure was extracted, consisting of a cognitive fusion, an awareness, and an avoidance factor. However, the interpretation of the factors was somewhat unclear, due to the overlap of ACT components across factors. One possible reason for this lack of clarity might be the tools used for the evaluation of the model constructs, since not all ACT components were comprehensively assessed. Experiential avoidance, cognitive fusion and mindfulness were examined using at least two measures for each variable, for self-as-context and values only one scale was used for each, whereas committed action was not assessed. Given the problems in assessing the constructs (e.g., not measuring all ACT components, absence of validated measures assessing each skill), it is no surprise that the six components could not be extracted as theorized, thus probably this approach did not adequately test the "Hexaflex" model.

Vowles, Sowden and Ashworth (2014) also examined the six-factor model and found a poor fit with multiple crossloadings between components. A second EFA showed an acceptable fit for the three-factor model consisting of a defusion/acceptance, a values/committed action, and a self-as-context/be present factor. Even though these results support the idea of the Triflex ACT model, the interpretation of each factor was confusing due to lack of specificity in the measures used to assess the ACT components. For example, the defusion/acceptance factor comprised 3 subscales (Self-Judgement, Isolation, Overidentification) from the Self-Compassion Scale (Neff, 2003). The values/committed action factor consisted of the Activity Engagement subscale from an acceptance measure (Chronic Pain Acceptance Questionnaire; McCracken, Vowles & Eccleston, 2004), the Psychological Flexibility Coping subscale from a general measure of psychological flexibility (Brief Pain Coping Inventory; McCracken & Vowles, 2007) and the Values Success subscale from a values questionnaire (Chronic Pain Values Inventory; McCracken & Yang, 2006). Finally, the self-as-context/be present factor consisted of the Humanity and Mindfulness subscales from the Self-Compasion Scale.

In a comparison of alternative models, Scott, McCracken and Norton (2016) found acceptable fit for four specifications of the ACT conceptual structure. Lower-order, higher-order and bifactor specifications were examined but none of them fully captured the conceptual ACT models. The authors argued in favour of a bifactor model with a single lower-order factor reflecting decentering and two general Openness and Committed Action factors. This was interpreted as being similar to the ‘open, aware, and engaged’ conceptualization of PI/PF model. Again however, the measures used to assess the models lacked scales for values clarification and present moment/mindfulness skills.

Tyndall, Waldeck, Pancani, Whelan, Roche, and Pereira (2020) explored the PI/PF model by using latent class analysis to detect different subgroups of people based on the PI/PF score. Three classes of people were identified: 1) high PF reflecting low levels of experiential avoidance and cognitive fusion and high levels of mindfulness and committed action, 2) moderate PF with medium to moderate levels of experiential avoidance and cognitive fusion, mindfulness and committed action, and 3) low PF characterized by high levels of experiential avoidance and cognitive fusion and low levels of mindfulness and committed action. Three specific ACT components (i.e., experiential avoidance, mindfulness, committed action) were found to be critical in the PI/PF model since they were believed to form a distinct class within the model reflecting on a common latent factor. However, results are incomplete because not all six ACT components were utilized in the analysis (i.e., self as context and values were not assessed), therefore the classes of PF or the connections among the ACT components might have been formed differently.

4. *Development of new ACT measures*

Although the plethora of ACT measures are useful in exploring the distinct influence of each PI/PF component on psychological welfare and behavior, they were not created to comprehensively assess the broader construct of PI/PF. This problem became more apparent after the combination of these distinct single-component ACT scales in examining the full PI/PF model, since it was unclear how all measures are theoretically interrelated and can lead to problems of over- or under-representation of ACT components. Recently, there have been attempts to remedy this, by developing scales to assess PI/PF components at the same time. Francis, Dawson and Golijani-Moghaddam (2016) developed the Comprehensive Assessment of ACT Processes (CompACT), a new measure that evaluates the ACT components using items from existing ACT scales (e.g., AAQ-II, CFQ, MAAS, SACS, VQ, CAQ-8). EFA resulted in a three-factor solution consisting of an Openness to Experience factor, a Behavioral Awareness factor, and a Valued Action factor. Although this scale resembles the idea of the Triflex model, its second factor does not include any items to assess the SACxt component, which is part of the “Aware” process of the Triflex model.

Another attempt to create a comprehensive measure to assess all ACT components was done by Benoy and colleagues (2019) with the Open and Engaged State Questionnaire

(OESQ). OESQ initially consisted of six items, one for each ACT component, however the final version has four items. At first a two-factor solution was tested with all six items, resulting in a poor fit. After removing two items, a two-factor solution was again tested showing a poor fit and two highly correlated factors. Finally, CFA results on a single-factor structure demonstrated an acceptable fit on all study's samples, with good internal consistency. However, the ultra-brief OESQ does not include items for the evaluation of all ACT components.

A recent effort was made by Kashdan and colleagues (2020) to create a new tool that evaluates the concept of PF, which to them is conceptualized as a skill that allows people to achieve valued goals while being distressed (Kashdan & Rottenberg, 2010). The Personalized Psychological Flexibility Index (PPFI) is a 15-item scale that assesses the way people react when facing stressful events by capturing them in three factors: Avoidance, Acceptance, and Harnessing distress. EFA and CFA confirmed the three-factor structure of the scale and found positive associations with adaptive personality characteristics (e.g., conscientiousness, open-mindedness, etc.), mindfulness and well-being. There were also negative correlations with negative emotionality, distress intolerance, depression, generalized anxiety, social anxiety, and stress. PPFI is an appropriate measure to assess how people behave when feeling distress, however it cannot be used for the comprehensive evaluation of the "Hexaflex" model, since it does not include all six ACT components (e.g., DEF, SACxt, CA, PMA).

A more promising measure was developed by Rolffs, Rogge and Wilson (2018), the Multidimensional Psychological Flexibility Inventory (MPFI), a 60-item scale that assesses all 12 dimensions of the PI/PF model (i.e., six for PI and six for PF). EFA and CFA were employed to test several alternative measurement structures of the MPFI: one general factor with no subscales, one higher-order factor with 6 subscales, two higher-order factors with no subscales, and two higher-order factors with 12 subscales. They found an excellent fit for the two higher-order factors of PI and PF loading on 12 subfactors (Rolffs, Rogge & Wilson, 2018). Seider and colleagues (2020) tried to replicate the two higher-order factor structure of the scale for the long and short version of the scale. CFA results were consistent with the original study supporting the two higher-order factor solution, but with some alterations on the measurement model of both versions. The long version showed adequate fit after adding an error covariance between DEF and FUS subfactors, and the short version had excellent fit when two pairs of subfactors were allowed to freely correlate (i.e., ACC & DEF, EA & FUS). They proposed that those changes might be considered as useful areas for further examination and improvement of the scale (Seidler et al., 2020).

Lin, Rogge and Swanson (2020) translated and adapted the MPFI in three Asian languages (traditional Mandarin, simplified Mandarin and Japanese) and used the translated version to explore the theoretical structure of the PI/PF model. They examined five alternative measurement structures with 12 intercorrelated subfactors, two higher-order factors with 12 subfactors, one higher-order factor with 12 subfactors, two factors with no subfactors, and a single factor with no subscales. Results demonstrated acceptable fit only for the first two models, supporting that the alternative theoretical structure of the Hexaflex model, either in the form of 12 intercorrelated components or two correlated higher-order PI and PF dimensions. Therefore, these results support the stability of the factorial structure of the MPFI, providing researchers and clinicians with a comprehensive scale that fully assess the PI/PF model and all its components.

A recent attempt was made by Gregoire and colleagues (2020) to create a shorter 24-item version of the MPFI in French and test its invariance with the English version using samples from different countries. Researchers explored the factorial structure of the MPFI-24 through several models with one factor and no subscales, two factors with no subscales, one higher-order factor with 12 subscales, and two higher-order factors with 12 subscales. CFA results on both MPFI-24 English and French versions showed that the best fitted model was the fourth with the two higher-order factors of PI and PF, which was in line with the original 60-item MPFI English version (Rolffs, Rogge &Wilson, 2018). The measurement invariance of the English and French MPFI-24 versions was also evaluated revealing full invariance between the two languages, which means that the two versions are equivalent and comparable in terms of factorial structure, items loadings and total scores (Gregoire et al., 2020).

In addition, there have been some efforts to evaluate the usefulness of the MPFI in the ACT theoretical and clinical field. Dubler (2018) examine the clinical utility of MPFI in tracing behavior change after an ACT intervention. Research outcomes showed that the MPFI could track progress in psychological functioning after treatment and that several ACT components (e.g., fusion, inaction) served as mediators in behavior change. Other studies revealed another advantage of using the MPFI for clinical and research purposes (Rogge, Daks, Dubler & Saint, 2019; Stabbe, Rolffs & Rogge, 2019). Due to the multiple dimensions of the scale, researchers and clinicians were able to identify different profiles of people (high, moderate, or low PI/PF), and investigate how these types function and predict their response to therapy (Stabbe, Rolffs & Rogge, 2019).

Rogge and colleagues (2019) argued that flexible and inflexible behaviors might simultaneously exist in people in different context and situations and vary across days and weeks. Therefore, this might change the way researchers perceive and examine the components of the PI/PF model. Specifically, by using a comprehensive measure, like the MPFI, researchers and clinicians may explore and understand a wide range of PI and PF behaviors and patterns and help them enhance therapy goals and interventions. Although, the MPFI presents now with new opportunities for complete examination of the PI/PF model and all the above results are very promising, a more in-depth research is needed for better assessing the ACT constructs and examining the relations among them, using traditional and new statistical modelling approaches.

5. *A critical review of traditional psychometric approaches examining the PI/PF model.*

A significant problem in terms of clarifying the structure and interrelations among the PI/PF components, has to do with the psychometric approaches utilized to assess them. The psychopathology field has traditionally been utilizing different psychometric methods to conceptualize psychological constructs and mental disorders. Borsboom (2008) described three conceptual models that have been used to understand the relation among several observed variables, as well as between observed and latent variables, and they all have been operationalized with latent variable approaches. First, is the *constructivist* view, which is associated to the formative modelling approach in psychometrics (Borsboom et al., 2003). This approach presupposes that latent constructs (e.g., PI/PF) are conceived as a function of the observed variables (e.g., components such as experiential avoidance, cognitive fusion, etc.), meaning that the indicators seem to form different features of the latent construct. In the *diagnostic* perspective, constructs are conceptualized as categorical latent classes of variables/traits clusters. For example, PI/PF is thought to be a reflective construct that causes its observable components (i.e., experiential avoidance, cognitive fusion, etc.). The third approach, the *dimensional* perspective, psychological concepts are conceptualized as continuous latent dimensions measured by variables/traits. For instance, PF and PI, as measured by their encompassing components (i.e., experiential avoidance, cognitive fusion, etc.), are conceptualized as the two ends of a continuum. The latter two models assume that the latent constructs reflect and cause observed variables (Borsboom, 2008; Borsboom & Cramer, 2013; Nuijten et al., 2016; Schmittmann et al., 2013).

These traditional psychometric models are certainly useful techniques to evaluate the dimensionality, the measurement or theoretical structure of a psychological construct and how it connects to its components. By using them the study of a concept is simplified, since they do not conceptualize or evaluate the underlying interconnections among the model's components, leaving out the overall complexity of the system. Attention is focused on the common factor that unifies and explains all its components. Therefore, it can be hypothesized that any response to the observed indicators (i.e., symptoms/traits) might be translated back as a common latent factor and that the model's components have nothing mutual among them after accounting for that common factor (Guyon, Falissard & Kop, 2017; van Bork et al., 2019).

Nevertheless, they all come with some common limitations. Firstly, they do not take into consideration the interactions between the observed indicators. The constructivist model perceives the connections between several components as a fact and does not consider their origin. The diagnostic and dimensional views, both assume that the connections between the components are real, only because they serve as indicators of a common latent construct. This is the statistical hypothesis of "*local independence*", which assumes that in a latent variable model no association exists among the observed indicators of a latent variable, making them independent in the model (Borsboom, 2008; Cramer et al., 2010; McNally, 2016). However, the relationships among the characteristics of many psychological concepts can be identified (McNally, 2016; Nuijten et al., 2016; Schmittmann et al., 2013). For instance, in the conceptual model of PF (Hayes et. al. 2004), it is suggested that the skills (i.e., defusion, values, committed action, etc.) are all interconnected, not just because they are part of a bigger construct (i.e., PF), but also because they are likely to share some special connection between them that needs to be further explored. Therefore, it is important to account for the relationships between the observed variables since their interaction might affect the form or appearance of the construct.

Another problem with these measurement models lies in that time is not clearly signified; it is not clear whether "causes" (i.e., latent constructs), precede their "effects" (i.e., observed indicators) in time. For instance, in the constructivist model, it is questionable whether the latent construct serves as a "consequence" of the indicators, whereas, in the diagnostic model, it is unclear if the latent construct takes place "before" the appearance of the indicators (McNally, 2016; Nuijten et al., 2016; Schmittmann et al., 2013). For example, in the PI/PF model it is uncertain whether a person exhibiting psychological inflexible/flexible behaviors might cause changes in the ACT components, or vice versa. In addition, there is no obvious evidence whether PI/PF serves as a "cause" or "effect" in psychopathological problems (Kashdan & Rottenberg, 2010).

A third issue with the traditional measurement models is the inability to identify the common processes that appear in the relationship between a psychological construct and its traits (Schmittmann et al., 2013). It becomes difficult to illustrate the exact underlying mechanism which explains that relation, perhaps because most psychological concepts are not empirically distinguishable and cannot be directly observed. Thus, it is unclear how a certain psychological condition might cause the appearance of certain traits (McNally, 2016; Nuijten et al., 2016; Schmittmann et al., 2013). Consequently, this does not help clinicians and researchers understand the differences in the clinical appearance of people with the same psychopathology (Castro et al., 2019; Nuijten et al., 2016). In practice, the results of exploring the PI/PF structure based on traditional psychometric models are somewhat restricted and do not lead to clear and reasonable conclusions. Thus, these same difficulties are evident in attempts to comprehend the underlying mechanism or functional relation between the PI and its maladaptive components. For example, it is unclear *how* PI arises, or in *what way* a person starts to avoid unwanted experiences or to be dominated by ineffective ways of thinking and exhibits PI (Gootzeit, 2014; Scott et al., 2016; Vowles et al., 2014).

Considering all the above issues that arise from using traditional approaches to study the PI/PF model, an alternative statistical approach should consider not only the structure of the PI/PF model, but also explore the associations among the components. It should provide information on how these skills relate to each other, which ones connect more strongly, and which are more central (i.e., the ones whose change might significantly affect all other variables of the network). Network analysis could address some of the aforementioned issues, making it a suitable method to explore the architecture and functional relations among the PI/PF model components.

6. Network analysis: A new statistical approach to explore the PI/PF model.

Network analysis is an approach that allows researchers to explore and understand human, biological, and other systems that exhibit an interdependent structure. Through an exploration of graphs that represent relations between discrete objects, network analysis tries to explain specific classes of phenomena. Objects are reflected by nodes (i.e., people, organizations, constructs, traits, etc.) and the connections between them are called edges. Nodes and edges are used to better understand the structure of a phenomenon and the type of interactions among its traits (Borner et al., 2007; Lewis, 2011).

In psychological research, networks have been recently introduced as an alternative statistical approach of exploring and evaluating phenomena with the aim to remedy some of the problems with the traditional psychometric approaches (Borsboom, 2008, 2017; Borsboom & Cramer, 2013; Borsboom et al., 2011; Cramer et al., 2010). In network analysis, a psychological construct (e.g., PI/PF) can be modelled as a system of variables/nodes (e.g., components such as experiential avoidance, cognitive fusion, etc.) interconnected by edges encoding the relations among variables. An example of a simple psychological network can be visualized in Figure 2, where there are 6 nodes (i.e., A to F) connected by 7 edges, such as an edge between nodes A and B, or an edge between nodes E and F, and so on. In a network structure, a latent construct does not have the leading role anymore, as in the traditional approaches; instead, is represented by a set of indicators as the core of the network.

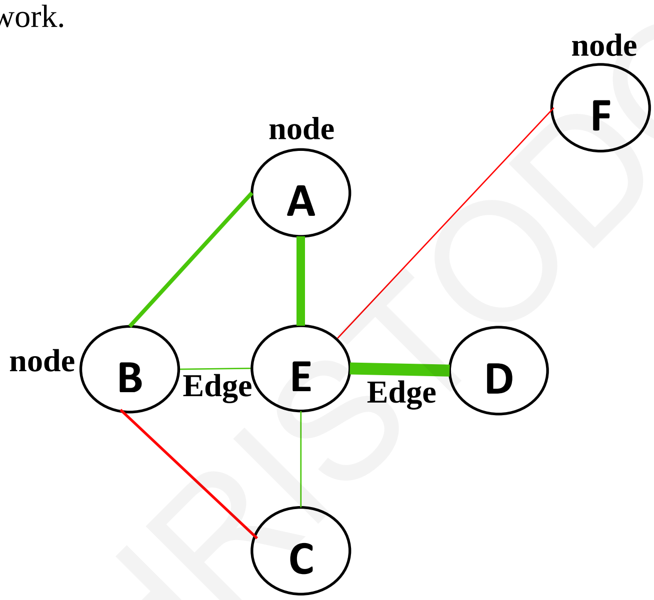


Figure 2. A psychological network can differ in terms of *edge weight*, *sign*, *closeness*, and *betweenness*.

The analysis of a network explores the function and the role of the variables within the network (i.e., how the variables relate with each other; Borsboom & Cramer, 2013; Borsboom et al., 2011; Fried et al., 2017; Nuijten et al., 2016; Schmittmann et al., 2013). For example, in the PI/PF model some maladaptive behaviors, like experiential avoidance and cognitive fusion which are theoretically considered closer together (Hayes, Strosahl, & Wilson, 2012; Hayes et al., 2013) might present with stronger and closer interconnections within the network. If found, this connection would suggest that individuals who deny experiencing their feelings and thoughts, may also use ineffective ways of dealing with them. This means that if one maladaptive aspect is present, then the likelihood of the other being present is high and perhaps if there is an increase in one, this might lead to an increase in the other.

Psychological networks have been examined for various mental health problems, such as anxiety disorders (Beard et al., 2016; Heeren & McNally, 2016; Levinson et al., 2017), post-traumatic stress disorder (McNally et al., 2015; Armour et al., 2017), depression (Boschloo et al., 2016; Fried et al., 2016; Levinson et al., 2017), obsessive compulsive disorder (Ruzzano et al., 2015; Jones et el., 2018), autism (Ruzzano et al., 2015; Deserno et al., 2017), psychosis (Bak et al., 2016; Isvoranu et al., 2016a, 2016b), and personality traits (Cramer et al., 2012; Costantini et al., 2015; 2019). Based on findings from these studies, the importance of the network approach is highlighted as advantageous over traditional models in allowing to explore the relationships among the components of a problem/characteristic and identify which are more central and stronger. Conceiving problems as networks could help to guide therapy by targeting the ones that could exert the greatest influence on individual problems/characteristics.

Another important novelty of the psychological network is that it gives different centrality measures for the identification of the core components that might contribute to the development of a psychological problem or a therapeutic change (Contreras et al., 2019). Certain components may be found to be differently connected to others, if they differ in levels of edge weight and sign (Borsboom et al., 2011; Costantini et al., 2019; McNally, 2016). The weight of an edge is represented in the graph by the thickness of the connecting line between nodes. This indicates the size of the association between a certain node to others. In Figure 2, the strongest edge is between nodes E and D because of the thickest line connecting them indicating a correlation between them after controlling for all other variables in the network; on the contrary, the weaker edge is found between nodes B and C or nodes E and F. For instance, in the PI/PF network it might be hypothesized that the edge/connection between experiential avoidance and cognitive fusion might be stronger than the edge between cognitive fusion and values, since experiential avoidance and cognitive fusion are related and have even been conceptualized to form the “open” aspect of the Triflex model according to ACT theory (Harris, 2009; Hayes, Strosahl & Wilson, 2012; Hayes et al., 2013) and research (Vowles, Sowden, & Ashworth, 2014; Francis, Dawson, & Golijani-Moghaddam, 2016).

The connection between two nodes in a network can have positive or negative signs, which indicates a positive or a negative relationship between the two variables, respectively (Costantini et al., 2019; McNally, 2016). In Figure 2, the red line/edge between nodes B and C, and nodes E and F, represents the negative connection found between them. For example, in the PI/PF network, “cognitive fusion” and “present moment/mindfulness” will probably have a negative relationship, because when people get constantly more entangled with their unhelpful thinking, they tend to be less in contact with the present moment (Hayes et al., 2012; 2013). In contrast, the relationship between “lack of values” and “experiential avoidance” is expected to be positive, because when people avoid any negative or unwanted experience, they tend to avoid what is important for them, and abandon their values (Hayes et al., 2012; 2013).

Moreover, the network structure can be analysed using different measures of node centrality. One such measure, strength centrality index, is calculated by taking the sum of the absolute edge weights a certain node is directly connected to in a network. It is an important index because it reflects the nodes that have the strongest connections in a psychological network (Borsboom et al., 2011; Costantini et al., 2019; McNally, 2016). Closeness, another centrality index, evaluates the distance of a certain node to all others in the network. When a node is closer to other nodes is an indication of how central (i.e., important) this node is to the network structure. As can be seen in Figure 2, node E has the highest closeness because it is the closest to all others, compared to node F which is more distant. In addition, if edges represented mutual causal relationships, changes in a node high in closeness would have more quickly affected changes or be affected by changes in all other connected nodes, compared to more peripheral nodes (Borsboom et al., 2011; McNally, 2016). For example, in the PI/PF model, the “loss of contact with the present moment” forces people to be more fused, judgemental, rigid and in distance with their thoughts and feelings, and to adopt behaviors and actions not in line with their personal values (Hayes, 2004; Hayes et al., 2012; 2013). Hence, if this component was high in closeness, then we could assume that it is more central in the network and more important to the overall PI/PF model.

Network analysis considers also the betweenness of a node, which is measured by the number of times a certain node is found in the shortest path between two other nodes. In Figure 2, node E has the highest betweenness since it is found twice in the path of two pairs of nodes. Between nodes B and D, we find node E and it is also found on the path between nodes A and C, thus node E has a betweenness of two. Therefore, if edges represented mutual causal relationships, then we would assume that the activation of node E, which is high on betweenness, could have caused the activation of all other paired nodes (Borsboom et al., 2011; McNally, 2016). For example, according to ACT theory, “self-as-context” is the ability of people to observe their thoughts and emotions by keeping a flexible perspective without attaching to them. It is also believed that if people increase their ability of using their observer self, they might indirectly enhance their ability to keep contact with present moment, get more defused and open to their thoughts and feelings and more in line with their values (Hayes et al., 1999; 2004). Therefore, if we assume that "self-as-context" is high on betweenness, we may find it on the paths between "acceptance" and "defusion" nodes, "acceptance" and "contact with present moment" nodes, "acceptance" and "values" nodes and "defusion" and "values" nodes. This might indicate that the ability to observe thoughts in perspective might be of high importance in the overall PI/PF model and clinicians need to therapeutically target this PF skill in order to enhance the overall psychological flexibility of people.

Another important function of network analysis is the identification of possible differences after comparing networks of different populations (e.g., gender, disorders, culture, intelligence level, etc.). Estimating networks of different groups is a useful procedure to find similarities or differences between them, in terms of network structure, strength of edges or the overall level of connectivity (Costantini et al., 2017; 2019; van Borkulo et al., 2017). Therefore, it would be very interesting to examine whether the network structure and connectivity of the PI/PF model might differ across different groups of people, such as male/female or low/high level of perceived stress, overall distress, depression, and self-compassion. This will allow examination of equivalence of the PI/PF network structure across different samples and generalizability across groups, or lack thereof.

Multiple studies have shown no differences between gender groups in symptom networks of depression symptoms (Murri et al., 2018), schizotypal traits (Fonseca-Pedrero et al., 2018), schizophrenic symptoms (Galderisi et al., 2018a; 2018b), posttraumatic stress disorder symptomatology (Birkeland et al., 2017; Gay et al., 2020), eating disorder symptoms (Perko et al., 2019), and borderline personality disorder features (Southward & Cheavers, 2018). No differences were also detected before and after therapy groups in networks of depression symptoms (Bos et al., 2018), and eating disorder psychopathology symptoms (Smith et al., 2019). However, mixed results were extracted for groups with-or-without psychopathology. Some researchers found significant differences only in the network structure, with more network connectivity in groups with social anxiety disorder symptoms (Heeren & McNally, 2018), and eating disorder/social anxiety disorder symptoms (Levinson et al., 2018). Others detected changes only in global strength, with stronger networks in groups of depression symptomatology (Santos et. al., 2017). No group differences in network structure and global strength were observed in groups of with-or-without depressive symptoms (Hakulinen et al. 2020).

Network analysis can provide a new way of understanding psychological phenomena in relation to their complex nature and structure, which enables researchers to explore them as systems and not as simply unidimensional or multidimensional constructs. Conceptualizing psychological constructs as networks has the advantage of enhancing our understanding of the unique role of each trait/variable has within a dynamic and interactive model, that may help better explain psychopathology and suffering of people. This approach can also open the field of psychopathology up to new explorations and understandings and may contribute to better linking diagnoses to treatment (Gloster & Karekla, 2020) and maximizing the effectiveness of therapeutic intervention (Borsboom, 2017; Borsboom & Cramer, 2013; Haslbeck & Fried, 2017; Nuijten et al., 2016). In general, this alternative psychometric methodology presents with great potential for expanding the study of ACT, the underlying PI/PF model and the problems identified with the dimensionality of the overall PI/PF construct, and mechanisms that contribute to change.

7. Aims and hypotheses.

Important problems have been identified in the use of traditional psychometric approaches to study the ACT model components, in combination with the lack of comprehensive measurement of all ACT components. The combination of the new integrated measure (MPFI) with an alternative statistical approach, network analysis, appears promising for expanding the study of ACT, and its underlying psychopathology model and mechanisms of therapy change.

The purpose of the present study was to examine the PF/PI model and its components with a new and innovative methodology. By using data from both a battery of different ACT measures and the comprehensive MPFI measure, and an application of network analysis, the study has examined the structure of the PI/PF model and the connections between its components as a system and across groups. This might contribute to a better understanding of the proposed model and its impact on psychopathology and therapeutic process of change, a novelty of the study, since no evaluation was fully conducted simultaneously on all ACT components.

By combining the traditional factor analytic with the network analysis methodologies, the study will help to the enhancement and validation of the theoretical background of the PI/PF model, which is of great importance for the ACT community. It was hypothesized that the new methodologies will help to identify the ACT components that are more actively involved, how they interact within the model and which of them are most important or contribute significantly to the development of a problem and subsequently lead to successful intervention and behaviour change. Finally, it is believed that the function of the PI/PF components is common in many psychological problems and disorders (Hayes et al., 2006; 2012). Therefore, the present study aimed at providing clinical psychology community with empirical evidence of a common underlying mechanism on how psychopathology and psychological problems are developed and maintained. This is critical, since it will help mental health professionals plan and implement a comprehensive therapeutic intervention to address a wide range of mental health issues.

The first aim of the study was to examine the structure of the PI/PF model with traditional psychometric approaches by using both the comprehensive MPFI measure and a battery of distinct ACT measures. The three alternative PI/PF models (Hexaflex, Triflex, Duoflex) were explored through confirmatory factor analysis for both sets of measures. It was hypothesized that the model that better explains the PF/PI model will be the Hexaflex model as measured by the MPFI scale, since it is supported by previous findings (Gregoire et al., 2020; Lin, Rogge & Swanson, 2020; Rolffs, Rogge & Wilson, 2018; Seidler et al., 2020). These results will enhance the comprehension of ACT theory and the measurement structure of the PI/PF model, in order to use a more parsimonious and empirically supported theoretical model. Finally, by comparing a single comprehensive and multiple distinct batteries of ACT measures, will help to evaluate their effectiveness in better and more accurately measuring the PI/PF construct and its components. By doing so, will provide researchers with useful information on how to develop appropriate ACT scales tailored to the needs of ACT theory. Clinicians by using those enhanced ACT measures will be more able to better evaluate and therapeutically target the psychologically inflexible and flexible behaviors of their clients.

The second aim was to explore the relations among the PI/PF model components through network analysis and by using the two data sources (comprehensive ACT measure and six different ACT measures). The most important components within the network of the PI/PF model and how they relate to each other in both datasets were explored. It was hypothesized that certain ACT components, such as EA or FUS, will be more central and stronger in the network, compared to other ACT components. Additionally, it was assumed that specific pairs of ACT components (e.g., PMA/LCPM and SACxt/SACnt or VAL/LCV and CA/IA) will have higher connectivity related to other different ACT pairs. It was also believed that the MPFI measure will be more suitable for complete and accurate identification of the connections among ACT components. It was expected that useful information will extract from the MPFI, about the role of each ACT component in the PI/PF model and the associations among them, which will help clinicians to therapeutically target the most strong and central ACT components that will further enhance their clients' psychological flexibility.

The final aim of the study was to search for similarities or differences in the structure and relationships of the PI/PF model components by comparing the networks of different populations. Specifically, we aimed to investigate the network structure, strength of edges and overall level of connectivity of the model between different samples of people. Network comparison was done on five groups: 1) low and high levels of distress, 2) low and high levels of self-reported depression, 3) males and females, 4) low and high levels of self-compassion, and 5) low and high levels of perceived stress. No differences were expected on the structure, edge strength or network connectivity across different groups, such as male/female or low/high level of perceived stress, overall distress, depression, and self-compassion. Extracting this kind of information will clarify whether certain ACT components or the overall PI/PF model structure was stable regardless of the population, making it more stable and accurate. This will contribute to further strengthening and support of the PI/PF model as a competing therapeutic intervention for the treatment of different populations, due to the stability and replicability of the PI/PF model structure and connections among its components in different groups of people.

CHAPTER 2: METHOD

1. Participants

<u>*Sample 1.*</u> The sample consisted of 501 Greek-speaking adults, aged 18-67 years old (M_{age} = 25.49, SD = 9.49) who showed interest in participating in the present study. Most of them were females (77%), high-school graduates (54%), live in Nicosia (67%), do not work (55%) and are currently studying (77%). Demographic details about the sample appear on Table 1 (Chapter 3) and information for the recruitment of participants can be found in the Procedures section.

<u>*Sample 2.*</u> Table 5 (Chapter 4) shows the demographic information about the 428 people aged 18-74 years old (M_{age} = 27.52, SD = 11.46) who showed interest in being part of the present study; more details on the collection method can be seen in the Procedure section. Most of the participants were women (77%), had graduated high-school (54%), live in Nicosia (65%), are unemployed (53%) and currently studying (65%).

2. Measures

Measures for sample 1

Multidimensional Psychological Flexibility Inventory (MPFI; Rolffs et al., 2018). The MPFI is a 60-item questionnaire designed to evaluate the Psychological Flexibility (PF) and Psychological Inflexibility (PI) dimensions of Acceptance and Commitment Therapy model. The scale consisted of 6 distinct 5-item subscales for the PF dimension (i.e., Acceptance, Present Moment Awareness, Self-as-Context, Defusion, Values, Committed Action) and 6 distinct 5-item subscales for the PI dimension (i.e., Experiential Avoidance, Lack of Contact with the Present Moment, Self-as-Content, Fusion, Lack of Contact with Values, Inaction). Items are rated on a 6-point ordinal scale ranging from 1 (never true) to 6 (always true). Higher scale scores indicate higher levels of each dimension and subscale. The original MPFI had good internal consistency for the PI dimension (*Cronbach's a* = .91) and its subscales (*Cronbach's a range: .89* - *.93*) and for the PF dimension (*Cronbach's a* = .90*)* and its subscales (*Cronbach's a range: .87* - *.95*). The scale was adapted in Greek (Appendix 1) and more details about the translation process can be found on the procedure section. In the present study, the Greek MPFI had good reliability for the PI dimension (*Cronbach's a* = .95) and its subscales (*Cronbach's a range: .84* - *.91*) and for the PF dimension (*Cronbach's a* = .93*)* and its subscales (*Cronbach's a range: .54* - *.86*).

Symptoms Checklist-90-Revised – Greek Version (G-SCL-90-R; Donias et al., 1991; English version by Derogatis, 1983). The SCL-90-R was created to assess the general level of psychological distress and identify clinical symptoms experienced in the past week. It is a 90-item scale rated on a 5-point ordinal scale ranging from 0 (not at all) to 4 (very much). The SCL-90-R consists 9 primary symptom categories (somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism) and 3 global indices of distress (global severity index, positive symptom distress index, positive symptom total). Higher scores indicate higher levels of the dimension being measured by the items. For the present study of interest was the general level of psychological distress (Global Severity Index; GSI) and the depression subscale. The GSI and depression subscale were used to create two groups of low and high levels of distress and depression, respectively. Participants with a mean GSI score above 1.94 (T_{score}=70) and a mean depression score above 29 (T_{score} = 70) were assumed to have increased levels of distress and depression, respectively (Donias et al., 1991). In the present study, the Greek version had excellent internal consistency (*Cronbach's a* of GSI = .97*)*.

Measures for sample 2

Acceptance and Action Questionnaire – II-Greek Version (G-AAQ-II; Karekla & Michaelides, 2017; English version by Bond et al., 2011). The AAQ-II evaluates people's inability to accept unwanted private events (e.g., thoughts, feelings, memories) and pursue goals in the presence of those unwanted private events. It is a seven-item measure of experiential avoidance (EA) rated on a 7-point ordinal scale ranging from 1 (*never true*) to 7 (*always true*), with higher total scores indicate higher EA. The Greek AAQ-II showed good internal consistency in the original study (*a* =.92) and in the present study (*a* =.92).

Cognitive Fusion Questionnaire – Greek Version (G-CFQ; Zacharia et al, 2021; English version by Gillanders et al., 2014) evaluates people's excessive attachment to their internal experiences and over-regulation of their behavior based on the content of their thoughts and emotions. It is a 7-item scale of cognitive fusion (FUS) rated on 7-point ordinal scale ranging from 1 (*never true*) to 7 (*always true*), with higher total scores show higher FUS. The Greek CFQ showed a high reliability (*Cronbach's a* = .92). In the present study, Cronbach's alpha was .94.

Cognitive and Affective Mindfulness Scale – Revised – Greek (G-CAMS-R; Vasiliou et al., 2019; English version by Feldman et al., 2007) evaluates people's ability to be aware and in contact with their thoughts and feelings of the present moment. It is s 12-

item measure of mindfulness/ present moment awareness (PMA), which is rated on a 4-item frequency scale ranging from 1 (*rarely*) to 4 (*almost always*), with higher total scores indicate higher PMA. The CAMS-R had good internal consistency of *a* = .86 and *α* = 78, in the original and present study, respectively.

Self as Context Scale – Greek (G-SACS; Zacharia & Karekla, 2020; English version by Zettle et al., 2018). SACS it is a 10-item scale that measures the construct of self-as-context through two dimensions. Items 1, 2, 5, and 6 reflected the Centering dimension, that is the relaxed response to negative thoughts and feelings, and items 3, 4, 7, 8, 9 and 10 reflected the Transcending dimension, which is the unchanged sense and perspective for self. All items are rated on a 7-item Likert scale ranging from 1 (*completely disagree*) to 7 (*completely agree*), with higher scores showing higher SACxt. The English SACS version was translated in Greek with back-and-forth translation to be used as part of another dissertation study by Zacharia (2020). In the present study, the Greek SACS had good psychometric properties (Cronbach's α range: Total score = 84; Centering = .75; Transcending = .80).

Valuing Questionnaire – Greek (G-VQ; Anagnostopoulou, 2019; English version by Smout et al., 2014). VQ is 10-item scale that assesses general valued living through the dimensions of Progress (i.e., living according to values) through items 3, 4, 5, 7 and 9, and Obstruction (i.e., disruption of valued living) with items 3, 4, 5, 7 and 9. All items are rated on a 7-point ordinal scale from 0 (*not at all true*) to 6 (*completely true*), with higher scores showing higher valued living. The Greek VQ had good reliability scores in the original (*Cronbach's α:* Progress = .88; Obstruction = .74). and present study (*Cronbach's α:* Progress = .79; Obstruction = .81).

Committed Action Questionnaire – 8 - Greek (G-CAQ-8; Vasiliou et al., 2020; English version by McCracken et al., 2015) CAQ-8 is an 8-item measure that evaluates people's actions that are guided by personal goals and values. All items are graded on 7-item ordinal scale from 0 (*never true*) to 6 (*always true*), composing two subscales of four positively phrased items (i.e., 1 - 4) and four negatively worded items (i.e., 5-8). The Greek CAQ-8 exhibited good reliability indices in the original study (*Cronbach's* $a_{\text{total score}}$ = .80) and in the present study (*Cronbach's α*: Positive = .90; Negative = .76).

Self-Compassion Scale – Short - Greek (G-SCS; Matzios, Wilson & Giannou, 2015; English version by Neff, 2003) assesses self-compassion (i.e., feelings of self-kindness and acceptance of weaknesses and failures) through the dimensions of Self-Kindness ("I try to be understanding and patient towards those aspects of my personality I don't like"), Self-Judgment ("I'm disapproving and judgmental about my own flaws and inadequacies"), Common Humanity ("I try to see my failings as part of the human condition"), Isolation ("When I'm feeling down, I tend to feel like most other people are probably happier than I am"), Mindfulness ("When something painful happens I try to take a balanced view of the situation"), and Over-Identification ("When I fail at something important to me I become consumed by feelings of inadequacy"). It is a 12-item measure rated on a 5-item scale form 1 (*almost never*) to 5 (*almost always*), with higher total scores indicate higher self-compassion. The original Greek SCS had good psychometric properties (Cronbach's α: Total score = .87, Self-Kindness =.70, Self-Judgment = .77, Common Humanity = .72, Isolation = .71, Mindfulness = .72, Over-Identification = .76). In the present study, the Greek SCS had adequate internal consistency for the total score (α = .83) and poor estimates for some of the subscales (α_{range} = .29 - .71).

Perceived Stress Scale – Greek (G-PSS; Michaelides et al., 2016; English version by Cohen & Williamson, 1988) measures people's perception of stress through the dimensions of Perceived Stress ("how often have you been upset because of something that happened unexpectedly") and Perceived Coping ("how often have you felt confident about your ability to handle your personal problems"). All items are rated on a 5-pont frequency scale from 0 (never) to 4 (very often), with higher total scores show higher perception of stress. The original Greek scale had good reliability (Cronbach's α: Total score = .85, Perceived Stress .87, Perceived Coping = .75) and in the present study Cronbach's α: Total score = .87, Perceived Stress .85, Perceived Coping = .83.

3. Procedure

Both samples were part of a new study designed to examine the PI/PF model and its components using latent factor analysis and network analysis with a comprehensive PI/PF measure and a battery of different ACT measures. After receiving approval by the Cyprus National Bioethics Committee (#EEBK ΕΠ 2019.01.78) for collecting data for the first sample, permission was granted by MPFI and SCL-90-R developers to use them. A second permission was granted by the CNBC, after requesting protocol modifications, to use a battery of measures for the second data collection since problems were encountered with existing datasets that were initially explored (secondary data analysis)[1]. Approval was

[1] In the original research proposal for the investigation of the study's objectives, it was proposed to use two secondary samples (data of previous research). However, the final size of the two samples was extremely small (N1 = 93, N2 = 98), which created problems in the research analyses. After consultation with the research supervisor, experts in the proposed statistical analysis, and communication with the 3-member doctoral committee it was decided to drop the secondary samples and collect original data from a new sample of participants.

received by the original creators for using the Greek version of the AAQ-II, CFQ, CAMS-R, SACS, VQ, CAQ, SCS, and PSS in the second study.

MPFI was translated and adapted in Greek in the present study by using the TRAPD model's guidelines (European Social Survey, 2016). For the first step, the instrument was translated in Greek by two skilled ACT experts experienced in Greek and English language, creating two independent translations of the questionnaire. Then, three experienced researchers reviewed both versions and decided on the final Greek version. The final version was reviewed and checked by two experts in the Greek language. Finally, the Greek version was pre-tested with 30 respondents to check for comprehension, wording, and flow issues. After suggestions by almost all participants of the pre-test, the order of the MPFI items was changed. In the original MPFI, all five items of each ACT component were placed in sequence, starting with the items of the six PF subscales (ACC, PMA, SACxt, DEF, VAL, CA) and then for the six PI subscales (EA, LCPM, SACnt, FUS, LCV, IA). In the Greek adaptation of the MPFI, the first question of each PF subscale was positioned in the beginning six slots of the final scale, the second question of each PF subscale was positioned in the next six slots, and so on. The same re-ordering method was performed for the items of the six PI subscales. The scale started with 30 re-ordered items of the PF subscales, followed by the remaining 30 items of the PI subscales. Two control items were also placed in between the 60 items of the scale to check for lack of attention or response bias ("Please select the answer *Occasionally True*", "Please select the answer *Often True*").

The final version of the MPFI, the SCL-90-R, several demographics questions (i.e., age, sex, education, work status, residence city) were uploaded on the Survey Monkey online survey platform to create the first online package of questionnaire for the first sample. The AAQ-II, CFQ, CAMS-R, SACS, VQ, CAQ, SCS, PSS and several demographic questions (i.e., age, sex, education, work status, residence city) were uploaded on the online survey platform to form the other package of questionnaires administered to the second sample.

While the selection of participants was not probability based, various collection methods were used to recruit participants for sample 1 (December 2019 – July 2020) and then for sample 2 (September 2020 – December 2020). Initially, social media (i.e., Facebook, Instagram) were utilized. The announcement invited people to participate in a voluntary and anonymous research study by completing the online package of questionnaires. In addition, participants from different departments (e.g., physics, mathematics, economics, psychology, social science, etc.) of several universities in Cyprus (i.e., University of Cyprus, University of Nicosia, European University Cyprus, Neapolis University) were contacted. After informing and receiving permission from different class instructors, each class was briefly informed about the study and invited to voluntarily participate in the study. Afterwards, an email invitation was sent to the instructors with the link of the online questionnaire to forward it to students. Some of the students received extra class credit for participating in the study, after providing their class code and identification information. Finally, participants were also recruited from different organizations and companies across Cyprus. After informing the administration or secretarial staff of a company/organization about the study and receiving permission, an email invitation was sent to them to forward to it their associates, colleagues, or employees. The email had details and information about the study, the link of the online questionnaire, and an invitation asking them to voluntarily participate in the study.

4. *Statistical Analyses*

All analyses were conducted using R (version 1.3.959). Univariate and multivariate normality was tested with the *MVN* package (Korkmaz et al., 2014), by using Mardia's test statistic for multivariate skewness and kurtosis, Henze-Zirkler's test for Mahalanobis distances, and Royston's test for the Shapiro–Wilk and Shapiro-Francia statistic.

Latent Variable Analysis. Confirmatory Factor Analysis was performed to examine each scale's factorial structure and the alternative PI/PF models by using the *Lavaan* package (Rosseel, 2012) with Maximum Likelihood Estimation with robust standard errors and a Satorra-Bentler scaled test statistic (MLM) due to ordinal and non-normal data. By using both samples, three alternative PI/PF measurement models were examined: Hexaflex (see Figures 4 and 26 for a graphical representation of the model), Duoflex (see Figures 8 and 27), and Triflex (see Figures 10 and 28). The fit of the CFA models was evaluated using: 1) the Satorra-Bentler chi-square statistic, 2) the Comparative Fit Index (CFI), 3) the Root-Mean-Square Error of Approximation (RMSEA) and 4) the Standardized Root-Mean-Square Residual (SRMR). AIC (Akaike Information Criterion) and BIC (Bayes Information Criterion) were employed to compare model fit for CFA models. Excellent model fit was evaluated using the following cut-off scores: the CFI close to .95 or higher, the RMSEA .06 or lower, and the SRMR lower than .05. A Sattora-Bentler Scaled chi-square difference test was applied with the *SBSDiff* package (Mann, 2018) to compare the model fit of the alternative nested models. Also, lower values of the AIC and BIC were used as indicators of more parsimonious models for model selection. All the above a priori criteria and cut-off scores were based on suggestions by Hu and Bentler (1998), Jackson, Gillaspy, and Purc-Stephenson (2009), and Kline (2011).

Network Analysis. All analyses to assess the PI/PF model structure and interrelated connections among its components were conducted with network analysis by using different R packages. The R package *bootnet* (Epskamp et al., 2018) was used for two analyses. At first, the *estimateNetwork* function was used to estimate the partial correlations among the nodes/variables of the PI/PF network. The *EBICglasso* regularization method was selected with tuning-parameter gamma set to 0.5 (Chen & Chen, 2008; Foygel & Drton, 2010), which deals with small samples (N<500) in psychological research (Epskamp et al., 2017). Spearman's rank-correlation method was selected because data were ordinal. Additionally, the *Bootnet* package was also used to estimate the confidence intervals (CI's) on the edge-weights with the *Non-Parametric Bootstrapping* technique with 1000 bootstrap samples, and the stability of centrality indices with the *Case-Drop Bootstrapping* technique using 1000 bootstrap samples. The clustering structure of the PI/PF model was explored using with the *Exploratory Graph Analysis* package (Golino & Epskamp, 2017). The *EBICglasso* technique was combined with the *Walktrap algorithm,* as applied in the *Igraph* R package (Golino & Epskamp, 2017). The main purpose was to identify which PI/PF nodes are more strongly connected and grouped in clusters to investigate whether such cluster conform to the theoretical components of the PI/PF model.

Two methods were used to explore the structure of the PI/PF model with different samples of people (i.e., low vs high depression, distress, self-compassion and perceived stress, and male vs female). Firstly, the *Network Comparison Test* package (NCT; van Borkulo, 2016) was used to independently compare the PI/PF model of different groups to check for significant differences in network structure (*invariance of structure*) and edge strength (*invariance of global strength*). If significant differences across groups were identified, a *Fused Graphical Lasso* (FGL; Danaher et al., 2014) was implemented to assess those group differences more accurately, by using the *Estimate Group Network* package (EGN; Costantini & Epskamp, 2017). EGN simultaneously estimates different network structures by relying on an extra tuning parameter to enhance network edges' estimates and facilitate the identification of group differences.

CHAPTER 3: RESULTS FOR SAMPLE 1

1. Data screening

Before the main analyses, the data were screened for missing values, and violations of univariate and multivariate normality. The original sample consisted 689 cases, 188 cases were list-wise deleted, since 133 of them had more than 20% of missing data and 55 had wrong answers on both control items. Table 1 shows the demographic information for final and deleted cases. Chi-square difference test detected significant differences between final and deleted cases for work, study, and education variables ($p < .01$), which shows that more students were likely to complete the questionnaire, compared to non-students, maybe due to the motive of extra credit in a class. No differences were found in terms of gender or place of residence. A t-test revealed significant age differences between the two samples, indicating that that participants removed from the sample (M = 29.95, SD = 10.15) were slightly older that those that retained (M = 25.49, SD = 9.49), t (317) = 5.2, p = .0001. Normality checks were done for the final sample (N=501) and results indicated violation of multivariate normality according to Mardia's skewness (S = 60290.905, p <.001) and kurtosis (K = 80.825, p <.001) and Henze–Zirkler's statistic (HZ = 1.000125, p <.001). There was also deviation from univariate normality according to Shapiro-Wilk test (SW_{range} = .85 - .94, p <.001) for all scales' items.

Table 1. **Demographics for final and deleted cases for Sample 1**

Variables	Final number of cases retained (N=501) *n (%)*	Deleted cases (N=188) *n (%)*
Age *Mean (SD)*	25.49 (9.49)	29.96 (10.15)
Gender		
Female	385 (77)	149 (79)
Male	116 (23)	39 (21)
Work		
Full-time	131 (26)	90 (48)
Part-time	96 (19)	41 (22)
Unemployed	274 (55)	57 (30)
Study		
Yes	387 (77)	103 (55)
No	114 (23)	85 (45)

Table 1. Continued.

Variables	Final number of cases retained (N=501) *n (%)*	Deleted cases (N=188) *n (%)*
Education		
High school	268 (54)	60 (32)
Undergraduate	152 (30)	60 (32)
Postgraduate	70 (14)	60 (32)
Other	11 (2)	8 (4)
Residency		
Nicosia	337 (67)	115 (61)
Larnaca	62 (12)	23 (12)
Limassol	65 (13)	32 (17)
Famagusta	18 (4)	9 (5)
Paphos	13 (3)	2 (1)
Other	6 (1)	7 (4)

2. Evaluation of the alternative MPFI and PI/PF structures using latent variable analysis

At first, two measurement structures of the MPFI were tested (Figure 3). A uni-factorial structure with all 60 items loading on a Psychological Flexibility (PF)/ Psychological Inflexibility (PI) factor, that demonstrated a poor fit (Table 2). A two-factor model was also evaluated with two latent variables: items 1 to 30 loaded on PF factor and items 31 to 60 loaded on PI factor and both factors allowed to covary, resulting in a poor fit (Table 2).

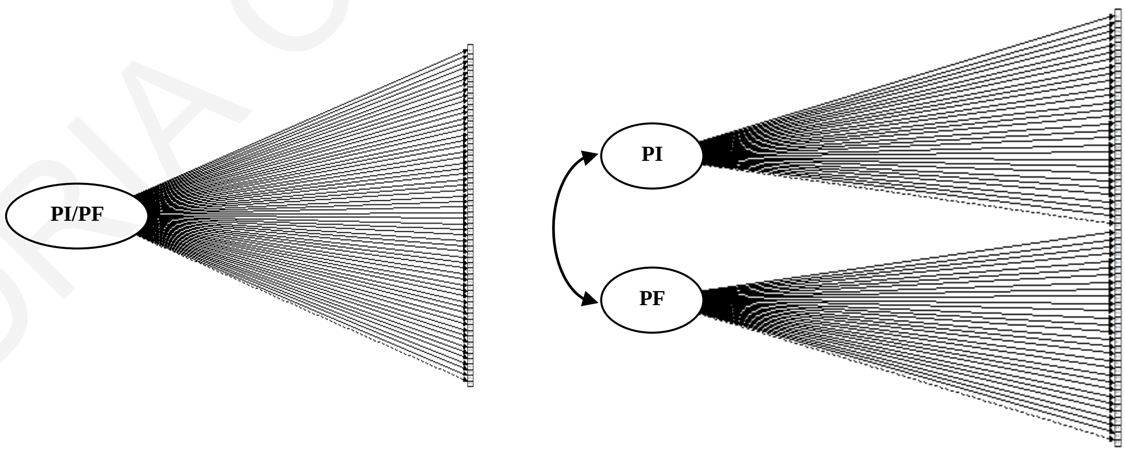


Figure 3. Alternative measurement models. *Left*: A uni-factorial model with a PI/PF factor. *Right*. A two-factor model with two PI and PF factors.

Different theoretical PI/PF structures (Hexaflex, Duoflex, Triflex) were explored with latent variable analysis with the MPFI.

Hexaflex model. This model was examined using the Greek MPFI with 12 first-order latent variables: items 1 to 5 loaded on an Acceptance factor (ACC), items 6 to 10 loaded on a Present Moment Awareness factor (PMA), items 11 to 15 loaded on a Self-as-Context factor (SACxt), items 16 to 20 loaded on a Defusion factor (DEF), items 21 to 25 loaded a Values factor (VAL), items 26 to 30 loaded on a Commitment Action factor (CA), items 31 to 35 loaded on an Experiential Avoidance factor (EA), items 36 to 40 loaded on a Lack of Contact with Present Moment factor (LCPM), items 41 to 45 loaded on a Self-as-Content factor (SACnt), items 46 to 50 loaded on a Fusion factor (FUS), items 51 to 55 loaded on a Lack of Contact with Values factor (LCV), and items 56 to 60 loaded in an Inaction factor (IA). All factors were intercorrelated (Figure 4).

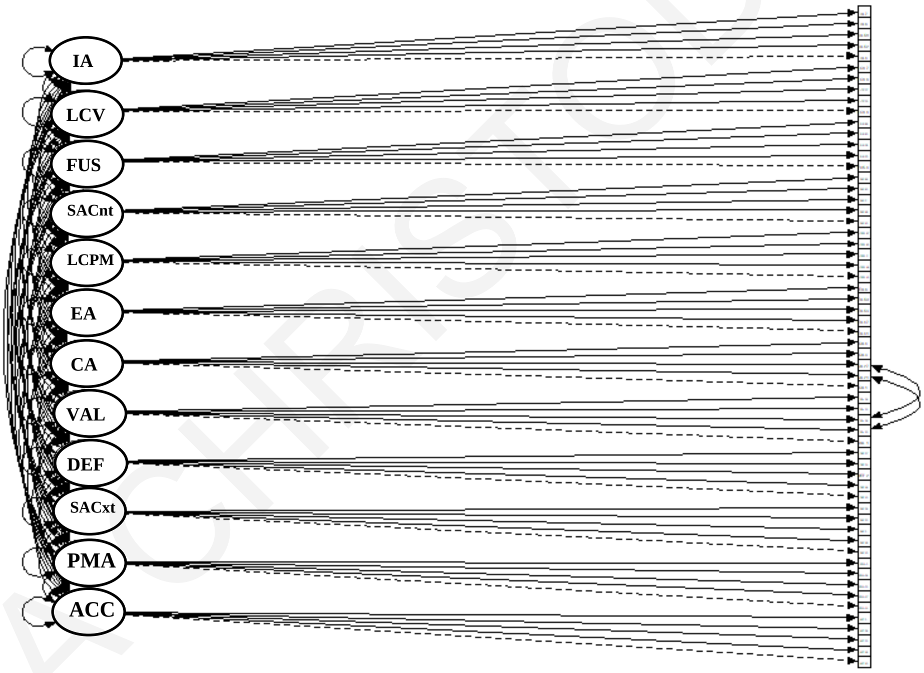


Figure 4. A Hexaflex model with 12 intercorrelated factors.

The 12-factor model resulted in a no-solution due to non-positive definite matrix. After careful inspection of the correlation among the variables, near perfect correlation between VAL & IA factor was found (r = .979), which might be the cause of matrix inversion operations failure (Kline, 2011, p.51). Therefore, two post-hoc modifications were made based on inspection of modification indices to improve the fit of the model. The residuals for items VAL.20 (“I stuck to my deeper priorities in life”) and CA.21 (“Even when times get tough, I was still able to take steps toward what I value in life”) and for items VAL.26 (“I tried to connect with what is truly important to me on a daily basis”) and

CA.27 (“Even when life got stressful and hectic, I still worked toward things that were important to me”) were allowed to covary. Both pairs of items share a similar idea of choosing to adopt valued-actions. The modified model’s fit was inadequate (Table 2).

Additionally, two separate 6-factor models were examined (Figure 5). The first model consisted of six first-order PF latent variables (ACC, PMA, SACxt, DEF, VAL, CA) that allowed to covary and the other model had six first-order PI factors (EA, LCPM, SACnt, FUS, LCV, IA) that were intercorrelated. Fit indices demonstrated an excellent fit for PI “Hexaflex” (Table 2). The PF “Hexaflex” model had poor fit and after inspections on the correlation of all variables and the modification indices, a high correlation was found between VAL and CA (*r* = .980). One post-hoc modification was done by allowing the residuals of the items VAL20 and CA.21 to correlate, resulting in an improved but still unacceptable fit (Table.2).

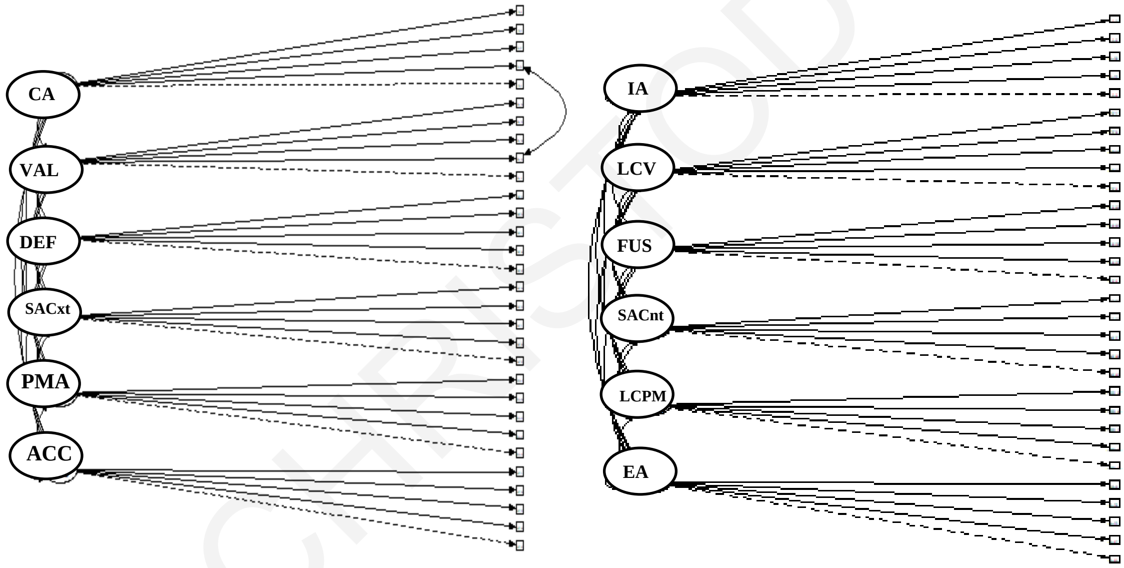


Figure 5. Two Hexaflex models. *Left*: A Hexaflex model with 6 PF intercorrelated factors. *Right*: A Hexaflex model with 6 PI intercorrelated factors.

A higher-order “Hexaflex” model was also tested with two second-order variables of PF and PI, that were allowed to correlate (Figure 6). PF loaded on 6 first-order variables (ACC, PMA, SACxt, DEF, VAL, CA) and PI reflected on 6 first-order variables (EA, LCPM, SACnt, FUS, LCV, IA). The model did not result in a solution, due to non-positive definite matrix. After inspections a near perfect correlation was found between several latent variables (e.g., PF & VAL = .973, PI & FUS = .909, VAL & CA = .949, IA & FUS = .906). This extreme multivariate collinearity might have caused failures in matrix inversion. This might be a possible indication that the higher-order PI/PF factors might not be needed since they do not add something different than the first-order latent variables.

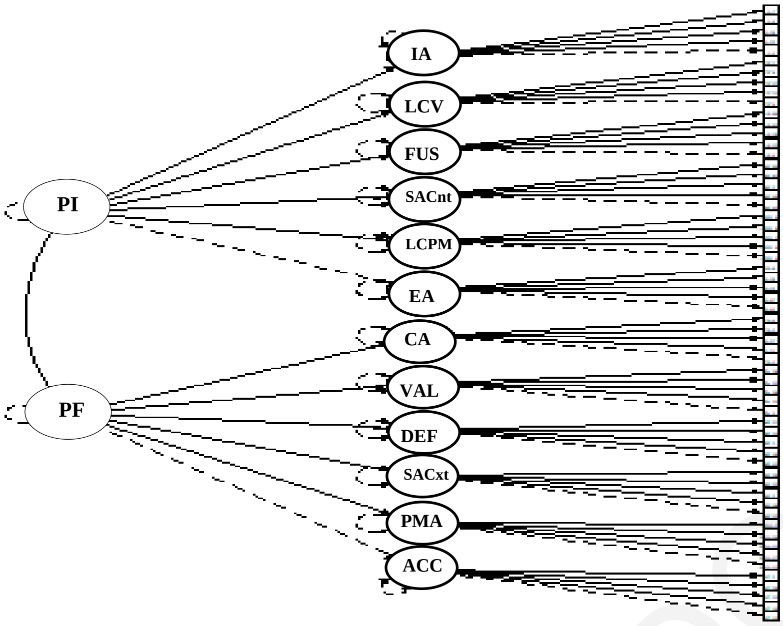
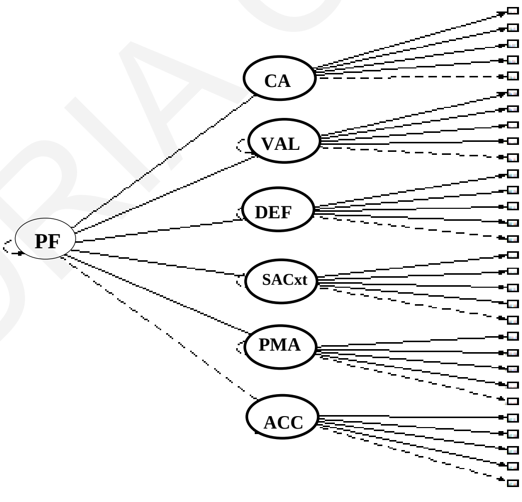


Figure 6. A higher-order Hexaflex model with two intercorrelated factors.

Additionally, two separate higher-order models were examined (Figure 7). The first model reflected a PF higher-order factor loading on six first-order variables (ACC, PMA, SACxt, DEF, VAL, CA) and second model consisted of a PI higher-order variable loading on six first-order factors (EA, LCPM, SACnt, FUS, LCV, IA). Results showed an adequate fit for the higher-order PI model (Table 2). A poor fit was found for the higher-order PF model and after careful inspection a post-hoc modification was imposed. A correlation was allowed on the residuals of items VAL.20 and CA.21, resulting in an improved but inadequate fit (Table 2).



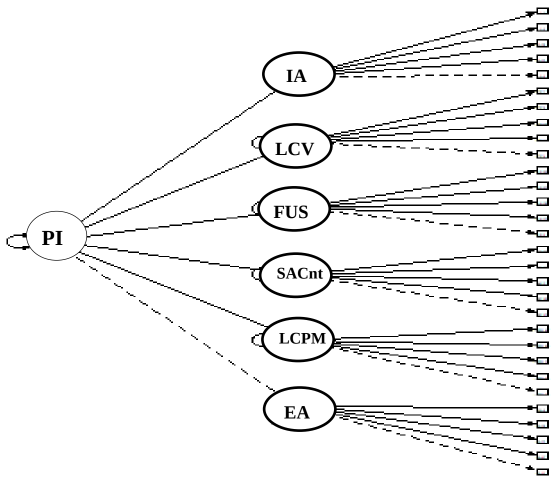


Figure 7. Two higher-order Hexaflex models. *Left*: A higher-order PF Hexaflex model. *Right*: A higher-order PI Hexaflex model.

Duoflex model. The "Duoflex" model consisted of two intercorrelated second-order variables of Mindfulness-Acceptance skills (ACCE) and Commitment-Behavior Change skills (COM). ACCE reflected on eight first-order latent variables (ACC, PMA, SACxt, DEF, EA, LCPM, SACnt, FUS) and COM on eight first-order latent variables (VAL, CA, PMA, SACxt, LCV, IA, LCPM, SACnt) (Figure 8). Note that some of the first-order factors loaded on both second-order latent factors. The model did not result in a solution due to a non-positive definite matrix. After thorough examination, almost perfect correlations were found between several latent variables (e.g., ACCE & COM = .911, COM & IA = 1.000, IA & LCV = .938), which might justify the inability for matrix inversion.

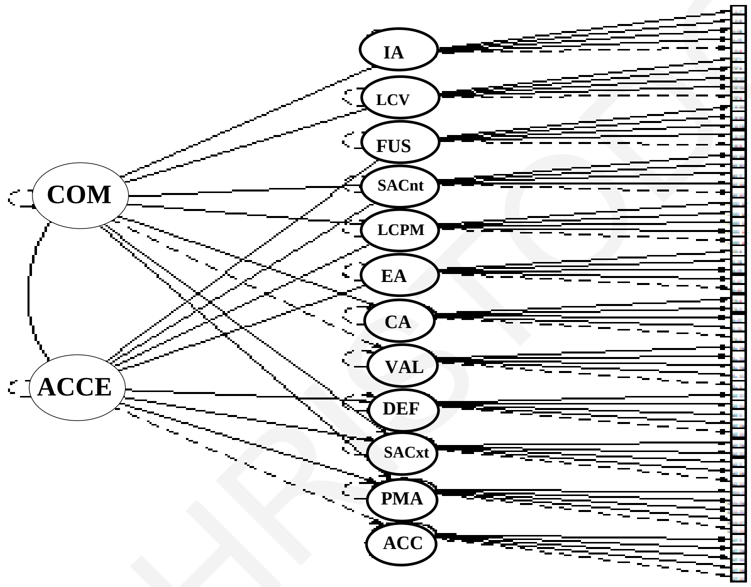


Figure 8. A Duoflex model with two intercorrelated middle-level processes

Two separate "Duoflex" models were examined (Figure 9). A model with only PF variables was tested (ACC, PMA, SACxt, DEF, VAL, CA), which had two second-order factors of ACCE and COM. ACCE reflected on four first-order PF variables (ACC, DEF, PMA, SACxt) and COM on four first-order PF factors (VAL, CA, PMA, SACxt). The model resulted in a poor fit (Table 2) and after inspections no meaningful alterations could be done for model improvement. Another "Duoflex" model with only PI variables was examined (EA, FUS, LCPM, SACnt, LCV, IA) that reflected two second-order variables of ACCE and COM. ACCE reflected on four first-order PI variables (EA, FUS, LCPM, SACnt) and COM on four first-order PI latent variables (LCV, IA, LCPM, SACnt). The model did not result in a solution (Table 2); there were very high and even > 1.00 associations between multiple pairs of latent variables (e.g., ACCE & COM = .998, ACCE & IA = 1.000, COM & IA = 1.009, IA & LCV = .941). No higher-order models were tested for the Duoflex model because of identification issues, since the third-order variable of PI/PF loaded on just two indicators (ACCE & COM).

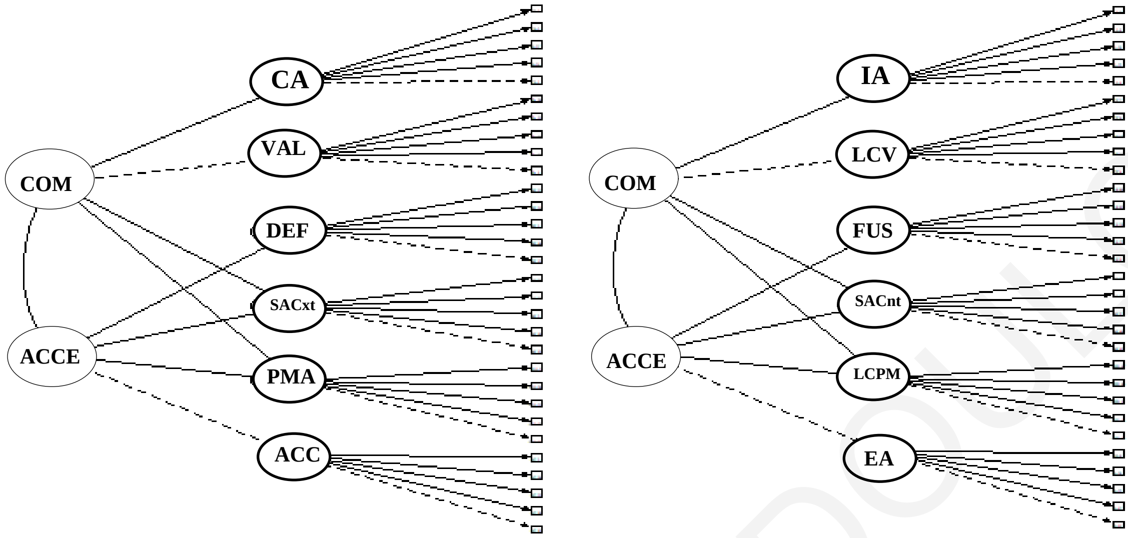


Figure 9. Two Duoflex models. *Left*: A PF Duoflex model. *Right*: A PI Duoflex model.

<u>*Triflex model*</u>. The "Triflex" model consisted of three intercorrelated second-order latent variables of OPEN, AWARE, and ACTIVE processes. OPEN process reflected on four first-order latent variables (ACC, EA, DEF, FUS), AWARE process loaded on four first-order variables (PMA, SACxt, LCPM, SACnt), and ACTIVE process reflected on four variables (VAL, CA, LCV, IA) (Figure 10). The model resulted in no solution because of a non-positive definite matrix (Table 2). There were very strong correlations between several variables (e.g., OPEN & AWARE = .942, AWARE & ACTIVE = .965, ACTIVE & IA = -.984, LCV & IA = .930).

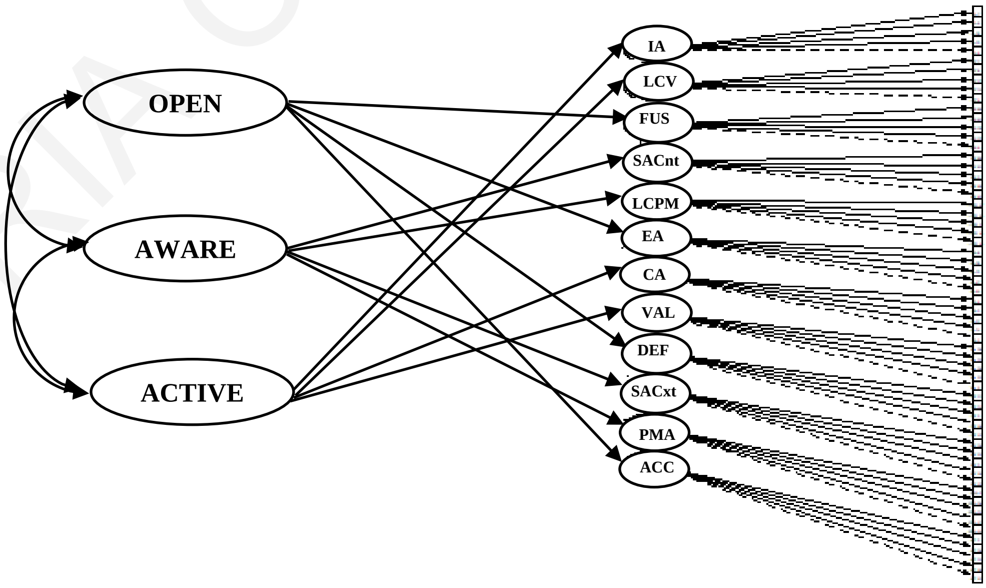


Figure 10. A Triflex model with three intercorrelated middle-level processes.

Two separate "Triflex" models were evaluated (Figure 11). A "Triflex" model with only PF variables was tested (ACC, DEF, PMA, SACxt, VAL, CA) that consisted of three intercorrelated second-order variables of OPEN (ACC, DEF), AWARE (PMA, SACxt), and ACTIVE (VAL, CA). The model had no solution because of non-positive definite matrix (Table 2). The almost perfect correlations between several variables (e.g., OPEN & AWARE = 1.065, AWARE & VAL = .991, VAL & CA = .980) might have cause problems with matrix inversion. A second "Triflex" model with only PI variables was examined (EA, FUS, LCPM, SACnt, LCV, IA), which had three intercorrelated second-order latent variables of OPEN (EA, FUS), AWARE (LCPM, SACnt), and ACTIVE (LCV, IA). No solution was reached (Table 2) near perfect collinearity between OPEN with all others except EA (r_{range} = .806 – 1.136), AWARE with all other except EA (r_{range} = .820 – .915), ACTIVE with FUS (r =.898), LCV (r = .935) and IA (r = 1.000), IA with FUS (r = .898) and LCV (r = .935) and FUS with LCV (r = .839).

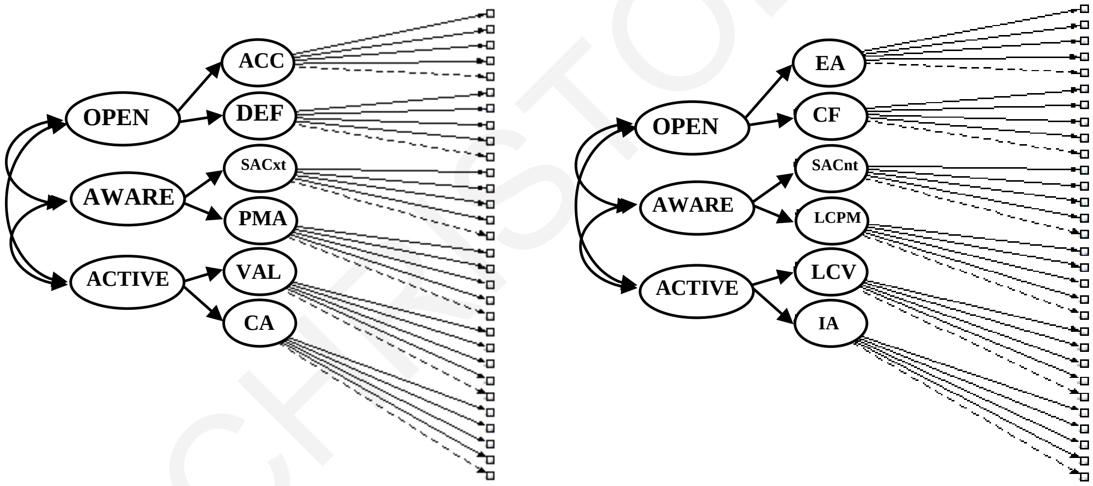


Figure 11. Two Triflex models. *Left*: A PF Triflex model. *Right*: A PI Triflex model.

A higher-order "Triflex" model reflected a third-order PI/PF latent variable that loaded on three second-order factors of OPEN, AWARE and ACTIVE (Figure 12). The model showed no solution (Table 2) and after inspections multiple high correlations were found between several latent variables which might have caused failure in reaching a solution (e.g., PI/PF & OPEN= .944, PI/PF & AWARE = .997, PI/PF & ACTIVE = .968).

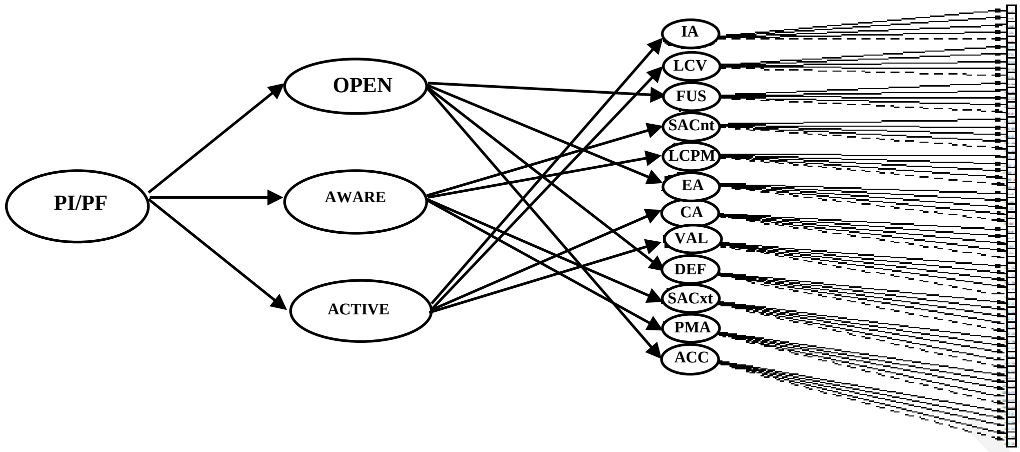


Figure 12. A higher-order Triflex model with three middle-level processes.

Two separate higher-order "Triflex" models were tested (Figure 13). A higher-order "Triflex" model with only PF variables was tested that consisted a third-order latent variable of PF loading on three second-order variables of OPEN (ACC, DEF), AWARE (PMA, SACxt), and ACTIVE (VAL, CA). The present model did not result in a solution (Table 2), due to the perfect correlations among several factors that probably caused problems resulting in a solution (e.g., PF & OPEN=1.000, PF & AWARE = 1.000, CA & VAL = .980). Another higher-order "Triflex" model with only PI variables was evaluated that reflected one third-order variable of PI loading on three second-order variables of OPEN (EA, FUS), AWARE (LCPM, SACnt), and ACTIVE (LCV, IA). The model result in no solution (Table 2) because of the near perfect collinearity between several latent variables causing problems achieving a solution (e.g., PI & OPEN = 1.000, PI & AWARE = .959, ACTIVE & CA = 1.000).

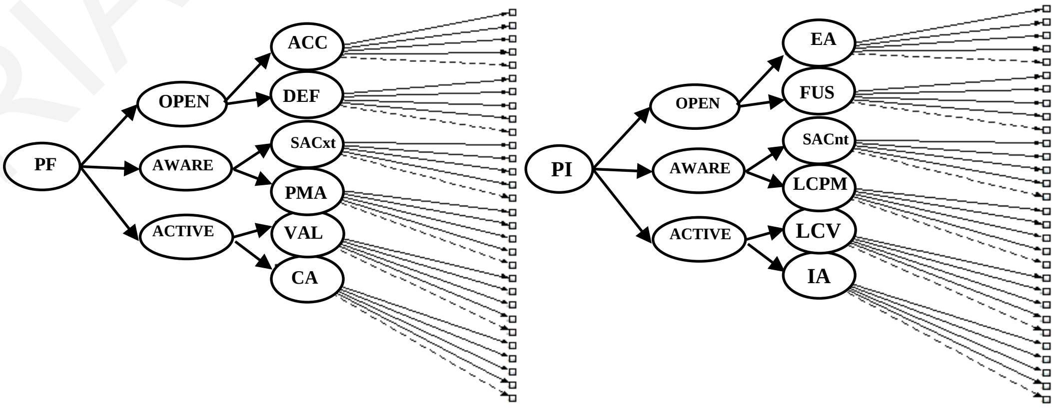


Figure 13. Two higher-order Triflex models. *Left*: A higher-order PF Triflex model. *Right*: A higher-order PI Triflex model.

Comparison of the alternative PI/PF models. Examination of the fit statistics for the alternative PI/PF models showed that the "Hexaflex" model with six first-order PI factors with no modifications had the best fit and the lowest AIC and BIC values, compared to all other alternative models. The Sattora Betler chi-square difference test showed that the PI Hexaflex model had significantly better fit than the higher-order PI Hexaflex model (Table 4). All factor loadings, latent factor variances and covariances (except EA & LCV, EA & IA) and item residuals were statistically significant; standardized factor loadings ranged from .64 to .78 for the EA factor, .69 to .85 for the LCPM factor, .74 to .82 for the SACnt factor, .74 to .85 for the FUS factor, .65 to .86 for the LCV factor, and .77 to .85 for the IA factor. The variances of all factors were: .63 for EA factor, .64 for LCPM factor, .97 for SACnt factor, 1.301 for FUS factor, .661 for LCV factor, and 1.17 for IA factor. Table 3 shows the correlation coefficients between all PI factors. EA had no or weak correlation coefficients with and all PI factors, but all other PI variables had strong associations among them.

Due to the weak or lack of associations between the EA factor with all others and the high intercorrelation of all others, it was assumed that based on the MPFI data, EA appears to be distinct from the remaining factors. In an attempt to further explore the structure of the PI construct, we tested two post-hoc PI models (Figure 14). First, a five-factor PI model consisting one second-order latent variable of PI that reflected only five first-order latent variables, excluding EA. The resulting fit for this reduced model was acceptable (Table 2). The second post-hoc model included the first-order EA variable, as a distinct factor, that was freely correlated with a second-order PI variable (loaded on LCPM, SACnt, FUS, LCV, IA). The model's fit was adequate (Table 2) and identical to the higher-order PI Hexaflex.

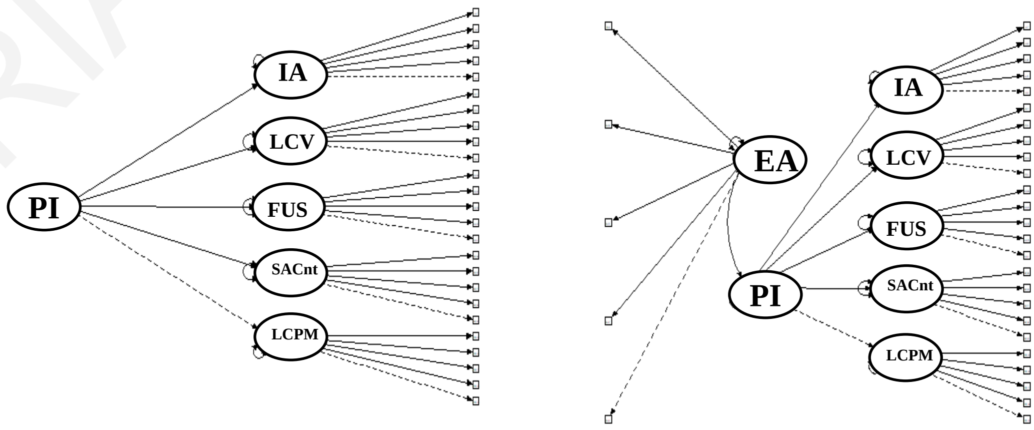


Figure 14. Alternative post-hoc models. *Left*: A five-factor PI model. *Right*: A five-factor PI and EA correlated model.

Table 2. Fit Indices for Confirmatory Factor Analysis of MPFI alternative models

Model	S-B χ^2	Df	P	CFI	RMSEA	SRMR	AIC	BIC
Measurement models								
MPFI 1 factor	7856.818	1710	.000	.582	.094	.112	86572.245	87078.237
MPFI 2 factors[1]	5821.322	1709	.000	.724	.077	.088	83958.238	84468.447
Hexaflex PI/PF model								
Hexaflex (12 factors)[1]	3030.779	1642	.000	.902	.046	.069	80679.539	81472.261
PF Hexaflex (6 factors)[1]	1070.685	389	.000	.879	.066	.073	40916.027	41236.489
PI Hexaflex (6 factors)	**782.674**	**390**	**.000**	**.950**	**.051**	**.049**	**40286.323**	**40602.569**
Higher-order PI/PF Hexaflex					No solution			
Higher-order PF Hexaflex[1]	1255.491	398	.000	.849	.073	.082	41116.370	41398.883
Higher-order PI Hexaflex	**911.161**	**399**	**.000**	**.935**	**.058**	**.065**	**40437.902**	**40716.198**
Duoflex PI/PF model								
Duoflex					No solution			
PF Duoflex	1196.049	396	.000	.859	.070	.077	41049.831	41340.777
PI Duoflex					No solution			
Triflex PI/PF model								
Triflex					No solution			
PF Triflex					No solution			
PI Triflex					No solution			
Higher-order PI/PF Triflex					No solution			
Higher-order PF Triflex					No solution			
Higher-order PI Triflex					No solution			
Post Hoc alternative models								
1. Five factor PI (Excluding EA)	661.397	270	.000	.942	.063	.046	33021.466	33253.379
2. Five factor PI correlated with EA	911.161	399	.000	.935	.058	.065	40437.902	40716.198

Note: 1 = Model with modifications; **bold** = Accepted model.

Table 3. Correlation coefficients among all components of the PI Hexaflex model

		1	2	3	4	5	6
1	Experiential Avoidance	1.00					
2	Lack of Contact with Present Moment	.209*	1.00				
3	Self as Content	.358*	.695*	1.00			
4	Fusion	.121*	.727*	.786*	1.00		
5	Lack of Contact of Values	.096	.808*	.660*	.810*	1.00	
6	Inaction	084	.797*	.706*	.920*	.941*	1.00

Note. * $p < .05$.

Table 4. Sattora Betler chi-square difference test for alternative PI/PF model evaluation

Model	S-B χ^2	df	$\Delta SB\chi^2$	Δdf
PI Hexaflex (6 factors)	782.674	390	128.487*****	9
Higher-order PI Hexaflex	911.161	399		

Note. ***** $p < .01$

3. *Exploration of the PI/PF model structure using network analysis.*

The theoretical structure of the PI/PF model and the relations among its components were evaluated with network analysis, using the MPFI data.

Network Estimation. A full PI/PF network structure was explored with all 60 MPFI items representing either a PF component or a PI component. Figure 15 visualizes the full PI/PF network structure through which 458 of all possible 1770 edges (26%) were estimated to be above zero. All MPFI items were visually separated into two larger groups representing the PF and PI dimensions. Weak negative associations were found among items of the two dimensions, such as EA with ACC (e.g., EA.53 & ACC.22 = -.086), FUS with DEF (e.g., FUS.50 & DEF.37 = -.089), and LCV with VAL (e.g., LCV.70 & VAL.38 = -.083).

Regarding the visual structure of the PF dimension, it was apparent that items reflecting the six PF components were not distinctly clustered. For example, the ACC items were all scattered among the other PF items, revealing positive connections among themselves (e.g., ACC.28 & ACC.34 = .163), but also with different PF items, such as

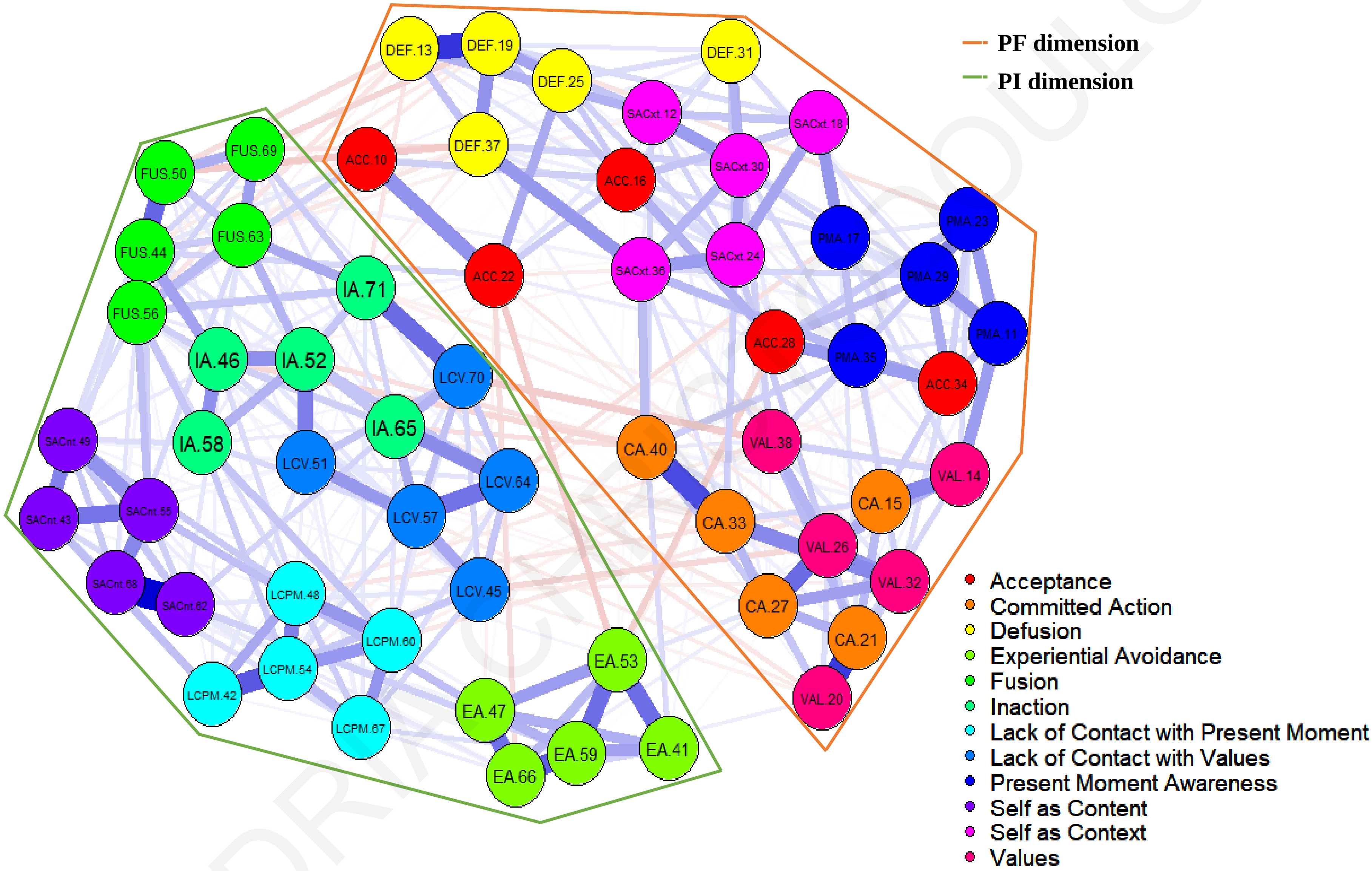


Figure 15. Network structure of the PI/PF model: Based on ACT theory.

DEF (e.g., ACC.22 & DEF.25 = .142), SACxt (e.g., ACC.16 & SACxt.18 = .097), and PMA (e.g., ACC.34 & PMA.35 = .142). VAL and CA items were found to be fully blended, forming a single group with very strong positive associations within CA items (e.g., CA.40 & CA.33 = .297) and VAL items (e.g., VAL.26 & VAL. 32 = .174), but also between CA and VAL items (e.g., CA.27 & VAL.26 = .244). It is worth noting that there were certain PF items that gathered in smaller groups, based on their original component. The DEF items were grouped together and had positive inter-connections (e.g., DEF.13 & DEF.19 = .336). However, item DEF.31 ("I was able to step back and notice negative thoughts and feelings without reacting to them") was closer to three SACxt items (e.g., DEF.31 & SACxt.30 = .129), maybe due to sharing a common idea of changing point of view, by stepping back or widening perspective. Positive associations were also detected within the SACxt items (e.g., SACxt.24 & SACxt.36 = .165), and PMA items (e.g., PMA.23 & PMA.29 = .194).

The graphical composition of the PI dimension was noticeably clearer. Almost all items reflecting a different PI component were organized into smaller and distinct groups and had positive interrelations among themselves: FUS (e.g., FUS.44 & FUS.50 = .254), SACxt (e.g., SACnt.68 & SACnt.62 = .425), LCPM (e.g., LCPM.54 & LCPM.42 = .276) and EA (e.g., EA.66 & EA.59 = .266). However, IA and LCV items were merged together forming a single group, with strong positive connections among them (e.g., IA.46 & IA.52 = .187, IA.71 & LCV.70 = .245, LCV.57 & LCV.64 = .237). Positive associations were also detected among the items of different PI components. SACxt had positive connections with FUS (e.g., SACnt.55 & FUS.56 = .107), LCPM (e.g., SACnt.43 & LCPM.42 = .107), and EA (e.g., SACnt.55 & EA.47 = .108). LCPM was positively connected with LCV (e.g., LCPM.42 & LCV.45 = .092), and IA (LCPM.60 & IA.58 = .097). Finally, positive connections were found between FUS and IA items (e.g., FUS.44 & IA.46 = .155).

Network inference. Standardized estimates of strength, closeness and betweenness centrality are reported in Figure 16. The strongest items regarding *strength* centrality were FUS.56 (1.67), SACxt.24 (1.48), DEF.19 (1.47), IA.52 (1.44), LCPM.54 (1.32) and LCV.57 (1.13). This indicates that the activation of several PI and PF components might influence the activation of all other connected variables.

- **FUS.56: "It was very easy to get trapped into unwanted thoughts and feelings"**
- **SACxt.24: "I tried to keep perspective even when life knocked me down"**
- **DEF.19: "When I was upset, I was able to let those negative feelings pass through me without clinging to them"**

Different PI and PF components were detected with high *closeness* index: three CA items (e.g., CA.40 = 2.43), three FUS items (e.g., FUS.44 = 1.69) and two VAL items (e.g., VAL.26 = 1.61). Some of the PI/PF components had only one item high in closeness, such as IA.46 (1.70), SACxt.36 (1.52), LCV (1.18) and DEF.37 (1.17). This shows that several PI/PF components are closer and more central to the network and can quickly affect changes on all other connected variables.

- **CA.40: “I didn't let my own fears and doubts get in the way of taking action toward my goals”**
- **FUS.44: “Negative thoughts and feelings tended to stick with me for a long time”**
- **VAL.26: “I tried to connect with what is truly important to me on a daily basis”**
- **IA.46: “Negative feelings often trapped me in inaction”**

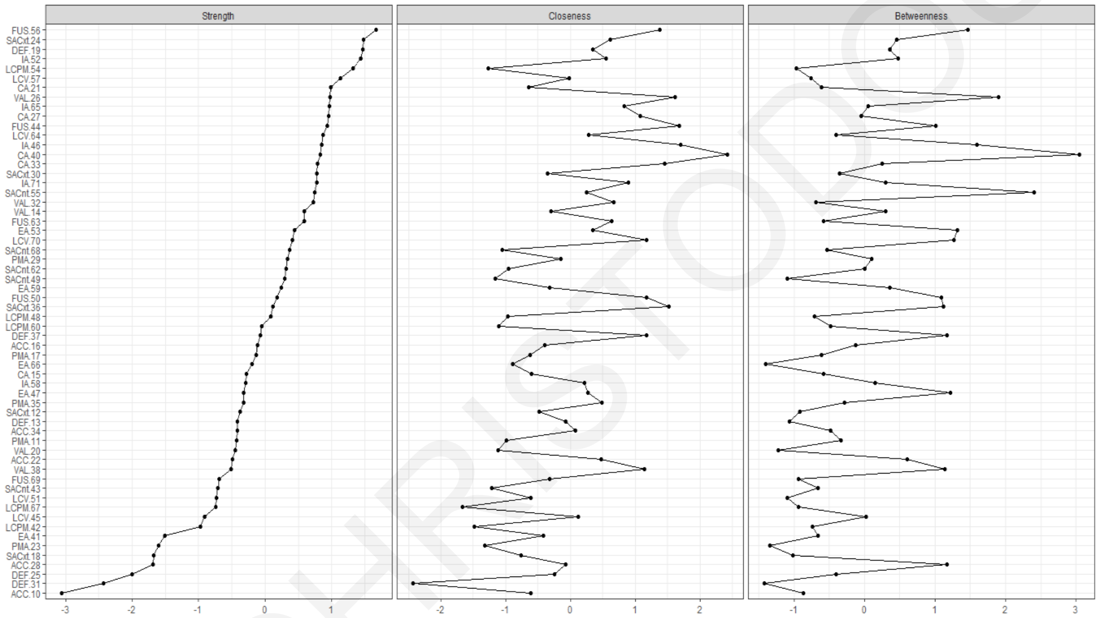


Figure 16. Centrality indices of the full PI/PF network model.

Regarding the *betweenness* centrality three FUS items were found high (e.g., FUS.56 = 1.47). Two components had two items high in betweenness, such as VAL (e.g., VAL.26 = 1.90) and EA (e.g., EA.53 = 1.32). Several other components’ items had high betweenness, such as CA.40 (3.04), SACnt.55 (2.41), IA.46 (1.59), LCV.70 (1.28), DEF.37 (1.17), ACC.28 (1.17) and SACxt.36 (1.12). This indicates that different PI/PF components, that are often found in the shortest path between two other connected variables, can be perceived as “bridge” components and might more easily trigger all other paired variables.

- **FUS.56: “It was very easy to get trapped into unwanted thoughts and feelings”**
- **EA.53: “When unpleasant memories came to me, I tried to put them out of my mind”**
- **SACnt.55: “I believed some of my thoughts are abnormal or bad and I shouldn't think that way”**
- **LCV.70: “When times got tough, it was easy to forget about what I truly value”**

Network stability. The non-parametric bootstrapping stability analysis indicated that the PI/PF network was accurately estimated, with small to moderate confidence intervals (CI's) around the estimated edge-weighs (For more details, see Table 1 - Appendix 3). Based on case-drop bootstrapping stability analysis (Figure 17), the resulting CS coefficient for strength centrality was .595, indicating strong stability since it exceeded the recommended threshold value of .50 (Epskamp et al., 2018). Closeness and betweenness CS coefficients were both .128, which were below the recommended threshold for stable estimation.

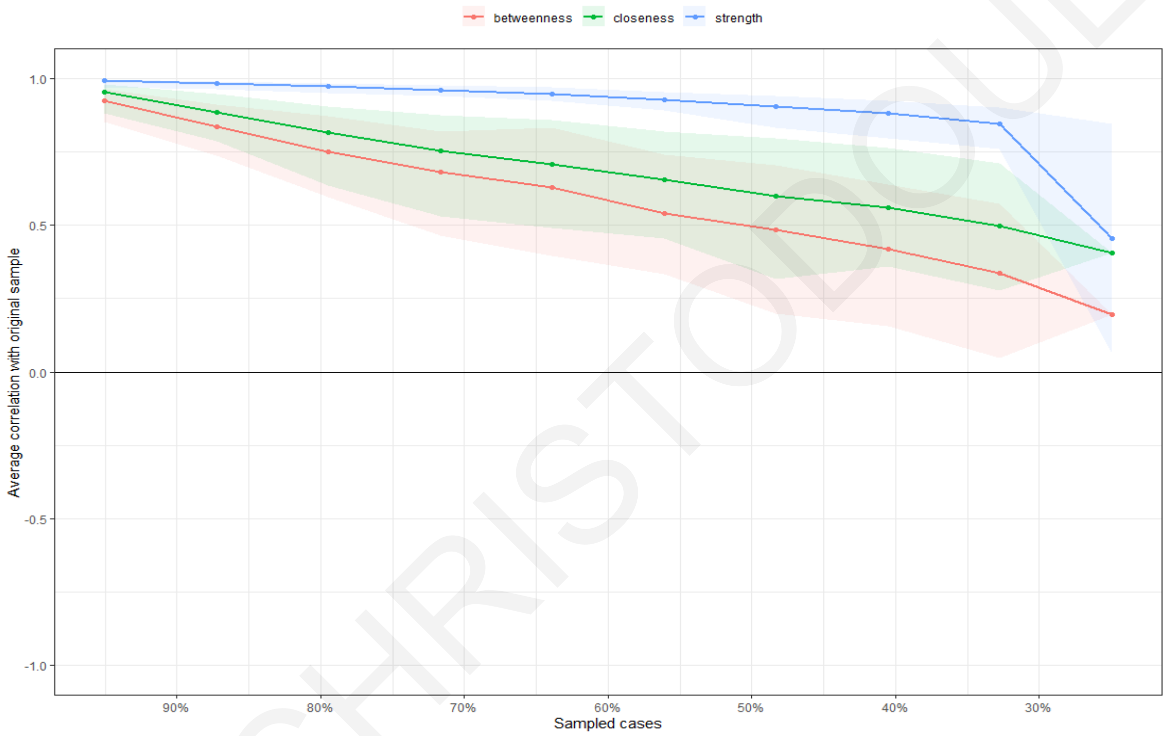


Figure 17. Average correlations between centrality indices of networks sampled with cases dropped and the original sample. *Lines* indicate the means. *Areas* show the range from 2.5th quantile to 97.5th quantile.

Walktrap Clustering. EGA was applied as a new method to estimate the number of dimensions of the theoretical structure of the full PI/PF model, in order to detect whether any nodes are grouped together in clusters, confirming the components of the model. EGA resulted in 7 estimated communities of variables (Figure 18). Three resulting clusters confirmed the theoretical PI components of SACnt, LCPM and EA since each component's items were grouped together in a separate factor, indicating that they might have a distinct role in overall PI/PF model. Four additional clusters were extracted, each of them combining items of different PI or PF components. One cluster was formed by FUS, IA and LCV items, somehow resembling the "ACTIVE" part of the PI Triflex model, but with an additional FUS component.

Another cluster emerged with CA and VAL items, representing the “ACTIVE” part of the PF Triflex model. Both clusters showed that these ACT components seem to have a larger connection between them placing them in a common community. All PMA items and certain ACC items (e.g., ACC.3) were grouped together in a separate cluster forming an acceptance and mindfulness factor. This cluster can be explained by the fact that the PMA and ACC components are allies and are frequently found to be examined together and targeted jointly in treatment protocols, since people who are more aware and in touch with the feelings and thoughts of the present moment, are more willing to be open and accept them. A final factor was obtained that was assembled by all DEF and SACxt items and some ACC items (e.g., ACC.10); the DEF component was found in research to be related to both ACC and SACxt components. Therefore, a combined factor resulted from that association indicating that people who don’t get confused in their internal experiences, can more easily keep a broader perspective and have greater openness and acceptance towards them.

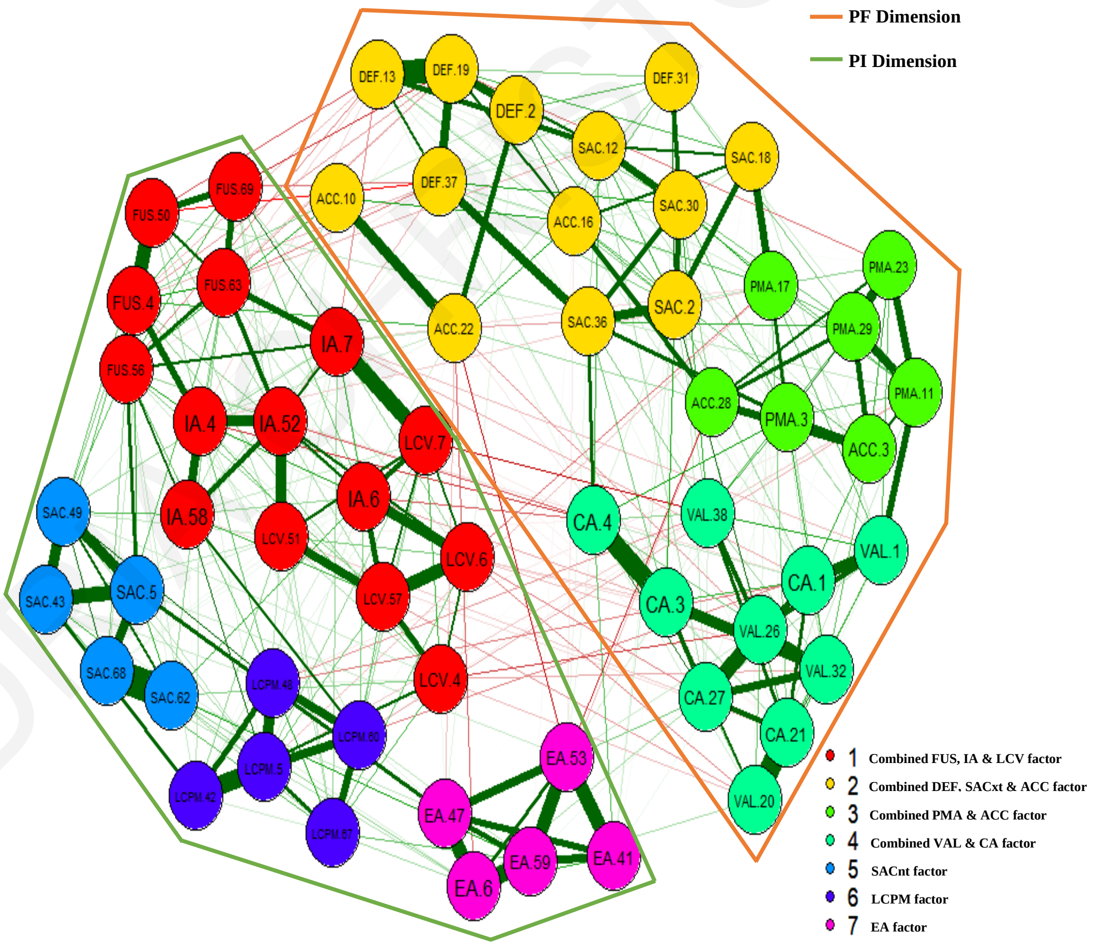


Figure 18. Network structure of the PI/PF model: *Walktrap Clustering*.

Network comparison. The Network Comparison Test was used to examine the difference or similarities in network strength and connectivity of different groups. The low and high depression and distress groups were created based on a mean depression subscale and GSI score suggested by the scale's creators, respectively; participants who were above 29 (Tscore = 70) and 1.94 (Tscore=70) were assumed to have an increased level of depression and distress, respectively (Donias et al., 1991). Low and high depression groups consisted of 339 and 162 participants, respectively; 351 and 150 people were part of the low and high distress group, respectively; male and female groups had 116 and 385 participants, respectively. Figure 19 reveals no significant differences on network structure between low-high depression groups (M = .184; p = .952), low-high distress groups (M = .683; p = .216), and male-female groups (M = .254; p = .333). No significant differences were also found in global strength for all three pairs of groups (Figure 20). Depression groups (S = .559; p = .668) had connectivity estimates of 27.7 for high and 27.2 for low group. Distress groups (S = 1.54; p = .253) revealed connectivity estimates of 26.4 for high and 27.9 for low group. Finally, gender groups (S = 1.53; p = .372) had connectivity estimates of 28.1 for male and 29.6 for female group. These findings imply that the PI/PF network structure and strength, as measured by the MPFI, does not present marked differences in the subgroups examined.

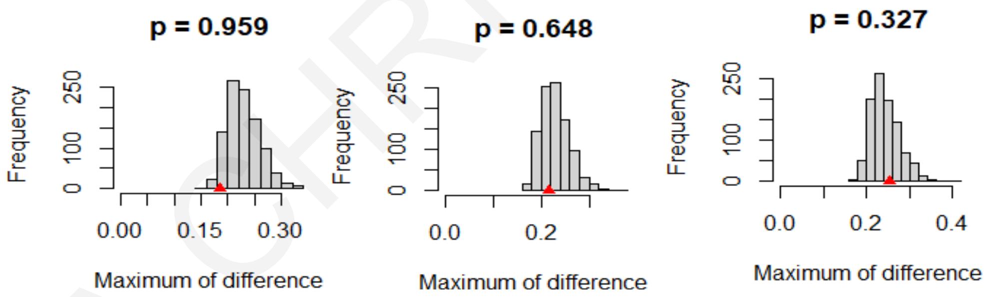


Figure 19. The maximum difference in invariance network structure of the three pairs of groups. *Left*: Low-High depression; middle: Low-High distress; *Right*: Male-Female. The *red triangle* reveals the test indication based on the observed

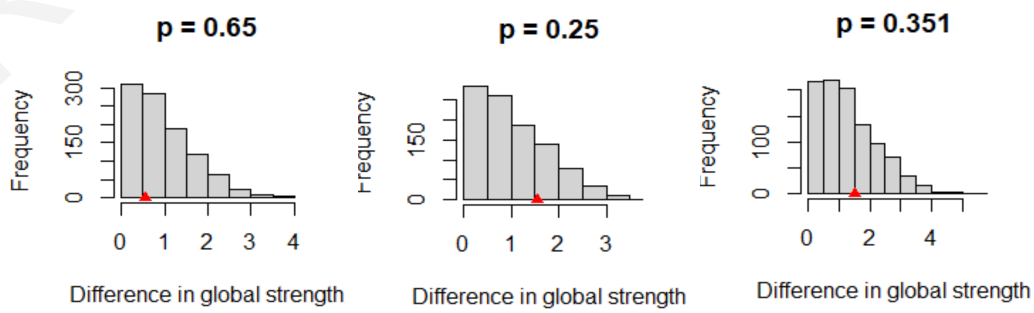


Figure 20. The maximum difference in invariance global strength of the three pairs of groups. *Left*: Low-High depression; middle: Low-High distress; *Right*: Male-Female. The *red triangle* reveals the test indication based on the observed data.

CHAPTER 4: RESULTS FOR SAMPLE 2

1. Data screening.

Prior to further analyses, univariate and multivariate normality violation tests and a thorough screening for missing data were conducted. The initial sample contained 488 cases of which 60 were list-wise deleted since they had more than 20% of missing data. Table 4.1 shows the demographic information for final and deleted cases. Chi-square difference tests detected significant differences between final and deleted cases for work and education variables ($p<.01$), but not for gender, residency, or study (marginally non-significant); individuals who work full-time and of higher education (usually non-students) were more likely to be removed from the analysis. A t-test was conducted showing significant age difference between the two samples, which suggested that slightly older participants (M = 32.04, SD = 12.24) were more likely to be excluded from the sample, t (74) = 2.7, p = .009. Normality inspections were performed for the final sample (N=428), resulting in violation of multivariate normality according to Mardia's skewness (S = 41195.97, p <.001 and kurtosis (K = 53.643, p <.001) and Henze–Zirkler's statistic (HZ = 1.000045, p <.001). Deviation from univariate normality was observed according to Shapiro-Wilk test (SW_{range} = .81 - .95, p <.001) for all scales' items.

Table 5. Demographics for final and deleted cases for Sample 2.

Variables	Final number of cases retained(N=428) *n (%)*	Deleted cases (N=60) *n (%)*
Age *Mean (SD)*	27.52 (11.46)	32.04 (12.24)
Gender		
Female	329 (77)	41 (72)
Male	96 (22)	19 (26)
Other	3 (1)	0 (0)
Work		
Full-time	147 (34)	27 (46)
Part-time	53 (13)	14 (22)
Unemployed	228 (53)	19 (32)
Study		
Yes	278 (65)	29 (48)
No	150 (35)	31 (52)

Table 5. Continued.

Variables	Final number of cases retained(N=428) *n (%)*	Deleted cases (N=60) *n (%)*
Education		
High school	234 (54)	19 (34)
Undergraduate	115 (27)	16 (26)
Postgraduate	71 (17)	23 (38)
Other	8 (2)	2 (2)
Residency		
Nicosia	279 (65)	33 (56)
Larnaca	49 (12)	11 (18)
Limassol	59 (14)	11 (18)
Famagusta	6 (1)	0 (0)
Paphos	17 (4)	4 (6)
Other	18 (4)	1 (2)

2. *Evaluation of the alternative measurement structures of all scales.*

Acceptance and Action Questionnaire-II (AAQ-II). The unifactorial structure of the Greek AAQ - II was examined with an EA latent variable loading on all scale's items (Figure 21). Results showed a poor fit, thus after careful inspections two post-hoc modifications were done by allowing the residuals of items 1 ("My painful experiences and memories make it difficult for me to live a life that I would value") and 4 ("My painful memories prevent me from having a fulfilling life") and items 2 ("I am afraid of my feelings") and 3 ("I worry about not being able to control my worries and feelings") to covary. Each pair of items shared similar phrasing and common content of internal experiences affecting life and fear of internal experiences, respectively. The same modifications were made by Karekla and Michaelides (2017). The modified model showed an excellent fit (Table 6). All standardized factor loadings (.73 to .80), latent factor variance (1.19) and item residuals variances and covariances were statistically significant.

Cognitive Fusion Questionnaire (CFQ). A single factor measurement structure of the CFQ scale was tested with a FUS latent factor reflecting all scale's items (Figure 21). An adequate fit was demonstrated, however one post-hoc modification was done for model improvements after modification indices inspection. A correlation was set between Item 1 ("My thoughts cause me distress or emotional pain") and Item 2 ("I get so caught up in my thoughts that I am unable to do the things that I most want to do"), because they share a mutual concept of psychological suffering due to fused thoughts. An excellent fit was demonstrated for the modified model (Table 6). All standardized factor loadings (.79 to

.90), latent factor variance (1.52) and item residuals variances and covariance were statistically significant.

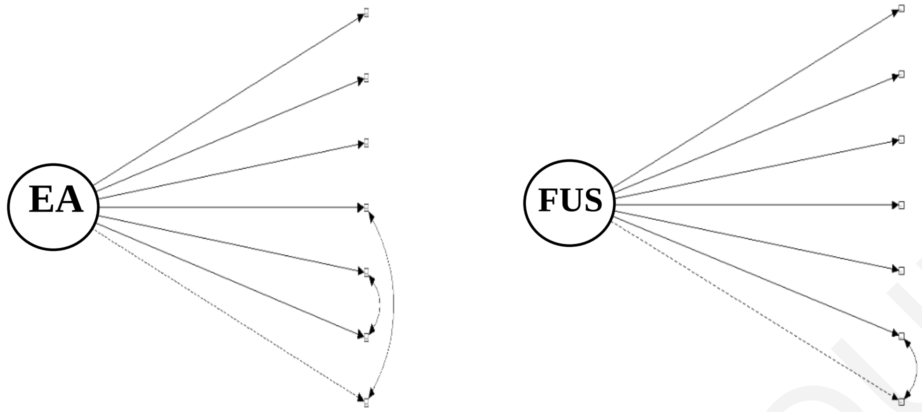


Figure 21. Unifactorial measurement structure of the AAQ-II (*Left*) and CFQ (*Right*).

Cognitive and Affective Mindfulness Scale-Revised (CAMS-R). Two alternative CAMS-R measurement structures were explored (Figure 22). Firstly, a unifactorial structure was tested with a PMA factor loading on all 12 items, which resulted in a very poor fit. Inspections of the modification indices suggested some changes for model improvement; five post-hoc modifications were explored by sequentially freeing a covariance between residuals of items 1 ("It is easy for me to concentrate on what I am doing") and 6 ("I am easily distracted"), items 3 ("I can tolerate emotional pain") and 4 ("I can accept things I cannot change"), items 5 ("I can usually describe how I feel at the moment in considerable detail") and 8 ("It's easy for me to keep track of my thoughts and feelings"), items 2 ("I am preoccupied by the future") and 7 ("I am preoccupied by the past"), and items 8 ("It's easy for me to keep track of my thoughts and feelings") and 9 ("I try to notice my thoughts without judging them"). Each pair of items shared common ideas of attention focus, acceptance of unwanted experiences, aware of internal experiences, and not focused on the present, respectively.

The modified model showed an improved fit (Table 6), but the item 2 loading was non-significant. A single-factor model was examined with PMA factor loading on 10 items, after excluding items 2 and 7 (Figure 22), something that has been applied by the CAMS-R creators as well. The model resulted in a poor fit and after inspections three error covariances were sequentially added on items 1 ("It is easy for me to concentrated on what I am doing") and 6 ("I am easily distracted"), items 3 ("I can tolerate emotional pain") and 4 ("I can accept things I cannot change"), and items 5 ("I can usually describe how I feel at the moment in considerable detail") and 8 ("It's easy for me to keep track of my thoughts and feelings"). The modified model showed an improved adequate fit (Table 6).

An alternative measurement structure evaluated on the 12-item CAMS-R, as proposed by the scale creators (Feldman et al., 2007). As shown in Figure 22, one second-order PMA factor loaded on four first-order latent variables: Items 3, 4, and 10 loaded on an Acceptance factor (ACC), items 5, 8, and 9 loaded on an Awareness factor (AWA), items 2, 7 and 11 loaded on a Present Focus factor (PF), and items 1, 6 and 12 loaded on an Attention factor (ATT). The resulting model showed a poor fit so after inspecting the modification indices three error covariances were sequentially allowed on items 1 ("It is easy for me to concentrated on what I am doing") and 6 ("I am easily distracted"), items 3 ("I can tolerate emotional pain") and 4 ("I can accept things I cannot change"), and items 2 ("I am preoccupied by the future") and 7 ("I am preoccupied by the past"). The modified model showed an improved adequate fit (Table 6). After thorough examination of the fit statistics of the alternative CAMS-R measurement models, the single-factor 10-item PMA model with three modifications had the most parsimonious structure and better fit and lower AIC and BIC values, compared others. All factor loadings, variances, and item residual variances and covariances were statistically significant. All standardized factor loadings ranged from .36 to .77 for PMA factor with .285 variance.

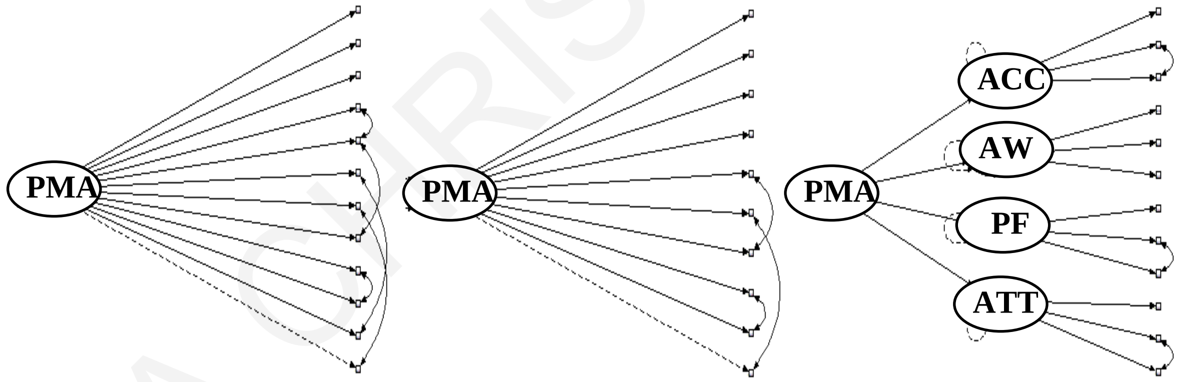


Figure 22. A unifactorial PMA model on the 12-item CAMS-R (*Left*), a single PMA factor model on the 10-item CAMS-R (*Middle*), and a higher-order PMA model on the 12-item CAMS-R (*Right*).

Self as Context Scale (SACS). Two alternative measurement structures were assessed for the SACS (Figure 23). A single-factor structure with SACxt latent variable loading on all scale's items was evaluated, resulting in a poor fit. Four modifications were examined for model improvement based on modification indices, by sequentially allowing a covariance between the residuals of items 5 ("I allow my emotions to come and go without struggling with them") and 6 ("I am able to notice my changing thoughts without getting caught up in them"), items 1 ("When I am upset, I am able to find a place of calm within myself") and 2 ("I have a perspective on life that allows me to deal with life's disappointments without getting overwhelmed with them"), items 2 ("I have a perspective on life that allows me to deal with life's disappointments without getting overwhelmed with them") and 6 ("I am able to notice my changing thoughts without getting caught up in them"), and items 1 ("When I am upset, I am able to find a place of calm within myself") and 6 ("I am able to notice my changing thoughts without getting caught up in them"). All pairs of items share a mutual idea of relaxed response to internal experiences. The modified model resulted in an improved and adequate fit (Table 6).

An alternative two-factor model was examined as proposed by the scale's authors (Zettle et al., 2018) with two latent variables: items 1, 2, 5, and 6 loading on a Centering factor (CEN), and items 3, 4, 7, 8, 9, and 10 loading on a Transcending factor (TRA) and both factors were allowed to covary. Results showed a poor fit, thus after careful inspection of the modification indices, three post-hoc alterations were made, by sequentially setting a correlation between the residuals of items 5 ("I allow my emotions to come and go without struggling with them") and 6 ("I am able to notice my changing thoughts without getting caught up in them"), items 8 ("Even though there have been many changes in my life, I'm aware of a part of me that has witnessed it all") and 9 ("I am able to access a perspective from which I can notice my thoughts, feelings, and emotions"), and items 4 ("As I look back upon my life so far, I have a sense that part of me has been there for all of it") and 10 ("When I think back to when I was younger, I recognize that a part of me that was there then is still here now"). The first pair of items shared the concept of relaxed response to internal experiences, and the other two pair of items shared a common idea of perspective-taking. The altered model demonstrated an improved and acceptable fit (Table 6).

Inspection of the fit indices for the alternative SACS measurement models showed that the two-factor structure with three modifications had the best fit and the lowest AIC and BIC values, compared to the unifactorial model. All factor loadings, latent factor variances and covariances and item residuals variances and covariances were statistically significant. Standardized factor loadings ranged from .41 to .76 for CEN factor and .57 to .69 for TRA factor, variance was 1.05 and .669 for CEN and TRA factors, respectively, and their correlation was .676.

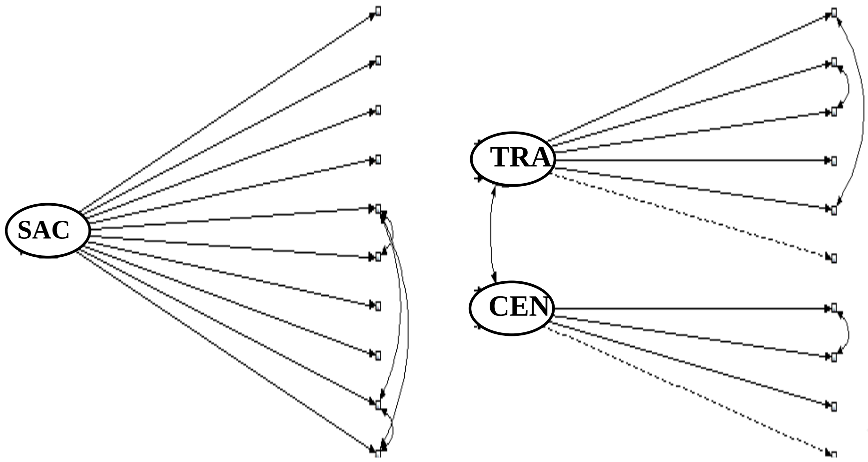


Figure 23. Two alternative measurement structures of the SACS: A unifactorial SACxt model (*Left*) and a two-factor model (*Right*).

Valuing Questionnaire (VQ). Two alternative VQ measurement models were explored (Figure 24). A single factor model with a VAL factor was tested, which resulted in a poor fit. Four additional post-hoc alterations were added, after modification indices inspection. A covariance was sequentially allowed between the residuals of items 5 ("I made progress in the areas of my life I care most about") and 7 ("I continued to get better at being the kind of person I want to be"), items 4 ("was proud about how I lived my life") and 9 ("I felt like I had a purpose in life"), items 1 ("I spent a lot of time thinking about the past or future, rather than being engaged") and 6 ("Difficult thoughts, feelings or memories got in the way of what I really wanted to do"), and 1 ("I spent a lot of time thinking about the past or future, rather than being engaged") and 2 ("I was basically on "auto-pilot" most of the time"). The first two pairs of items shared a common idea of progress in valued life, and the last two pairs share the concept of disruption of valued living. The modified model resulted in an improved but poor fit (Table 6).

An alternative two-factor model was evaluated, as suggested by the scale's creators (Smout et al., 2014), with two first-order latent variables: items 1, 2, 6, 8 and 10 loaded on an Obstruction factor (OBS) and items 3, 4, 5, 7 and 9 loaded on a Progress factor (PRO), and both factors were allowed to covary. The unifactorial model demonstrated a poor fit, thus after examination of the modification indices, two additional post-hoc modifications were done, by sequentially allowing covariance between items 5 ("I made progress in the areas of my life I care most about") and 7 ("I continued to get better at being the kind of person I want to be") and items 1 ("I spent a lot of time thinking about the past or future, rather than being engaged") and 6 ("Difficult thoughts, feelings or memories got in the way of what I really wanted to do"). The altered model resulted in an excellent fit (Table 6). Examination of the fit statistics of the alternative measurement models demonstrated that the two-factor model with two modifications had the best fit with the lowest AIC and BIC values, compared to the unifactorial model. All factor loadings, latent factor variances and covariances and item residuals variances and covariances were statistically significant. Standardized factor loadings ranged from .53 to .80 for OBS factor and .36 to .75 for PRO factor, variance was 1.68 and .351 for OBS and PRO factors, respectively, and their correlation was -.542.

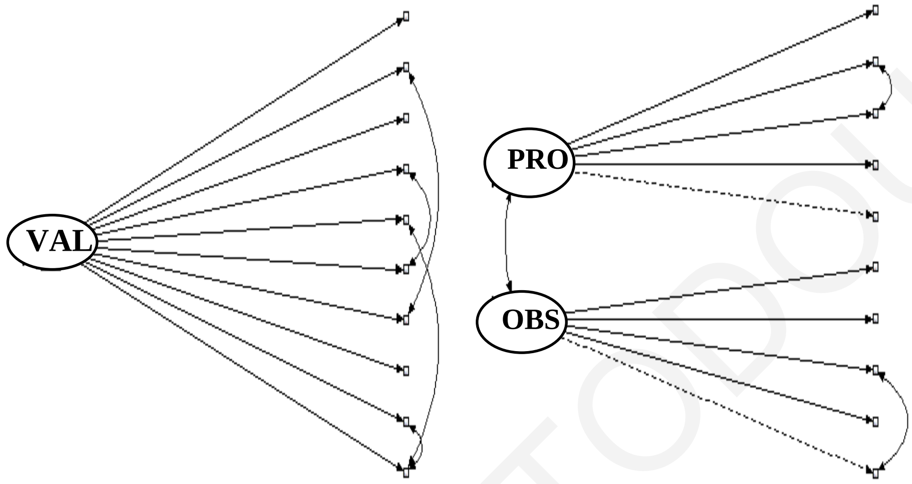


Figure 24. Two alternative measurement structures of the VQ: A unifactorial VAL model (*Left*) and a two-factor model (*Right*).

<u>*Committed Action Questionnaire (CAQ)*</u>. Two different models were explored for the CAQ (Figure 25). A unifactorial model with a CA latent factor reflecting on all scale's items, which showed a poor fit. Four post-hoc modifications were examined for model improvement after modification indices inspection, by sequentially freeing a covariance between items 6 ("If I feel distressed or discouraged, I let my commitments slide") and 7 ("I get so wrapped up in what I am thinking or feeling that I cannot do the things that matter to me"), items 5 ("I find it difficult to carry on with an activity unless I experience that it is successful") and 6 ("If I feel distressed or discouraged, I let my commitments slide"), items 5 ("I find it difficult to carry on with an activity unless I experience that it is successful") and 7 ("I get so wrapped up in what I am thinking or feeling that I cannot do the things that matter to me"), and items 5 ("I find it difficult to carry on with an activity unless I experience that it is successful") and 8 ("If I cannot do something my way, I will not do it at all"). The modified model showed an improved but adequate fit (Table 6).

An alternative two-factor structure was evaluated based on the suggestions of the scale's authors (McCracken et al., 2015), with two latent variables: items 1, 2, 3 and 4 loaded on Positive factor (POS) and items 5, 6, 7 and 8 loaded on Negative factor (NEG) that were allowed to correlate. Results demonstrated an excellent fit (Table 6). Inspection of the fit indices of the alternative CAQ measurement models indicated that the two-factor model with no modifications had the best fit with the lowest AIC and BIC values, in contrast to the unifactorial model. All factor loadings, latent factor variances and covariances and item residuals variances and covariance were statistically significant. Standardized factor loadings ranged from .77 to .89 for POS factor and .50 to .82 for NEG factor, variance was 1.30 and .992 for POS and NEG factors, respectively, and their correlation was -.647.

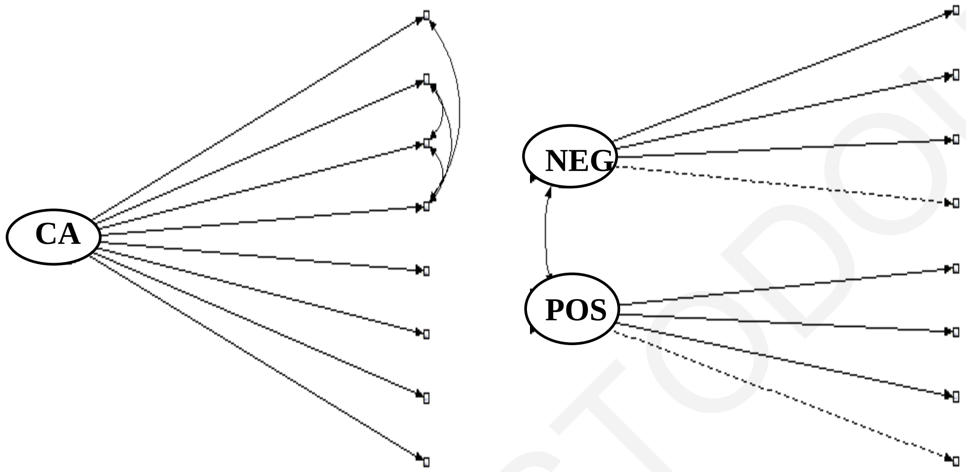


Figure 25. Two alternative measurement structures of the CAQ: A unifactorial CA model (Left) and a two-factor model (Right).

Table 6. Indices for Confirmatory Factor Analysis of all ACT scales' measurement structures

Model	S-B χ^2	df	P	CFI	RMSEA	SRMR	AIC	BIC
AAQ-II								
Single EA factor[1]	**21.607**	**12**	**.042**	**.993**	**.050**	**.019**	**9121.357**	**9186.303**
CFQ								
Single FUS factor[1]	**31.789**	**13**	**.003**	**.989**	**.072**	**.018**	**9061.834**	**9122.721**
CAMS-R								
Single PMA factor (12-items)[1]	134.955	49	.00	.913	.069	.052	11655.114	11772.828
Single PMA factor (10-items)[1]	**100.424**	**32**	**.00**	**.926**	**.076**	**.051**	**9697.310**	**9790.669**
Higher-order PMA factor (12-items)[1]	119.159	47	.000	.927	.064	.049	11641.294	11767.127
SACS								
Single SACxt factor[1]	93.601	31	.000	.930	.084	.057	13477.931	13575.294
Two-factors of CEN & TRA[1]	**85.272**	**31**	**.000**	**.942**	**.076**	**.058**	**13459.300**	**13556.663**
VQ								
Single VAL factor[1]	199.324	31	.000	.848	.129	.106	15544.451	15641.870
Two-factors of OBS & PRO[1]	**72.816**	**32**	**.000**	**.965**	**.060**	**.060**	**15373.197**	**15466.557**
CAQ								
Single CA factor[1]	65.911	16	.000	.964	.093	.055	10613.011	10694.193
Two-factors of POS & NEG	**37.485**	**19**	**.007**	**.986**	**.053**	**.028**	**10574.346**	**10643.351**

Note: 1 = Model with modifications; bold = Accepted model.

3. Examination of the alternative PI/PF structures using latent variable analysis.

Alternative PI/PF structures (Hexaflex/Inflexahex, Duoflex, Triflex) were examined with latent variable analysis by using the different ACT measures.

Hexaflex model. Two "Hexaflex" models were evaluated (Figure 26). The "Hexaflex" model consisted three second-order latent variables of SACxt, VAL and CA, and three first-order variables of EA, FUS and PMA that were all allowed to intercorrelate. SACxt loaded on two first-order variables of CEN and TRA, VAL loaded on two first-order variables of PRO and OBS, and VA loaded on two first-order variables of POS and NEG. All first-order variables reflected the accepted measurement model of each ACT measure that was described and tested in the previous section. The six-factor model resulted in no solution (Table 7) because of a non-positive definite matrix; after careful inspection Heywood cases were found, e.g., extremely correlations between several latent variables (e.g., VAL & CA = 1.09, SACxt & CENTER = 1.00) and unreasonable variance estimates of CEN (358815.14). A higher-order "Hexaflex" model was evaluated with one third-order PI/PF variable that loaded on three second-order latent variables of SACxt (loaded on CEN & TRA), VAL (loaded on PRO & OBS), and CA (loaded on POS & NEG) and three first-order variables of EA, FUS, and PMA. Results showed no solution (Table 7) since problems of multivariate collinearity arise (e.g., PI/PF & VAL= 1.00, SACxt & CEN = 1.00) and unreasonable variance estimates (e.g., CEN = 943349.63, VAL = 565927.60).

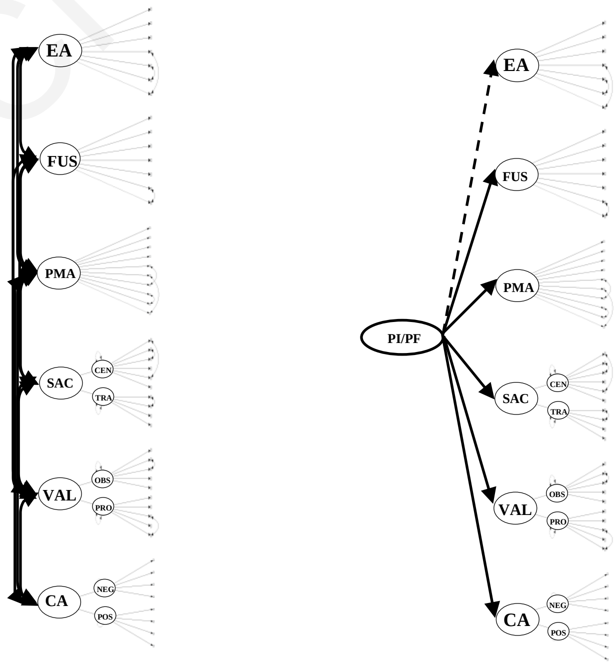


Figure 26. A Hexaflex model (*Left*) and a higher-order PI/PF Hexaflex model (*Right*).

Duoflex model. The "Duoflex" model (Figure 27) contained two intercorrelated third-order factors of Mindfulness-Acceptance skills (ACCE) and Commitment-Behavior Change skills (COM). ACCE loaded on three first-order variables (EA, FUS, PMA) and one second-order SACxt factor and COM loaded on three second-order latent variables (SACxt, VAL, CA) and one first-order PMA latent factor. The model did not result in a solution (Table 7) due to several high correlations between variables (e.g., ACCE & EA = 1.00, COM & VAL = 1.00). No higher-order models were examined for the "Duoflex" model due to under-identification, since only two indicators (ACCE & COM) loaded on the third-order variable of PI/PF.

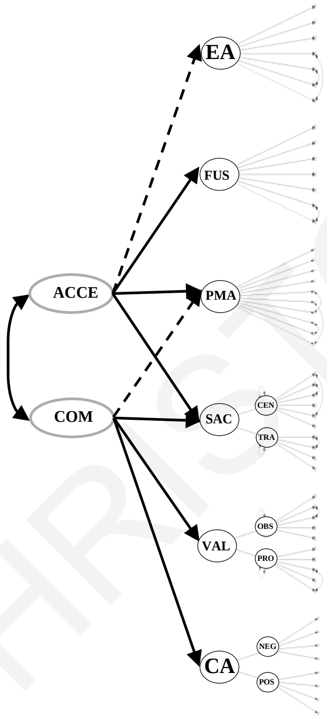


Figure 27. A Duoflex model with two interconnected middle-level processes.

Triflex model. Two "Triflex" models were assessed (Figure 28). The "Triflex" model consisted of three intercorrelated third-order factors OPEN, AWARE and ACTIVE processes. The OPEN factor loaded on two first-order variables (EA & FUS), the AWARE factor loaded on one first-order PMA factor and one second-order SACxt variable, and the ACTIVE factor loaded on two second-order variables (VAL & CA). The model did not reach a solution (Table 7) because of problems with extremely high correlation among several variables (e.g., ACCEPT & EA = 1.00, ACTIVE & CA = 1.00). A higher-order "Triflex" model was also tested with a fourth-order PI/PF latent variable that loaded on three third-order factors of OPEN (EA & FUS), AWARE (PMA & SACxt) and ACTIVE (VAL & CA). The model showed no solution (Table 7) and after inspections multiple high correlations were found among different variables (e.g., ACCEPT & EA = 1.00, ACTIVE & VAL = 1.00).

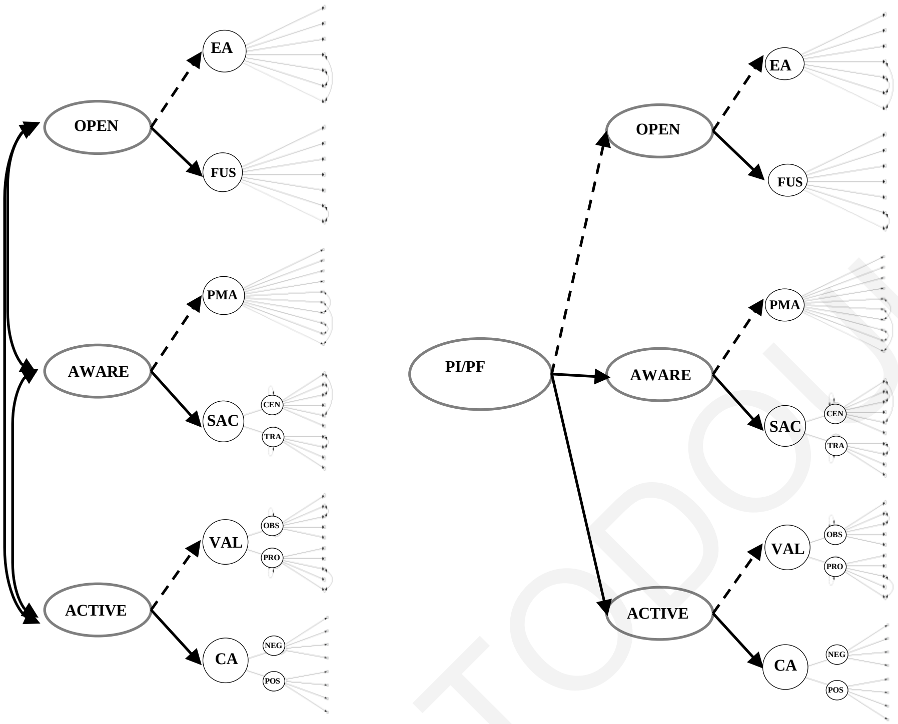


Figure 28. A Triflex model (*Left*) and higher-order Triflex model (*Right*).

Examination of different post-hoc models. The above results revealed a general difficulty in finding a solution for the alternative PI/PF theoretical models, possibly due to the multicollinearities among the models' variables. Therefore, further investigations were done to detect possible common issues in all tested PI/PF theoretical models. The simplest model, Hexaflex, was first examined by gradually adding each ACT component and its measurement model. No problems arose when combining the measurement models of EA, FUS, PMA, and VAL. However, problems appeared after certain pairs of ACT components and their measurement models were combined (i.e., PMA & SACxt, VAL & CA). After putting together PMA and SACxt measurement models, unreasonable estimates arose (e.g., ACC = 241830.74, CEN = 535387.77). The coexistence of VAL and CA measurement models caused multicollinearity issues (e.g., correlations between VAL & CA = 1.04, VAL & NEG = .965). An effort to resolve these problems was to examine a post-hoc model (Figure 29) that consisted the distinct measurement models of the EA and FUS components and the combined measurement models of PMA with SACxt loaded by a PMA/SACxt factor, and VAL with CA loaded by a VAL/CA factor, with all ACT components to intercorrelate. The model resulted in a poor fit (Table 7).

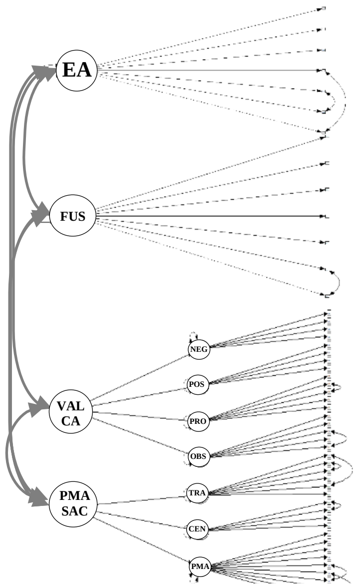


Figure 29. A post-hoc four intercorrelated factor model.

Another issue with using different ACT scales to examine the alternative PI/PF models was the addition of extra higher-order latent variables (i.e., SACxt, VAL, CA) on certain measurement modes to resemble the six ACT components. For example, the VQ measurement model examined the VAL component through two subfactors, thus a second-order VAL factor was added in the alternative PI/PF models. The same solution was applied to the other two-factor models of SACxt and CA components, which might have caused the failure to find a solution for all alternative PI/PF models. Hence, four post-hoc models were examined by using only the first-order latent variables of all measurement models (Figures 30 and 31). The first model consisted nine first-order variables of EA, FUS, PMA, CEN, TRA, OBS, PRO, NEG, and POS that were allowed to intercorrelate resulting in an acceptable fit (Table 7).

A higher-order post-hoc model was tested with a PI/PF second-order variable loading on nine first-order factors, which demonstrated poor fit (Table 7). The third post-hoc model consisted two correlated second-order factors of ACC (loaded on EA, FUS, PMA, CEN, TRA) and COM (loaded on PMA, CEN, TRA, OBS, PRO, NEG, POS) and showed borderline acceptable fit (Table 7), however all EA items loadings were not statistically significant, and its variance was extremely high (i.e., 63.7) compared to others (e.g., TRA = 2.10, POS = 2.21). The final post-hoc model had three intercorrelated higher-order variables of OPEN (EA, FUS), AWARE (PMA, CEN, TRA) and ACTIVE (OBS, PRO, POS, NEG) and demonstrated no solution due to multicollinearity issues (e.g., EA & ACCEPT = 1.00) and unreasonable variance estimates (e.g., EA = 109205.45).

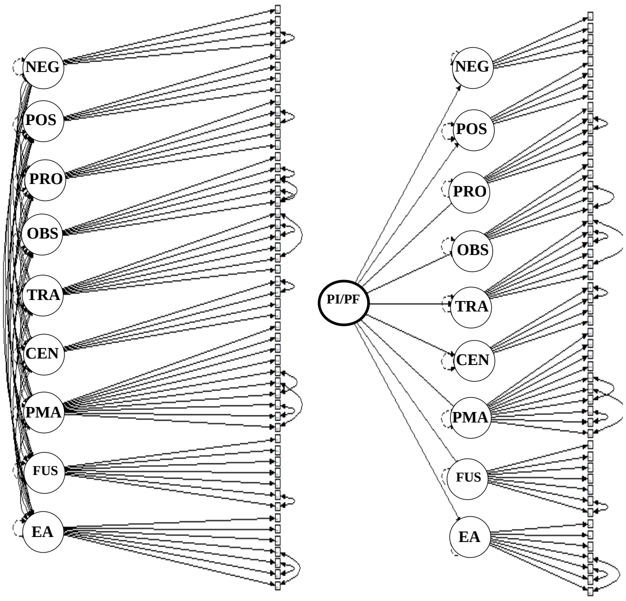


Figure 30. Two post-hoc models: Nine intercorrelated factor model (*Left*), and a higher-order PI/PF model (*Right*).

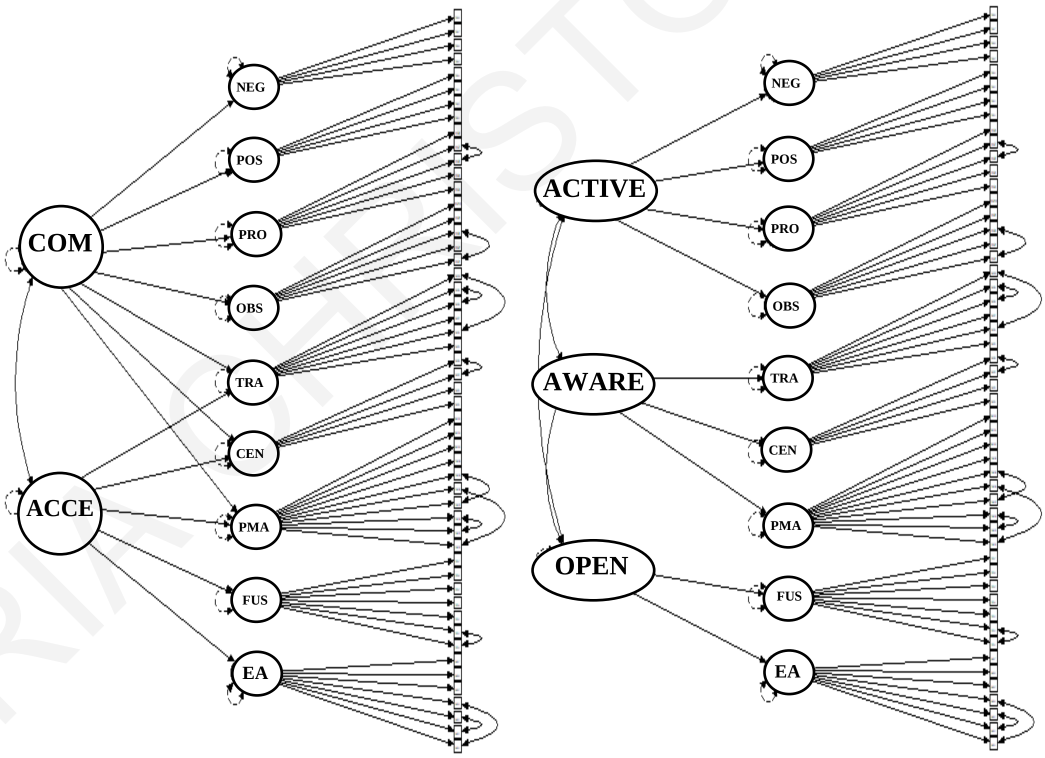


Figure 31. Two higher-order ACCE and COM factor model (*Left*), and three higher-order OPEN, AWARE, and ACTIVE factor model (*Right*).

Comparison of the post-hoc models. Inspection of the fit indices of the alternative post-hoc models indicated that the nine intercorrelated factor model had the best fit with the lowest AIC and BIC values, in contrast to the alternative models. All factor loadings, latent factor variances and covariances and item residuals variances and covariance were statistically significant. Standardized factor loadings ranged from .72 to .84 for EA factor, .81 to .89 for FUS factor, .37 to .75 for PMA, .51 to .71 for CEN factor, .55 to .69 for TRA factor, .58 to .76 for OBS factor, .38 to .75 for PRO factor, .78 to .88 for POS factor and .46 to .84 for NEG factor. The variance was 1.18 for EA, 1.58 for FUS, .29 for PMA, .85 for CEN, .68 for TRA, 1.70 for OBS, .40 for PRO, 1.31 for POS, and .80 for NEG. The correlation coefficients among all latent variables are shown on Table 8. High associations were detected among different ACT components, like EA and FUS ($r = .866$), PMA and SACxt (i.e., PMA & CEN = .800), and CA and VAL (i.e., NEG & OBS = .809), which indicates that some ACT components might be representing similar concepts. Moderate to strong correlations between the subfactors of certain ACT components were found, such as SACxt (CEN & TRA = .696), VAL (OBS & PRO = -.536), and CA (POS & NEG = -.633), showing that certain ACT components, as measured by the study’s scales, might comprise different dimensions rather than being unidimensional constructs.

Table 7. Fit Indices for Confirmatory Factor Analysis of alternative theoretical PI/PF models

Model	S-B χ^2	df	P	CFI	RMSEA	SRMR	AIC	BIC
Hexaflex PI/PF model								
Hexaflex					No solution			
Higher-order PI/PF Hexaflex					No solution			
Duoflex PI/PF model								
Duoflex					No solution			
Triflex PI/PF model								
Triflex					No solution			
Higher-order PI/PF Triflex					No solution			
Post-hoc alternative models								
Four intercorrelated factors	2482.081	1350	.000	.895	.048	.082	67821.927	68369.909
Nine intercorrelated factors	**2023.744**	**1227**	**.000**	**.925**	**.042**	**.059**	**65609.917**	**66222.845**
Higher-order PI/PF factor	2467.892	1254	.000	.885	.052	.088	66104.195	66607.526
Two higher-order ACC & COM factors	2266.929	1250	.000	.904	.047	.077	65864.244	66383.811
Three higher-order OPEN, AWARE & ACTIVE factors					No solution			

Note: 1 = Model with modifications; **bold** = Accepted model.

Table 8. Correlation coefficients among all components of the nine intercorrelated factor model.

		1	2	3	4	5	6	7	8	9
1	EA	1.00								
2	FUS	.866*	1.00							
3	PMA	-.605*	-.510*	1.00						
4	CEN	-.688*	-.641*	.800*	1.00					
5	TRA	-.257*	-.167*	.600*	.696*	1.00				
6	OBS	.704*	.679*	-.567*	-.601*	-.201*	1.00			
7	PRO	-.511*	-.380*	.722*	.750*	.592	-.536*	1.00		
8	POS	-.473*	-.321*	.686*	.575*	.533	-.479*	.761*	1.00	
9	NEG	.723*	.687*	-.638*	-.587*	-.316*	809*	-.573*	-.633*	1.00

Note. * = $p < .05$.

4. Exploration of the PI/PF model structure using network analysis.

The theoretical structure of the PI/PF model and the relations among its components were evaluated with network analysis, using the different ACT scales administered to the Sample 2 participants.

Network Estimation. A full PI/PF network structure was evaluated by using all ACT scales' items. Each scale represented one of the six ACT component: EA (AAQ items), FUS (CFQ items), PMA (CAMS-R items), SACxt (SACS items), VAL (VQ items), and CA (CAQ items). Figure 32 demonstrates the full PI/PF structure through which 409 of all possible 1326 edges (31%) were estimated to be above zero. The PI/PF structure was not so clear since only two of the six ACT components were visually distinct; the rest of them were blended forming different groups. For example, all AAQ items were close together forming a single group of EA, with high positive intercorrelations (e.g., AAQ1 & AAQ4 = .55). The same observation can be also made for all CFQ items which were positively intercorrelated (e.g., CFQ1 & CFQ2 = .24) and clustered together, indicating a separate FUS group. High positive associations were also observed between EA and FUS groups (e.g., AAQ3 & CFQ7 = .20).

Regarding the remaining variables of the model, two groups were created containing items of different scales. One mixed group contained items of CAMS-R and SACS with high and positive connections among CAMS (e.g., CAMS 3 & CAMS 4 = .25)

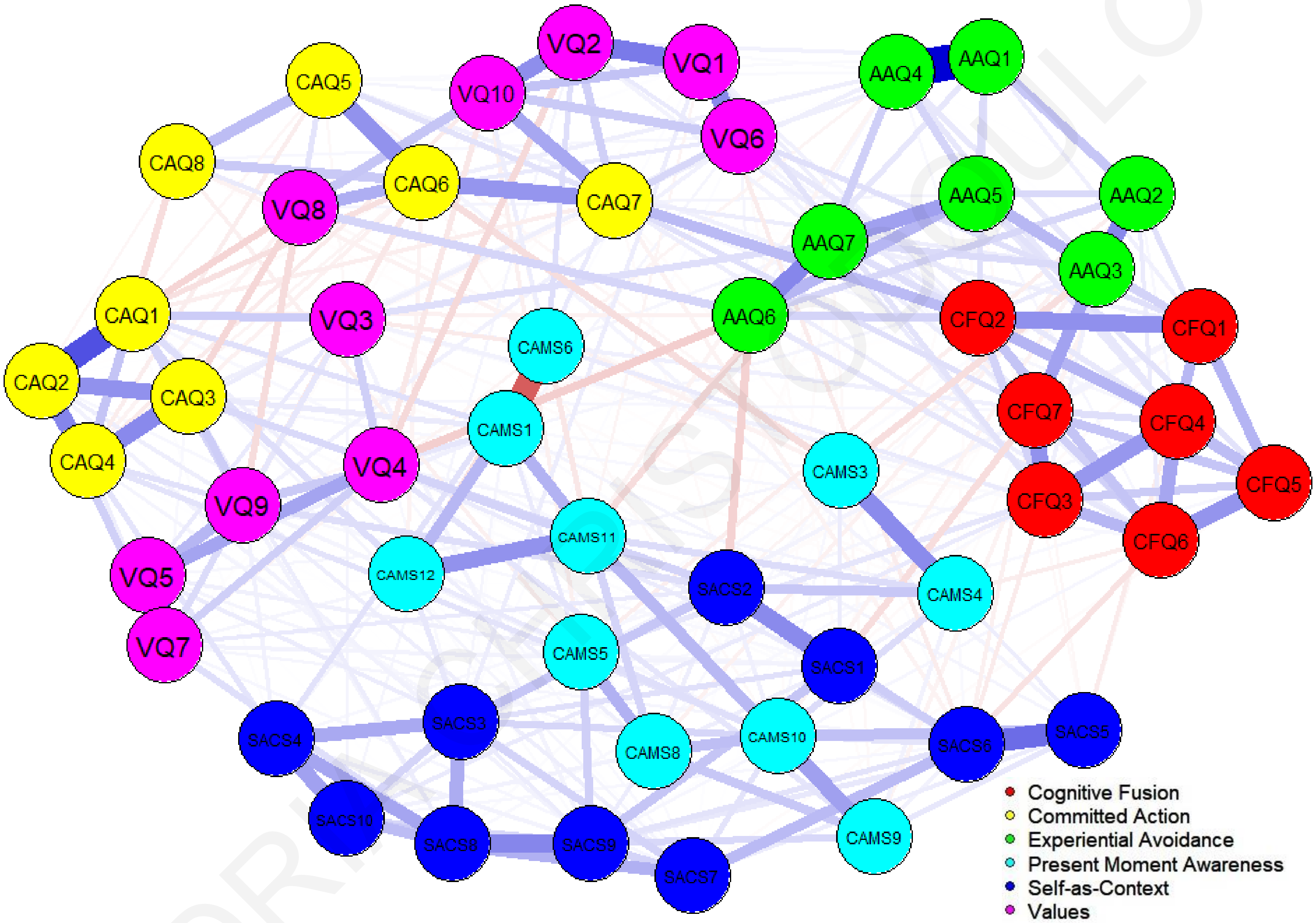


Figure 32. Network structure of the PI/PF model: Based on ACT theory.

and SACS items (e.g., SACS 5 & SACS 6 = .31) and between them (e.g., CAMS10 & SACS5 = .13). Only one strong negative association was found between two CAMS items due to negatively worded items (i.e., CAMS1 & CAMS6 = -.35). All VQ and CAQ items were fully blended forming another distinct group with strong and positive connections among the VQ (e.g., VQ5 & VQ7 = .39) and CAQ items (e.g., CAQ1 & CAQ2 = .37) and between them (e.g., VQ10 & CAQ7 = .19). A few negative connections were observed among the VQ (e.g., VQ2 & VQ4 = -.08) and CAQ items (e.g., CAQ1 & CAQ6 = -.07), but also between them (e.g., VQ8 & CAQ1 = -.09) because of the negatively phrased items.

Network inference. Figure 33 shows the standardized estimates of strength, closeness and betweenness centrality. Several items were found to be high in strength centrality: three CAQ items (e.g., CAQ1 = 1.56), three CFQ items (e.g., CFQ2 = 1.18), two CAMS-R items (e.g., CAMS10 = 1.33) and SACS5 (1.10). This suggests that the activation of certain PI/PF components, like CA, FUS, PMA and SACxt might influence the activation of all other connected variables in the network.

- **CAQ1**: *"It was very easy to get trapped into unwanted thoughts and feelings"*
- **CFQ2**: *"It seems like most people are handling their lives better than I am"*
- **CAMS10**: *"I am able to accept the thoughts and feelings I have"*
- **SACS5**: *"I allow my emotions to come and go without struggling with them"*

Different items were detected with high closeness: three AAQ items (i.e., AAQ6 = 3.03), two VQ items (VQ4 = 1.77), SACS2 (2.19), CAMS11 (1.11) and CFQ2 (1.02). This is an indication that certain PI/PF components, i.e., EA, VAL, SACxt, PMA and FUS, are more central in the PI/PF model and can easily trigger all other connected variables.

- **AAQ6**: *"It seems like most people are handling their lives better than I am"*
- **VQ4**: *"I was proud about how I lived my life"*
- **CAMS11**: *"I am able to focus on the present moment"*

As for the betweenness centrality, specific items were found high: three CAMS (e.g., CAMS11 = 1.92), two AAQ (e.g., AAQ6 = 3.57), two VQ (e.g., VQ4 = 1.37), two CAQ items (e.g., CAQ6 = 1.59) and SACS2 (2.69). This shows that different PI/PF components can be seen as a "bridge" between two other connected variables and might more easily trigger them.

- **CAQ6**: *"If I feel distressed or discouraged, I let my commitments slide"*
- **SACS2**: *"I have a perspective on life that allows me to deal with life's disappointments without getting overwhelmed with them"*

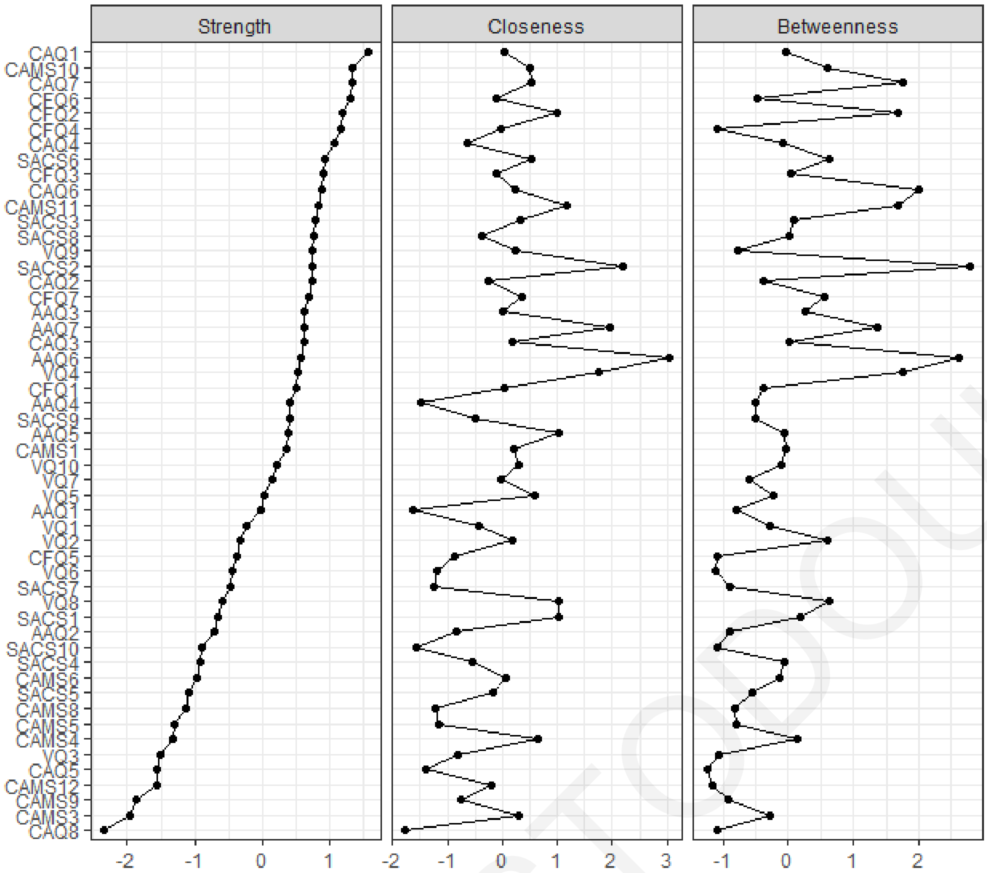


Figure 33. Centrality indices of the full PI/PF network model.

Network stability. Results of the non-parametric bootstrapping stability analysis indicated that the PI/PF network was accurately estimated, with small to moderate confidence intervals (CI's) around the estimated edge-weighs (For more details, see Table 2 – Appendix 3). Based on case-drop bootstrapping stability analysis (Figure 34), the resulting CS coefficient for strength centrality was .75, indicating strong stability since it exceeded the recommended threshold value of .50 (Epskamp et al., 2018). Closeness and betweenness CS coefficients were .283 for both, which were below the recommended threshold for stable estimation.

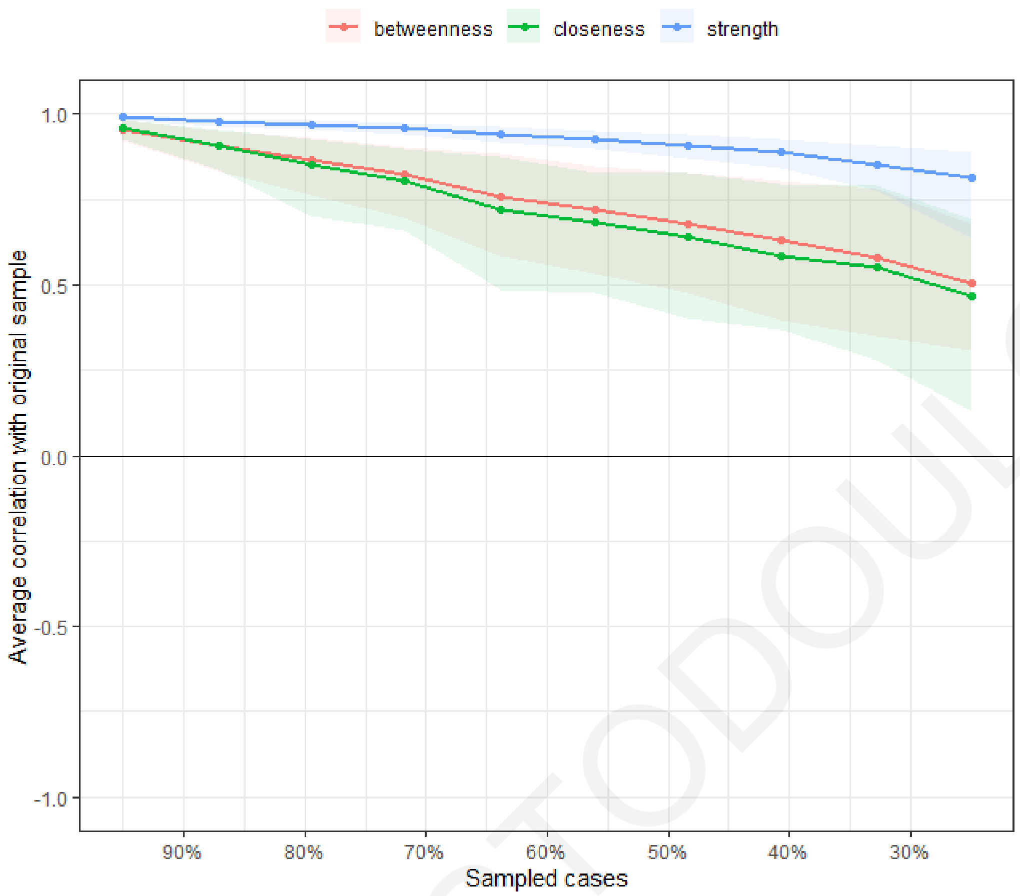


Figure 34. Average correlations between centrality indices of networks sampled with cases dropped and the original sample. *Lines* indicate the means. *Areas* show the range from 2.5th quantile to 97.5th quantile.

Walktrap Clustering. A different approach to estimate the dimensions of the PI/PF model was applied with the EGA, in order to check for nodes that might group together in clusters, similar to the ACT components. As shown in Figure 35, six estimated clusters of connected variables were extracted. Four clusters included items of two different scales. One cluster combined all AAQ and CFQ items, which might be an indication that that the EA and FUS components seem to have a special connection in the overall PI/PF model. This consistent with the ACT theory and research, which argues that these two ACT components function together in way that leads to increased psychological inflexibility (Hayes et al., 2013). Another community contained most CAMS-R items (i.e., CAMS 3, 4, 5, 8, 9, 10) that represented the subfactors of “acceptance” and “awareness”, and four SACS items (i.e., SACS1, 2, 5, 6) that reflected the “centering” subfactor. This cluster might an indication of the “AWARE” process of the Triflex model, which shows that PMA and SACxt components share a unique association. A negative “ACTIVE” pilar of the Triflex model was reflected by a cluster of the negative CAQ (i.e., CAQ5, 6, 7, 8) and VQ items (i.e., VQ1, 2, 6, 8, 10). A positive aspect of “ACTIVE” process emerged consisting of the remaining positive VAL and CAQ items. Finally, two communities of connected variables were extracted. The first consisted of the remaining SACS items of the “transcending” dimension and the other of the CAMS-R items reflecting the “present focus” and “Attention” subfactors. This might be an indication that each scale’s subfactors might reflect a distinct entity of the SACxt and PMA components in the PI/PF model, respectively.

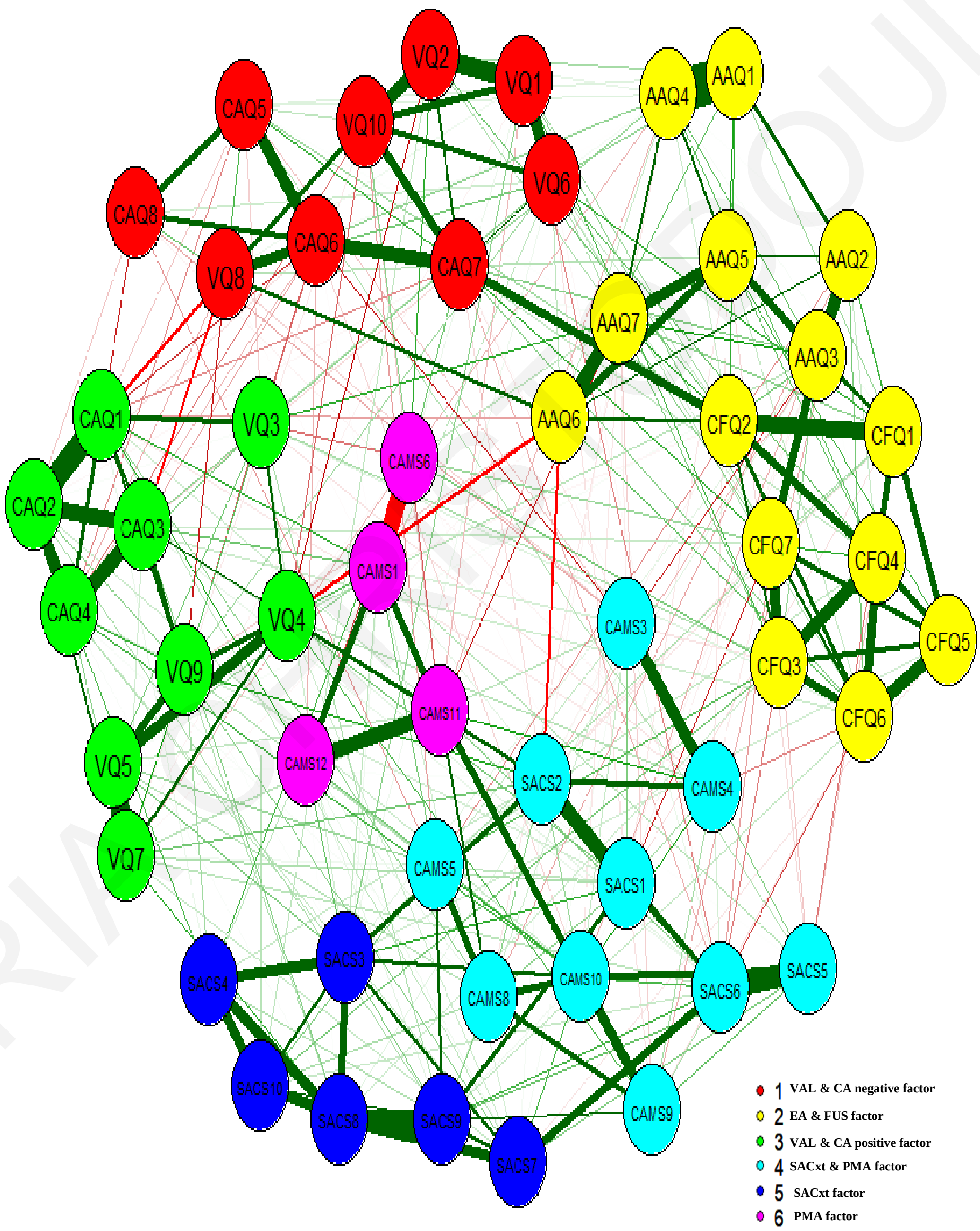


Figure 35. Network structure of the PI/PF model: *Walktrap Clustering*.

<u>*Network comparison.*</u> The Network Comparison Test was used for the examination of group differences in network structure (Figure 36) and strength (Figure 37). A median split was performed to create the categorical variables of high and low groups for perceived stress and self-compassion. 225 and 203 participants represented the low and high perceived stress groups, respectively; low and high self-compassion groups had 231 and 197 people, respectively; males were 96 and females were 332. No significant differences were detected between low and high self-compassion group on network structure (*M* = .222; *p* = .583) and strength (*S* = .367; *p* = .645; high-SC = 22.4; Low-SC = 22.9). After comparing male with female groups, significant differences were found in network structure (*M* = .403; *p* = .04) and strength (*S* = 23.8; *p* = .025), with strength estimates of .254 for males and 24.1 for females. Low and high perceived stress groups were also compared, revealing differences in network structure (*M* = .303; *p* = .028) and strength (*S* = 1.53; *p* = .06; High-PS = 23.8; Low-PS = 22.3). These findings imply that only the low and high self-compassion groups did not present marked differences regarding network structure and strength, compared to the other pairs of groups.

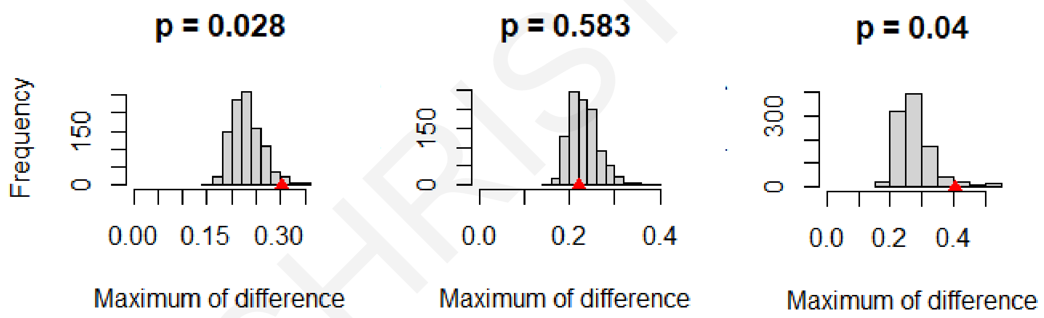


Figure 36. The maximum difference in invariance network connectivity of the three pairs of groups: Low-High perceived stress (*Left*), Low-High self-compassion (*Middle*), Male-Female (*Right*). *Red triangle* reveals test indication based on observed data.

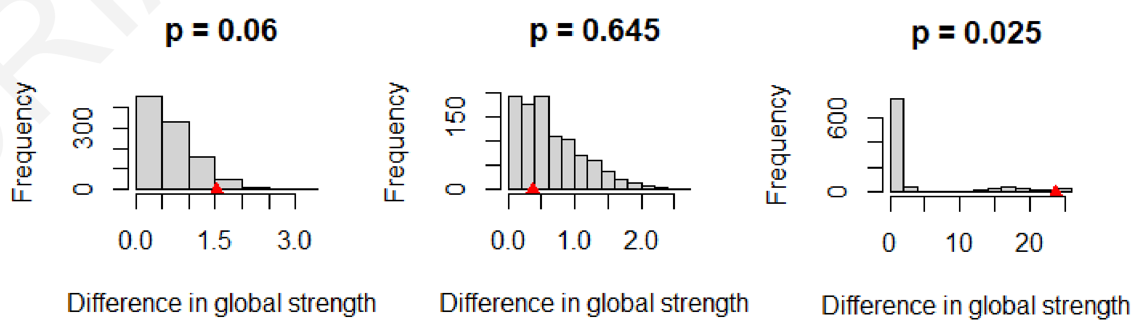


Figure 37. The maximum difference in invariance global strength of the three pairs of groups: Low-High perceived stress (*Left*), Low-High self-compassion (*Middle*), Male-Female (*Right*). *Red triangle* reveals test indication based on observed data.

PI/PF network structure of people with low and high perceived stress (PS) was further investigated by using Estimate Group Network (EGN) since significant differences were detected. Figure 38 demonstrates the visual network structure of the PI/PF model between low and high PS groups and some differences were detected. SACS and CAMS-R items were merged forming a single group for people with high PS, in contrast they reflected two separate entities for low PS people, with CAMS-R items being more centrally located and closer to all items. This might indicate that the PMA skill might play a more central role to the overall psychological flexibility of people with lower perceived stress. People who aware and focused on their internal and external experiences of the present moment seem to perceive themselves as less stressed. Another difference found was for the VQ and CAQ items, which formed a single group for the high PS group and two distinct groups of positive VQ and CAQ items, as the VAL and CA components, and negative VQ and CAQ items, as the LCV and IA components, for the low PS group. This differentiation seems to suggest that the VAL and CA skills have a different connection with the general psychological flexibility model compared to the LCV and IA. The EA and CFQ items formed two separate groups for both groups.

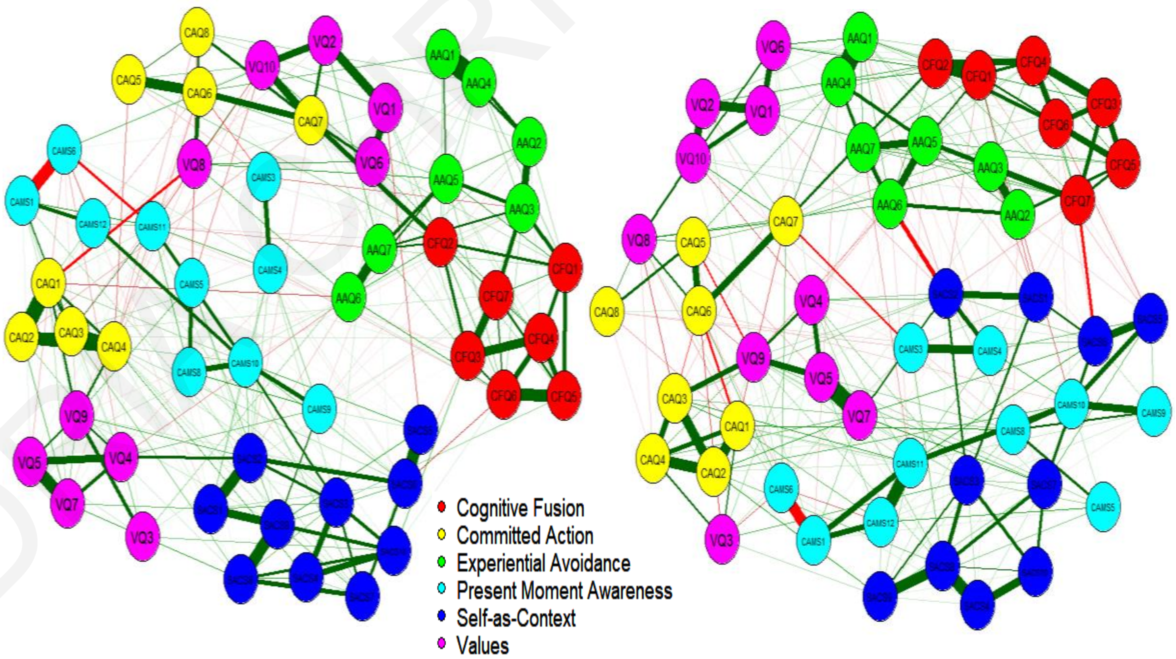


Figure 38. PI/PF network structure of low perceived stress (*Left*) and high perceived stress groups (*Right*).

The joint network comparison for male and female groups presented with only one difference about the VQ and CAQ items (Figure 39). For males, all items were grouped together, while for females were divided into two groups of positive VQ-CAQ and negative VQ-CAQ items. This might be an indication that VAL/CA and LCV/IA components are distinguished in the female network, in relation to the male network. No other differences were observed between gender groups. AAQ and CFQ items formed two distinct entities of EA and FUS components. Although CAMS-R and SACS items merged in one group reflecting a SACxt/PMA component in both groups, most of the CAMS-R items were more centered in the female network than the male network, indicating that the PMA component might be more central in the PI/PF model of women.

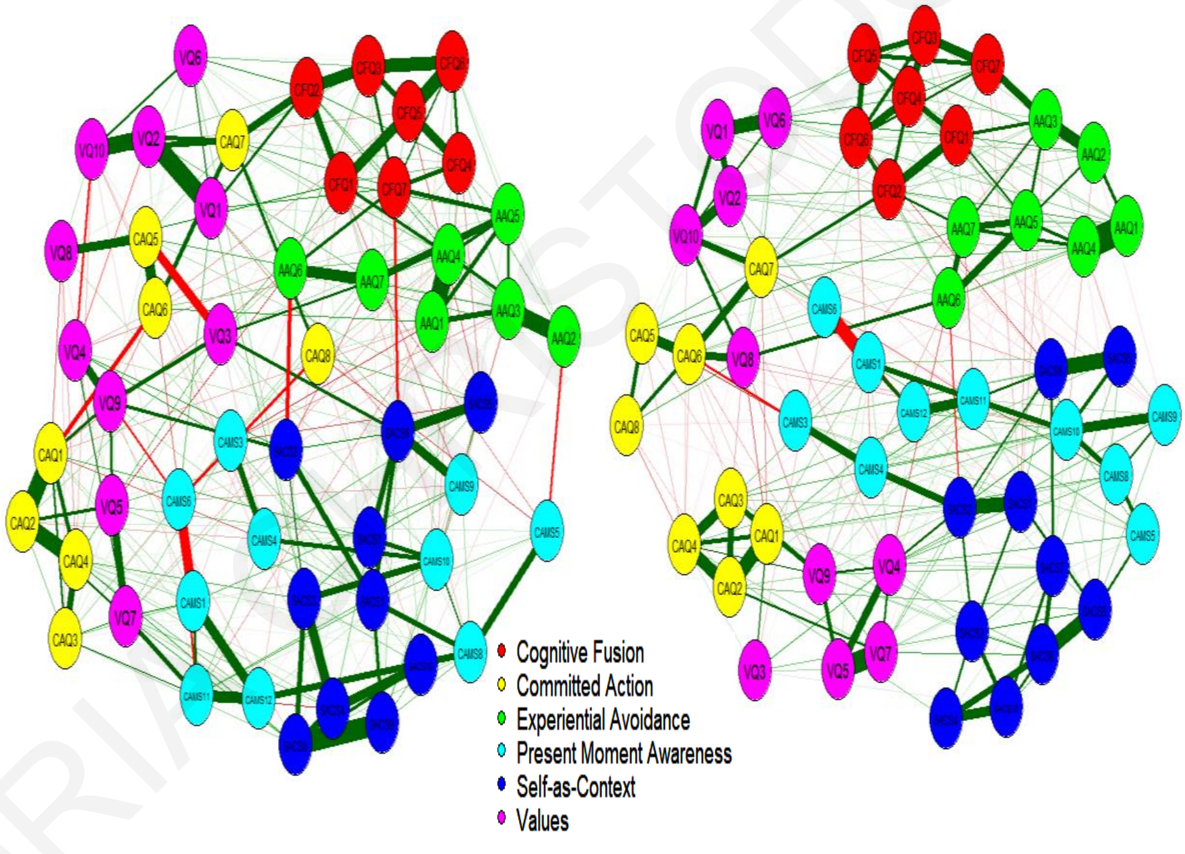


Figure 39. PI/PF network structure of male (*Left*) and female groups (*Right*).

CHAPTER 5: DISCUSSION

Acceptance and Commitment Therapy is an empirically supported intervention that has been successfully used to treat a variety of mental and physical health problems. It is imperative that it be supported by a scientifically proven model of psychopathology development and therapy change. It is also extremely important that the assessment and psychometric methods used to assess the model are reliable and valid to produce useful and appropriate information about the structure and function of the PI/PF model and its components. Up until now, no sufficient research has been done to comprehensively examine the PI/PF model components with appropriate statistical methodology. This was the main purpose and novelty of the present study: to combine different sets of ACT measures (a comprehensive measure vs. a battery of different measures) and different psychometric approaches (latent variable modeling vs. network analysis) to evaluate the PI/PF model and the relations among its components.

The alternative structures of PI/PF model

The first aim was the examination of the three alternative theoretical PI/PF structures (i.e., Hexaflex, Duoflex, Triflex) and the associations among the ACT components with confirmatory factor analysis by using the comprehensive MPFI measure and six different ACT measures. Results on the MPFI measure (Chapter 3) showed that only the Hexaflex model fitted well, but only with the six PI components and not the PF. This outcome was not consistent with previous research on MPFI that supported the full Hexaflex model with either 12 intercorrelated subfactors or two intercorrelated PI and PF higher-order factors (Gregoire et al., 2020; Lin, Rogge & Swanson, 2020; Rolffs, Rogge & Wilson, 2018; Seider et al., 2020**)**. One reason for failing to confirm the Hexaflex model with all 12 PI/PF components was probably the extremely high correlation found between two PF components, i.e., VAL and CA. After careful examination of the VAL and CA items, some of them seemed to represent common concepts of choosing valued actions (e.g., VAL.26: “I tried to connect with what is truly important to me on a daily basis” and CA.27: “Even when life got stressful and hectic, I still worked toward things that were important to me”). This evidence probably reflects problems with the MPFI scale as well as with ACT theory, thus it is important for the ACT community to address these issues. A recommendation is to clarify the definitions of VAL and CA components, so that they can be distinguished from each other and their unique role in the PI/PF model can be identified.

Also, MPFI developers need to refine or rephrase the items of both subscales to precisely capture the distinct concepts of the VAL and CA components.

Based on the different ACT measures (Chapter 4), none of the three alternative models were accepted and after careful inspections of the models two fundamental issues arose. The primary problem was the coexistence of very highly interrelated variables (e.g., VAL & CA) which was an indication that they were not appraised as distinct constructs. This was probably due to the tools chosen in the present study to measure similar ACT components as they appeared to include items with common content. For example, the VQ and CAQ questionnaires shared items that reflected similar ideas of internal experiences as obstacles in achieving important goals (e.g., VQ6: “Difficult thoughts, feelings, or memories got in the way of what I really wanted to do” & CAQ7: “I get so wrapped up in what I am thinking or feeling that I cannot do the things that matter to me”) or take action towards personal goals (the same issue was detected with CAMS-R & SACS) that assessed similar components, which led to the conclusion that the real problem might lie in the ability of those scales to discriminate between them. After inspecting the original scales, no discriminant validity evidence was found between the selected pairs of tools to confirm that the constructs were distinct (Feldman et al., 2007; McCracken et al., 2015; Smout et al., 2014; Zettle et al., 2018). For example, the discriminant validity of the VQ was examined with several ACT components (e.g., EA/ACC, LCPM/PMA) but not with the IA/CA component (Smout et al., 2014). This was very odd since it was expected that some discrimination examination would have been performed between these components, due to their special association in the Triflex model (Harris, 2009; Hayes et al., 2011; 2012). The same pattern was also observed with the CAMS-R (Feldman et al., 2007) for which no test was performed about its ability to be distinguished from the SACnt/SACxt, its other half in the Triflex model (Harris, 2009; Hayes et al., 2011; 2012). Thus, taking into consideration all the above it makes sense for the battery of different scales to fail in confirming any alternative PI/PF model due to their difficulty to reflect six adequately distinct ACT components.

The second problem detected was the addition of extra higher-order variables in the two-factor models to create a single ACT component (e.g., SACxt, VAL, CA). This is another concern when using separate ACT scales. While the ACT theory supports the existence of six distinct processes (Hayes et al., 2006; 2012), some ACT tools were multidimensional. For example, the SACS tool measures the single construct of Self-as-Context, however it is represented by a two-factor structure of the centering and transcending dimensions. The same problem happens with the VQ or CAQ tools that are supposed to evaluate the Values or Committed Action constructs, through a two-dimensional structure. This shows an inconsistency between what the ACT theory has proposed, and the operationalization of the scales designed to measure that theory. Several post-hoc models were tested to solve the above issues, by combining pairs of highly correlated components or by removing additional second-order factors. A post-hoc model with nine factors was the only one with a good fit compared to all other tested models. This result was less compatible with the ACT theory and research (Hayes et al., 2006; 2012) but could be justified since it reflected the structural form of each ACT component as perceived and measured by each individual scale. Similar difficulties were also detected in previous studies that used different scales to examine the factorial structure of the PI/PF model (Gootzeit, 2014; Scott et al., 2016; Tyndall et al., 2020; Vowels et al., 2014). Their common issue was again the multidimensionality of the measures, whose different aspects overlapped creating alternative post-hoc structures for the ACT model.

A general conclusion that can be drawn from the present study about the structure of the PI/PF model is that both sets of questionnaires were unable to confirm the “Duoflex” or “Triflex” alternative structures, which might be an indication that a simpler and more parsimonious model is more appropriate to represent the ACT theory and related components. The fact that the six-factor structure for the comprehensive MPFI scale and the nine-factor structure for the different questionnaires were the only ones who fitted well, might be another example of the need to adopt a plain way of comprehending the PI/PF model components, which includes six intercorrelated PI/PF components: EA/ACC, FUS/DEF, LCPM/PMA, SACnt/SACxt, LCV/VAL, and IA/CA. It is important to note, that the first three components were replicated by both sets of questionnaires as unidimensional constructs, which is line with the ACT theory (Hayes et al., 2006; 2012). On the contrary, the last three factors appear to have caused a discrepancy between the two types of scales since the MPFI revealed them as unidimensional, while the battery of questionnaires as bi-dimensional. This cannot be considered as an inaccuracy of the ACT theory, that is, that there are more than six key elements in the model. The issue here probably derives from the measurement structure of the scales used to measure those concepts, which is consistent with similar studies (Gootzeit, 2014; Scott et al., 2016; Tyndall et al., 2020; Vowels et al., 2014). Therefore, a more careful selection of scales is necessary when examining the full PI/PF model, so that their measurement structure corresponds to a single ACT component, regardless of how many sub-dimensions it comprises.

Across both sets of scales certain pairs of components were found to be highly associated, like LCPM/PMA and SACnt/SACxt or LCV/VAL and IA/CA. This finding was expected since there are several theoretical and research findings to confirm these strong relationships. For example, LCPM/PMA and SACnt/SACxt were found to be a pair of highly associated variables in both types of tools, which are assumed to derive from the same process of “Aware” in the Triflex model (Harris, 2009; Hayes et al., 2011; 2012). This process represents the loss of contact with the “here-and-now” and the inability for flexible perspective-taking that leads to excessive self-criticism and a narrower self-perception (Foody et al., 2013; Hayes, Pistorello, & Levin, 2012; Hayes et al., 2013). LCV/VAL and IA/CA were two highly related components in the overall study as well, which is consistent with previous research findings (Francis et al., 2016; Trindade et al., 2016; Trompetter et al., 2013; Vowles et al., 2014). These two components are perceived as parts of the same “Active” process of the “Triflex” model, which reflects the inability of people to stay focused and act based on their valued goals, even in the presence of unwanted experiences (Hayes, Pistorello, & Levin, 2012; Hayes et al., 2013).

A more surprising finding was the association of the EA with the other ACT components. Through the MPFI, EA had weak or no correlations to the remaining highly intercorrelated factors, while in the battery of questionnaires EA was highly associated with all others, especially the FUS factor. This disagreement between the two kinds of questionnaires was unexpected since ACT theory and research support the idea that the EA is a main component in the model and shares connections with several other ACT components, like FUS, PMA, and LCV (Hayes & Strosahl, 2004; Hayes, 2004; Hayes, Strosahl & Wilson, 2012; Hayes et al., 2013; Levin et al., 2012; Levin et al., 2020; Stockton et al., 2019; Tyndall et al., 2020; Vilardaga et al., 2007). However, similar patterns of outcomes were extracted in the original MPFI study (Rolffs, Rogge &Wilson, 2018) in which moderate correlations between EA and other ACT components were found (r_{range} = .31 - .62), compared to the stronger interrelations among the others (r_{range} = .51 - .88).

This contradiction might have to do with the way the EA component is perceived and measured by the two questionnaires. According to Hayes and colleagues (2004), the EA construct consists of different aspects, such as the need to avoid or control unwanted emotions and thoughts, unwillingness to deal with internal experiences, and negative evaluation of internal experiences or of the self (Hayes et al., 2004). EA items of the MPFI (e.g., EA.41: “When I had a bad memory, I tried to distract myself to make it go away”, EA.53: “I tried to distract myself when I felt unpleasant emotions”) seem to reflect only one of these dimensions, which is the need to get distracted or avoid negative thoughts and feelings (Rolffs, Rogge &Wilson, 2018). In contrast, the AAQ-II is likely to reflect a broader EA construct, which includes items about the avoidance of unwanted experiences (e.g., Q3: “I worry about not being able to control my worries and feelings”) or negative self-evaluation (Q6: “It seems like most people are handling their life better than I am”).

Therefore, the differences in the associations between EA and other components, are likely due to the type of questionnaire used in the study and it is not a problem with the ACT theory. The high correlation found between EA and FUS in the battery of questionnaires is reasonable since some items of the AAQ-II (e.g., Q1: “My painful experiences and memories make it difficult for me to live a life that I would value”) represent the concept of negative self-evaluation, which resembles the process of cognitive fusion (CFQ-Q5: “I get so caught up in my thoughts that I am unable to do then things that I most want to do”). However, the absence or weak association between EA and FUS components in the MPFI scale is not justified, since these two processes, regardless of their dimensionality, should have a strong intercorrelation according to ACT theory and research (Hayes & Strosahl, 2004; Hayes, 2004; Hayes, Strosahl & Wilson, 2012; Hayes et al., 2013; Levin et al., 2020).

The structure and connections of the PI/PF model components

The second aim of the study was to investigate the structure and connections among the components of the PI/PF model with the use of network analysis in the two sets of scales. The most important thing was to identify the role and relationships of the ACT components within the overall PI/PF model. Another goal was to detect which of the ACT components are more central in the PI/PF model. After comparing findings from both sets of scales, useful information about the PI/PF model were identified. The most important outcome is that the six distinct PI or PF components could not be verified by both sets of scales, which provides some insight about the reasons why the theoretical PI/PF model was not confirmed. Important information was also extracted about the function and connections of each component, some of which agree with the theory, while others do not.

One common finding of both scales was about the SACxt/SACnt component that was found to be high on strength centrality, which means that the ability to maintain a flexible perspective is strongly connected to all other ACT skills. This was a new finding and important contribution to the ACT community since it highlights the need to redirect the research focus on this understudied component as well and learn more about how it functions and interacts with the rest of the PI/PF model. This result would be of great use to mental health professionals, as well, who can help their clients enhance their SACxt skill in order to become more open and aware of their internal experiences and closer to their valued living (Hayes et al., 1999; 2004). A frequently used SACxt exercise by ACT research is helping people become better observers of their self and their inner experiences. This will make people maintain a broader perspective of their life in the here-and-now without being caught up in it (Forman et al., 2007; Harris, 2009)

One inconsistency found between the two questionnaires was about the role and relationship of the SACxt/SACnt and PMA/LCPM components. According to the ACT theory the two components are perceived as two distinct elements while being more interrelated (Hayes et al., 2006; 2012). However, only the comprehensive scale agreed with ACT theory by identifying them as separate subgroups with higher intercorrelations. This result was consistent with the walktrap clustering as well since both components were identified as separate communities. On the contrary, in the different questionnaires mixed results were found. In the partial network, all SACxt and PMA items were mixed up forming a single subgroup with strong interconnections, while in the walktrap clustering, three SACxt/PMA communities were created. A combined group containing certain items of the two components, but also two extra clusters reflecting a separate SACxt and PMA components. The items of the comprehensive MPFI scale and the separate scales (i.e., SACS, CAMS-R) were examined in order to explain the inconsistency created between the two types of scales regarding the nature of these two components. In the MPFI, the two components were designed to examine two distinct concepts of the awareness of internal experiences with the PMA/LCPM factor (e.g., PMA.11: “I was attentive and aware of my emotions”) and the maintenance of an open and larger perspective with the SACxt/SACnt factor (e.g., SACxt.36: “I carried myself through tough moments by seeing my life from a larger viewpoint”). This could explain why these two components in the MPFI were distinguished as two separate entities in both visualization methods.

Alternatively, the problem with the CAMS-R and SACS tools for having mixed results seemed to be detected in their multidimensional nature. The CAMS-R contains items for four different aspects of the PMA factor (acceptance, awareness, present focus, attention), while the SACS items reflect two different facets of the SACxt construct (decentering, transcending). It appears that the SACS Centering factor (i.e., relaxed reaction to thoughts and feelings) might be very similar to two CAMS-R dimensions of Acceptance (e.g., CAMS8: “I am able to accept the thoughts and feelings I have” and SACS6: “I am able to notice my changing thoughts without getting caught up in them”) and Awareness (e.g., CAMS10: “It’s easy for me to keep track of my thoughts and feelings” and SACS5: “I allow my emotions to come and go without struggling with them”). Additionally, the rest of the SACS and CAMS-R items represented two separate concepts of Transcending and Present Focus/Attention, respectively, making them appear as two different entities. All the above could explain why the separate scales perceived them both as a joint SACxt/PMA and as two independent components.

A combined SACxt/PMA grouping was also detected in previous studies that have used multidimensional scales to evaluate these components (Gootzeit, 2014; Vowles et al., 2014). Thus, in the light of the current and past research findings and the theoretical Triflex model it seems that both components share a special connection between them. In both types of scales, SACxt and PMA skills were found to be higher in strength, which means that this would be better to simultaneously address them both in therapy. Clinicians could employ strategies to enhance the wider perspective skill, while targeting the contact with present moment ability, as well, to maximize the enhancement of the overall psychological flexibility. Despite the usefulness of this finding, it is important for SACS and CAMS-R scales’ developers to address the issue of having overlapping dimensions between the two theoretically distinct PMA and SACxt components. In order to do that they first need to elaborate on more refined definitions for each component and then rephrase or change the problematic items to capture the PMA and SACxt components with more precision.

The LCV/VAL and IA/CA components were grouped together with higher connectivity among their items in both sets of scales. The higher intercorrelations were expected (Trindade et al., 2016; Trompetter et al., 2013), although in ACT theory they form distinct PI/PF components (Hayes et al., 2006; 2012). This finding cannot only be considered as a problem in the way they were measured because the same outcome was found on both sets of questionnaires. After examining the items of each set of questionnaires similar patterns were detected. Some LCV/VAL and IA/CA items were found to be similarly phrased in the MPFI (e.g., LCV.51: “When life got hectic, I often lost touch with the things that I value” and IA.65: “Negative experiences derailed me from what’s really important”) and in the battery of questionnaires (e.g., VQ6: “Difficult thoughts, feelings or memories got in the way of what I really wanted to do" and CAQ7: "I get so wrapped up in what I am thinking or feeling that I cannot do the things that matter to me"). All these item pairs seem to reflect a common idea of how the internal experiences affect the valued actions, which can consequently explain the high intercorrelation found among them.

There were also other items that only captured the LCV/VAL or IA/CA constructs in the MPFI (e.g., LCV.45: "My priorities and values often fell by the wayside in my day-to-day life" and IA.46: "Negative feelings often trapped me in inaction") and in the individual questionnaires (e.g., VQ1: "I was basically on "auto-pilot" most of the time" and CAQ5: "I find it difficult to carry on with an activity unless I experience that it is successful"). This might be an indication that each of these scales evaluate both components, making them unable to be distinguished as separate entities. This might be an evidence that the LCV/VAL and IA/CA are better perceived as integral parts of a common "Active" process, as proposed by the Triflex model (Harris, 2009; Hayes et al., 2011; 2012). Both of them were found to be strong and central components in the model, which shows that by combining these two skills in therapy, the overall psychological flexibility and well-being of the client might be more easily enhanced. All the above support the need for theoretical work within the ACT framework to refine and clarify the definition of these two components, to represent the unique contribution of each in the overall PI/PF model. It is also essential for scales' developers to use these refined definitions and revise scales to have a greater discriminant validity and higher specificity.

The distinct role of the EA component was verified in both sets of scales, which is consisted with ACT theory that considered it as a unique element in the PI/PF model (Hayes, 2004; Hayes et al., 2012). However, the distinct role of the ACC component, the positive opposite of EA component (Hayes et al., 1996; 2004; 2013) could not be verified in the MPFI. Instead, the ACC items were scattered through the network, connecting to the DEF, PMA, SACxt components. Although unexpected, it seems that these components share some items with common concepts. For instance, ACC and DEF resemble the process of experiencing than avoiding thoughts and feelings (e.g., ACC.22: "I made room to fully experience negative thoughts and emotions, breathing them in rather than pushing them away" and DEF.25: "When I was scared or afraid, I was able to gently experience those feelings, allowing them to pass"). This connection can also be explained by ACT theory that supports that ACC seems to connect with the DEF in a way that can increase the psychological flexible behaviors (Hayes & Strosahl, 2004; Hayes, 2004; Hayes, Strosahl & Wilson, 2012; Hayes et al., 2013; Levin et al., 2020).

ACC and PMA items both reflect the concept of being open and aware to internal experiences (e.g., ACC.34: “I opened myself to all of my feelings, the good and the bad “, and PMA.35: “I strived to remain mindful and aware of my own thoughts and emotions”). This connection is well justified since ACC is appraised to be ally of PMA and by targeting them both in therapy clinicians might enhance the overall ability of people to stay in touch with the present moment and embrace all their inner experiences (Baer & Krietemeyer, 2006; Cardaciotto et al., 2008). Another pair of components, ACC and SACxt, share the idea of keeping an open and accepting perspective for dealing with internal experiences (e.g., ACC.16: “I tried to make peace with my negative thoughts and feelings rather than resisting them” and SACxt.18: “I carried myself through tough moments by seeing my life from a larger viewpoint”). Hence, the above results might be an indication that the ACC and EA components function very differently in the ACT model. Avoiding negative internal experiences might be appraised as a core maladaptive process that seems to operate independently from others for the development of several mental health problems (Bardeen & Fergus, 2016; Buckner et al., 2014; Rolffs et al., 2018).

On the contrary, the therapeutic process of accepting all unwanted experiences that appears to work better when people are more aware and in touch with the present, without negatively criticizing their feelings or emotions and keep a more flexible perspective of their life. The co-function of these four components seems to be in line with the “Mindfulness and Acceptance process” of the Duoflex model (Hayes et al., 2006; 2012; 2013), which justified why the ACC items were closely connected with those components. This can be applied by therapists who could enhance client’s ability to accept all internal experiences in order to influence the activation of all other connected skills, which means that the more willing and open people become to their life, the more in touch with the present moment, less confused with their thoughts and feelings and a wider perspective in life they will have.

For the FUS/DEF component, mixed results were obtained between the two sets of measures. In the battery of individual scales, the FUS was found to be closer and shared more interconnections with the EA subgroup in both visualization methods, which agrees with previous findings (Hayes & Strosahl, 2004; Hayes, 2004; Hayes, Strosahl & Wilson, 2012; Hayes et al., 2013; Levin et al., 2020). In contrast, a more distant relationship was detected between them in the MPFI, which which was not anticipated. This can be explained due to the different measures used to examine the ACT components. MPFI evaluates only one aspect of EA (i.e., distraction or avoidance) that does not share similar ideas with the FUS construct, hence no connection was expected. In contrast, the AAQ-II assesses several dimensions of the EA (i.e., avoidance, negative self-evaluation) and FUS component appears to resemble to the "negative self-evaluation" aspect, which justified the stronger and closer connection of those two components.

The connection found between FUS/DEF component with LCV/IA and SACxt/ACC groups in the MPFI, was not anticipated since limited evidence exists to support those communities. However, they appear to reflect common ideas, which might explain those relationships. For example, DEF and SACxt both reflect the idea of adopting a more flexible viewpoint (e.g., DEF.31: "I was able to step back and notice negative thoughts and feelings without reacting to them" and SACxt.30: "When I was scared or afraid, I still tried to see the larger picture"), which is also replicated in a previous study (Kross, Ayduk, & Mischel, 2005). The FUS and LCV/IA community can be explained because they all appear to share the notion that unwanted experiences are obstacles to a valued living (e.g., FUS.69: "When something bad happened it was hard for me to stop thinking about it", LCV.70: "When times got tough, it was easy to forget about what I truly value", and IA.65: "Negative experiences derailed me from what's really important"). Hence, it can be assumed that the differences that arose regarding the role and relationships of the FUS/DEF component in the PI/PF model had more to do with the way it was measured, than with inconsistency issues of the ACT theory. Therefore, it is recommended that ACT scale developers need to revise the current measures to capture the distinct contribution of each ACT component in the overall PI/PF model.

The PI/PF model component across different populations

For the final aim of the study, different groups of participants were formed to explore the PI/PF network connectivity and strength, and search for differences and similarities in the PI/PF model. The most important finding of this analysis was that differences were detected between the two types of scales regarding the replicability of the PI/PF model in different populations. It was expected that the PI/PF model would be the same regardless of the type of group it represented, because the ACT psychopathology development and therapy change models were applied and successful in a wide range of mental health problems (Hayes, Pistorello, & Levin, 2012; Gloster et al., 2020). For the MPFI, no significant differences were detected on the network structure and global strength between the male-female and the low-high depression and distress groups. This shows that the PI/PF model structure and the connections among its components, as measured by the comprehensive scale, were stable and unchanged regardless of the gender or the level of distress and depression of people.

On the contrary, mixed results were detected in the battery of individual measures since only the PI/PF model of the low and high self-compassion groups had the same network structure and global strength. No matter how compassionate people are with themselves, they have the same perception of the PI/PF model. However, statistically significant differences were found for the gender and low-high perceived stress groups on both network structure and strength. After thorough examination of the groups' networks, minimal differences were identified between them. The EA and FUS showed an invariant role and connections in the model. They were represented as two distinct but interrelated entities across groups and in the overall sample, which is also in agreement with the ACT theory (Hayes et al., 2006; 2012). Another common outcome presented in both pairs of groups was the mixture of the VAL and CA components into one entity, which was found on the overall sample as well. This is an evidence in favor of the argument that these two abilities are better understood as parts of the same "Aware" process of the Triflex model (Harris, 2009; Hayes et al., 2011; 2012), even in different types of people.

A notable difference detected is that, in groups of women and people with low perceived stress, a distinction between the positively and negatively phrased VQ/CAQ items was observed. This might be an indication that those two groups perceive the role of the VAL/CA and LCV/IA in the model differently. Although this was an expected finding, studies on other scales, like Rosenberg Self Esteem Scale, reported significant gender differences in the comprehension of positively versus negatively worded items (Michaelides et al., 2016; Rodrigo et al., 2019; Urban et al., 2014), suggesting different response tendencies to items of opposite wording or valence. Thus, it should be strongly considered in future studies to examine whether such differences exist regarding the way people respond to differently worded LCV/VAL and IA/CA items. As for the SACxt and PMA components, they were found to be blended in a single group on almost all groups and the general sample, an observation in favor of the "Aware" process of the Triflex model (Harris, 2009; Hayes et al., 2011; 2012). However, in the low perceived stress group they were perceived as two distinct components, which is consistent with the ACT theory and the six distinct PI/PF components (Hayes et al., 2006; 2012).

A general conclusion drawn from these findings is that the differences identified across groups regarding the structure and connections of the PI/PF model, concerned only in some sections of the battery of scales and not the comprehensive questionnaire. This might be important evidence in favor of the MPFI as a good tool for measuring the ACT components since its items are similarly understood in different populations. With the six measures, the differences that arose in the PI/PF model's structure were minimal across groups and with the overall sample. Therefore, it is critical to note that the discrepancy between the two sets of measures might not have to do with inconsistency or instability issues of the PI/PF model, but perhaps it might be related with the way it was measured. This could be interpreted as a limitation of the battery of tools since they were unable to replicate the same PI/PF model structure across samples.

Research and clinical implications

From the present study important findings have emerged which are significant contributions to the ACT theory and research, and they have several research and clinical implications, as well. The main goal of these suggestions is to assists the ACT community to produce new knowledge or update the existing one by using an empowered and research-validated PI/PF model. These recommendations would also be useful for the scale developers who can use the new knowledge provided by this research for the separated and the comprehensive ACT scales and use it either to review some of the existing measures or create new ones.

1. ***Reconsider the alternative PI/PF models and focus on strengthening the most appropriate for the ACT theory.***

An important outcome of the present study was that none of the two types of questionnaires could agree on a common latent structure for the PI/PF model. Similar difficulties have occurred with other research efforts that could not replicate one of the alternative PI/PF structures without imposing post-hoc alterations on them (Gootzeit, 2014; Scott, McCracken, & Norton, 2016; Tyndal et al., 2010; Vowles, Sowden, & Ashworth, 2014). Additionally, the MPFI in the present study showed that only the six intercorrelated PI factors, the PI Hexaflex model, was a relatively better fitting model, at least in comparison to the alternative Duoflex or Triflex models. Another possible proof of the weakness of the other two alternative models is the fact that they could not be fully supported by any scale or analysis. For example, the Triflex model appeared to be able to explain the higher associations found between pairs of components as parts of the same process. However, not all three Triflex processes could be confirmed as specified by the model or even if they corresponded to the theory, they were not replicated in both types of scales. Therefore, this might be an indication for the ACT community to reconsider the three alternative models and redirect their focus on strengthening and validating a more parsimonious model which responds to the theoretical foundations of the ACT theory. The Hexaflex model might be comparatively better at describing the structure of the PI/PF model, which seems to consist of six distinct and interrelated components. However, based on the overall results of the present study, it is highly recommended to make clarifications about the content of each ACT component, as well as improvements to the existing ACT scales, before examining the alternative theoretical PI/PF structures. This would help to draw more psychometrically appropriate conclusions about the best and most representative alternative structure for the ACT theory.

2. Clarification of the structure and content of each ACT component and the associations among them.

The present study identified several issues regarding the structure and content of the ACT components, since it was impossible to reproduce the same number of components in both sets of scales and psychometric approaches. This might have happened due to the inability of specific components to be perceived as distinct variables in the PI/PF model. This should be of concern to the ACT community as it might reflect problems of accurately defining certain ACT components and distinguishing among them – an issue of discriminant validity. LCV/VAL and IA/CA were the two most highly correlated variables, which in all measurement and analysis occasions were unable to appear as separate components and ended up being parts of the same community. This could not be only considered as a problem of the way they had been measured, since the same results were obtained with both sets of scales and statistical approaches; it could also be a definitional ambiguity of the two components. LCV/VAL and IA/CA represent two distinct components of chosen life directions and effective actions, respectively; it is unlikely a case of a “Jangle fallacy”, that is, two identical concepts are different only because they have a different label (Kelley, 1927). They both seem to reflect a common construct, which might be a reason why they cannot be distinguished as separate entities in the model. Similar patterns have emerged with other associated pairs of components (i.e., EA & FUS, LCPM & SACnt), which depending on the type of analysis they emerged sometimes as different components, and other times they were grouped as a single community. Therefore, in order to strengthen the proposed theoretical structure of the PI/PF model of the six discrete components, it is suggested to revisit the definition and the operationalization of all ACT components, targeting higher specificity and discriminant validity making them be more perceived as separate entities so that their unique contribution to model can be evaluated.

3. ***Reconsider the role and function of each ACT component and how it influences the overall PI/PF model.***

An important finding that emerges from the use of different ways of conceptualizing the PI/PF model is that it provided a more in-depth understanding of the role and function of each ACT component, which might contribute to the theoretical enhancement and clinical effectiveness of the ACT model. A central discovery of this research was about the different role the EA and FUS components had in the overall PI/PF model. Although, ACT theory supported them as key components, the present study has found that almost all ACT components, separately and together, had an eminent role in the model. The SACnt/SACxt component was found to be an important asset of the PI/PF model, since it had the strongest association with most components, which makes it more central to the overall PI/PF model. As mentioned in the introduction section (Chapter 1) the SACxt component is the least examined in the ACT research and it would be best to create more appropriate and valid scales to better comprehend its unique role and how it interacts with the other components of the model. Also, a clinical implication of this finding is for clinicians to consider whether emphasizing on the enhancement of this skill could lead to a greater improvement in all other ACT skills (i.e., FUS/DEF, LCPM/PMA, EA/ACC) and the overall psychological flexibility of the client.

Another important ACT component was the LCPM/PMA which was found to have stronger connections the SACnt/SACxt component. It might be advisable for clinicians to consider the possibility of therapeutically targeting both skills to strengthen the ACT treatment efficacy. LCV/VAL and IA/CA was one more pair of components that shared a special connection between them in the model and they were also found to have a stronger and closer connection, as a pair, with other ACT components (i.e., FUS/DEF, SACnt/SACxt, LCPM/PMA). Clinicians through the simultaneous use of these two skills can more easily strengthen the overall psychological flexibility and well-being of clients.

The different role of the EA and ACC components is another important discovery of this research, as it seems to be inconsistent with ACT theory, which perceives all PI and PF components as mirror-images. In the MPFI, they did not function as two sides of the same process. EA emerged as a separate component that works independently in the model, while the ACC component was found to be part of several other components (i.e., PMA, SACxt, DEF). Therefore, it is important in the clinical assessment of clients to evaluate these two components independently, in order to distinguish their unique role in the development of psychopathology and therapy change. It would also be best for therapists to aim at strengthening clients' ability to be more open and willing to accept feelings and thoughts. In this way they might help enhance the other closely connected skills, like getting in touch with the here-and-now, maintain a broader perspective of self and others and be more distanced from unwanted private events.

4. ***The suitability of using the ACT model in different populations is confirmed.***

In the present study, it seems that the PI/PF model has the same structure and strength in different populations. Although in the battery of tools there is a difficulty in confirming the role and function of some components across groups, this should not be considered as a disadvantage of the model, but more as a problem with the way the concepts were measured. This research confirms the suitability of using the ACT model to understand the mechanism of how different mental health problems are developed, but also the application of the ACT model to treat different psychopathologies. It is important to note that although the different scales seemed to be blamed for the inability of the model to stay invariant in different samples, it would be best to try and replicate this result by using different scales. If indeed people with lower perceived stress are found to have better PMA skills (Araas, 2008; Atanes et al., 2015; Brisbon & Lachman, 2017), this can be used as an asset in therapy, by targeting clients' ability to stay in contact with the present moment to enhance the overall treatment effectiveness.

5. ***Revision of the separate ACT scales to better respond to the content and structure of each ACT component.***

Through the present study, a wide range of problems arose with the use of different scales in the comprehensive and efficient examination of the PI/PF model. The primary problem detected was that some scales perceived and measured the ACT components in a different way than is supported by ACT theory. The PI/PF model supports the existence of six unidimensional PI/PF components (Hayes et al., 2006; 2012), however some tools, such as SACS, VQ, or CAQ, are used as two-dimensional. This might be causing problems of inaccuracy and inconsistency regarding the content of those ACT component, since with these scales it is no longer clear whether those components represent one or multiple processes. If we accept that those scales did assess a single ACT component through different aspects, it is very strange why these dimensions could not reflect a single ACT component with their measurement model. Therefore, it would be ideal for existing or even new ACT scales to depend on a common theoretical background that corresponds to the content of the ACT theory. In this way, whatever ACT scale is used to measure a component, researchers and clinicians can be confident that it captures the same specific concept.

Another major problem that arises with the multidimensional measurement of some ACT components are the multiple high correlations found between certain components, like the LCV/VAL and IA/CA or the LCPM/PMA and SACnt/SACxt. This probably happened because a certain sub-dimension of an ACT component might be resembling a different component's sub-dimension, thus resulting in a strong association between those components. All this can lead to misconceptions about how the ACT model works since only the common contribution of each pair of components is taken into consideration, which might be completely different from the contribution of each distinct component. Consequently, when researchers want to evaluate these highly correlated pairs of components, it is suggested to avoid using multidimensional scales or tools with very similar items. Instead, they can assess one of the two components with an alternative measurement approach (e.g., behavioral measure) or with a tool that contains a different verbal content. For example, in the case of the LCV/VAL and IA/CA components, it is recommended to use a typical self-report scale for the IA/CA variable (e.g., CAQ) and a tool with different content for the LCV/VAL, like the VLQ (Wilson et al., 2010) that evaluates the important life areas of a person and how close he/she is to accomplish them. These scales are more likely to be less correlated, since they do not have similarly phrased items, which makes them more suitable in detecting the unique role each component plays in the model.

An additional problem created with the use of different scales was the failure to reproduce any of the alternative PI/PF models. It was impossible to confirm even the simplest form of the Hexaflex model with the six interrelated factors. The best model extracted post hoc, was that of the nine interconnected factors, since three of the ACT components were represented by two factors, thus "increasing" the number of latent variables of the model. A suggestion might be to avoid the simultaneous use of different multidimensional tools for the comprehensive examination of the PI/PF model, but perhaps it would be better to apply them in assessing each ACT component separately. Nevertheless, this inability of the battery of scales to respond to any of the theoretical structures of the PI/PF model should alarm the ACT community, as it would be expected that the scales derived from a particular theory to be used effectively for its comprehensive measurement without any complications. Perhaps a clearer statement should be made by the ACT theorists about how they perceive the nature and structure of the ACT components, i.e., whether they are uni- or multi-dimensional or if they represent a distinct ACT component or combination of components. This might assist researchers to have a clearer perception of the model and its components and use it to develop new or update existing scales to better relate to the actual theoretical background of the ACT model.

The necessity for multiple post-hoc modifications for model improvement was another issue of the battery of scales. This is not a recommended strategy in confirmatory factor analysis because it moves away from confirming a measurement model specified a priori, to exploring an alternative post-hoc one (Whittaker, 2012). In the present study several modifications on almost all scales were necessary to reach acceptable solutions to their measurement structures. Although there is evidence that these issues may originate from the original scales (e.g., Bond et al., 2011; Fledderus et al., 2012; Gloster et al., 2011; Monestès et al., 2018), this may be partly related to the fact that these scales have been recently adapted in Greek mainly by using the back-and-forth translation and have not all been properly standardized or validated. Therefore, it is recommended that these scales should be revised using a more appropriate adaptation methodology that includes various strategies, steps, and experts in the process (Beaton et al., 2000; Sousa & Wilaiporn Rojjanasrirat, 2010; Sperber, 2004; Wild et al., 2005). The TRAPD model (European Social Survey, 2016) represents a comprehensive procedure for the adaptation of psychometric tools, which has been used in the present study for the MPFI scale translation. This was a multifaceted process that involved many experts with different backgrounds, who collectively agreed on a final version of the scale. A pilot study was performed afterwards to detect problems with comprehension, wording, or flow of the translated scale. This method produced a more psychometrically sound adapted version of the scale that is more likely to increase its equivalence to the original MPFI tool and minimize the risk of encountering with construct, method, and item bias (Byrne, 2016; Aegisdottir et al., 2008; van de Vijver & Hambleton, 1996).

6. The AAQ-II as an inappropriate scale for the comprehensive assessment of the PI/PF model.

There is a strong debate about the AAQ-II as to whether it is a suitable tool for measuring the PI/PF construct. The AAQ-II creators (Bond et al., 2011; Hayes et al., 2004) consider it as a good tool for examining the EA component and the overall PF construct. However, there are some researchers who argue that it should be only considered as a tool for measuring distress, neuroticism, or negative emotionality (Gamez et al., 2011; Wolgast, 2014). Others believe that it should not be used at all to assess the broader concept of PI/PF since it does not include items for all the model's components (Francis et al., 2016; Rolffs et al., 2018) and its factorial structure has proven to be unidimensional by several studies (Fledderus et al., 2012; Gloster et al., 2011; Jacobs et al., 2008; McCracken & Zhao-O'Brien, 2010; Monestès et al., 2018). The present research is in line with the argument that the AAQ-II should not be used for the complete evaluation of the PI/PF model, as its unifactorial structure was once again replicated, indicating that it should be only considered as an EA scale. An interesting finding though has emerged from this study about the relationship of AAQ-II with tools of other ACT components (i.e., CFQ, CAMS-R, SACS, VQ, CAQ). It was obvious that all scales had moderate to strong connections among them, although the strongest, almost perfect association was between the AAQ-II and CFQ. AAQ-II includes items that reflect similar ideas with the CFQ (i.e., negative self-evaluation) which can explain why the EA and FUS factors are so highly related, almost merging into a single component. Therefore, more studies need to be done to establish whether the AAQ-II should be considered as a tool for measuring the "Open" aspect of the Triflex model where EA and FUS are parts of the same process (Harris, 2009; Hayes et al., 2011; 2012).

7. The MPFI as the most appropriate measure to explore the PI/PF model and its components.

The present study's outcomes have revealed several reasons to consider the MPFI as the most psychometrically appropriate tool for the examination of the PI/PF model and its components. Most importantly the MPFI was the only one that could replicate one of the alternative PI/PF structures, as opposed to the failure of the battery of scales. This might be a good indication that the MPFI theoretical structure and the content of its items accurately reflected the ACT theory. The MPFI also does not encounter any under or over-representation issues like the separate scales, because it was explicitly designed to include the same number of items for each ACT component, so that each one was equally represented. Additionally, the construction of the MPFI scale was theoretically driven based on the ACT model. MPFI authors developed separate and clearly distinguishable subscales that consider the ACT components as unidimensional. In contrast to the battery of scales that were created independently of one another, doomed to deal with problems of reflecting some ACT components as multidimensional. Finally, the MPFI was the only one in the study that revealed a stable and invariant structure and strength of the PI/PF model in different groups of people. This should be considered as a great advantage of the MPFI since it managed to preserve its theoretical structure in diverse populations.

Despite the careful design of the MPFI scale, it appears that some ACT components are not being properly represented. The EA items and factor, as measured in the present study, did not seem to have moderate or strong associations with the rest of the model's variables. This is not consisted with the ACT theory and research that stipulates that all ACT components are interrelated (Hayes & Strosahl, 2004; Hayes, 2004; Hayes, Strosahl & Wilson, 2012; Hayes et al., 2013; Levin et al., 2020) and could be considered in a future revision of the MPFI. The LCV/VAL and IA/CA was a pair of components that was found to be so strongly correlated in the MPFI that they were identified as a single group in both visualization methods of the network approach. This might be a good sign that the scale's authors need to reconsider and adjust the definitions for these two components and develop suitable items that can better grasp the distinct contribution and role of the LCV/VAL and IA/CA components in the overall PI/PF model.

8. Latent variable models and network analysis as complementary approaches to better understanding the ACT theory.

Although the present study supported that the latent variable models come with several limitations and the network approach would be a more advanced method to evaluate the PI/PF model, the results led us to assume that they are complementary to each other. In a confirmatory mode, the latent variable approach allowed for the comparison of the alternative PI/PF models and offered evidence for the underlying latent structure of the ACT theory. We also investigated the correlations among the latent variables of the resulting PI/PF model, which gave us a more superficial and simplistic picture of the associations among the ACT components. By using network analysis, we also explore the connections of the components but in greater depth, since it was done on an item level that provided us with a wider range of details for each item. Another critical contribution of network approach was that it allowed us to examine the connections among the ACT scales and identify the overlapping items or communities of items of different scales. This is of high importance as we needed to acknowledge which set of scales (i.e., MPFI or battery of scales) was more suitable for the accurate and valid measurement of the ACT model components.

Overall, despite the different information provided by the two psychometric approaches, the most important conclusion is that they converge to the similar conclusions regarding the structure of the PI/PF model and the relationships between its components. Latent model gave more detailed evidence about the theoretical structure of the ACT model, while network analysis provided us with sufficient information on the role and function of each ACT component with information at the item level. Both approaches helped identify the model that best reflects the ACT theory, and which ACT components are most important or central in the overall PI/PF model.

Limitations and future suggestions

Despite the novelty and usefulness of the present study it comes also with some limitations. Initially, the small size (<500) and the relative homogeneous demographic characteristics of both samples (mostly young female students) limits generalization to wider populations. It is recommended to replicate the results in a larger and more heterogeneous samples with a wider age range and various populations and cultures. Another weakness was the absence of a homogeneous clinical sample, although efforts had been made to include different groups with specific mental health characteristics (e.g., depression, anxiety, psychosis). Therefore, a suggestion for future research would be to repeat the present analyses on clinical samples to investigate whether the structure and relationships among the PI/PF model's components differ depending on clinical diagnosis. The online mode of administration can be considered as an easy and fast approach to collect data, however it raised problems of limited or incomplete response, no contact to resolve any comprehension difficulties, and perhaps low motivation and commitment to respond to the questionnaires. Thus, a more traditional paper-and-pencil collection method could be applied in future studies that might mitigate some of the above problems.

The battery of translated Greek questionnaires that were used in the present study might be another limitation. Many problems have been observed with the use of these tools and this probably has to do with the adaptation method used. Therefore, future studies are recommended to replicate the present study by using Greek scales that have used a more suitable and comprehensive adaptation methodology (i.e., like the TRAPD adaptation method used for the MPFI). Another eminent constraint of these study is the selection of separate tools which are responsible for several measurement problems. While the ACT theory believes in six single constructs, some of the scales used in this study were multi-dimensional, which inevitably has affected the correct and appropriate assessment of the ACT components. Also, several post-hoc alterations were needed to be made to almost all of these measures in order to achieve an accepted model fit. Thus, it would be suggested that in future studies, a more careful choice of measures should be done to avoid similar problems.

Through the present study we contributed to a better understanding of the role and associations of the PI/PF model components and how certain ACT components are strongly connected and interrelated, which might assist clinicians in jointly targeting them in therapy. Insights were also gained as to the relative merits of administering a comprehensive instrument to assess all components of ACT versus using selected individual scales for specific ACT constructs. However, the cross-sectional design of the study was a barrier in expanding the clinical utility of PI/PF model components assessment on drawing conclusions regarding the stability of the role and function of each ACT component across time. Currently, claims from this analysis pertain to inter-relationships among components. Thus, it would be of great importance if future studies employed data from different time points or after an ACT intervention to search for different patterns of connections over time or the existence of causal relationships among the PI/PF components.

Conclusions

Overall, the present study was successful in providing several interesting findings regarding the ACT theory, the ACT measurement tools and the alternative psychometric approaches. One of the first that examined all alternative theoretical structures of the PI/PF model, the present research showed that only the PI Hexaflex structure, as measured by the MPFI, was a comparatively better fitting model in relation to the other alternative models, which is an insight regarding the need of adopting a simpler conceptual model for describing ACT theory. Almost all ACT components had a distinct role and function in the overall PI/PF model, not just the EA/ACC and FUS/DEF, as proposed by ACT theory. However, the strong correlation found between certain pairs of components, like LCV/VAL and IA/CA or LCPM/PMA and SACnt/SACxt, made them be perceived as a single entity in both sets of scales and with the two analysis approaches. This is an indication that ACT theory needs to further clarify and refine the definition of each core component, to reflect their distinct and unique contribution to the overall PI/PF model. The MPFI was found to be a better tool for the comprehensive examination of the ACT model, while the battery of scales needs improvements to be more consistent with the ACT theory. Finally, this was one of the first studies that combined the two analysis methods, the Latent Variable Models and the Network Analysis, to study the PI/PF model components. This a novel methodological approach that has been recently applied in several psychological domains, like intelligence (Schmank et al., 2021), ADHD and ODD symptoms (Preszler & Burns, 2019), and reading comprehension (Goring et al., 2019). Present results showed that both approaches are essential since they offer different type of information for better understanding of the ACT model and its components.

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APPENDICES

Appendix 1. Consent form and battery of scales used in sample 1 (Chapter 3).

Ενημερωτικό Δελτίο Συμμετοχής

Έχεις κληθεί να λάβεις μέρος σε μια έρευνα στα πλαίσια διδακτορικής διατριβή με τίτλο «Εξετάζοντας το υποκείμενο μοντέλο Ψυχολογικής Ευελιξίας/Ψυχολογικής Ακαμψίας, χρησιμοποιώντας καινοτόμες ψυχομετρικές μεθόδους».

Είναι σημαντικό να ενημερωθείς για τον ερευνητικό σκοπό και περιεχόμενο της έρευνας. Παρακαλούμε αφιέρωσε λίγο χρόνο, για να διαβάσεις το ακόλουθο δελτίο προσεκτικά:

Ερευνητικός Σκοπός: Η μελέτη του θεωρητικού μοντέλου της Θεραπείας Αποδοχής και Δέσμευσης και των σχέσεων μεταξύ των στοιχείων, του μοντέλου, χρησιμοποιώντας διαφορετικά εργαλεία, ψυχομετρικές μεθόδους και δείγματα συμμετεχόντων.

Διαδικασία Έρευνας: Αποτελείται από δυο ανεξάρτητες φάσεις. Σε πρώτη φάση θα κληθείς να απαντήσεις ανώνυμα σε κάποιες δημογραφικές ερωτήσεις, και σε δύο κλίμακες. Η πρώτη μετρά διάφορες έννοιες του εξεταζόμενου θεωρητικού μοντέλου και η δεύτερη αξιολογεί διαστάσεις της ψυχικής υγείας. Ο χρόνος συμπλήρωσης τους υπολογίζεται περίπου στα 15 λεπτά. Σε δεύτερη φάση, εάν συμφωνήσεις να συμμετέχεις, θα χρειαστεί να παρέχεις το email σου, ώστε να σου σταλεί ένα σύντομο ερωτηματολόγιο που μετρά τις έννοιες του θεωρητικού μοντέλου, μια φορά κάθε 2 εβδομάδες για 2 μήνες. Επίσης, θα χρειαστεί να δημιουργήσεις ένα προσωπικό 7-ψήφιο κωδικό, τον οποίο θα πρέπει να καταχωρείς κάθε φορά που θα συμπληρώνεις το ερωτηματολόγιο για χάρη ταυτοποίησης.

Συμμετοχή: Η συμμετοχή σου σε αυτή την έρευνα είναι εθελοντική, αλλά σημαντική, αφού με τις απαντήσεις σου στα ερωτηματολόγια θα βοηθήσεις να επιτευχθεί ο σκοπός της έρευνας. Έχεις το δικαίωμα να αρνηθείς να συμμετέχεις στη μελέτη αυτή, οποιαδήποτε στιγμή της διαδικασίας, για οποιοδήποτε λόγο και χωρίς κανένα κόστος.

Οφέλη συμμετοχής: Συμμετέχοντας είτε στην πρώτη ή στην δεύτερη φάση της έρευνας, θα έχεις την ευκαιρία να κερδίσεις 4 δώρα (π.χ. χρηματικά κουπόνια σε υπεραγορά ή καταστήματα, τηλεφωνικές κάρτες πίστωσης χρόνου). Μετά το τέλος της έρευνας θα ακολουθήσει κλήρωση για όσους σημείωσαν την ηλεκτρονική τους διεύθυνση κατά την συμπλήρωση των δυο φάσεων της έρευνας.

Κίνδυνοι συμμετοχής: Με την συμμετοχή σου στην έρευνα αυτή δε θα υπάρχει καμία αρνητική επίπτωση. Αν λάβεις μέρος, θα πρέπει να αφιερώσεις λίγα λεπτά για την απάντηση των ερωτηματολογίων.

Εμπιστευτικότητα: Για όλες οι προσωπικές πληροφορίες που θα συλλεχθούν, θα τηρούνται αυστηρά τα μέτρα της εμπιστευτικής και ασφαλούς αποθήκευσης, με πλήρης ανωνυμία απαντήσεων, ώστε να μην είναι δυνατός ο εντοπισμός οποιουδήποτε συμμετέχοντα.

Έγκριση έρευνας: Η έρευνα αυτή πραγματοποιείται από διδακτορική φοιτήτρια του Τμήματος Ψυχολογίας, του Πανεπιστημίου Κύπρου και έχει εγκριθεί από τριμελή επιτροπή ακαδημαϊκών στο Πανεπιστήμιο Κύπρου, και από την Εθνική Επιτροπή Βιοηθικής Κύπρου.

Για οποιαδήποτε απορία, παρακαλώ όπως επικοινωνήσεις με την ερευνήτρια Άντρια Χριστοδούλου (christodoulou.andria@ucy.ac.cy)

1. Έχω ενημερωθεί για το σκοπό και περιεχόμενο της έρευνας και επιθυμώ να συμμετέχω.

Ναι ☐ Όχι ☐

2. Για φοιτητές/-τριες, σε περίπτωση πίστωσης βαθμού σε μάθημα, παρακαλώ όπως σημειώσετε τον κωδικό του μαθήματος για το οποίο θέλετε να πάρετε το βαθμό (π.χ. ΨΥΧ111).

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3. Για φοιτητές/-τριες, παρακαλώ για χάρη ταυτοποίησης, σημειώστε τον αριθμό της ταυτότητας σας, ώστε να γίνει η πίστωση του βαθμού.

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<u>Μέρος Ι:</u> Δημογραφικά στοιχεία

1. ***<u>Φύλο:</u>*** (Βάλε Χ στο κατάλληλο κουτάκι)

Άνδρας ☐
Γυναίκα ☐
Δεν απαντώ/άλλο ☐

2. ***<u>Ηλικία:</u>*** (Σε έτη)

☐

3. ***<u>Επαγγελματική κατάσταση:</u>*** (Βάλε **Χ** στο κατάλληλο κουτάκι)

Εργάζομαι σε πλήρη απασχόληση ☐
Εργάζομαι σε μερική απασχόληση ☐
Δεν εργάζομαι ☐

4. ***<u>Σπουδάζεις:</u>*** (Βάλε **Χ** στο κατάλληλο κουτάκι)
Ναι ☐
Όχι ☐

5. ***<u>Ποιο είναι το υψηλότερο επίπεδο εκπαίδευσης που έχεις συμπληρώσει:</u>*** (Βάλε **Χ** στο κατάλληλο κουτάκι)
Δευτεροβάθμια Εκπαίδευση (Μέχρι Λύκειο) ☐
Πανεπιστημιακή Εκπαίδευση (Δίπλωμα ή Πτυχίο) ☐
Μεταπτυχιακή – Διδακτορική Εκπαίδευση ☐
Άλλο (Παρακαλώ διευκρίνισε) ☐

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6. ***<u>Επαρχία Διαμονής:</u>*** (Βάλε **Χ** στο κατάλληλο κουτάκι)

Λευκωσία ☐
Λάρνακα ☐
Λεμεσός ☐
Αμμόχωστος ☐
Πάφος ☐
Άλλο (Παρακαλώ διευκρίνισε) ☐

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<u>Μέρος ΙΙ:</u> Ερωτηματολόγιο Ψυχολογικής Ευελιξίας (MPFI Greek)

(Note. **bold** indicates the number of the item in the original version of the MPFI)

		ΤΙΣ ΤΕΛΕΥΤΑΙΕΣ ΔΥΟ ΕΒΔΟΜΑΔΕΣ…	Δεν ισχύει	Ισχύει Σπανια	Ισχύει Κάποτε	Ισψύει Συχνά	Ισχύει Πολύ Συχνά	Ισχύει Πάντα
1	**1**	Είχα πρόθεση να παρατηρώ τις αρνητικές σκέψεις και συναισθήματα μου χωρίς να παλεύω μαζί τους.	1	2	3	4	5	6
2	**6**	Έδινα προσοχή και είχα επίγνωση των συναισθημάτων μου.	1	2	3	4	5	6
3	**11**	Ακόμα και όταν πληγωνόμουν ή αναστατωνόμουν, προσπαθούσα να δω τα πράγματα από μια διαφορετική σκοπιά.	1	2	3	4	5	6
4	**16**	Άφηνα τα αρνητικά συναισθήματα να περνούν χωρίς να με παγιδεύουν.	1	2	3	4	5	6
5	**21**	Αναγνώριζα αυτά που είναι σημαντικά για μένα στη ζωή μου.	1	2	3	4	5	6
6	**26**	Ακόμη κι όταν έβρισκα εμπόδια, δεν σταματούσα να ασχολούμαι με αυτά που είναι σημαντικά για μένα.	1	2	3	4	5	6
7	**2**	Προσπαθούσα να συμφιλιωθώ με τις αρνητικές σκέψεις και συναισθήματά μου, παρά να τους αντιστέκομαι.	1	2	3	4	5	6
8	**7**	Ήμουν συγχρονισμένος/η με τις σκέψεις και τα συναισθήματά μου κάθε στιγμή.	1	2	3	4	5	6
9	**12**	Επιβίωνα δύσκολων καταστάσεων με το να βλέπω τη ζωή μου από μια άλλη γενικότερη οπτική.	1	2	3	4	5	6
10	**17**	Όταν αναστατωνόμουν, άφηνα τα αρνητικά συναισθήματα να περνούν χωρίς να κολλώ σε αυτά.	1	2	3	4	5	6
11	**22**	Ακολουθούσα πιστά τις σημαντικότερες προτεραιότητες που έθεσα στη ζωή μου.	1	2	3	4	5	6
12	**27**	Ακόμη και σε δύσκολες στιγμές, μπορούσα να κατευθύνομαι προς αυτά που έχουν αξία για μένα.	1	2	3	4	5	6
13	**3**	Άφηνα τις αρνητικές σκέψεις και συναισθήματα να υπάρχουν, χωρίς να προσπαθώ να τα διώχνω.	1	2	3	4	5	6
14	**8**	Έδινα ιδιαίτερη προσοχή σε αυτά που σκεφτόμουν και ένιωθα.	1	2	3	4	5	6
15	**13**	Προσπαθούσα να διατηρήσω την προοπτική των πραγμάτων ακόμα κι όταν στη ζωή μού συνέβαιναν δυσάρεστα γεγονότα.	1	2	3	4	5	6
16	**18**	Όταν φοβόμουν, βίωνα τα συναισθήματα αυτά, αφήνοντας τα απλώς να περάσουν.	1	2	3	4	5	6
17	**23**	Προσπαθούσα καθημερινά να επενδύω σε αυτά που είναι πραγματικά σημαντικά για μένα.	1	2	3	4	5	6
18	**28**	Ακόμη και όταν η ζωή ήταν αγχωτική και έντονη, συνέχιζα να εργάζομαι για πράγματα που ήταν σημαντικά για μένα.	1	2	3	4	5	6
19	**4**	Όταν είχα μια ανησυχητική σκέψη ή συναίσθημα, προσπαθούσα να τα δεχτώ αντί να τα αγνοήσω.	1	2	3	4	5	6
20	**9**	Παρακολουθούσα τη ροή των σκέψεων και των συναισθημάτων μου.	1	2	3	4	5	6
21	**14**	Όταν φοβόμουν, προσπαθούσα ξανά να δω την ευρύτερη εικόνα.	1	2	3	4	5	6
22	**19**	Μπορούσα να κάνω ένα βήμα πίσω και να παρατηρώ τις αρνητικές σκέψεις και τα συναισθήματα χωρίς να αντιδρώ.	1	2	3	4	5	6
23	**24**	Ακόμη και αν ήμουν σε δίλημμα, συνέχιζα να θέτω σε προτεραιότητα αυτά που είναι σημαντικά για μένα.	1	2	3	4	5	6
24	**29**	Δεν άφηνα τις αναποδιές να καθυστερούν την προσπάθεια μου να επιτύχω σε αυτά που πραγματικά θέλω στη ζωή μου.	1	2	3	4	5	6
25	**5**	Ανοιγόμουν σε όλα τα συναισθήματά μου, τα καλά και τα κακά.	1	2	3	4	5	6
E		Παρακαλώ επέλεξε την πρόταση «ισχύει κάποτε».	1	2	3	4	5	6
26	**10**	Κατέβαλλα προσπάθεια να παραμένω συγκεντρωμένος/η και να έχω επίγνωση των σκέψεων και των συναισθημάτων μου.	1	2	3	4	5	6
27	**15**	Όταν συνέβαινε κάτι που με πονούσε, προσπαθούσα να κρατήσω μια ισορροπημένη αντίληψη της κατάστασης.	1	2	3	4	5	6
28	**20**	Σε δύσκολες καταστάσεις, παρατηρούσα τις σκέψεις και τα συναισθήματά μου χωρίς αυτά να με πνίγουν.	1	2	3	4	5	6
29	**25**	Οι βαθύτερες αξίες μου έδιναν συνεχώς κατεύθυνση στη ζωή μου.	1	2	3	4	5	6
30	**30**	Δεν άφηνα τους φόβους και τις αμφιβολίες μου, να παρεμποδίζουν την προσπάθεια μου να υλοποιήσω τους στόχους μου.	1	2	3	4	5	6
31	**31**	Όταν είχα μια κακή ανάμνηση, προσπαθούσα να αποσπάσω την προσοχή μου για να την διώξω.	1	2	3	4	5	6
32	**36**	Ήμουν «στον αυτόματο», με ελάχιστη επίγνωση του τι έκανα.	1	2	3	4	5	6

33	**41**	Νόμιζα ότι κάποια από τα συναισθήματά μου ήταν κακά ή ακατάλληλα και δεν έπρεπε να τα νιώθω.	1	2	3	4	5	6
34	**46**	Οι αρνητικές σκέψεις και τα συναισθήματα παρέμεναν μέσα μου για πολύ καιρό.	1	2	3	4	5	6
35	**51**	Οι προτεραιότητες και οι αξίες μου έμπαιναν συχνά στο περιθώριο στην καθημερινότητά μου.	1	2	3	4	5	6
36	**56**	Τα αρνητικά συναισθήματα συχνά με καθήλωναν σε αδράνεια.	1	2	3	4	5	6
37	**32**	Προσπαθούσα να αποσπάσω την προσοχή μου, όταν ένιωθα δυσάρεστα συναισθήματα.	1	2	3	4	5	6
38	**37**	Έκανα τα περισσότερα πράγματα ασυναίσθητα, χωρίς να δίνω μεγάλη προσοχή.	1	2	3	4	5	6
39	**42**	Επέκρινα τον εαυτό μου για το γεγονός ότι είχα παράλογα ή ακατάλληλα συναισθήματα.	1	2	3	4	5	6
40	**47**	Οι ανησυχητικές σκέψεις τριγύριζαν στο μυαλό μου συνεχώς.	1	2	3	4	5	6
41	**52**	Όταν πνιγόμουν με πολλά πράγματα, έχανα επαφή με αυτά που είναι σημαντικά για μένα.	1	2	3	4	5	6
42	**57**	Τα αρνητικά συναισθήματα μπορούσαν εύκολα να μπλοκάρουν τα σχέδια μου.	1	2	3	4	5	6
43	**33**	Όταν έρχονταν δυσάρεστες αναμνήσεις, προσπαθούσα να τις βγάλω από το μυαλό μου.	1	2	3	4	5	6
44	**38**	Τις περισσότερες μέρες ήμουν στον «αυτόματο πιλότο», χωρίς να δίνω σημασία στο τι σκεφτόμουν ή αισθανόμουν.	1	2	3	4	5	6
45	**43**	Πίστευα ότι κάποιες από τις σκέψεις μου είναι παράλογες ή κακές και δεν πρέπει να σκέφτομαι έτσι.	1	2	3	4	5	6
E		Παρακαλώ επέλεξε την απάντηση «ισχύει πάντα».	1	2	3	4	5	6
46	**48**	Ήταν πολύ εύκολο να παγιδευτώ σε ανεπιθύμητες σκέψεις και συναισθήματα.	1	2	3	4	5	6
47	**53**	Συχνά παραμελούσα εντελώς αυτά που είναι σημαντικά για μένα.	1	2	3	4	5	6
48	**58**	Όταν αναστατωνόμουν, έμενα ακινητοποιημένος/η και αδρανής.	1	2	3	4	5	6
49	**34**	Όταν συνέβαινε κάτι που με αναστάτωνε, προσπαθούσα έντονα να μην το σκέφτομαι.	1	2	3	4	5	6
50	**39**	Περνούσα τις περισσότερες μου μέρες αδιάφορα, χωρίς να δίνω προσοχή στο τι συμβαίνει.	1	2	3	4	5	6
51	**44**	Έλεγα στον εαυτό μου ότι δεν έπρεπε να νιώθω έτσι όπως ένιωθα.	1	2	3	4	5	6
52	**49**	Όταν είχα αρνητικές σκέψεις ή συναισθήματα, ήταν πολύ δύσκολο να δω πέρα από αυτά.	1	2	3	4	5	6
53	**54**	Συνήθως δεν είχα χρόνο να επικεντρωθώ στα πράγματα που είναι πραγματικά σημαντικά για μένα.	1	2	3	4	5	6
54	**59**	Οι αρνητικές εμπειρίες με αποπροσανατόλιζαν από αυτά που είναι πραγματικά σημαντικά.	1	2	3	4	5	6
55	**35**	Εάν υπήρχε κάτι που δεν ήθελα να σκέφτομαι, δοκίμαζα διάφορα πράγματα για να το βγάλω από το μυαλό μου.	1	2	3	4	5	6
56	**40**	Τις περισσότερες φορές ακολουθούσα μηχανικά τη ρουτίνα μου, χωρίς να δίνω μεγάλη προσοχή.	1	2	3	4	5	6
57	**45**	Έλεγα στον εαυτό μου ότι δεν έπρεπε να σκέφτομαι με τον τρόπο που σκεφτόμουν.	1	2	3	4	5	6
58	**50**	Όταν συνέβαινε κάτι κακό, ήταν δύσκολο να σταματήσω να το σκέφτομαι.	1	2	3	4	5	6
59	**55**	Όταν τα πράγματα δυσκόλευαν, ήταν εύκολο να ξεχάσω αυτά που έχουν πραγματικά αξία για μένα.	1	2	3	4	5	6
60	**60**	Οι δυσάρεστες σκέψεις και τα συναισθήματα, εύκολα παρεμπόδιζαν τις προσπάθειες μου για βαθύτερο νόημα στη ζωή μου.	1	2	3	4	5	6

<u>Μέρος ΙΙΙ:</u> Ερωτηματολόγιο Ψυχικής Υγείας

Παρακάτω υπάρχει ένας κατάλογος με ενοχλήματα που έχουν μερικές φορές οι άνθρωποι. Διάβασε κάθε μια προσεκτικά και επέλεξε με βάση αυτή την πεντάβαθμη κλίμακα που περιγράφει καλύτερα το βαθμό δυσκολίας που σου έχει προκαλέσει το συγκεκριμένο πρόβλημα κατά τη διάρκεια των τελευταίων 7 ημερών <u>συμπεριλαμβανομένης και της σημερινής ημέρας</u>. Επέλεξε <u>ένα</u> αριθμό που σε αντιπροσωπεύει. Μην αφήνεις καμία ερώτηση χωρίς απάντηση.

	ΠΟΣΟ ΕΝΟΧΛΗΘΗΚΑΤΕ ΑΠΟ:	**ΚΑΘΟΛΟΥ**	**ΛΙΓΟ**	**ΜΕΤΡΙΑ**	**ΑΡΚΕΤΑ**	**ΠΟΛΥ**
1	Πονοκεφάλους	0	1	2	3	4
2	Νευρικότητα ή εσωτερική τρεμούλα	0	1	2	3	4
3	Επαναλαμβανόμενες δυσάρεστες σκέψεις που δεν φεύγουν από το μυαλό σας	0	1	2	3	4
4	Λιποθυμία ή ζαλάδα	0	1	2	3	4
5	Απώλεια σεξουαλικού ενδιαφέροντος ή ευχαρίστησης	0	1	2	3	4
6	Διάθεση να κατακρίνετε τους άλλους	0	1	2	3	4
7	Την ιδέα ότι κάποιος ελέγχει τη σκέψη σας	0	1	2	3	4
8	Την αίσθηση ότι οι άλλοι φταίνε για τα προβλήματα σας	0	1	2	3	4
9	Δυσκολία να θυμάστε διάφορα πράγματα	0	1	2	3	4
10	Ανησυχία ότι είστε απεριποίητος/η, ατημέλητος/η ή απερίσκεπτος/η	0	1	2	3	4
11	Αισθάνεστε ότι νευριάζετε ή ερεθίζεστε εύκολα	0	1	2	3	4
12	Πόνοι στην καρδία ή στον θώρακα	0	1	2	3	4
13	Αισθάνεστε φόβο όταν βρίσκεστε σε ανοικτούς χώρους ή στους δρόμους	0	1	2	3	4
14	Αισθάνεστε υποτονικός/η, αδρανής, ή αποδυναμωμένος/η	0	1	2	3	4
15	Σκέψεις αυτοκτονίας	0	1	2	3	4
16	Ακούτε φωνές που οι άλλοι δεν ακούν	0	1	2	3	4
17	Τρέμετε	0	1	2	3	4
18	Αισθάνεστε ότι δεν μπορείτε να εμπιστεύεστε τους περισσότερους ανθρώπους	0	1	2	3	4
19	Ανορεξία	0	1	2	3	4
20	Κλαίτε εύκολα	0	1	2	3	4
21	Αισθάνεστε ντροπαλός/η ή όχι άνετα με το αντίθετο φύλο	0	1	2	3	4
22	Αίσθημα ότι έχετε μπλεχτεί ή παγιδευτεί	0	1	2	3	4
23	Ξαφνικά φοβάστε χωρίς κανένα λόγο	0	1	2	3	4
24	Εκρήξεις οργής που δεν μπορείτε να ελέγξετε	0	1	2	3	4
25	Φοβάστε να βγείτε μόνος από το σπίτι	0	1	2	3	4
26	Κατηγορείτε τον εαυτό σας για διάφορα πράγματα	0	1	2	3	4
27	Πόνους στην μέση	0	1	2	3	4
28	Αισθάνεστε ότι κάτι σας εμποδίζει από το να κάνετε αυτό που θέλετε	0	1	2	3	4
29	Αισθάνεστε μοναξιά	0	1	2	3	4
30	Αισθάνεστε κακοκεφιά	0	1	2	3	4
31	Ανησυχείτε υπερβολικά για διάφορες καταστάσεις	0	1	2	3	4
32	Δεν βρίσκετε ενδιαφέρον σε τίποτα	0	1	2	3	4
33	Νιώθετε φοβισμένος/η	0	1	2	3	4
34	Τα αισθήματα σας πληγώνονται εύκολα	0	1	2	3	4
35	Οι άλλοι γνωρίζουν τις προσωπικές σας σκέψεις	0	1	2	3	4
36	Αισθάνεστε ότι οι άλλοι δεν σας καταλαβαίνουν ή δεν σας συμπονούν	0	1	2	3	4
37	Αισθάνεστε ότι οι άλλοι είναι νευρικοί ή σας αντιπαθούν	0	1	2	3	4
38	Πρέπει να ενεργείτε αργά ώστε να είστε σίγουρος/η ότι δεν έχετε κάνει λάθος	0	1	2	3	4
39	Αίσθημα καρδιακών παλμών ή ταχυκαρδία	0	1	2	3	4
40	Ναυτία ή σωματικές διαταραχές	0	1	2	3	4
41	Αισθάνεστε κατώτερος από τους άλλους	0	1	2	3	4
42	Πόνο στους μυς	0	1	2	3	4

	ΠΟΣΟ ΕΝΟΧΛΗΘΗΚΑΤΕ ΑΠΟ:	ΚΑΘΟΛΟΥ	ΛΙΓΟ	ΜΕΤΡΙΑ	ΑΡΚΕΤΑ	ΠΟΛΥ
43	Αισθάνεστε ότι σας παρακολουθούν ή μιλούν για σας	0	1	2	3	4
44	Αυπνίες	0	1	2	3	4
45	Πρέπει να ελέγχετε ξανά και ξανά ότι κάνετε	0	1	2	3	4
46	Δυσκολεύεστε να παίρνετε αποφάσεις	0	1	2	3	4
47	Φοβάστε να ταξιδέψετε με λεωφορείο ή τρένο	0	1	2	3	4
48	Δύσπνοια	0	1	2	3	4
49	Αισθάνεστε χέστη ή κρύο	0	1	2	3	4
50	Νιώθετε ότι πρέπει να αποφεύγετε μερικά πράγματα, μέρη ή ασχολίες γιατί σας φοβίζουν	0	1	2	3	4
51	Αδειάζει το μυαλό σας	0	1	2	3	4
52	Αισθάνεστε μούδιασμα ή ελαφρύ πόνο σε τμήματα του σώματος σας	0	1	2	3	4
53	Έχετε κόμπο στο λαιμό	0	1	2	3	4
54	Δεν έχετε ελπίδες για το μέλλον	0	1	2	3	4
55	Δυσκολεύεστε να συγκεντρωθείτε	0	1	2	3	4
56	Αισθάνεστε αδυναμία σε τμήματα του σώματος σας	0	1	2	3	4
57	Αισθάνεστε τεντωμένα τα νεύρα σας ή γεμάτος αγωνία	0	1	2	3	4
58	Νιώθετε βάρος στα χέρια ή στα πόδια	0	1	2	3	4
59	Έχετε σκέψεις θανάτου ή ότι πεθαίνετε	0	1	2	3	4
60	Τρώτε παραπάνω από το κανονικό	0	1	2	3	4
61	Δεν αισθάνεστε άνετα όταν σας κοιτάνε ή όταν μιλούν για σας	0	1	2	3	4
62	Έχετε σκέψεις που δεν είναι δικές σας	0	1	2	3	4
63	Έχετε παρορμήσεις να χτυπήσετε, να τραυματίσετε, ή να βλάψετε κάποιον	0	1	2	3	4
64	Ξυπνάτε πολύ νωρίς το πρωί	0	1	2	3	4
65	Πρέπει να επαναλαμβάνετε τις ίδιες πράξεις π.χ. να αγγίζετε κάτι ή να πλένεστε	0	1	2	3	4
66	Κοιμάστε ανήσυχα ή με διακοπές	0	1	2	3	4
67	Σας έρχεται να σπάσετε πράγματα	0	1	2	3	4
68	Έχετε ιδέες και απόψεις που οι άλλοι δεν συμμερίζονται	0	1	2	3	4
69	Νιώθετε συνεσταλμένος/η	0	1	2	3	4
70	Δεν αισθάνεστε άνετα όταν βρίσκεστε μέσα σε πλήθος π.χ. καταστήματα ή σινεμά	0	1	2	3	4
71	Νιώθετε ότι για το παραμικρό πράγμα πρέπει να κάνετε προσπάθεια	0	1	2	3	4
72	Έχετε περιόδους με τρόμο ή πανικό	0	1	2	3	4
73	Δεν αισθάνεστε άνετα να τρώτε ή να πίνετε δημόσια	0	1	2	3	4
74	Τσακώνεστε συχνά	0	1	2	3	4
75	Αισθάνεστε νευρικότητα όταν μένετε μόνος/η	0	1	2	3	4
76	Νιώθετε ότι οι άλλοι δεν εκτιμούν όσο πρέπει αυτά που κάνετε	0	1	2	3	4
77	Αισθάνεστε μοναξιά ακόμη και όταν βρίσκεστε με κόσμο	0	1	2	3	4
78	Είστε τόσο ανήσυχος ώστε δεν μπορείτε να μείνετε σε μια θέση	0	1	2	3	4
79	Αισθάνεστε ότι δεν αξίζετε	0	1	2	3	4
80	Έχετε το προαίσθημα ότι κάτι κακό θα συμβεί	0	1	2	3	4
81	Φωνάζετε ή πετάτε πράγματα	0	1	2	3	4
82	Φοβάστε ότι θα λιποθυμήσετε όταν είστε με κόσμο	0	1	2	3	4
83	Αισθάνεστε ότι οι άλλοι θα σας εκμεταλλευτούν αν τους αφήσετε	0	1	2	3	4
84	Έχετε σκέψεις για σεξουαλικά θέματα που σας απασχολούν πάρα πολύ	0	1	2	3	4
85	Νομίζετε ότι θα έπρεπε να τιμωρηθείτε για τις αμαρτίες σας	0	1	2	3	4
86	Έχετε σκέψεις ή φαντασίες που σας τρομάζουν	0	1	2	3	4
87	Νομίζετε ότι έχετε κάποιο σοβαρό ελάττωμα στο σώμα σας	0	1	2	3	4
88	Δεν αισθάνεστε πολύ κοντά σε κάποιο πρόσωπο	0	1	2	3	4
89	Νιώθετε ενοχές	0	1	2	3	4
90	Νομίζετε ότι κάτι δεν λειτουργεί καλά στο μυαλό σας	0	1	2	3	4

Appendix 2. Consent form and battery of scales used in sample 2 (Chapter 4).

Ενημερωτικό Δελτίο Συμμετοχής

Έχεις κληθεί να λάβεις μέρος σε έρευνα στα πλαίσια διδακτορικής διατριβής με τίτλο «Εξετάζοντας το υποκείμενο μοντέλο Ψυχολογικής Ευελιξίας/Ψυχολογικής Ακαμψίας, χρησιμοποιώντας καινοτόμες ψυχομετρικές μεθόδους».

Πριν αποφασίσεις αν θα συμμετέχεις στην έρευνα αυτή, είναι σημαντικό να ενημερωθείς για τον ερευνητικό σκοπό και περιεχόμενο της έρευνας:

Ερευνητικός Σκοπός: Η μελέτη του θεωρητικού μοντέλου της Θεραπείας Αποδοχής και Δέσμευσης, αλλά και των σχέσεων μεταξύ των μεταβλητών του μοντέλου, χρησιμοποιώντας διαφορετικά εργαλεία, ψυχομετρικές μεθόδους και δείγματα συμμετεχόντων.

Διαδικασία Έρευνας: Θα κληθείς να απαντήσεις ανώνυμα σε κάποιες δημογραφικές ερωτήσεις, και σε οκτώ κλίμακες που αξιολογούν τις συνιστώσες του μοντέλου Ψυχολογικής Ευελιξίας/ Ψυχολογικής Ακαμψίας, αλλά και τις έννοιες αυτό-συμπόνιας και αντιλαμβανόμενου στρες. Ο χρόνος συμπλήρωσης τους υπολογίζεται περίπου στα 10-15 λεπτά.

Συμμετοχή: Η συμμετοχή σου σε αυτή την έρευνα είναι εθελοντική, αλλά εξαιρετικά σημαντική για τους σκοπούς της έρευνας. Έχεις το δικαίωμα να αρνηθείς να συμμετέχεις στη μελέτη αυτή, οποιαδήποτε στιγμή της διαδικασίας, για οποιοδήποτε λόγο και χωρίς κανένα κόστος.

Κίνδυνοι συμμετοχής: Με την συμμετοχή σου στην έρευνα αυτή δε θα υπάρχει καμία αρνητική επίπτωση. Αν λάβεις μέρος, θα πρέπει να αφιερώσεις λίγα λεπτά για την απάντηση των ερωτηματολογίων.

Εμπιστευτικότητα/ ανωνυμία: Για όλες τις προσωπικές πληροφορίες που θα συλλεχθούν, θα τηρούνται αυστηρά τα μέτρα της εμπιστευτικής και ασφαλούς αποθήκευσης, με πλήρη ανωνυμία απαντήσεων, ώστε να μην είναι δυνατός ο εντοπισμός οποιουδήποτε συμμετέχοντα. Τα ηλεκτρονικά αρχεία θα αποθηκεύονται σε φακέλους προστατευμένους με κωδικό πρόσβασης τους οποίους θα έχει μόνο η ερευνήτρια. Επίσης, τα δεδομένα που θα συλλεχθούν θα χρησιμοποιηθούν σε συλλογικό και όχι σε ατομικό επίπεδο και μόνο για ερευνητικούς σκοπούς.

Έγκριση έρευνας: Η έρευνα αυτή πραγματοποιείται από διδακτορική φοιτήτρια του Τμήματος Ψυχολογίας, του Πανεπιστημίου Κύπρου. Η μελέτη αυτή έχει εγκριθεί από τριμελή επιτροπή ακαδημαϊκών στο Πανεπιστήμιο Κύπρου, και από την Εθνική Επιτροπή Βιοηθικής Κύπρου.

Για οποιαδήποτε απορία, παρακαλώ όπως επικοινωνήσεις με την ερευνήτρια Άντρια Χριστοδούλου (christodoulou.andria@ucy.ac.cy)

4. Έχω ενημερωθεί για το σκοπό και περιεχόμενο της έρευνας και επιθυμώ να συμμετέχω.

   - [ ] Ναι

5. Για φοιτητές/-τριες, σε περίπτωση πίστωσης βαθμού σε μάθημα, παρακαλώ όπως σημειώσετε τον κωδικό του μαθήματος για το οποίο θέλετε να πάρετε το βαθμό (π.χ. ΨΥΧ111).

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6. Για φοιτητές/-τριες, παρακαλώ για χάρη ταυτοποίησης, σημειώστε τον αριθμό της ταυτότητας σας, ώστε να γίνει η πίστωση του βαθμού.

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<u>Μέρος Ι:</u> Συλλογή Δημογραφικών Στοιχείων

1. ***<u>Φύλο:</u>*** (Βάλε Χ στο κατάλληλο κουτάκι)

Άνδρας ☐
Γυναίκα ☐
Δεν απαντώ/άλλο ☐

2. ***<u>Ηλικία:</u>*** (Σε έτη)

☐

3. ***<u>Επαγγελματική κατάσταση;</u>*** (Βάλε **Χ** στο κατάλληλο κουτάκι)

Εργάζομαι σε πλήρη απασχόληση ☐
Εργάζομαι σε μερική απασχόληση ☐
Δεν εργάζομαι ☐

3. ***<u>Σπουδάζεις:</u>*** (Βάλε **Χ** στο κατάλληλο κουτάκι)

Ναι ☐
Όχι ☐

7. ***<u>Ποιο είναι το υψηλότερο επίπεδο εκπαίδευσης που έχεις συμπληρώσει:</u>*** (Βάλε **Χ** στο κατάλληλο κουτάκι)

Δευτεροβάθμια Εκπαίδευση (Μέχρι Λύκειο) ☐
Πανεπιστημιακή Εκπαίδευση (Δίπλωμα ή Πτυχίο) ☐
Μεταπτυχιακή – Διδακτορική Εκπαίδευση ☐
Άλλο (Παρακαλώ διευκρίνισε) ☐

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6. ***<u>Επαρχία Διαμονής;</u>*** (Βάλε **Χ** στο κατάλληλο κουτάκι)

Λευκωσία ☐
Λάρνακα ☐
Λεμεσός ☐
Αμμόχωστος ☐
Πάφος ☐
Άλλο (Παρακαλώ διευκρίνισε) ☐

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<u>Μέρος ΙΙ:</u> G-AAQ-II

Από τις παρακάτω δηλώσεις, παρακαλώ επιλέξετε πόσο ισχύει η κάθε δήλωση για εσάς, επιλέγοντας την απάντηση (ποτέ δεν αληθεύει – πάντα αληθεύει) που σας αντιπροσωπεύει καλύτερα.

		Ποτέ δεν αληθεύει	**Πολύ σπάνια αληθεύει**	**Σπάνια αληθεύει**	**Αληθεύει μερικές φορές**	**Αληθεύει συχνά**	**Αληθεύει σχεδόν πάντα**	**Πάντα αληθεύει**
1	Οι οδυνηρές μου εμπειρίες και μνήμες με δυσκολεύουν να ζήσω μια ζωή την οποία θα εκτιμώ.	O	O	O	O	O	O	O
2	Φοβάμαι τα συναισθήματά μου.	O	O	O	O	O	O	O
3	Ανησυχώ ότι δε μπορώ να ελέγξω τις ανησυχίες και τα συναισθήματά μου.	O	O	O	O	O	O	O
4	Οι οδυνηρές μου εμπειρίες με εμποδίζουν να έχω μια ζωή που να με γεμίζει.	O	O	O	O	O	O	O
5	Τα συναισθήματα μου προκαλούν προβλήματα στη ζωή μου.	O	O	O	O	O	O	O
6	Μου φαίνεται ότι οι περισσότεροι άνθρωποι χειρίζονται τη ζωή τους καλύτερα από μένα	O	O	O	O	O	O	O
7	Οι ανησυχίες είναι εμπόδιο για την επιτυχία μου.	O	O	O	O	O	O	O

<u>Μέρος ΙΙΙ:</u> G-CFQ

Πιο κάτω θα βρείτε μια λίστα με δηλώσεις. Παρακαλούμε όπως επιλέξετε πόσο αληθής είναι η κάθε δήλωση για εσάς, επιλέγοντας την απάντηση (Δεν ισχύει ποτέ - Ισχύει πάντα) που αντιστοιχεί στην κάθε δήλωση.

		Δεν ισχύει ποτέ	**Ισχύει πολύ σπάνια**	**Ισχύει σπάνια**	**Ισχύει κάποτε**	**Ισχύει συχνά**	**Ισχύει σχεδόν πάντα**	**Ισχύει πάντα**
1	Οι σκέψεις μου μου προκαλούν δυσφορία ή συναισθηματικό πόνο.	O	O	O	O	O	O	O
2	Μπλέκομαι τόσο μέσα στις σκέψεις μου, που αδυνατώ να κάνω τα πράγματα που θέλω περισσότερο να κάνω.	O	O	O	O	O	O	O
3	Υπεραναλύω καταστάσεις στο σημείο όπου δεν είναι βοηθητικό για μένα.	O	O	O	O	O	O	O
4	Παλεύω με τις σκέψεις μου.	O	O	O	O	O	O	O
5	Εκνευρίζομαι με τον εαυτό μου που κάνει συγκεκριμένες σκέψεις.	O	O	O	O	O	O	O
6	Τείνω να μπερδεύομαι και να «κολλώ» πολύ με τις σκέψεις μου.	O	O	O	O	O	O	O
7	Είναι δύσκολο για μένα να αποστασιοποιηθώ από τις αγχωτικές σκέψεις μου, ακόμη και όταν ξέρω ότι θα ήταν βοηθητικό να το κάνω.	O	O	O	O	O	O	O

<u>Μέρος IV</u>: G-CAMS-R

Οι άνθρωποι έχουν διάφορους τρόπους να σχετίζονται με τις σκέψεις και τα συναισθήματα τους. Για κάθε μια από τις παρακάτω ερωτήσεις, επιλέξετε μία απάντηση (Σπάνια/Καθόλου – Σχεδόν πάντα) ανάλογα με το πόσο πολύ ταιριάζει με εσάς, **<u>κατά την προηγούμενη εβδομάδα</u>**.

		Σπάνια/ Καθόλου	**Μερικές φορές**	**Συχνά**	**Σχεδόν πάντα**
1	Είναι εύκολο για εμένα να συγκεντρώνομαι σε οτιδήποτε κάνω	O	O	O	O
2	Είμαι τελείως απορροφημένος/-η με τις σκέψεις μου για το μέλλον	O	O	O	O
3	Μπορώ να αντέξω το συναισθηματικό πόνο	O	O	O	O
4	Μπορώ να αποδεχτώ πράγματα που δεν μπορώ να αλλάξω	O	O	O	O
5	Συνήθως μπορώ να περιγράψω με σημαντική λεπτομέρεια πως νιώθω κάθε στιγμή	O	O	O	O
6	Αποσπώμαι εύκολα	O	O	O	O
7	Είμαι τελείως απορροφημένος/-η με τις σκέψεις μου για το παρελθόν	O	O	O	O
8	Είναι εύκολο για μένα να ακολουθώ τις σκέψεις και τα συναισθήματα μου	O	O	O	O
9	Προσπαθώ να παρατηρώ τις σκέψεις μου χωρίς να τις κρίνω	O	O	O	O
10	Είμαι ικανός/-η να αποδέχομαι τις σκέψεις και τα συναισθήματα που έχω	O	O	O	O
11	Είμαι σε θέση να επικεντρώνομαι στη παρούσα στιγμή	O	O	O	O
12	Είμαι σε θέση να δίνω ιδιαίτερη προσοχή σε ένα πράγμα για μεγάλο χρονικό διάστημα.	O	O	O	O

<u>Μέρος V</u>: G-SACS

Παρακάτω υπάρχουν διάφορες δηλώσεις με τις οποίες μπορεί να συμφωνείτε ή να διαφωνείτε. Παρακαλώ όπως επιλέξετε την απάντηση (Διαφωνώ απόλυτα - Συμφωνώ απόλυτα) που ισχύει για εσάς σε κάθε δήλωση. Σας παρακαλούμε να είστε ανοιχτοί και ειλικρινείς στις απαντήσεις σας.

		Διαφωνώ απόλυτα	**Διαφωνώ**	**Διαφωνώ λίγο**	**Ούτε διαφωνώ/ούτε συμφωνώ**	**Συμφωνώ λίγο**	**Συμφωνώ**	**Συμφωνώ πολύ**
1	Όταν είμαι αναστατωμένος/-η, μπορώ να βρω ένα χώρο ηρεμίας μέσα μου.	O	O	O	O	O	O	O
2	Η προοπτική που έχω για τη ζωή, μου επιτρέπει να διαχειρίζομαι τις απογοητεύσεις της ζωής χωρίς να κατακλύζομαι από αυτές.	O	O	O	O	O	O	O
3	Παρά τις πολλές αλλαγές στη ζωή μου, υπάρχει ένα βασικό μέρος αυτού που είμαι, που δεν αλλάζει.							
4	Καθώς κοιτάζω πίσω στη ζωή μου μέχρι τώρα, έχω την αίσθηση ότι ένα κομμάτι μου ήταν εκεί για όλα αυτά.	O	O	O	O	O	O	O
5	Επιτρέπω στα συναισθήματα μου να έρχονται και να φεύγουν χωρίς να παλεύω μαζί τους.	O	O	O	O	O	O	O
6	Μπορώ να παρατηρώ τις σκέψεις μου που αλλάζουν χωρίς να κολλάω σε αυτές.	O	O	O	O	O	O	O
7	Έχω μια βασική αίσθηση για τον εαυτό μου, η οποία δεν αλλάζει ακόμα κι αν οι σκέψεις και τα συναισθήματα μου αλλάζουν.	O	O	O	O	O	O	O
8	Παρόλο που έγιναν πολλές αλλαγές στη ζωή μου, γνωρίζω ένα κομμάτι του εαυτού μου, που τα έχει παρακολουθήσει όλα.	O	O	O	O	O	O	O
9	Μπορώ να έχω πρόσβαση σε μια προοπτική από την οποία μπορώ να παρατηρήσω τις σκέψεις μου και τα συναισθήματα μου.	O	O	O	O	O	O	O
10	Όταν σκέφτομαι παλαιότερα όταν ήμουν νεότερος/η, αναγνωρίζω ότι ένα μέρος του εαυτού μου που ήταν εκεί τότε, βρίσκεται ακόμα εδώ τώρα.	O	O	O	O	O	O	O

<u>Μέρος VI</u>: G-VQ

Παρακαλώ, διαβάστε προσεκτικά κάθε δήλωση και μετά επιλέξετε την απάντηση (Δεν αληθεύει καθόλου - Αληθεύει απόλυτα) που σας αντιπροσώπευει καλύτερα, κατά τη διάρκεια της προηγούμενης εβδομάδας, συμπεριλαμβανομένης και της σημερινής ημέρας.

		Δεν αληθεύει						Αληθεύει απόλυτα
1	Ξόδευα πολύ χρόνο να σκέφτομαι το παρελθόν ή μέλλον, αντί να εμπλέκομαι σε δραστηριότητες που αξίζουν.	O	O	O	O	O	O	O
2	Βασικά ήμουν στον «αυτόματο πιλότο» τον περισσότερο καιρό.	O	O	O	O	O	O	O
3	Δούλευα προς τους στόχους μου ακόμη και αν δεν ένιωθα κινητοποιημένος/-η.	O	O	O	O	O	O	O
4	Ήμουν περήφανος/-η σχετικά με το πως ζούσα τη ζωή μου.	O	O	O	O	O	O	O
5	Έκανα πρόοδο σε περιοχές της ζωής μου που με νοιάζουν.	O	O	O	O	O	O	O
6	Δύσκολες σκέψεις, συναισθήματα ή μνήμες παρενέβαιναν σε αυτό που ήθελα να κάνω.	O	O	O	O	O	O	O
7	Συνέχιζα να πηγαίνω καλύτερα, έτσι ώστε να γίνομαι ο τύπος του ανθρώπου που θέλω να είμαι.	O	O	O	O	O	O	O
8	Όταν τα πράγματα δεν πήγαιναν σύμφωνα με τα πλάνα μου, τα παρατούσα εύκολα.	O	O	O	O	O	O	O
9	Ένιωθα σαν να είχα ένα σκοπό στη ζωή.	O	O	O	O	O	O	O
10	Φαινόταν σαν να έκανα πράγματα μηχανικά, παρά να εστιάζομαι στο τι ήταν σημαντικό για μένα.	O	O	O	O	O	O	O

<u>Μέρος VII</u>: G-CAQ

Παρακάτω υπάρχει μια λίστα από δηλώσεις. Παρακαλώ όπως αξιολογήσετε το πόσο αληθής είναι η κάθε δήλωση για εσάς επιλέγοντας την κατάλληλη απάντηση (Ποτέ δεν αληθεύει - Πάντα αληθεύει) που σας αντιπροσωπεύει καλύτερα.

		Δεν αληθεύει ποτέ	**Αληθεύει πολύ σπάνια**	**Αληθεύει σπάνια**	**Αληθεύει μερικές φορές**	**Αληθεύει συχνά**	**Αληθεύει σχεδόν πάντα**	**Αληθεύει πάντα**
1	Μπορώ να μείνω αφοσιωμένος/-η στους στόχους μου, ακόμη και όταν υπάρχουν στιγμές που δεν μπορώ να τους επιτύχω.	O	O	O	O	O	O	O
2	Όταν ένας στόχος είναι δύσκολο να επιτευχθεί, μπορώ να κάνω μικρά βήματα για να τον επιτύχω.	O	O	O	O	O	O	O
3	Προτιμώ να αλλάξω το πως προσεγγίζω κάποιο στόχο, παρά να σταματήσω.	O	O	O	O	O	O	O
4	Είμαι σε θέση να ακολουθήσω τα μακροπρόθεσμα μου σχέδια, ακόμα και σε περιόδους που η πρόοδος είναι αργή.	O	O	O	O	O	O	O
5	Το βρίσκω δύσκολο να συνεχίσω μια δραστηριότητα εκτός και αν νιώσω ότι πετυχαίνει.	O	O	O	O	O	O	O
6	Αν νιώσω στεναχωρημένος/-η ή απογοητευμένος/-η, εγκαταλείπω τις δεσμεύσεις μου.	O	O	O	O	O	O	O
7	Κατακλύζομαι τόσο πολύ από αυτά που σκέφτομαι ή αισθάνομαι, που δεν μπορώ να κάνω πράγματα που είναι σημαντικά για μένα.	O	O	O	O	O	O	O
8	Αν δεν μπορώ να κάνω κάτι με τον δικό μου τρόπο, δεν το κάνω καθόλου.	O	O	O	O	O	O	O

Μέρος VIII: G-SCS

Παρακαλώ διαβάστε κάθε πρόταση προσεκτικά πριν απαντήσετε. Επιλέξετε μία απάντηση από το "Σχεδόν ποτέ" μέχρι το "Αληθεύει πάντα" για κάθε πρόταση για να προσδιορίσετε πόσο συχνά συμπεριφέρεστε με αυτόν τον τρόπο.

		Σχεδόν ποτέ				**Σχεδόν πάντα**
1	Όταν αποτυγχάνω σε κάτι προσωπικά σημαντικό, κατακλύζομαι από συναισθήματα ανεπάρκειας.	O	O	O	O	O
2	Προσπαθώ να δείχνω υπομονή και κατανόηση στις πτυχές της προσωπικότητας μου που δεν συμπαθώ.	O	O	O	O	O
3	Όταν συμβεί κάτι επώδυνο, προσπαθώ να δω την κατάσταση ψύχραιμα και ισορροπημένα.	O	O	O	O	O
4	Όταν αισθάνομαι θλιμμένος/-η, αισθάνομαι επίσης ότι οι περισσότεροι άνθρωποι είναι πιθανότατα πιο ευτυχισμένοι από εμένα.	O	O	O	O	O
5	Προσπαθώ να δω τις αποτυχίες μου ως μέρος της ανθρώπινης φύσης.	O	O	O	O	O
6	Όταν περνώ δύσκολες στιγμές, δίνω στον εαυτό μου τη φροντίδα και την στοργή που έχει ανάγκη.	O	O	O	O	O
7	Όταν κάτι με αναστατώσει, προσπαθώ να μετριάσω τα συναισθήματα μου.	O	O	O	O	O
8	Όταν αποτυγχάνω σε κάτι σημαντικό για μένα, αισθάνομαι μόνος/-η στην αποτυχία μου.	O	O	O	O	O
9	Όταν αισθάνομαι θλιμμένος/-η, τείνω να εστιάζω υπερβολικά την προσοχή μου σε όλα αυτά που πηγαίνουν στραβά.	O	O	O	O	O
10	Όταν αισθάνομαι ανεπαρκής για κάποιο λόγο, σκέφτομαι ότι οι περισσότεροι άνθρωποι έχουν συναισθήματα ανεπάρκειας.	O	O	O	O	O
11	Αποδοκιμάζω και κατακρίνω τα ελαττώματα και τα μειονεκτήματα μου.	O	O	O	O	O
12	Δεν ανέχομαι, ούτε έχω υπομονή με πτυχές της προσωπικότητας μου που δεν συμπαθώ.	O	O	O	O	O

Μέρος IX: G-PSS

Δίπλα σε κάθε μια από τις παρακάτω προτάσεις υπάρχουν πέντε πιθανές απαντήσεις. Διαβάστε κάθε πρόταση προσεκτικά και διαλέξτε ποια από τις απαντήσεις περιγράφει καλύτερα το πως αισθανθήκατε ή σκεφτήκατε κατά την διάρκεια του περασμένου μήνα. Σε κάθε πρόταση παρακαλώ όπως σημειώσετε πόσο συχνά αισθανθήκατε ή σκεφτήκατε κατά τον συγκεκριμένο τρόπο.

	Πόσο συχνά τον τελευταίο μήνα…	**Ποτέ**	**Σπάνια**	**Μερικές φορές**	**Αρκετά συχνά**	**Πολύ συχνά**
1	Αναστατωθήκατε επειδή συνέβηκε κάτι απροσδόκητα;	O	O	O	O	O
2	Νιώσατε ότι ήσασταν ανίκανος/-η να ελέγξετε σημαντικά πράγματα στη ζωή σας;	O	O	O	O	O
3	Νιώσατε νευρικός/-η και “αγχωθήκατε”;	O	O	O	O	O
4	Νιώσατε σιγουριά για την ικανότητα σας να χειριστείτε προσωπικά προβλήματα;	O	O	O	O	O
5	Νιώσατε ότι όλα πήγαιναν όπως τα θέλετε;	O	O	O	O	O
6	Νιώσατε ότι δεν μπορούσατε να αντιμετωπίσετε όλα όσα έπρεπε να κάνετε;	O	O	O	O	O
7	Νιώσατε ικανός να ελέγξετε διάφορα ερεθίσματα (προκλήσεις) στη ζωή σας;	O	O	O	O	O
8	Νιώσατε να είστε κυρίαρχος/η των καταστάσεων;	O	O	O	O	O
9	Οργιστήκατε επειδή τα πράγματα ξέφυγαν από τον έλεγχο σας;	O	O	O	O	O
10	Νιώσατε ότι συσσωρεύτηκαν τόσες δυσκολίες σε σημείο που δεν μπορούσατε να τις ξεπεράσετε;	O	O	O	O	O

Appendix 3. Tables with results for non-parametric bootstrapping on both samples.

Table 1. Results for non-parametric bootstrapping for sample 1

Node 1	Node 2	Sample	q2.5	q97.5	CI's Difference
PMA.11	PMA.29	0.176459	0.079303	0.259574	-0.18027
LCV.64	LCV.70	0.09569	0.00356	0.183798	-0.18024
EA.47	EA.59	0.129816	0.037482	0.217275	-0.17979
VAL.20	VAL.32	0.08412	0	0.178807	-0.17881
PMA.11	PMA.23	0.165342	0.071643	0.244472	-0.17283
LCV.64	IA.52	0.100321	0.008626	0.180944	-0.17232
ACC.34	PMA.11	0.09661	0.002244	0.171672	-0.16943
LCPM.54	LCPM.60	0.175427	0.088754	0.257429	-0.16868
VAL.14	VAL.26	0.132726	0.038655	0.207317	-0.16866
LCV.51	LCV.57	0.171156	0.075465	0.243828	-0.16836
LCV.64	IA.65	0.193256	0.102995	0.27134	-0.16835
EA.41	EA.53	0.242892	0.151583	0.31958	-0.168
ACC.34	PMA.29	0.136819	0.05078	0.218653	-0.16787
EA.47	EA.53	0.166178	0.081656	0.249413	-0.16776
VAL.32	CA.33	0.197667	0.106225	0.273519	-0.16729
EA.41	EA.47	0.13543	0.052381	0.21743	-0.16505
VAL.20	CA.33	0.095905	0.002159	0.166904	-0.16475
SACxt.12	SACxt.18	0.097765	0.007981	0.172696	-0.16472
ACC.10	ACC.22	0.181083	0.091362	0.256033	-0.16467
ACC.16	ACC.28	0.127891	0.027908	0.192492	-0.16458
FUS.56	IA.71	0.095398	0.010637	0.175103	-0.16447
LCV.45	LCV.57	0.146564	0.055123	0.219456	-0.16433
EA.53	EA.59	0.243874	0.156065	0.319577	-0.16351
VAL.32	CA.21	0.087359	0	0.163473	-0.16347
EA.47	EA.66	0.239499	0.153231	0.316415	-0.16318
PMA.23	PMA.29	0.19355	0.106981	0.269845	-0.16286
LCPM.48	LCPM.60	0.173276	0.08341	0.245863	-0.16245
EA.41	EA.59	0.156725	0.077683	0.240041	-0.16236
SACxt.36	DEF.37	0.171756	0.080558	0.241752	-0.16119
SACnt.43	SACnt.49	0.208392	0.127299	0.288266	-0.16097
ACC.34	PMA.35	0.141981	0.052416	0.213008	-0.16059
ACC.28	PMA.23	0.091812	0.005197	0.165726	-0.16053
VAL.14	CA.15	0.201908	0.112032	0.272533	-0.1605

EA.41	EA.66	0.073852	0	0.160443	-0.16044
SACnt.49	SACnt.68	0.088134	0.006788	0.166988	-0.1602
CA.21	CA.27	0.133618	0.048708	0.2089	-0.16019
IA.52	IA.65	0.096646	0.016193	0.175644	-0.15945
LCV.51	IA.52	0.215705	0.121278	0.280497	-0.15922
EA.53	EA.66	0.113318	0.028752	0.187849	-0.1591
DEF.13	DEF.19	0.336117	0.24743	0.405544	-0.15811
VAL.38	CA.21	0.114981	0.027901	0.185854	-0.15795
VAL.32	CA.27	0.159029	0.081729	0.23965	-0.15792
ACC.16	DEF.25	0.088043	0.005751	0.163596	-0.15785
SACnt.43	SACnt.55	0.229134	0.148096	0.305823	-0.15773
PMA.17	SACxt.18	0.171845	0.082823	0.240403	-0.15758
ACC.28	ACC.34	0.162583	0.078626	0.235839	-0.15721
SACxt.12	SACxt.30	0.1625	0.069311	0.225722	-0.15641
SACxt.24	DEF.31	0.087348	0.003851	0.160249	-0.1564
LCPM.48	LCPM.67	0.08682	0.005078	0.161242	-0.15616
LCPM.42	LCPM.54	0.276094	0.186341	0.342449	-0.15611
LCPM.42	SACnt.43	0.107392	0.01656	0.172568	-0.15601
ACC.22	DEF.25	0.142128	0.062462	0.218457	-0.156
DEF.19	DEF.25	0.150814	0.068066	0.22394	-0.15587
LCV.70	IA.65	0.124076	0.03771	0.193429	-0.15572
LCPM.60	IA.58	0.097267	0.012367	0.168001	-0.15563
VAL.26	CA.21	0.070296	0	0.155601	-0.1556
LCV.70	IA.71	0.244478	0.157423	0.312974	-0.15555
ACC.28	PMA.29	0.110703	0.027122	0.182668	-0.15555
LCV.45	LCV.64	0.094542	0.009417	0.164953	-0.15554
EA.59	EA.66	0.26612	0.191433	0.346949	-0.15552
FUS.44	FUS.50	0.253634	0.167826	0.322992	-0.15517
SACxt.30	DEF.31	0.129852	0.044515	0.199368	-0.15485
LCPM.48	LCPM.54	0.213702	0.134506	0.289357	-0.15485
IA.52	IA.58	0.127892	0.040407	0.194521	-0.15411
LCPM.42	LCV.45	0.092255	0.002217	0.155959	-0.15374
ACC.16	DEF.19	0.097956	0.010896	0.164583	-0.15369
FUS.69	IA.71	0.086997	0.006041	0.159708	-0.15367
LCV.51	LCV.70	0.09866	0.011341	0.164795	-0.15345
ACC.16	ACC.22	0.085299	0.014642	0.16795	-0.15331
ACC.22	EA.53	-0.08649	-0.15298	0	-0.15298

ACC.16	SACxt.18	0.096774	0.014189	0.167003	-0.15281
ACC.34	PMA.23	0.075638	0	0.152428	-0.15243
ACC.10	ACC.16	0.078368	0	0.15239	-0.15239
SACxt.12	DEF.13	0.125786	0.041149	0.193082	-0.15193
LCPM.54	IA.58	0.08773	0	0.151929	-0.15193
SACnt.55	SACnt.68	0.197718	0.117416	0.269074	-0.15166
IA.52	IA.71	0.095867	0.013641	0.164944	-0.1513
ACC.28	EA.53	-0.07902	-0.15335	-0.00231	-0.15103
SACxt.30	SACxt.36	0.125704	0.043936	0.194717	-0.15078
LCPM.42	LCPM.48	0.144197	0.064236	0.215006	-0.15077
FUS.63	IA.71	0.141562	0.05691	0.207536	-0.15063
VAL.20	CA.21	0.328228	0.243728	0.394311	-0.15058
LCPM.60	LCPM.67	0.177394	0.098965	0.249214	-0.15025
VAL.26	CA.27	0.244181	0.163663	0.313772	-0.15011
SACnt.55	SACnt.62	0.078897	0.000319	0.150081	-0.14976
VAL.26	VAL.38	0.125174	0.041139	0.190561	-0.14942
IA.65	IA.71	0.071839	0	0.149243	-0.14924
FUS.63	FUS.69	0.160358	0.083354	0.232519	-0.14917
SACxt.24	SACxt.30	0.139994	0.060578	0.209127	-0.14855
PMA.17	SACxt.30	0.085041	0	0.14852	-0.14852
SACxt.24	SACxt.36	0.165083	0.081837	0.230011	-0.14817
FUS.44	IA.46	0.155101	0.067239	0.215054	-0.14782
LCPM.54	LCPM.67	0.116343	0.03809	0.185756	-0.14767
LCPM.48	SACnt.49	0.088306	0.00017	0.147672	-0.1475
LCV.57	LCV.64	0.236589	0.15608	0.303389	-0.14731
SACxt.12	SACxt.24	0.073428	0	0.147211	-0.14721
PMA.35	SACxt.36	0.11431	0.038734	0.185819	-0.14709
SACxt.36	CA.40	0.110027	0.02684	0.173886	-0.14705
FUS.56	IA.58	0.094809	0.018813	0.165414	-0.1466
PMA.17	PMA.35	0.107369	0.02783	0.173532	-0.1457
SACnt.62	SACnt.68	0.424633	0.346208	0.49134	-0.14513
SACxt.12	DEF.19	0.09897	0.018312	0.163391	-0.14508
DEF.19	DEF.37	0.181296	0.096927	0.241706	-0.14478
CA.15	CA.21	0.113002	0.034918	0.179647	-0.14473
FUS.50	FUS.69	0.135814	0.057482	0.202023	-0.14454
DEF.13	DEF.37	0.103027	0.025489	0.169819	-0.14433
LCV.57	LCV.70	0.101631	0.026713	0.170991	-0.14428

IA.46	IA.58	0.185007	0.111779	0.255518	-0.14374
PMA.35	CA.40	0.081944	0.001619	0.145104	-0.14349
VAL.26	VAL.32	0.173831	0.095917	0.239382	-0.14347
LCV.57	IA.65	0.140755	0.061966	0.205399	-0.14343
DEF.37	FUS.50	-0.08851	-0.14879	-0.00538	-0.14341
PMA.11	VAL.14	0.16262	0.083013	0.225798	-0.14279
CA.33	CA.40	0.297258	0.220818	0.363358	-0.14254
SACxt.30	VAL.38	0.07769	0	0.142406	-0.14241
PMA.29	PMA.35	0.087793	0.017518	0.159833	-0.14232
SACnt.55	FUS.44	0.078449	0	0.141869	-0.14187
FUS.44	FUS.63	0.086223	0.007818	0.149676	-0.14186
SACnt.49	SACnt.62	0.092082	0.020738	0.162461	-0.14172
SACnt.49	SACnt.55	0.181364	0.105966	0.247589	-0.14162
SACnt.49	FUS.56	0.061732	0	0.141135	-0.14114
SACnt.43	SACnt.62	0.06674	0	0.140846	-0.14085
IA.46	IA.52	0.187423	0.111833	0.252673	-0.14084
LCPM.67	LCV.45	0.070253	0	0.140751	-0.14075
PMA.35	VAL.38	0.074543	0	0.140398	-0.1404
VAL.14	VAL.38	0.077233	0	0.140398	-0.1404
SACxt.30	DEF.37	0.077236	0	0.140056	-0.14006
CA.15	CA.27	0.136874	0.064403	0.20375	-0.13935
FUS.44	FUS.69	0.070286	0	0.139301	-0.1393
FUS.56	FUS.69	0.073075	0.004068	0.142898	-0.13883
SACnt.43	SACnt.68	0.066931	0	0.138769	-0.13877
SACnt.55	FUS.56	0.107485	0.031323	0.170021	-0.1387
ACC.34	CA.15	0.081713	0	0.138682	-0.13868
PMA.29	SACxt.36	0.068642	0	0.138677	-0.13868
SACxt.24	DEF.25	0.075878	0	0.138553	-0.13855
SACxt.18	SACxt.24	0.14883	0.073208	0.21103	-0.13782
VAL.14	CA.21	0.062604	0	0.137566	-0.13757
SACxt.24	VAL.26	0.088464	0.008698	0.146226	-0.13753
FUS.50	FUS.56	0.138917	0.061344	0.198518	-0.13717
FUS.50	FUS.63	0.094361	0.025707	0.162549	-0.13684
VAL.14	VAL.20	0.066862	0	0.136664	-0.13666
IA.46	IA.65	0.0775	0.004178	0.140783	-0.13661
FUS.56	FUS.63	0.118329	0.047191	0.182961	-0.13577
PMA.35	SACxt.30	0.067946	0	0.13549	-0.13549

ACC.16	DEF.31	0.058228	0	0.134102	-0.1341
CA.27	CA.33	0.121631	0.048902	0.182348	-0.13345
SACxt.12	CA.40	0.073143	0	0.133314	-0.13331
VAL.26	CA.15	0.06194	0	0.133293	-0.13329
VAL.38	LCV.70	-0.08315	-0.13396	-0.00084	-0.13312
FUS.63	IA.52	0.122589	0.051112	0.183846	-0.13273
FUS.56	IA.46	0.077799	0.007801	0.140477	-0.13268
DEF.25	DEF.31	0.056022	0	0.132185	-0.13219
CA.27	CA.40	0.089455	0.016225	0.147339	-0.13111
ACC.10	FUS.56	0.075528	0.001266	0.132002	-0.13074
PMA.35	VAL.32	0.07879	0.000011	0.12997	-0.12996
PMA.17	VAL.14	0.062634	0	0.129452	-0.12945
ACC.22	DEF.31	0.040122	0	0.129211	-0.12921
LCV.45	LCV.70	0.069346	0	0.129065	-0.12907
ACC.22	EA.66	-0.05672	-0.12831	0	-0.12831
SACxt.36	VAL.38	0.050303	0	0.127301	-0.1273
PMA.23	VAL.14	0.062149	0	0.127131	-0.12713
DEF.19	FUS.69	-0.07053	-0.12679	0	-0.12679
CA.15	CA.33	0.067829	0	0.126196	-0.1262
PMA.29	VAL.38	0.070142	0	0.125368	-0.12537
VAL.20	CA.27	0.049367	0	0.125218	-0.12522
PMA.29	DEF.31	0.056331	0	0.125094	-0.12509
ACC.22	FUS.44	0.070051	0	0.124627	-0.12463
LCV.57	IA.58	0.06527	0	0.124372	-0.12437
EA.59	SACnt.62	0.080359	0.009621	0.133844	-0.12422
PMA.17	PMA.29	0.050014	0	0.124057	-0.12406
SACnt.43	FUS.44	0.059705	0	0.12359	-0.12359
SACxt.24	CA.33	0.083209	0.005777	0.129355	-0.12358
EA.47	SACnt.55	0.108277	0.025901	0.149024	-0.12312
VAL.20	VAL.26	0.055905	0	0.123102	-0.1231
ACC.16	SACxt.24	0.061889	0	0.122913	-0.12291
FUS.69	IA.65	0.053939	0	0.122795	-0.1228
VAL.32	CA.40	0.044839	0	0.122562	-0.12256
SACnt.49	FUS.50	0.056055	0	0.1225	-0.1225
PMA.11	PMA.17	0.049993	0	0.121914	-0.12191
ACC.16	ACC.34	0.051667	0	0.121299	-0.1213
PMA.23	DEF.19	-0.04638	-0.12108	0	-0.12108

LCV.51	LCV.64	0.044975	0	0.12104	-0.12104
SACxt.24	DEF.37	0.04285	0	0.12081	-0.12081
LCPM.67	LCV.64	0.05647	0	0.119352	-0.11935
SACxt.18	DEF.19	0.061229	0	0.118192	-0.11819
SACnt.49	FUS.44	0.047319	0	0.117707	-0.11771
CA.40	IA.46	-0.06654	-0.11765	0	-0.11765
LCV.45	IA.46	0.059167	0	0.117608	-0.11761
LCPM.54	LCV.57	0.056244	0	0.117453	-0.11745
DEF.37	FUS.69	-0.04921	-0.11692	0	-0.11692
DEF.13	FUS.50	-0.05673	-0.11669	0	-0.11669
LCPM.48	IA.46	0.059146	0	0.116613	-0.11661
SACnt.49	IA.58	0.056684	0	0.116397	-0.1164
PMA.11	SACxt.12	0.053904	0	0.115862	-0.11586
SACxt.24	CA.21	0.050667	0	0.114488	-0.11449
FUS.44	FUS.56	0.043152	0	0.114426	-0.11443
LCPM.60	LCV.57	0.054964	0	0.11381	-0.11381
VAL.26	LCV.45	-0.06559	-0.11377	0	-0.11377
FUS.63	IA.58	0.050188	0	0.113466	-0.11347
EA.59	LCPM.67	0.05347	0	0.113438	-0.11344
SACnt.62	IA.65	0.072638	0.000263	0.113671	-0.11341
ACC.16	PMA.17	0.054804	0	0.112773	-0.11277
IA.58	IA.65	0.035115	0	0.112509	-0.11251
ACC.34	VAL.32	0.058878	0	0.112375	-0.11238
PMA.29	SACxt.30	0.049331	0	0.112108	-0.11211
LCPM.67	SACnt.68	0.055919	0	0.111563	-0.11156
PMA.11	PMA.35	0.051655	0	0.110005	-0.11001
DEF.19	DEF.31	0.040512	0	0.109334	-0.10933
LCV.64	IA.71	0.042153	0	0.109226	-0.10923
PMA.17	PMA.23	0.038793	0	0.109087	-0.10909
FUS.69	LCV.70	0.035115	0	0.108971	-0.10897
LCPM.48	FUS.56	0.057865	0	0.108887	-0.10889
LCV.57	IA.52	0.034296	0	0.108629	-0.10863
SACxt.36	CA.33	0.050416	0	0.108538	-0.10854
CA.40	IA.65	-0.05463	-0.10835	0	-0.10835
ACC.16	SACxt.12	0.033247	0	0.108098	-0.1081
SACnt.68	FUS.63	0.06291	0	0.10772	-0.10772
ACC.28	SACxt.30	0.038873	0	0.106601	-0.1066

VAL.38	CA.40	0.037542	0	0.106517	-0.10652
LCV.45	LCV.51	0.027071	0	0.106438	-0.10644
DEF.31	DEF.37	0.027596	0	0.106324	-0.10632
ACC.22	EA.47	-0.02327	-0.10609	0	-0.10609
PMA.35	VAL.14	0.028703	0	0.106073	-0.10607
PMA.17	CA.21	0.046139	0	0.10579	-0.10579
ACC.22	ACC.28	0.033213	0	0.105254	-0.10525
LCPM.60	LCV.70	0.036869	0	0.104848	-0.10485
SACxt.30	DEF.25	0.041658	0	0.104836	-0.10484
VAL.32	VAL.38	0.039375	0	0.104201	-0.1042
FUS.56	IA.52	0.0361	0	0.104094	-0.10409
FUS.44	LCV.45	0.04386	0	0.103963	-0.10396
ACC.34	PMA.17	0.034247	0	0.103708	-0.10371
SACnt.68	FUS.56	0.045064	0	0.1037	-0.1037
LCPM.54	SACnt.43	0.037776	0	0.103699	-0.1037
FUS.50	IA.46	0.035879	0	0.103172	-0.10317
SACxt.24	DEF.13	0.040878	0	0.103086	-0.10309
LCPM.67	SACnt.62	0.032928	0	0.103036	-0.10304
DEF.13	FUS.56	-0.0453	-0.10281	0	-0.10281
LCPM.67	LCV.70	0.033458	0	0.102463	-0.10246
FUS.44	IA.65	0.040654	0	0.102412	-0.10241
LCPM.60	IA.65	0.046146	0	0.102395	-0.1024
CA.21	CA.33	0.02882	0	0.1023	-0.1023
LCPM.42	LCV.51	0.041585	0	0.102112	-0.10211
FUS.63	IA.46	0.031703	0	0.102093	-0.10209
PMA.11	DEF.31	0.019981	0	0.101842	-0.10184
EA.66	SACnt.62	0.036105	0	0.101009	-0.10101
SACxt.24	CA.15	0.033964	0	0.100015	-0.10002
LCPM.54	LCV.70	0.041379	0	0.09973	-0.09973
SACxt.18	SACxt.30	0.027249	0	0.099362	-0.09936
ACC.10	FUS.44	0.042086	0	0.098843	-0.09884
LCPM.42	LCPM.60	0.029734	0	0.098692	-0.09869
VAL.20	LCV.64	-0.04184	-0.09865	0	-0.09865
DEF.37	FUS.63	-0.04363	-0.09825	0	-0.09825
VAL.32	CA.15	0.029565	0	0.097755	-0.09776
CA.40	IA.52	-0.05342	-0.0971	0	-0.0971
EA.66	LCPM.67	0.031097	0	0.096925	-0.09693

CA.40	EA.41	0.059539	0	0.096773	-0.09677
LCPM.67	FUS.69	0.030371	0	0.096528	-0.09653
SACxt.12	SACxt.36	0.027239	0	0.096362	-0.09636
LCV.70	IA.58	0.019687	0	0.096059	-0.09606
LCPM.54	SACnt.49	0.034115	0	0.095934	-0.09593
ACC.16	DEF.37	0.028977	0	0.095539	-0.09554
FUS.50	IA.52	0.039869	0	0.095508	-0.09551
ACC.10	DEF.25	0.020246	0	0.095292	-0.09529
DEF.13	IA.71	-0.04499	-0.0951	0	-0.0951
IA.58	IA.71	0.031913	0	0.095	-0.095
LCPM.67	LCV.51	0.024947	0	0.094753	-0.09475
DEF.19	FUS.63	-0.03603	-0.09456	0	-0.09456
LCPM.42	LCPM.67	0.016708	0	0.094278	-0.09428
FUS.63	IA.65	0.028559	0	0.093996	-0.094
VAL.38	LCPM.48	-0.03547	-0.09373	0	-0.09373
SACxt.24	VAL.38	0.030055	0	0.093538	-0.09354
FUS.56	LCV.57	0.042381	0	0.093305	-0.09331
LCPM.54	LCV.51	0.027324	0	0.093181	-0.09318
SACxt.12	VAL.14	0.029983	0	0.09301	-0.09301
ACC.22	SACxt.36	-0.03379	-0.09264	0	-0.09264
PMA.17	LCV.64	-0.05125	-0.09234	0	-0.09234
SACnt.62	FUS.69	0.040675	0	0.092082	-0.09208
VAL.14	LCPM.60	-0.04168	-0.09131	0	-0.09131
CA.27	LCV.64	-0.04074	-0.09115	0	-0.09115
SACnt.62	LCV.45	0.04096	0	0.091108	-0.09111
CA.15	CA.40	0.022035	0	0.090918	-0.09092
LCPM.67	IA.71	0.038416	0	0.090113	-0.09011
ACC.28	EA.59	-0.02368	-0.09004	0	-0.09004
ACC.10	IA.58	0.030896	0	0.090006	-0.09001
CA.15	LCPM.48	-0.04446	-0.08983	0	-0.08983
SACxt.12	DEF.37	0.015867	0	0.089498	-0.0895
DEF.13	FUS.63	-0.01771	-0.08945	0	-0.08945
DEF.37	FUS.44	-0.02439	-0.08908	0	-0.08908
PMA.17	SACxt.36	0.019247	0	0.089011	-0.08901
LCPM.60	IA.46	0.019339	0	0.088851	-0.08885
ACC.34	DEF.25	0.017346	0	0.08885	-0.08885
DEF.19	FUS.44	-0.03481	-0.08885	0	-0.08885

LCV.57	IA.71	0.019005	0	0.088445	-0.08845
CA.27	EA.47	0.045028	0	0.088292	-0.08829
DEF.25	DEF.37	0.005027	0	0.08809	-0.08809
LCV.51	IA.65	0.007273	0	0.08809	-0.08809
ACC.34	VAL.20	0.019307	0	0.087029	-0.08703
ACC.16	SACxt.30	0.01259	0	0.086101	-0.0861
VAL.20	LCV.45	-0.0227	-0.08608	0	-0.08608
PMA.17	VAL.32	0.033281	0	0.085944	-0.08594
VAL.38	CA.27	0.014648	0	0.084866	-0.08487
SACxt.12	CA.15	0.027458	0	0.084843	-0.08484
EA.47	SACnt.62	0.020556	0	0.084787	-0.08479
PMA.35	SACxt.18	0.018095	0	0.084522	-0.08452
FUS.69	IA.52	0.020291	0	0.084444	-0.08444
PMA.17	SACxt.24	0.017574	0	0.084085	-0.08409
ACC.22	VAL.26	-0.0378	-0.08397	0	-0.08397
SACnt.49	IA.71	0.034705	0	0.083812	-0.08381
FUS.63	LCV.64	0.02067	0	0.083695	-0.0837
PMA.11	LCPM.60	-0.02707	-0.083	0	-0.083
SACxt.24	CA.40	0.013672	0	0.082795	-0.0828
DEF.13	FUS.44	-0.02353	-0.08268	0	-0.08268
VAL.14	EA.66	0.030336	0	0.082575	-0.08258
VAL.20	LCV.57	-0.03492	-0.08251	0	-0.08251
EA.53	SACnt.55	0.018802	0	0.082441	-0.08244
FUS.50	LCV.51	0.031198	0	0.081605	-0.08161
VAL.20	CA.40	0.018095	0	0.081536	-0.08154
ACC.16	DEF.13	0.013116	0	0.081448	-0.08145
PMA.11	FUS.50	0.021177	0	0.081395	-0.0814
EA.59	LCPM.60	0.022077	0	0.081329	-0.08133
SACxt.18	VAL.14	0.021177	0	0.081171	-0.08117
LCPM.42	IA.46	0.02449	0	0.081116	-0.08112
LCPM.48	IA.71	0.018963	0	0.080869	-0.08087
SACxt.36	DEF.31	0.006997	0	0.080434	-0.08043
VAL.14	IA.71	-0.02279	-0.08043	0	-0.08043
SACxt.12	CA.27	0.03083	0	0.080282	-0.08028
IA.46	IA.71	0.012602	0	0.080082	-0.08008
FUS.69	LCV.51	0.004989	0	0.078689	-0.07869
LCPM.48	SACnt.43	0.018465	0	0.078662	-0.07866

EA.66	SACnt.68	0.024365	0	0.078149	-0.07815
VAL.38	CA.33	0.010601	0	0.078055	-0.07806
CA.21	CA.40	0.018072	0	0.077877	-0.07788
LCPM.54	SACnt.55	0.027895	0	0.077854	-0.07785
VAL.20	EA.66	0.029465	0	0.077715	-0.07772
LCV.57	IA.46	0.013185	0	0.077503	-0.0775
VAL.32	LCV.45	-0.03006	-0.0774	0	-0.0774
DEF.37	CA.33	0.025527	0	0.077214	-0.07721
ACC.16	EA.53	-0.00819	-0.07711	0	-0.07711
LCPM.48	LCV.45	0.010227	0	0.07711	-0.07711
CA.33	IA.65	-0.02829	-0.07674	0	-0.07674
PMA.35	SACxt.24	0.013489	0	0.076534	-0.07653
FUS.56	LCV.51	0.019063	0	0.076362	-0.07636
SACnt.43	LCV.51	0.022366	0	0.076298	-0.0763
ACC.16	CA.15	0.021978	0	0.075564	-0.07556
DEF.37	IA.52	-0.0306	-0.07538	0	-0.07538
PMA.17	VAL.38	0.004432	0	0.075248	-0.07525
LCPM.54	IA.46	0.010976	0	0.074876	-0.07488
LCV.64	IA.46	0.010171	0	0.074509	-0.07451
SACnt.49	LCV.51	0.020914	0	0.074482	-0.07448
PMA.11	LCPM.48	-0.00758	-0.07446	0	-0.07446
LCPM.42	IA.58	0.002946	0	0.074405	-0.07441
SACnt.68	FUS.50	0.020775	0	0.074354	-0.07435
PMA.11	VAL.20	0.020527	0	0.073993	-0.07399
PMA.17	SACxt.12	0.007737	0	0.073796	-0.0738
DEF.31	CA.27	0.019687	0	0.073713	-0.07371
SACxt.18	CA.15	0.018199	0	0.073703	-0.0737
DEF.37	FUS.56	-0.00762	-0.07355	0	-0.07355
PMA.11	LCPM.54	-0.01811	-0.07334	0	-0.07334
CA.15	IA.71	-0.02724	-0.07321	0	-0.07321
VAL.14	VAL.32	0.007439	0	0.073155	-0.07316
SACnt.49	LCV.45	0.01751	0	0.073122	-0.07312
LCPM.42	LCV.70	0.009925	0	0.072822	-0.07282
PMA.23	PMA.35	0.004728	0	0.07238	-0.07238
VAL.38	LCPM.60	-0.00622	-0.07228	0	-0.07228
VAL.26	CA.33	0.004759	0	0.072245	-0.07225
ACC.22	FUS.56	0.022174	0	0.071832	-0.07183

DEF.19	FUS.56	-0.01703	-0.07181	0	-0.07181
PMA.17	DEF.37	0.010222	0	0.071094	-0.07109
ACC.22	IA.46	0.018313	0	0.071011	-0.07101
SACxt.12	FUS.63	-0.02551	-0.07094	0	-0.07094
SACxt.30	DEF.13	0.009255	0	0.070836	-0.07084
VAL.32	LCV.64	-0.02098	-0.07054	0	-0.07054
PMA.11	VAL.38	0.004217	0	0.070485	-0.07049
VAL.14	EA.53	0.018212	0	0.070441	-0.07044
PMA.35	CA.33	0.004947	0	0.070175	-0.07018
LCPM.60	FUS.44	0.015946	0	0.070056	-0.07006
LCPM.60	LCV.64	0.004014	0	0.069915	-0.06992
SACxt.18	EA.41	0.002294	0	0.069906	-0.06991
SACnt.62	FUS.56	0.009796	0	0.069625	-0.06963
LCPM.42	FUS.56	0.019609	0	0.06957	-0.06957
DEF.13	IA.46	-0.01533	-0.06925	0	-0.06925
CA.33	LCV.64	-0.01863	-0.06901	0	-0.06901
ACC.16	VAL.38	0.004633	0	0.068447	-0.06845
EA.66	SACnt.43	0.012707	0	0.068289	-0.06829
ACC.22	LCPM.42	0.017612	0	0.067899	-0.0679
LCV.51	IA.71	0.008944	0	0.067786	-0.06779
PMA.35	CA.27	0.00639	0	0.067664	-0.06766
SACnt.55	LCV.51	0.015065	0	0.067504	-0.0675
PMA.17	LCPM.54	-0.02183	-0.06659	0	-0.06659
ACC.10	LCV.51	0.014546	0	0.066555	-0.06656
PMA.17	DEF.25	0.00099	0	0.066202	-0.0662
PMA.17	IA.71	-0.01244	-0.06592	0	-0.06592
VAL.26	LCV.64	-0.0129	-0.06581	0	-0.06581
DEF.25	LCPM.42	0.00414	0	0.065667	-0.06567
SACxt.30	VAL.14	0.007411	0	0.06525	-0.06525
EA.47	LCV.45	0.005194	0	0.06498	-0.06498
ACC.10	SACnt.49	0.006113	0	0.064858	-0.06486
CA.15	IA.52	-0.01167	-0.06469	0	-0.06469
PMA.17	DEF.13	0.014926	0	0.064115	-0.06412
SACnt.55	IA.71	0.013957	0	0.064064	-0.06406
SACxt.36	DEF.13	0.011769	0	0.06386	-0.06386
DEF.25	SACnt.55	0.008812	0	0.063812	-0.06381
PMA.17	IA.46	-0.01799	-0.06381	0	-0.06381

LCPM.54	IA.65	0.013698	0	0.063482	-0.06348
DEF.31	CA.33	0.008398	0	0.06323	-0.06323
DEF.25	EA.47	0.009695	0	0.062987	-0.06299
PMA.23	VAL.38	0.002338	0	0.062819	-0.06282
ACC.16	EA.59	-0.00263	-0.06277	0	-0.06277
PMA.17	VAL.26	0.01051	0	0.06257	-0.06257
PMA.23	FUS.69	0.00155	0	0.062375	-0.06238
ACC.22	CA.33	-0.00961	-0.06194	0	-0.06194
EA.47	LCPM.60	0.009521	0	0.061872	-0.06187
SACnt.68	IA.65	0.005561	0	0.061367	-0.06137
CA.40	EA.53	0.008414	0	0.061296	-0.0613
SACxt.12	IA.71	-0.00134	-0.06063	0	-0.06063
PMA.35	EA.47	0.000599	0	0.060145	-0.06015
DEF.13	VAL.14	0.004396	0	0.059775	-0.05978
DEF.13	CA.40	0.00944	0	0.059675	-0.05968
SACnt.68	LCV.51	0.005388	0	0.059584	-0.05958
CA.40	LCV.51	-0.00465	-0.05926	0	-0.05926
CA.21	LCV.51	-0.01797	-0.05922	0	-0.05922
ACC.28	VAL.32	0.004729	0	0.058986	-0.05899
FUS.44	LCV.57	0.005144	0	0.058531	-0.05853
CA.40	LCV.45	-0.0018	-0.05813	0	-0.05813
PMA.23	SACxt.30	0.000584	0	0.058066	-0.05807
SACxt.18	CA.21	0.006037	0	0.05794	-0.05794
CA.27	IA.65	-0.00939	-0.05771	0	-0.05771
PMA.35	EA.53	0.009096	0	0.05748	-0.05748
CA.40	FUS.56	-0.00786	-0.05646	0	-0.05646
SACxt.18	VAL.20	0.005051	0	0.056439	-0.05644
FUS.44	LCV.51	0.002396	0	0.055783	-0.05578
SACxt.30	EA.41	0.00632	0	0.054087	-0.05409
PMA.23	VAL.26	0.003391	0	0.053556	-0.05356
SACxt.30	VAL.32	0.008837	0	0.053112	-0.05311
SACxt.30	VAL.26	0.003718	0	0.052808	-0.05281
FUS.50	LCV.57	0.001701	0	0.051979	-0.05198
VAL.14	LCPM.54	-0.00023	-0.05163	0	-0.05163
CA.33	EA.53	0.01437	0	0.050798	-0.0508
SACnt.68	LCV.70	0.007889	0	0.050127	-0.05013
ACC.22	IA.52	0.005654	0	0.050013	-0.05001

CA.40	LCV.57	-5.8E-05	-0.04954	0	-0.04954
DEF.19	IA.46	-0.0046	-0.04942	0	-0.04942
VAL.26	EA.59	0.005472	0	0.049073	-0.04907
CA.40	LCV.70	-0.00642	-0.04824	0	-0.04824
CA.21	IA.58	-0.01239	-0.04818	0	-0.04818
DEF.19	CA.21	0.005856	0	0.047949	-0.04795
SACxt.24	EA.41	0.016479	0	0.047908	-0.04791
SACxt.36	EA.53	0.007842	0	0.047224	-0.04722
VAL.32	IA.65	-0.00159	-0.0465	0	-0.0465
SACxt.24	IA.71	-0.00093	-0.04618	0	-0.04618
CA.21	LCV.70	-0.00463	-0.04605	0	-0.04605
ACC.22	LCV.57	0.002563	0	0.045686	-0.04569
VAL.26	EA.41	0.006413	0	0.045675	-0.04568
VAL.32	LCV.57	-0.00182	-0.04558	0	-0.04558
CA.21	IA.71	-0.00466	-0.04462	0	-0.04462
DEF.13	CA.33	0.004851	0	0.044057	-0.04406
SACxt.36	EA.41	0.000338	0	0.043999	-0.044
DEF.19	LCV.64	-0.0007	-0.0411	0	-0.0411

Table 2. Results for non-parametric bootstrapping for sample 2

Node 1	Node 2	Sample	q2.5	q97.5	CI's Difference
SACS8	SACS10	0.142098	0.047364	0.236935	-0.18957
CAMS8	CAMS9	0.1186	0.010176	0.197423	-0.18725
CAQ5	CAQ6	0.233836	0.12435	0.310189	-0.18584
VQ4	VQ7	0.102569	0.004838	0.19052	-0.18568
SACS3	SACS8	0.177576	0.080987	0.266612	-0.18563
CFQ4	CFQ5	0.140196	0.039718	0.225203	-0.18549
CFQ3	CFQ6	0.156342	0.059936	0.245398	-0.18546
VQ1	VQ2	0.284729	0.176425	0.361007	-0.18458
SACS4	SACS10	0.201027	0.096819	0.280009	-0.18319
VQ2	VQ10	0.241476	0.132592	0.315584	-0.18299
SACS5	SACS6	0.313905	0.204714	0.385257	-0.18054
CAMS9	CAMS10	0.203052	0.093752	0.273475	-0.17972
VQ1	VQ10	0.129377	0.029047	0.208076	-0.17903
CAQ3	CAQ4	0.252862	0.154353	0.332674	-0.17832
CAQ5	CAQ8	0.141831	0.03677	0.214913	-0.17814
AAQ5	AAQ6	0.155835	0.056272	0.23292	-0.17665
CFQ4	CFQ6	0.190335	0.096479	0.272796	-0.17632
CAMS3	CAMS4	0.248169	0.13127	0.307389	-0.17612
CFQ6	CFQ7	0.099488	0.012434	0.188201	-0.17577
VQ9	CAQ3	0.107064	0.014679	0.190297	-0.17562
SACS4	SACS8	0.192458	0.092027	0.267379	-0.17535
SACS3	SACS10	0.091785	0	0.175336	-0.17534
CAQ2	CAQ3	0.234922	0.13451	0.309568	-0.17506
VQ1	VQ6	0.251809	0.141815	0.316261	-0.17445
VQ4	VQ9	0.113183	0.024474	0.198568	-0.17409
VQ6	VQ10	0.112505	0.021236	0.194595	-0.17336
SACS3	SACS7	0.093748	0	0.172859	-0.17286
CAMS1	CAMS11	0.165363	0.064331	0.236978	-0.17265
SACS7	SACS8	0.167908	0.074804	0.246411	-0.17161
VQ5	VQ9	0.156368	0.05395	0.22491	-0.17096
SACS3	SACS4	0.183729	0.083994	0.25459	-0.1706
CAMS11	CAMS12	0.233552	0.132638	0.303037	-0.1704
VQ5	VQ7	0.389288	0.284665	0.45433	-0.16967
AAQ5	AAQ7	0.203192	0.106362	0.275251	-0.16889

CAQ1	CAQ3	0.088141	0.016197	0.185045	-0.16885
CAMS8	CAMS10	0.13893	0.048284	0.216912	-0.16863
VQ8	CAQ6	0.173921	0.080054	0.247868	-0.16781
SACS7	SACS10	0.110379	0.014835	0.182325	-0.16749
CAQ1	CAQ4	0.125458	0.041864	0.209225	-0.16736
SACS8	SACS9	0.258428	0.162305	0.329621	-0.16732
VQ7	VQ9	0.077612	0.000004	0.16709	-0.16709
CFQ3	CFQ4	0.22251	0.126076	0.293051	-0.16698
CFQ3	CFQ5	0.111132	0.026614	0.193406	-0.16679
CAQ6	CAQ8	0.1158	0.029592	0.196383	-0.16679
CAMS5	CAMS8	0.166722	0.064025	0.23079	-0.16677
VQ3	VQ4	0.103162	0	0.166724	-0.16672
SACS7	SACS9	0.092013	0	0.166435	-0.16644
SACS1	SACS2	0.25096	0.151616	0.318013	-0.1664
SACS6	SACS7	0.148069	0.049799	0.214861	-0.16506
CFQ5	CFQ6	0.22936	0.130467	0.295072	-0.16461
VQ8	VQ10	0.12445	0.030774	0.195212	-0.16444
CFQ3	CFQ7	0.232779	0.139251	0.302878	-0.16363
CAMS4	SACS2	0.120477	0.02148	0.185024	-0.16354
CAMS1	CAMS12	0.153207	0.062108	0.225517	-0.16341
AAQ2	AAQ6	0.08492	0	0.163189	-0.16319
VQ10	CAQ7	0.187357	0.096735	0.2598	-0.16307
CAMS1	CAMS6	-0.34658	-0.40074	-0.23773	-0.16301
CFQ2	CFQ6	0.125989	0.035145	0.197226	-0.16208
SACS2	VQ4	0.094415	0.005957	0.167305	-0.16135
AAQ2	AAQ5	0.081304	0	0.161178	-0.16118
CAMS5	SACS9	0.103378	0.007517	0.168537	-0.16102
CAMS10	CAMS11	0.152315	0.055761	0.216272	-0.16051
AAQ3	AAQ5	0.152933	0.063458	0.223675	-0.16022
VQ4	VQ5	0.195328	0.105229	0.265265	-0.16004
SACS1	SACS6	0.091036	0.005015	0.164801	-0.15979
AAQ3	CFQ1	0.08352	0	0.15922	-0.15922
VQ8	CAQ1	-0.08885	-0.1623	-0.00341	-0.15889
SACS2	SACS6	0.109298	0.019506	0.178324	-0.15882
CAQ2	CAQ4	0.260235	0.166841	0.325494	-0.15865
CAQ6	CAQ7	0.226219	0.133276	0.291891	-0.15862
CFQ5	CFQ7	0.122896	0.031957	0.189809	-0.15785

SACS2	SACS3	0.121669	0.028124	0.185543	-0.15742
AAQ4	AAQ5	0.091558	0.008447	0.165694	-0.15725
CAQ1	CAQ2	0.373803	0.267249	0.42444	-0.15719
CFQ1	CFQ4	0.154577	0.067463	0.224187	-0.15672
SACS9	SACS10	0.085874	0	0.156606	-0.15661
SACS1	SACS9	0.124399	0.028046	0.183315	-0.15527
CAMS10	SACS5	0.134323	0.043761	0.198864	-0.1551
VQ6	CAQ7	0.086134	0	0.154521	-0.15452
CAMS8	CAMS11	0.090855	0.002583	0.155439	-0.15286
AAQ6	CFQ2	0.092045	0.008083	0.1609	-0.15282
VQ9	CAQ1	0.087366	0.015227	0.167756	-0.15253
AAQ5	CFQ1	0.093069	0.01116	0.16346	-0.1523
AAQ6	AAQ7	0.258331	0.165182	0.317087	-0.15191
CFQ4	CFQ7	0.068837	0	0.15173	-0.15173
AAQ1	AAQ5	0.074134	0	0.151353	-0.15135
VQ2	CAQ7	0.100942	0.015432	0.165727	-0.1503
AAQ6	VQ4	-0.10511	-0.16625	-0.01642	-0.14983
CFQ2	CFQ3	0.093184	0.015812	0.165516	-0.1497
CFQ1	CFQ2	0.237928	0.150409	0.298539	-0.14813
AAQ2	AAQ3	0.25636	0.165429	0.312897	-0.14747
AAQ3	AAQ7	0.076051	0	0.147078	-0.14708
VQ2	VQ4	-0.08091	-0.14674	0	-0.14674
AAQ3	CFQ7	0.198644	0.111347	0.25731	-0.14596
VQ8	VQ9	-0.07417	-0.14565	0	-0.14565
AAQ4	AAQ7	0.103341	0.011522	0.157052	-0.14553
CAMS9	SACS9	0.082425	0	0.145401	-0.1454
AAQ1	AAQ2	0.121406	0.028317	0.171714	-0.1434
CFQ2	CFQ4	0.159349	0.08292	0.226226	-0.14331
VQ3	CAQ1	0.109167	0.023521	0.166375	-0.14285
AAQ1	AAQ4	0.544803	0.434237	0.576866	-0.14263
CAMS10	SACS3	0.086886	0.000016	0.142351	-0.14234
CAMS5	CAMS10	0.068641	0	0.142098	-0.1421
AAQ6	VQ8	0.090606	0.001756	0.143176	-0.14142
VQ9	CAQ4	0.063254	0	0.138808	-0.13881
CAMS4	CAMS10	0.075121	0	0.138696	-0.1387
VQ8	CAQ3	-0.08649	-0.14025	-0.00179	-0.13846
CFQ1	CFQ5	0.159765	0.079198	0.217303	-0.13811

CFQ1	VQ6	0.065719	0	0.138103	-0.1381
CAMS11	CAQ3	0.081188	0	0.136691	-0.13669
CAMS6	CAMS12	-0.06182	-0.13615	0	-0.13615
CAMS10	SACS6	0.058414	0	0.136073	-0.13607
AAQ7	CFQ2	0.068187	0	0.135537	-0.13554
VQ7	CAQ2	0.099451	0.012397	0.147301	-0.1349
SACS6	SACS9	0.060208	0	0.134883	-0.13488
AAQ6	SACS2	-0.09561	-0.14274	-0.00789	-0.13485
CAQ1	CAQ6	-0.06613	-0.13455	0	-0.13455
AAQ5	CFQ5	0.061041	0	0.134502	-0.1345
AAQ2	CFQ1	0.064496	0	0.134158	-0.13416
CAMS9	SACS5	0.050595	0	0.133535	-0.13354
CAMS4	CAMS11	0.075362	0	0.132767	-0.13277
AAQ2	CFQ5	0.04944	0	0.132569	-0.13257
VQ8	CAQ5	0.057454	0	0.13225	-0.13225
CAMS6	CAMS11	-0.05171	-0.13217	0	-0.13217
CFQ2	CAQ7	0.147449	0.070283	0.201823	-0.13154
VQ3	VQ9	0.051125	0	0.130743	-0.13074
SACS2	VQ9	0.071487	0	0.128982	-0.12898
CAQ7	CAQ8	0.068313	0	0.128419	-0.12842
CAMS3	CAQ6	-0.07249	-0.12835	0	-0.12835
CAMS10	SACS7	0.059517	0	0.128119	-0.12812
SACS1	SACS3	0.067229	0	0.126594	-0.12659
SACS8	VQ7	0.06818	0	0.126234	-0.12623
CFQ7	CAQ7	0.065263	0	0.126091	-0.12609
SACS5	SACS9	0.04838	0	0.125884	-0.12588
SACS3	SACS9	0.040463	0	0.124968	-0.12497
VQ9	CAQ6	-0.05089	-0.1249	0	-0.1249
CAQ5	CAQ7	0.062729	0	0.124411	-0.12441
CAQ4	CAQ8	-0.0719	-0.12393	0	-0.12393
CAMS1	CAQ1	0.065714	0	0.123591	-0.12359
CAMS6	VQ2	0.067404	0	0.123569	-0.12357
VQ4	VQ10	-0.04995	-0.12271	0	-0.12271
AAQ3	CAMS3	-0.06996	-0.12188	0	-0.12188
CFQ3	VQ1	0.060201	0	0.121707	-0.12171
AAQ7	CAMS11	-0.07445	-0.11786	0	-0.11786
CAMS9	VQ4	0.056065	0	0.117692	-0.11769

VQ8	CAQ8	0.045635	0	0.117636	-0.11764
CAMS12	CAQ1	0.070961	0	0.117529	-0.11753
SACS5	SACS7	0.040876	0	0.117337	-0.11734
AAQ3	AAQ4	0.05014	0	0.117002	-0.117
AAQ5	CFQ4	0.048986	0	0.116856	-0.11686
CAMS1	VQ9	0.053904	0	0.116228	-0.11623
AAQ7	CFQ3	0.041957	0	0.116117	-0.11612
VQ3	VQ5	0.044735	0	0.114757	-0.11476
AAQ2	CFQ6	0.043728	0	0.11441	-0.11441
AAQ1	CFQ2	0.065785	0	0.114025	-0.11403
SACS1	VQ4	0.043079	0	0.113233	-0.11323
AAQ6	CFQ6	0.049801	0	0.113046	-0.11305
CAMS10	CAMS12	0.044038	0	0.111858	-0.11186
AAQ7	CFQ1	0.036638	0	0.111638	-0.11164
CFQ7	SACS1	-0.07221	-0.11149	0	-0.11149
CAMS6	VQ10	0.036991	0	0.111249	-0.11125
VQ7	CAQ4	0.036928	0	0.110794	-0.11079
VQ9	CAQ2	0.035707	0	0.110574	-0.11057
CAMS8	SACS9	0.040599	0	0.110332	-0.11033
CAMS5	SACS10	0.04012	0	0.110218	-0.11022
CFQ1	CFQ7	0.026129	0	0.110031	-0.11003
CFQ2	VQ2	0.045268	0	0.109709	-0.10971
AAQ1	AAQ6	0.05098	0	0.10943	-0.10943
CFQ4	VQ6	0.048452	0	0.109286	-0.10929
CAMS1	CAQ3	0.04578	0	0.108767	-0.10877
CAMS9	SACS6	0.026807	0	0.108386	-0.10839
CAMS8	SACS1	0.036979	0	0.108057	-0.10806
AAQ7	CFQ7	0.037457	0	0.107922	-0.10792
CAMS10	CAQ4	0.059415	0	0.107871	-0.10787
CFQ6	SACS6	-0.06134	-0.10747	0	-0.10747
AAQ7	VQ3	0.067722	0	0.106899	-0.1069
AAQ3	CFQ3	0.033029	0	0.106445	-0.10645
AAQ3	CFQ2	0.043346	0	0.106185	-0.10619
VQ3	CAQ6	-0.04628	-0.10488	0	-0.10488
AAQ3	CAQ7	0.038822	0	0.104478	-0.10448
CAMS4	SACS5	0.039193	0	0.103865	-0.10387
SACS2	VQ7	0.044696	0	0.103419	-0.10342

CAMS3	SACS1	0.041355	0	0.103402	-0.1034
SACS4	CAQ4	0.057977	0	0.103197	-0.1032
CAMS6	SACS4	0.060968	0	0.102862	-0.10286
CAMS6	CAQ7	0.045227	0	0.102489	-0.10249
CFQ1	CFQ6	0.012273	0	0.102477	-0.10248
CAMS10	SACS2	0.032404	0	0.101961	-0.10196
SACS4	SACS7	0.025436	0	0.101489	-0.10149
AAQ4	AAQ6	0.017535	0	0.100755	-0.10076
VQ3	CAQ4	0.03979	0	0.100694	-0.10069
CFQ6	CAQ7	0.03721	0	0.100128	-0.10013
CAMS1	CAMS5	0.043854	0	0.100033	-0.10003
SACS7	VQ9	0.036913	0	0.099947	-0.09995
CAMS8	SACS2	0.036643	0	0.099841	-0.09984
CFQ7	SACS6	-0.03133	-0.09976	0	-0.09976
CAMS11	VQ4	0.028546	0	0.099627	-0.09963
CFQ3	SACS6	-0.04216	-0.0993	0	-0.0993
VQ6	VQ8	0.044068	0	0.099018	-0.09902
SACS3	VQ5	0.041129	0	0.098339	-0.09834
CAMS5	SACS1	0.021254	0	0.098328	-0.09833
AAQ4	CFQ4	0.050528	0	0.098046	-0.09805
CAMS4	SACS1	0.027011	0	0.097978	-0.09798
CAMS4	CAMS9	0.027881	0	0.097375	-0.09738
CAQ3	CAQ6	-0.02891	-0.09715	0	-0.09715
VQ8	CAQ4	-0.02573	-0.09699	0	-0.09699
CAMS1	VQ4	0.036854	0	0.096843	-0.09684
AAQ1	CFQ1	0.031852	0	0.096575	-0.09658
CAMS6	VQ3	-0.04486	-0.09565	0	-0.09565
AAQ1	VQ6	0.034228	0	0.095625	-0.09563
CFQ7	VQ1	0.036748	0	0.095177	-0.09518
CAMS5	CAQ8	-0.03285	-0.09511	0	-0.09511
CAMS12	SACS3	0.049447	0	0.09505	-0.09505
AAQ4	CFQ2	0.015875	0	0.094558	-0.09456
VQ10	CAQ5	0.020558	0	0.094207	-0.09421
SACS6	VQ1	-0.03986	-0.09413	0	-0.09413
CAMS4	VQ4	0.023682	0	0.093862	-0.09386
CAMS11	SACS6	0.038341	0	0.093474	-0.09347
SACS1	VQ7	0.025657	0	0.092597	-0.0926

CAMS3	CAQ8	-0.02738	-0.09245	0	-0.09245
CAMS4	SACS6	0.013582	0	0.092416	-0.09242
CAMS5	VQ5	0.032863	0	0.09239	-0.09239
CAMS3	CAQ5	-0.01768	-0.09227	0	-0.09227
CAQ4	CAQ6	-0.02281	-0.09207	0	-0.09207
AAQ2	AAQ4	0.001092	0	0.092046	-0.09205
CAMS5	VQ9	0.024398	0	0.091033	-0.09103
SACS8	CAQ3	0.038199	0	0.091032	-0.09103
VQ10	CAQ4	-0.04344	-0.09058	0	-0.09058
AAQ4	CAQ7	0.033679	0	0.089943	-0.08994
AAQ2	CAMS8	-0.02913	-0.08968	0	-0.08968
SACS8	VQ9	0.02583	0	0.089572	-0.08957
AAQ7	VQ6	0.026108	0	0.08939	-0.08939
AAQ2	CFQ4	0.0175	0	0.089273	-0.08927
VQ7	CAQ3	0.014226	0	0.088994	-0.08899
CFQ3	CAMS5	0.053328	0	0.088373	-0.08837
SACS9	VQ3	0.026201	0	0.087968	-0.08797
CFQ2	VQ1	0.029972	0	0.087957	-0.08796
SACS10	VQ3	0.022471	0	0.087844	-0.08784
CFQ4	CAQ7	0.019794	0	0.087825	-0.08783
AAQ2	CAMS5	-0.03705	-0.08758	0	-0.08758
CAMS5	VQ10	-0.03156	-0.08756	0	-0.08756
AAQ5	CFQ6	0.018384	0	0.086799	-0.0868
CFQ6	CAMS6	0.042914	0	0.086315	-0.08632
CAQ1	CAQ7	-0.03713	-0.08614	0	-0.08614
VQ3	CAQ5	-0.01561	-0.08516	0	-0.08516
AAQ7	VQ2	0.025367	0	0.084837	-0.08484
CAQ4	CAQ5	-0.0387	-0.08419	0	-0.08419
SACS7	VQ7	0.018533	0	0.084101	-0.0841
AAQ5	VQ8	0.023669	0	0.084031	-0.08403
CFQ2	VQ6	0.017145	0	0.083813	-0.08381
SACS4	VQ9	0.030406	0	0.083641	-0.08364
SACS6	CAQ7	-0.0258	-0.08354	0	-0.08354
CAMS8	VQ5	0.023557	0	0.08349	-0.08349
CFQ6	VQ6	0.023476	0	0.083224	-0.08322
VQ3	VQ6	0.019329	0	0.083119	-0.08312
CAMS5	CAMS12	0.020925	0	0.08287	-0.08287

CAQ1	CAQ5	-0.01844	-0.08283	0	-0.08283
CFQ1	SACS5	-0.04351	-0.08212	0	-0.08212
CAMS11	CAQ1	0.015675	0	0.081884	-0.08188
CAMS3	CAMS5	0.01809	0	0.081723	-0.08172
SACS2	SACS7	0.003296	0	0.081527	-0.08153
CAMS11	VQ7	0.021954	0	0.081525	-0.08153
CAMS12	CAQ6	-0.02528	-0.08152	0	-0.08152
CAMS3	CAMS10	0.017843	0	0.081452	-0.08145
VQ3	VQ7	0.00627	0	0.080817	-0.08082
AAQ1	VQ2	0.028407	0	0.080436	-0.08044
CAMS8	CAQ1	0.0351	0	0.080363	-0.08036
CFQ6	CAMS4	-0.03937	-0.08017	0	-0.08017
AAQ2	CAMS9	-0.02635	-0.07967	0	-0.07967
AAQ4	CAQ6	0.034785	0	0.079658	-0.07966
CFQ7	VQ3	0.032142	0	0.079587	-0.07959
CFQ3	VQ3	0.027604	0	0.079257	-0.07926
CFQ6	VQ1	0.012802	0	0.079106	-0.07911
AAQ2	CAMS10	-0.02595	-0.07903	0	-0.07903
CFQ2	CAQ5	0.030418	0	0.07881	-0.07881
CAMS1	SACS5	0.023178	0	0.078777	-0.07878
CFQ7	VQ6	0.014005	0	0.078693	-0.07869
SACS3	CAQ4	0.023151	0	0.078333	-0.07833
CAMS3	SACS2	0.002594	0	0.078117	-0.07812
CAMS10	SACS9	0.004507	0	0.077844	-0.07784
CAMS8	SACS10	0.026905	0	0.077805	-0.07781
AAQ4	CFQ1	0.002426	0	0.077411	-0.07741
CAMS8	CAMS12	0.00756	0	0.077406	-0.07741
AAQ6	CAQ1	-0.02963	-0.07728	0	-0.07728
CAMS11	SACS5	0.000584	0	0.077264	-0.07726
AAQ6	VQ6	0.020563	0	0.076947	-0.07695
CAMS1	VQ5	0.031851	0	0.076709	-0.07671
CAMS10	SACS1	0.001542	0	0.076707	-0.07671
SACS7	VQ4	0.01587	0	0.076627	-0.07663
CAMS11	VQ10	-0.0172	-0.07648	0	-0.07648
SACS3	VQ3	0.014606	0	0.076316	-0.07632
CAMS11	SACS2	0.000807	0	0.076254	-0.07625
SACS6	VQ7	0.021817	0	0.076096	-0.0761

SACS2	VQ5	0.001143	0	0.076001	-0.076
SACS6	SACS10	0.017989	0	0.075811	-0.07581
CAMS11	VQ5	0.019593	0	0.075422	-0.07542
CAMS1	SACS7	0.013738	0	0.075121	-0.07512
CAMS3	VQ8	-0.01384	-0.07508	0	-0.07508
VQ1	VQ8	0.004951	0	0.074834	-0.07483
CAMS3	SACS6	0.006679	0	0.074689	-0.07469
SACS6	VQ4	0.008935	0	0.074544	-0.07454
CFQ3	SACS10	0.043961	0	0.074532	-0.07453
CAMS3	VQ7	0.02194	0	0.074502	-0.0745
AAQ4	CAMS11	-0.02413	-0.07444	0	-0.07444
CAMS5	SACS2	0.010984	0	0.074231	-0.07423
SACS9	CAQ2	0.026776	0	0.074171	-0.07417
SACS4	VQ6	0.020623	0	0.073618	-0.07362
SACS2	CAQ3	0.025271	0	0.073574	-0.07357
CAQ2	CAQ8	-0.01879	-0.07326	0	-0.07326
AAQ7	CAMS6	0.02051	0	0.073247	-0.07325
SACS8	CAQ4	0.002022	0	0.073136	-0.07314
AAQ6	VQ9	-0.01572	-0.07306	0	-0.07306
CAMS12	SACS7	0.00494	0	0.072833	-0.07283
CAMS9	VQ6	-0.0092	-0.07276	0	-0.07276
SACS3	VQ9	0.001488	0	0.072723	-0.07272
CFQ7	SACS5	-0.0181	-0.07269	0	-0.07269
CAMS4	CAQ8	-0.00398	-0.07264	0	-0.07264
CFQ4	SACS5	-0.01758	-0.07161	0	-0.07161
SACS2	SACS4	0.018041	0	0.071336	-0.07134
VQ6	CAQ3	0.034831	0	0.071265	-0.07127
SACS3	VQ1	0.03749	0	0.071093	-0.07109
AAQ3	CFQ4	0.000773	0	0.071083	-0.07108
VQ5	VQ6	0.030008	0	0.070704	-0.0707
CAMS3	SACS9	0.014984	0	0.070644	-0.07064
CAQ2	CAQ6	-0.01003	-0.07008	0	-0.07008
CAMS1	CAMS3	0.013281	0	0.07007	-0.07007
SACS1	CAQ4	0.014771	0	0.069756	-0.06976
CAMS10	CAQ6	-0.0135	-0.06951	0	-0.06951
CAMS3	CAQ7	-0.00771	-0.06941	0	-0.06941
CAMS10	CAQ2	0.016685	0	0.06931	-0.06931

CAMS6	VQ1	0.006144	0	0.069218	-0.06922
AAQ4	VQ2	0.008119	0	0.068824	-0.06882
VQ3	CAQ2	0.001871	0	0.068368	-0.06837
CAMS6	VQ4	-0.0024	-0.06831	0	-0.06831
CAMS1	SACS3	0.020337	0	0.068281	-0.06828
CFQ4	CAMS5	0.019922	0	0.068047	-0.06805
CAMS12	SACS9	0.008571	0	0.06799	-0.06799
SACS10	VQ2	0.020774	0	0.06765	-0.06765
CAMS11	VQ1	-0.02248	-0.06765	0	-0.06765
VQ6	CAQ8	0.016209	0	0.06762	-0.06762
SACS7	CAQ1	0.020854	0	0.067213	-0.06721
AAQ3	SACS2	-0.02347	-0.06703	0	-0.06703
SACS7	CAQ4	0.017961	0	0.066934	-0.06693
SACS2	CAQ7	-0.0113	-0.06678	0	-0.06678
SACS3	VQ6	0.005521	0	0.065951	-0.06595
SACS5	CAQ5	0.024218	0	0.065321	-0.06532
AAQ5	CAMS4	-0.00866	-0.06471	0	-0.06471
CAMS5	VQ7	0.004761	0	0.064532	-0.06453
CAMS8	CAQ4	0.002351	0	0.064291	-0.06429
AAQ3	SACS1	-0.00474	-0.06327	0	-0.06327
AAQ4	CAQ5	0.010678	0	0.063267	-0.06327
CAMS3	SACS7	0.003068	0	0.063098	-0.0631
CAMS4	CAQ7	-0.00141	-0.063	0	-0.063
CFQ7	SACS2	-0.00841	-0.06283	0	-0.06283
CAMS10	VQ8	-0.00126	-0.06265	0	-0.06265
CFQ7	CAMS4	-0.00629	-0.06257	0	-0.06257
AAQ5	SACS5	-0.01225	-0.06217	0	-0.06217
CAMS1	CAQ6	-0.00083	-0.06175	0	-0.06175
CAMS3	CAMS11	0.000237	0	0.060909	-0.06091
AAQ4	VQ7	-0.02371	-0.06081	0	-0.06081
AAQ6	VQ10	0.000215	0	0.060602	-0.0606
SACS6	VQ6	-0.00209	-0.0602	0	-0.0602
CFQ1	SACS3	0.025478	0	0.060068	-0.06007
AAQ7	CAMS3	-0.00569	-0.05954	0	-0.05954
AAQ7	CAMS9	-0.01524	-0.05879	0	-0.05879
AAQ4	VQ6	0.003133	0	0.0586	-0.0586
CAMS11	SACS1	0.002635	0	0.058428	-0.05843

CAMS12	SACS8	0.000975	0	0.057949	-0.05795
CFQ6	VQ3	0.010713	0	0.057939	-0.05794
CAMS1	SACS6	0.008407	0	0.057021	-0.05702
AAQ7	CAMS10	-0.00801	-0.05699	0	-0.05699
CFQ3	CAMS3	-0.00873	-0.05679	0	-0.05679
SACS4	CAQ1	0.006654	0	0.056107	-0.05611
AAQ7	SACS2	-0.0035	-0.05594	0	-0.05594
CFQ1	SACS1	-0.01004	-0.05581	0	-0.05581
AAQ5	SACS1	-0.00778	-0.05487	0	-0.05487
VQ7	VQ10	-0.00707	-0.05396	0	-0.05396
AAQ4	VQ8	0.002961	0	0.053719	-0.05372
CAMS4	VQ3	-0.00884	-0.05314	0	-0.05314
CFQ5	SACS3	0.015044	0	0.052996	-0.053
CAMS1	SACS8	0.004667	0	0.052987	-0.05299
AAQ1	CAQ5	0.010425	0	0.052665	-0.05267
CFQ6	CAMS9	-0.01066	-0.05243	0	-0.05243
CAMS6	SACS1	-0.00123	-0.05237	0	-0.05237
SACS6	CAQ3	0.006971	0	0.051155	-0.05116
AAQ7	CAQ5	0.000826	0	0.05095	-0.05095
CFQ2	SACS2	-0.00418	-0.05072	0	-0.05072
CFQ1	SACS2	-0.00829	-0.05061	0	-0.05061
AAQ4	CAMS8	-0.00789	-0.05015	0	-0.05015
AAQ6	VQ7	-0.00267	-0.04959	0	-0.04959
CFQ4	SACS10	0.000328	0	0.049249	-0.04925
AAQ3	VQ9	0.022358	0	0.047543	-0.04754
AAQ3	SACS3	0.008478	0	0.047385	-0.04739
AAQ3	CAMS10	-0.00398	-0.04735	0	-0.04735
AAQ7	CAQ6	0.002458	0	0.047248	-0.04725
VQ1	VQ7	-0.00429	-0.04691	0	-0.04691
CFQ7	CAQ3	0.017815	0	0.041834	-0.04183
CAQ2	CAQ7	-0.0026	-0.04144	0	-0.04144
CFQ6	SACS9	0.019179	0	0.041328	-0.04133
CFQ5	SACS7	-0.00834	-0.04085	0	-0.04085
AAQ3	SACS8	0.009058	0	0.040738	-0.04074
AAQ7	CAMS5	-9.7E-05	-0.0399	0	-0.0399
AAQ4	CAQ3	-0.01197	-0.03979	0	-0.03979
CFQ2	CAMS1	-0.00316	-0.03943	0	-0.03943

CFQ4	SACS8	0.015867	0	0.038903	-0.0389
AAQ3	VQ5	0.002566	0	0.036836	-0.03684
CFQ6	CAQ2	0.0162	0	0.035596	-0.0356
CAMS4	CAQ1	-0.00741	-0.03279	0	-0.03279
AAQ4	CAQ2	-0.00031	-0.03205	0	-0.03205