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Testing the Portuguese version of ANPS-s and its utility for
professional selection processes

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Resumo

A avaliação da personalidade permite recolher informação relevante na predição do desempenho contextual. Assim, os instrumentos que medem esta dimensão surgem como ferramentas importantes em seleção profissional.

Affective Neuroscience Personality Scales (ANPS) avalia a personalidade considerando seis sistemas emocionais básicos: *PLAY*, *SEEK*, *CARE*, *SADNESS*, *FEAR* e *ANGER*. Na primeira fase desta investigação foram estudadas as validades fatorial e convergente por forma a garantir a qualidade psicométrica da escala. Numa segunda fase prosseguiu-se o estudo do ANPS-s através da análise das validades concorrente e incremental para o desempenho contextual.

Construiu-se um questionário *online* com 4 instrumentos: ANPS-s, versão reduzida da *Marlowe-Crowne Social Desirability Scale* (11 itens), *Mini-IPIP* e a escala portuguesa de cidadania organizacional, medida *proxy* de desempenho contextual. Na primeira etapa consideraram-se 442 respostas válidas. Para a validade concorrente e incremental, a amostra reduziu para 341 elementos por ser necessária experiência profissional para responder à escala de cidadania organizacional.

Os resultados corroboraram a validade do ANPS-s tendo sido, no entanto, necessário eliminar alguns itens. Relativamente à validade concorrente, os resultados sugerem que o sistema *SEEK* é um preditor de cidadania organizacional. Quanto à validade incremental, existe evidência para considerar a existência de alguma variância específica para o ANPS-s na explicação de cidadania organizacional.

Esta investigação pretende ser um primeiro contributo para o estudo da avaliação de características básicas de personalidade em processos de seleção profissional. São sugeridas alterações para estudos futuros e identificada a pertinência do estudo da interação destes processos com sistemas de regulação emocional.

Palavras-Chave: Teoria Neuroafetiva; ANPS-s; Avaliação da Personalidade; Desempenho Contextual; Comportamento de Cidadania Organizacional; Validação de Escala.

Códigos JEL: M12, L84

TESTING THE PORTUGUESE VERSION OF ANPS-S

Abstract

Personality assessment allows us to collect important data for contextual performance prediction. Therefore personality measures are seen as useful tools in professional selection processes.

Affective Neuroscience Personality Scales (ANPS) is able to assess personality considering six basic emotional systems: PLAY, SEEK, CARE, SADNESS, FEAR, and ANGER. During the first stage of this research we have analysed factorial and convergent validities to ensure the psychometric quality of the scale. Then, in a second stage, we have continued studying ANPS with concurrent and incremental validities for contextual performance.

We have built an online questionnaire combining 4 instruments: ANPS-s, 11-item short version of Marlowe-Crowne Social Desirability Scale, Mini-IPIP, and the Portuguese scale of organization citizenship behaviour (OCB), a proxy measure for contextual performance. For the first research stage, we have considered 442 valid respondents. For concurrent and incremental validity we kept 341 elements because professional experience was required to answer about organizational citizenship behaviour.

Our results corroborate ANPS-s validation. However, it was necessary to discard some ANPS-s items. As regards concurrent validity, SEEK system can be seen as a valid predictor of organizational citizenship behaviour. Considering incremental validity, there is evidence to consider the existence of specific ANPS-s variance for organization citizenship behaviour prediction.

Our study intends to be a first contribution to the study of basic personality characteristics in professional selection processes. We suggest some important modifications to be introduced in future researches. We also present the relevance of considering the interaction between these basic processes and emotion regulation processes in future researches.

Key-Words: Affective Neuroscience; ANPS-s; Personality Assessment; Contextual Performance; Organizational Citizenship Behaviour; Scale's Validation.

JEL Codes: M12, L84

INTRODUCTION

“Affective neuroscience will be crucial in helping to understand development, psychopathology, personality and health. It is an emerging discipline with extraordinary vitality that should continue to grow over the coming years”

Davidson (2003b, p.131)

Our investigation develops around affective neuroscience context, as we believe this is a research area with a lot of potential and applicability. Our main interest is to ascertain to which extent this approach can be a useful contribution for professional selection processes.

Professional selection is a human resource practice to find the person who best fits a certain job, i.e. who offers some guarantee of a foreseeable performance level (Roe, 1998). So we can state that one of the major goals of a selection process is to predict performance. Performance can be anticipated, in a certain way, by competence analysis, however, it is known that sometimes even those who are skilled enough may fail (Roe, 2002). This kind of situation leads to the existence of other variables that can influence performance. Among these, we can refer situational and personal factors, and emotional states (Gilligan & Bower, 1984; Roe, 2002; Barsade & Gibson, 2007; Murphy, 2012). Knowing their influence in personnel selection, it has become necessary to measure these characteristics. As an example, we can mention personality and interest inventories (Taylor, 2008). In this research we will pay special attention to personality assessment.

The way in which personality influences professional performance still needs to be theoretically clarified (Rothstein & Goffin, 2006; Taylor, 2008), however, there is enough information to assume its influence on contextual performance (e.g. Motowidlo & Van Scotter, 1994). It is very usual the use of this kind of instruments in professional selection context, and the most used approach is the Big Five Model (Murphy, 2012). This Theory comes from a lexical approach that has been suffering from some criticism because it mostly cares about linguist criteria and it seems not to be able to offer a biological based explanation (Neuman, 2014).

Jaak Panksepp's Neuroaffective Theory tries to surpass the mentioned limitation, as it is able to explain personality according to individual differences on the way seven emotional systems operate. These systems are: SEEK, CARE, PLAY, FEAR, ANGER, SADNESS, and LUST. These systems work at a subcortical level and are the same for all mammals

TESTING THE PORTUGUESE VERSION OF ANPS-S

(Panksepp, 1998). Davis, Panksepp & Normansell (2003) developed the Affective Neuroscience Personality Scales (ANPS), a personality measure grounded on the Affective Neuroscience Theory.

Our major goal is to assess the contribution of ANPS-s (short version) to professional selection processes. To reach this objective we have designed 4 specific goals: a) to check if the Portuguese version of ANPS-s is able to assess 6 of the seven emotional systems presented in Neuroaffective Theory¹; b) to check if ANPS-s is a good personality measure; c) to check if ANPS-s is able to predict organizational citizenship behaviour, a proxy measure of contextual performance; and d) to check if ANPS-s gives us more information on organizational citizenship behaviour than an instrument from the most used approach in this context

In order to achieve our purposes, this research is divided in 4 chapters. In Chapter I we travel through literature review on Affective Neuroscience Theory, Affective Neuroscience Personality Scales, and personality assessment in professional selection. In Chapter II we present the methodology and the empirical strategy used to meet our goals. In Chapter III we present research findings. In Chapter IV we discuss results and we compare them to previous findings. To finish this chapter we present some important limitations and suggestions of improvements for future studies. At the end of this work we highlight some important conclusions.

¹ In these research we will use Affective Neuroscience Theory and Neuroaffective Theory as synonyms.

CHAPTER I. LITERATURE REVIEW

1.1 Affective Neuroscience Theory

"My soul is a hidden orchestra; I know not what instruments, what fiddle strings and harps, timbales and drums sound and clash inside myself. All I hear is the symphony."

Fernando Pessoa

But... what if we could know which instruments play? And what if there was a strange sound, like an instrument out of tune? How could we solve that problem without knowing which instruments we have?

If we carry this idea for brain functioning we know that, for a long time, all we could access was the symphony, in this case, our behaviour. The orchestra and the instruments, our brain structures and the systems involved were hidden and appeared as an irrelevant "black box". This idea was perpetuated by Behaviourism, in which emotions were seen as fictional reasons for behaviour (Panksepp, 1998), and the attention was focused on the inputs and outputs within the already mentioned "black box".

Jaak Panksepp developed a brain-based approach of personality, which he named "Affective Neuroscience", in an attempt to put together three important perspectives – behavioural findings of animal behaviourists, psychological basis of human mind, and the neural systems in mammalian brains (Panksepp, 1998).

Emotions, as we will see, are a core concept for Affective Neuroscience, a not so recent field of emotion and mood neural processes investigation (Bear, Connors & Paradiso, 2007). Although so many authors studied and still study emotions, there is no consensus about a single definition for emotion (Fredrickson, 2001; Scherer, 2005). Within our research context we are close to Levenson (1994) conceptualization, where emotions are seen as resulting from a psychological-physiological relation with the intention to guarantee adaptation towards environment changes.

Also, it is possible to find no agreement about which and how many emotions can be classified as basic or primary. This situation leads to question the real existence of basic emotions (Ortony & Turner, 1990). Ekman (1992), in response to this position, presented some arguments to justify why we can talk about some basic and universal emotions (e.g. universal facial expressions related to emotions; emotion-specific physiology).

TESTING THE PORTUGUESE VERSION OF ANPS-S

Due to strong developments in neurosciences studies, it is now possible to dive into the “black box” and have a better understanding about behaviour origins. According to Affective Neuroscience, basic emotions have a great influence on behaviour. One can take as example an experience with rats in which their play activity was reduced within 3 days after researchers introduced cat smell. What is particularly relevant about this experiment is the fact it was able to prove that this behavioural tendency is innate, because that rats had never seen a cat before (Panksepp, 1998). So, we can think about emotional feelings that are supported by instinctive action systems which produce unconditional emotional behaviours (Panksepp, 2005). An emotional system should be clearly defined beyond the idea that it creates subjective feelings and affectively valenced states. In order to clarify the affective system concept, Panksepp (1998) enunciates six other neural criteria that we present in Figure 1.1.

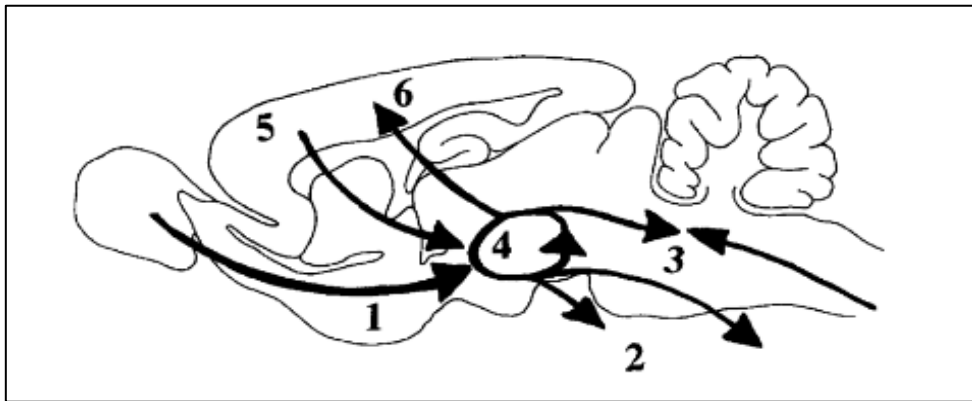


Figure 1.1 Criteria for emotional systems (from Panksepp, 1998, p. 48). “(1) Various sensory stimuli can unconditionally access emotional systems; (2) emotional systems can generate instinctual motor outputs, as well as (3) modulate sensory inputs. (4) Emotional systems have positive feedback components that can sustain emotional arousal after precipitating events have passed. (5) These systems can be modulated by cognitive inputs and (6) can modify and channel cognitive activities.”

Panksepp (1998) believes that the study of human emotions can be facilitated by the study of animal emotions because important subcortical brain structures, that are relevant in this field, are similar (homologous) in all mammals. So, it is possible to think about general principles for all these animals. This psychoneural homologies show that some structures have been conserved during evolution and so “the major evolutionary differences within the subcortical operating systems are matters more of emphasis than of kind” (p. 15). The pertinence of studying other animals has been defended by other researchers. For example,

Davidson (2003b) evinces the contribution of animal studies for the scientific study of emotional processes in neuroaffective approach. Bear et al. (2007) also refer the importance of human and animal studies to understand brain mechanisms of emotion.

Although this is an important research area, this is not a consensual issue and for this reason Panksepp (2005) presents some evidence supporting the idea of affective states in animals: animals show desire for similar agents (drugs) and that desire (attraction) is mediated by brain systems that are similar to those that happen with humans; affective experience in all mammals is linked to similar subcortical systems; brain stimulation studies, that promote emotional actions, show that animals can like and dislike.

1.1.1 Basic Emotional Systems

There are seven basic systems common to all mammals (e.g. Davis et al., 2003; Panksepp, 2005, 2010) although others may exist (Panksepp, 1998):

SEEK: “feeling like exploring, striving for solutions to problems and puzzles, positively anticipating new experiences, and a sense of being able to accomplish almost anything” (Davis et al., 2003, p.59). It is sometimes called “brain reward system” and it incites exploration (Panksepp, 2010). At first it was known as expectancy system but the name was changed as it was considered to be unclear (Panksepp, 1998).

CARE: “nurturing, being drawn to young children and pets, feeling softhearted toward animals and people in need, feeling empathy, liking to care for the sick, feeling affection for and liking to care for others, as well as liking to be needed by others” (Davis et al., 2003, p.59).

PLAY: “having fun vs. being serious, playing games with physical contact, humour, and laughter, and being generally happy and joyful” (Davis et al., 2003, p. 59). This is an important system as play allows learning of important social rules as well as the improvement of social relationships (Panksepp, 2010).

FEAR: “having feelings of anxiety, feeling tense, worrying, struggling with decisions, ruminating about past decisions and statements, losing sleep, and not typically being courageous” (Davis et al., 2003, p. 60). This system protects animals from pain and destruction, as it leads to escape or freezing behaviours (Panksepp, 2010).

ANGER: “feeling hotheaded, being easily irritated and frustrated, experiencing frustration leading to anger, expressing anger verbally or physically, and remaining angry for long

TESTING THE PORTUGUESE VERSION OF ANPS-S

periods” (Davis et al., 2003, p. 60). This system is related to the FEAR system. It strengthens aggressive behaviour, under certain conditions, and helps animals to defend themselves, as it provokes Fear in other animals (Panksepp, 2010). At first it was known as the RAGE system but the authors decided for ANGER because it is more understandable (Davis & Panksepp, 2011).

SADNESS: “feeling lonely, crying frequently, thinking about loved ones and past relationships, and feeling distress when not with loved ones” (Davis et al., 2003, p. 60). This system was also known as PANIC and GRIEF but at the end the authors decided for *SADNESS* because it is more understandable (Davis & Panksepp, 2011).

LUST: This system is different from the others and it doesn't work in the same way in females and males. The mind and body organization of sex characteristics is independent so it is possible to get a “crossed solution” with, for example, a male body with female sexual urges (Panksepp, 2010). We consider that this system must be seen under a Psychodynamic approach of libido/psychological energy.

Capital letter is used to name the systems as a way to indicate these are scientific designations (Panksepp, 1998). The brain has developed these emotional systems to serve adaptive functions and in a certain way to guarantee species survival (Panksepp, 2010). Other authors present emotions as serving important adaptive functions (e.g. Damasio, 2003; Davidson, 2003a; Greenberg, 2004). This idea seems to go along with researchers that see a link between an emotion function and a specific action tendency (Fredrickson, 2001). Six of these identified basic emotions can be grouped in a positive affect system, which includes SEEK, CARE, and PLAY, and a negative affect system, where we can find ANGER, FEAR, and *SADNESS* (Davis et al., 2003; Burgdorf & Panksepp, 2006). Thus, positive affect gives information that organisms are on the right way for survival and negative affect indicates that they might be going through a way of destruction (Panksepp, 2015). So, some internal feelings and needs come from old brain structures common to all mammalian brains (Panksepp, 2003).

As well as allowing specific action tendencies, emotions seem to create some physiological changes (Fredrickson, 2001). Returning to Affective Neuroscience, each system can be evoked by subcortical regions' stimulation (Panksepp & Watt, 2011), and PET studies are of great importance to identify brain arousals related to feelings (Burgdorf & Panksepp, 2006; Panksepp, 2015).

1.1.2 Affective Consciousness

Although basic systems work in a similar way in all mammals, the way people feel may be different from other animals and this happens because we have the ability to think about feelings. This is a huge difference between humans and other mammals and goes along with the idea of Fabbro, Aglioti, Bergamasco, Clarici & Panksepp (2015) that there are three characteristics only present in humans: language, theory of mind, and the ability to experience mental time traveling. This comes from the circumstance that we have a complex cortex that interacts with the emotional systems in a cognitive way. So, though emotions are raised on subcortical levels, they ramify and reach consciousness levels (Panksepp, 1998), which allows affective and cognitive systems to interact.

Does this preclude mammals' consciousness? Not necessarily. Panksepp (2005) argues that an affect should be seen as a kind of consciousness that is shared by mammals, but this form of consciousness is a more primitive one, when compared to cognitive forms. An example that clearly illustrates this idea is the evidence that even after brain damage with great prejudice on cognitive aspects, people still show emotional consciousness. Another curious confirmation is that it is possible to get information about some emotional systems even in fully anesthetized animals. This probably means that neural mechanisms operate even below unconsciousness. Apart from this basic level of consciousness (instinctual-affective) it's possible to find a secondary level (unconscious learning) and a tertiary level (thought-related), that is the cognitive one (Panksepp & Watt, 2011; Panksepp, 2015).

1.1.3 Affective Systems Functioning and Personality

Malatesta (1990) presents some authors who defend the importance of emotions for personality development. For example, Plutchick (1962) has presented eight primary emotions that, according to him, have an important adaptive function and are important for personality. For Lewis & Michalson (1983) personality relates to solid and permanent emotional states.

Emotional systems may affect the construction of long-term cognitive and temperamental structures because of their interaction with superior regions in the brain. For this reason, it is plausible to think that a lot of human personality relates to strengths and weaknesses of emotional functioning (Panksepp, 2005) or affective style (Davidson, 1998). Specifically, personality has been associated to strengths or weaknesses within the seven emotional

systems (Davis, et al., 2003; Özkara-Gradwohl, Panksepp, İçöz, Çetinkaya, Koksal, Davis & Scherler, 2014). Therefore, according to Davis & Panksepp (2011), basic emotional systems are foundational for personality development. The attempt to link neuroscience and personality assessment comprehends Carver & White's (1994) research that have tried their own approach in assessing individual differences in some personality dimensions that reflect the functioning of two physiological systems that regulate aversive and appetitive motivation. In addition, DeYoung, Peterson & Higgins (2005) consider the importance of studying the neuropsychological basis of personality and have provided their own model for Openness dimension of the Big-Five Factor.

This new Jaak Panksepp's approach is seen as a good one as it goes beyond "linguistic terms" and is based on the understanding of basic processes which allows a better knowledge about the "universal patterns underlying the meaning of personality" (Neuman, 2014, p. 653).

1.2 Affective Neuroscience Personality Scales

Davis et al. (2003) developed ANPS, a tool that measures temperamental variability, which is considered an important predictor of personality variability. Primary emotions are seen as of critical importance for understanding personality (Geir, Selsbakk, Theresa & Sigmund 2014) and ANPS allows personality assessment based on six affective systems' tendencies (Abella, Panksepp, Manga, Bárcena & Iglesias, 2011).

Though ANPS measures affective systems, as it is a self-report instrument that needs cognitive reflection, it operates at a tertiary level (Davis & Panksepp, 2011). However, ANPS tries to estimate primary processes (Panksepp, 2010; Davis & Panksepp, 2011) and be a way to get information about subcortical activity (Abella et al., 2011). Typically, personality has been studied through questionnaires focused on a lexical approach (like in Five Factor Model). However, as we have seen, ANPS brings a new approach as it is based in biological models (Abella et al., 2011).

1.2.1 ANPS Structure

ANPS has 7 scales, SEEK, PLAY, CARE, ANGER, SADNESS, FEAR and Spirituality (Davis et al., 2003). LUST was not included as it is a less important system in what refers to this human personality conceptualization (Davis & Panksepp, 2011). At the same time, the authors suspected that people might not be honest answering these kind of questions.

TESTING THE PORTUGUESE VERSION OF ANPS-S

Spirituality was included because of the authors' interest in highest human emotions. As there is no neurological evidence for more systems, these were the only ones included. However, as we have mentioned before, it is very possible that more emotional systems exist. Each scale has 14 items: 7 positive and 7 reversely scored. There are also some filling items that represent some theoretical interest and validity checks. The scales' statements try to represent behaviours and personal feelings instead of cognitive and social judgments (Davis et al., 2003).

1.2.2 ANPS Applicability

This tool is commonly used in clinical populations, as it was built as a clinical research instrument (Davis & Panksepp, 2011). For example, some chronic affective changes (sometimes related to psychiatric disorders) may emerge from changes in the basic emotional systems (Panksepp, 2010; Panksepp & Watt, 2011), and that is just what ANPS measures (Pingault, Pougá, Grezes & Berthoz, 2011). Taking depression as an example, this disorder may come from a decrease in positive systems and an increase in negative systems' stimulations (Panksepp, 2010).

In this research we will try to investigate if this tool can be useful in other areas, like professional selection.

1.2.3 Studies using ANPS

As we have seen ANPS is an instrument widely used for clinical purposes, however, it is possible to find other studies intended to validate the scale for different languages (e.g. Spanish, French, and Italian), and other researches worried about the psychometric quality of the scale. As our first intent is to validate this scale using a Portuguese sample, it is important to review some important findings of these previous studies. Appendix A summarizes relevant results about psychometric quality researches. None of these studies was able to get good fit indices for a six-factor model solution (in accordance with the theoretical model).

The original ANPS study conducted by Davis et al. (2003) using exploratory factor analysis (EFA), identified a 2-factor model solution. Although this solution is in accordance with the theoretical perspective of positive and negative affect systems it seems to be a poor explanation for the 6 systems postulated by Affective Neuroscience Theory. EFA 2-factor solution was replicated in other studies (e.g. Pahlavan et al., 2008; Davis & Panksepp, 2011;

TESTING THE PORTUGUESE VERSION OF ANPS-S

Abella et al., 2011; Özkarar-Gradwohl et al., 2014) using the original or more recent versions of ANPS. Some of these and other studies (e.g. Pahlavan et al., 2008; Abella et al., 2011; Pingault et al., 2011; Pingault et al., 2012; Geir et al., 2014) tried to test the theoretical solution for 7 or 6 factor solution using confirmatory factorial analysis (CFA): 7 factors when using the original ANPS and 6 for ANPS 2.4 and the short version as the latest two have excluded Spirituality dimension. Pascazio et al. (2015) found a different solution of 3 and then 6 factors using EFA. Although it was possible to find solutions in accordance to Neuroaffective Theory, the truth is that when we look to criteria values, we can easily conclude that they are not very strong.

Problems with fit indices as well as some overlapping scales (e.g. FEAR and SADNESS) and the scale length were present since the beginning. These limitations motivated the construction of a short form of this instrument, ANPS-s based in ANPS 2.4, a second version of the original ANPS. Spirituality scale was removed from the short version as it is not present in Panksepp's original model (Pingault et al., 2012). The intention was to reduce scales from 14 to 6 items per scale. With this purpose, the authors performed statistical trials to get the 6 best items in each scale, getting a 36 items instrument (Pingault et al., 2012). Reducing the number of items was a previous intention of Davis et al., (2003), who had shown interest in reducing to 10 items per scale.

Even the small version of ANPS seems to fall short on some fit indices, however, they are better than those obtained in the full scale. Geir et al., (2014) compared ANPS 2.4 with two short versions that strengthened preference for the short form as it is possible to get better psychometric properties from fewer items. Each of the short scales properly assesses the represented dimension. Although Cronbach alphas for positive scales are lower than those of the original instrument in some of the studies, there are other factors that claim for the advantages of the short version. Furthermore, the lower values of Cronbach alphas are expectable as this index decreases with items reduction (Pingault et al., 2012). Also, when developing the short version, the authors gave special attention to the overlap between SADNESS and FEAR and were able to reduce it. Considering our preceding description, we have decided to use ANPS-s in the present study.

It is possible to find similarities among all ANPS studies and, thus, these can be considered universal characteristics related to basic systems. At the same time, it is possible to find some interesting differences. Davis et al. (2003) found some gender differences, with higher values for CARE and SADNESS in women and in SEEK for men. Abella et al. (2011) identified

higher scores for women in SEEK, FEAR, CARE, and SADNESS (and also on Spirituality). Geir et al. (2014) also found higher scores for women in CARE, FEAR, and SADNESS when using ANPS 2.4 and ANPS-s. They have also found higher scores for women in ANGER (but as it was only representative for the short version, they considered this a result of the sample they had chosen). Pingault et al. (2012) and Pingault et al. (2011) found that women scored higher for CARE, FEAR, and SADNESS scales and Pingault et al. (2011) found higher scores for men in PLAY. Although we can point out some differences, these studies have a lot in common, in particular concerning CARE and SADNESS. But in a Turkish sample, for example, the authors found some different results that may suggest a single feature for Turkish culture. We can also describe possible implications of age, as the power of all systems (with the exception for CARE) seems to decrease with age, which probably means that affect regulation increases with age (Özkarar-Gradwohl et al., 2014). The majority of the studies we have described (i.e. Davis et al., 2003; Pahlavan et al., 2008; Abella, et al., 2011; Pingault et al., 2011; Pingault et al., 2012; Özkarar-Gradwohl et al., 2014) have used a sample of college students and so the average age was low. This may have distorted the results. Another example of how the sample can influence the results is described in the original study, where part of the respondents were job applicants. The authors later concluded that they scored less for the negative scales, probably as an attempt to give the expected answers (Davis et al., 2003).

Some of the presented studies have used other instruments to get better information on whether ANPS was measuring what it was supposed to. Particularly, instruments from Big Five approach, correlations and some factor analyses. Accordingly, some (e.g. Davis et al., 2003; Pahlavan, Mouchiroud, Zenasni & Panksepp, 2008; Davis & Panksepp, 2011; Abella et al., 2011; Özkarar-Gradwohl et al., 2014) found that each ANPS scale was related to at least one of the Five Factor Model (FFM) dimensions. Positive correlations between the negative dimension of Big Five approach (Neuroticism) and all negative ANPS dimensions were common to all studies. Although separately, these studies show positive correlations between Extraversion, Agreeableness and Openness, and positive ANPS dimensions. For Openness-Care, only two studies report this positive correlation (Abella et al., 2011; Özkarar-Gradwohl et al., 2014).

Some findings escape this same-valence logic. Some of these studies have found negative correlations between Neuroticism and ANPS positive dimensions (Pahlavan et al., 2007; Özkarar-Gradwohl et al., 2014), and between Extraversion and Agreeableness, and negative

ANPS dimensions (e.g. Davis et al., 2003; Pahlavan et al., 2007; Özkarakar-Gradwohl et al., 2014). An exception to the Extraversion-Anger was a positive correlation found by Pahlavan et al. (2007). Openness was found to positively correlate with both SADNESS and ANGER (Abella et al., 2011; Özkarakar-Gradwohl et al., 2014) and there are divergent results for FEAR (Pahlavan et al., 2007; Abella et al., 2011). We have not mention Conscientiousness as this dimension is the less consensual. Factor analyses have shown the existence of a positive affect factor: Extraversion, Agreeableness, Openness, SEEKING, CARE, and PLAYFULNESS; and a negative affect factor: Neuroticism, FEAR, ANGER, and SADNESS (Pahlavan et al., 2008; Abella et al., 2011). A 4-factor model solution was also found: FEAR, SADNESS, ANGER, Emotional Stability; CARE, Agreeableness; PLAY, Extraversion; SEEK, Openness to Experience (Davis et al., 2003; Davis & Panksepp, 2011; Özkarakar-Gradwohl et al., 2014). In some of these solutions Conscientiousness was not represented, and in others was a factor by itself. For detailed information about correlations and factors see appendix B.

Other instruments have been used, like PANAS (Positive and Negative Affect Schedule), in a study by Abella et al. (2011) which found correlations between positive affect and the positive emotional systems and between negative affect and the negative emotional systems. As expected, factor analysis has shown 2 factors: a positive affect factor (Positive Affect, PLAY, CARE, and SEEK) and a negative affect factor (Negative Affect, FEAR, ANGER, and SADNESS).

1.3 Personality Assessment in Selection Processes

On the previous sections we have presented a different approach to understand personality, based on neural systems functioning. We have also shown an instrument that allows personality measurement according to this new approach.

Considering the main goal of this research, it is important now to focus on professional selection and the importance of personality assessment within this process.

1.3.1 Professional Selection, Performance, and Personality

When someone begins to plan a professional selection process, either for a company or for other purposes, one must keep in mind that the major goal is to guarantee some level of performance for a certain job. In other words, “Since the aim of personnel selection is to

ensure a certain level of employees' performance in a future job or career, prediction is a crucial function that any selection procedure should fulfil" (Roe, 1998, p. 11). So, predicting performance seems to be the key for personnel selection success. We might ask for what we should assess in order to get some indicators of job performance. One easy way to answer this is to think about competences. Competences, as we know, relate to performance. However, sometimes even the most competent professional doesn't have the desired performance level (Goldberg, 1993; Roe, 2002). This leads us to think that maybe there are other factors influencing performance: e.g. situational and personal factors, and emotional states (Gilligan & Bower, 1984; Roe, 2002; Barsade & Gibson, 2007; Murphy, 2012). These other factors can be controlled by being assessed with different instruments, like interest or personality inventories (Taylor, 2008).

Considering our study purposes, we will now focus our review on personality assessment. Another example of how personality seems to affect performance can be observed in Robert Roe's Competence Model. According to this model, personality is an important construct for learning, and learning, in turn, is implied in competences acquisition. As we have seen, competences seem to be important for performance (Roe, 2002), and so, indirectly, this approach shows the importance of personality for performance.

We might consider the importance of personality inventories for clinical purposes by helping therapists identifying mental disorders. However, the origin of these instruments seems to relate to hiring processes during the beginning of World War I, where it was necessary to recruit people able to deal with high levels of stress (Barrick & Mount, 2012).

As a way of predicting performance, these inventories weren't seen as a good advantage until the 1990's where, with the boom of the Five Factor Model, this kind of assessment in selection processes has increased (Hurtz & Donovan, 2000; Rothstein & Goffin, 2006). This Model was studied by many researches and popularized by Lewis Goldberg. According to the FFM, there are five personality dimensions (Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience) each one containing different traits. So, for example, Extraversion incorporates talkativeness in contrast to silence; Agreeableness is responsible for kindness in opposition to hostility; Conscientiousness integrates traits like organization contrasting to carelessness; traits like nervousness are included in Neuroticism as opposition to traits related to Emotional Stability; Openness to Experience includes imagination or creativity in contradiction to shallowness (Goldberg, 1993).

TESTING THE PORTUGUESE VERSION OF ANPS-S

Notwithstanding its wide utilization, it seems that there are still few studies reporting the predictive value of personality concerning job performance (Rothstein & Goffin, 2006; Taylor, 2008). So, when we try to find a straight relation between personality and performance, we cannot find clear data (e.g. Rothstein & Goffin, 2006; Murphy, 2012). Studies using the Big Five Model show that conscientiousness is related to professional performance (e.g. Barrick & Mount, 1991; Salgado, 1997). However, even this data cannot be seen as totally flawless. Hurtz & Donovan (2000) state that these studies appear to present some methodological problems.

There are other problems around this field, like the evidence that personality does not predict cognitive abilities (with some exception for Openness). For this reason we can anticipate that when we talk about performance explained by personality this can't be the same performance that is explained by cognitive abilities. This situation indicates that the articulation of the two characteristics (personality and cognitive abilities) can produce better results in the whole performance prediction (Motowidlo & Van Scotter, 1994; Murphy, 2012; Barrick & Mount, 2012). This "dual approach" allows us to abandon a unidimensional concept of performance. So, cognitive assessment seems better predict what has been called task performance and personality assessment is a better choice to study other kind of performance - contextual performance (e.g. Bott, Svtantek, Goodman & Bernal, 2003). This happens because task performance is more dependent on individual differences related to skills, abilities, knowledge, experience and training, and contextual performance is more related to individual differences on personality that will influence e.g. motivation and interpersonal skills (Borman & Motowidlo, 1993).

1.3.2 Contextual Performance/Organizational Citizenship Behaviour

As our main goal is to test a personality instrument for professional selection purposes, we will now focus on contextual performance. Contextual performance was defined by Borman & Motowidlo (1993) and refers to activities that cannot be considered as task performance. So, these activities don't contribute to technical core, are similar across jobs, are not related to proficiency, and are not role-prescribed. Although these activities cannot be seen as task performance, they are a valid contribution to organizational performance.

The growing centrality of team work in organizations has been increasing employers interest in alternative skills, such as interpersonal ones (Ilgen & Pulakos, 1999). This

contributes to a heightened relevance of contextual performance within organizational context.

A concept related to contextual performance is organizational citizenship behaviour (OCB), as it cares with what goes beyond formal requests for a certain job. At the beginning this concept was similar but also quite different from contextual performance, mainly because Organ (1988) considered OCB as discretionary and non-rewarded behaviours. Later, Organ (1997) decided to change his previous definition in order to get closer to Borman & Motowidlo's (1993) concept of contextual performance. The new definition considers OCB as behaviours that add to “the maintenance and enhancement of the social and psychological context that supports task performance” (p. 91). So, these behaviours are linked to characteristics that are not demanded to perform established tasks but that are important to facilitate team and organizational performance (Smith, Organ & Near, 1983; Podsakoff & MacKenzie, 1997).

OCB is a multi-dimensional concept and different authors have been presenting different dimensions for this construct. For this study we use the model Rego & Cunha (2010) used, which comprises four OCB dimensions found for the Portuguese population: Identification with the Organization (putting the organization in first place even with personal sacrifice), Personal Initiative (keeping informed about the organization and taking initiative to solve problems, find alternative solutions, and improve skills), Interpersonal Harmony (avoiding behaviours that originate instability and a poor work environment), and Conscientiousness (being ready to work, and avoiding being thoughtless and wasting time).

TESTING THE PORTUGUESE VERSION OF ANPS-S

Table 1.1 presents other examples of dimensions included in different OCB instruments, gathered in Organ, Podsakoff & MacKenzie, (2006) work.

Table 1.1 Different conceptualizations of OCB dimensions

Authors	Dimensions
Bateman & Organ (1983)	OCB
Smith, Organ & Near (1983)	Altruism, Generalized Compliance
Podsakoff, MacKenzie, Moorman, & Fetter (1990)	Altruism Sportsmanship, Civic Virtue, Courtesy, Conscientiousness
Williams and Anderson (1991)	OCBI, OCBO
Motowidlo & Van Scotter (1994)	Contextual Performance
Podsakoff & MacKenzie (1994)	Altruism, Cheerleading, Courtesy, Peacekeeping, Sportsmanship, Civic Virtue
Van Dyne, Graham & Dienesch (1994)	Advocacy Participation, Obedience, Social Participation, Loyalty, Functional Participation
Moorman & Blakely (1995)	Interpersonal Helping, Individual Initiative, Personal Industry, Loyal Boosterism
Van Scotter & Motowidlo (1996)	Interpersonal Facilitation, Job Dedication
Farh, Earley & Lin (1997)	Altruism toward colleagues, Protecting Company Resources, Interpersonal Harmony, Conscientiousness, Identification with the company
Van Dyne & LePine (1998)	Helping, Voice, In-Role-Behaviour

Although it is possible to find so many different ways to describe OCB, Dennis Organ's (1988) five dimension model is still the most used (e.g. LePine, Erez & Johnson 2002). These dimensions are: Altruism (helping people to solve important problems for the organization), Conscientiousness (behaviour that goes beyond what is requested in assiduity, obey norms, or manage breaks for example), Sportsmanship (being able to bear with not so good circumstances without complaining), Courtesy (being able to prevent problems for the organization), and Civic Virtue (active and responsible participation in life of the organization). This model was later confirmed by other authors, such as Podsakoff et al. (1990) who developed one of the most important and used instruments to assess OCB.

Some OCB dimensions from different authors clearly overlap. LePine et al. (2002) give some examples of how different classifications and authors are actually presenting the same dimensions. They conclude that there is a strong relationship among OCB dimensions and that these dimensions have similar relations with the most common predictors used with

OCB. Although considering the importance of more developments in this field, it is suggested that OCB can be seen as a latent construct.

1.3.3 Personality assessment and OCB

As we have seen before, personality can be taken as a predictor of OCB. Until now, Big Five approach has been the most widely used for this purpose. Considering the theoretical characteristics of personality dimensions, Organ et al. (2006) anticipates that two personality dimensions should be linked to OCB: Agreeableness, especially with dimensions of helping, courtesy, and sportsmanship; and Conscientiousness especially with impersonal forms of OCB. For Neuroticism and Extraversion, the authors were also able to see some possible connections to OCB, although not so strong: they admit that more neurotic people will be less available to help others while extroverted might have more opportunities to help others. Concerning Openness, the authors consider that there are no theoretical grounds about a relation with OCB.

Elanain (2007) has shown that Openness, Conscientiousness, and Emotional Stability are valid predictors of OCB. Earlier studies found that Conscientiousness, Extraversion, Emotional Stability, and Agreeableness were related to contextual performance (e.g. Hertz & Donovan, 2000).

Also, Konovsky & Organ (1996) found that Conscientiousness was related to Civic Virtue and Generalized Compliance. Generalized Compliance is an alternative designation for OCB's Conscientiousness in order to prevent confusion with Conscientiousness as a personality trait (Organ et al., 2006). It is possible to find other studies highlighting the predictive ability of Conscientiousness (personality) to predict Conscientiousness (OCB), such as Organ & Ryan (1995) that found correlations between Conscientiousness and Generalized Compliance. This relation seems to be quite obvious, as it is expected that a personality trait is able to define a certain behaviour tendency. However, concerning personality, the Big Five dimension Conscientiousness was the strongest link to OCB, especially regarding impersonal forms of OCB (Organ et al., 2006), and Generalized Compliance is the most impersonal form of OCB (Organ & Ryan, 1995).

ANPS doesn't assess Conscientiousness and this instrument avoids having a trait predicting its behaviour. Also, ANPS assesses personality by studying the functioning of basic emotional systems and we think it will be an added value to analyse its ability to predict

OCB. Neuman (2014) considers that Jaak Panksepp's approach is closer to reflect underlying neurobiological processes than just paying attention to linguistic issues. The author emphasizes the idea that the correlations found between Big Five and Neuroaffective Theory (reported in earlier sections) show that "the complexity and theoretical vagueness of the FFM may be reduced, for both theoretical and practical reasons, to basic neurobiological systems that are easier to interpret" (p. 661). He also considers that Big Five theoretical dominance probably occurs because of the simple way in which it explains personality. So, although widely used, FFM personality assessment is not universally accepted. Block (1995), for example, presents some methodological, empirical, semantic, and theoretical objections to this Model.

Neuman (2014, p. 657), again, puts in evidence why neuroaffective approach, as against a lexical approach, seems to be a better choice: "(...) personality factors or traits are considered to be relatively stable patterns that are supposed to influence, in a causal manner, a variety of behavioural, cognitive, and emotional outcomes. As the factors are hypothetical mental constructs they cannot in themselves function as causes, only the underlying neurobiological systems and processes they are supposed to represent".

1.3.4 Other Reasons to consider ANPS in Organizational Context

Although we haven't found any information about ANPS as a predictor of OCB, we believe that a personality instrument based on a neurobiological ground can provide more detailed information on personality traits. So, we also believe that recruiters will be able to get more detailed and trustworthy information about OCB.

Given its particular emotion related nature, ANPS should be advantageous for organizational context. So, in addition to what has been previously described, there are other aspects that bring out the importance of Neuroaffective Theory and its presumptive utility in professional selection. As we have seen, ANPS assesses personality considering emotional variability within basic systems functioning. We know that emotion related issues are gaining relevance in organizational context, precisely because they seem to affect performance (Barsade & Gibson, 2007). Beyond this, there is also evidence that different emotional states can underly different cognitive styles. Fiedler (2001) presents some studies indicative that different moods (positive and negative) lead to different cognitive styles. In a general way, we can say that negative mood keeps people more careful, with more attention to the details,

while positive mood makes people more imaginative, and spontaneous. Carrying this idea to types of tasks, negative states are seen as being better for tasks that need verification and attention, and positive states are better for tasks that depend on creativity and alternative behaviours and so, one can argue that some moods or emotional states are more appropriate for certain jobs. Although part of these last arguments are more important for task performance, we decided to present them as a way to demonstrate the greater potential we believe this approach has, and somehow to capture researchers' interest for this field. We have seen that personality is only able to predict contextual performance, but given the different approach presented by ANPS it would be interesting to study, in the future (as this is not the purpose of the present study), if we can find a relation between ANPS and task performance indicators.

Altogether, the arguments that have been presented led us to believe that, perhaps, ANPS can offer a better contribute for personality analysis (particularly in professional selection processes) than instruments that come from the Big Five Model. As we have presented, ANPS studies are related to FFM, however, ANPS scales are closer to reflect underlying affective neurobiology (Barrett, Robins & Janata, 2013). We also believe that Jaak Panksepp's approach targets such a basic level of brain functioning that it can even probably help to explain other personality perspectives, like the Big-Five approach.

1.4 Research Operationalization

Considering our theoretical framework and objectives we can now expose the rational of our research. We will reintroduce our specific goals and then show their operationalization.

Objective 1: to check if the Portuguese version of ANPS-s is able to assess 6 of the seven emotional systems presented in Neuroaffective Theory - **Factorial Validation**

As explained, ANPS is a scale that has been studied in different countries (e.g. Abella et al., 2011). As our intent is to test its utility in professional selection processes, we should, in first place, test the Portuguese version of the scale.

So, we decided to test how this new version responds to factorial validation (e.g. Spector, 2012), in order to check if it is able to keep the original factorial solution of six basic systems (through quality indicators complemented by convergent and discriminant validities within factorial validation). Our literature review has shown some weaknesses with fit indices in

TESTING THE PORTUGUESE VERSION OF ANPS-S

previous investigations using ANPS. Thus, we can anticipate some difficulties with some eventual problematic items.

As our first hypothesis we have:

H1: The Portuguese version of ANPS-s keeps the 6 dimensions presented in the original scale.

Objective 2: to check if ANPS-s is a good personality measure - **Convergent Validation**

Convergent validation assumes that a new instrument is able to measure what it intends to measure when it correlates with other instrument measuring the same construct (Hair, Celsi, Money, Samouel & Page, 2011). As we have seen, ANPS was built to get personality assessment through the functioning of six basic emotional systems (Davis et al., 2003). We aim to be able, in the future, to use this personality instrument in personnel selection processes. So, we must guarantee that ANPS-s (Portuguese version) is, in fact, a personality measure.

During literature review we have presented the most widely used personality approach – Big-Five Theory. We expect ANPS-s to add a contribution for personality assessment acknowledging FFM relevance for personality conceptualization. So, it is reasonable to consider that if we get good correlations between ANPS-s and a Big-Five approach instrument, we will have achieved convergent validity. Moreover, considering earlier studies we can hypothesized:

H2: ANPS subscales are correlated to Big-Five dimensions.

H2.1: Each ANPS scale is at least related to one of the Big-Five Dimensions.

H2.2: Positive ANPS dimensions (PLAY, SEEK, and CARE) are positively related to positive Big-Five dimensions (Extraversion, Agreeableness and Openness).

H2.3: Negative ANPS dimensions (FEAR, ANGER, and SADNESS) are positively related to the negative Big-Five dimension (Neuroticism).

H2.4: Positive ANPS dimensions (PLAY, SEEK, and CARE) are negatively related to the negative Big-Five dimension (Neuroticism).

H2.5: Negative ANPS dimensions (FEAR, ANGER, and SADNESS) are negatively related to Extraversion and Agreeableness but positively for the ANGER-Extraversion dyad.

H2.6: Openness is positively related to SADNESS and ANGER.

TESTING THE PORTUGUESE VERSION OF ANPS-S

Up to now we have presented what we consider to be the first step of this research: a set of procedures that will allow us to go forward in our study knowing we have a trustworthy personality measure.

Objective 3: to check if ANPS-s is able to predict organizational citizenship behaviour, a proxy measure of contextual performance – **Concurrent Validity**

By testing concurrent validity, a type of criterion validity, we want to verify if an independent variable (predictive) is able to explain a dependent variable (criterion). As the predictor and criterion variables were collected at the same time we have concurrent validity instead of predictive validity (Hair et al., 2011).

Our literature review has shown that personality is important for performance, in particular for contextual performance (Borman & Motowidlo, 1993). In this way, once we were able to confirm H1 and H2, we can expect that ANPS-s, as a personality instrument, is able to predict contextual performance.

As we haven't found any study using ANPS and OCB we have lack of theoretical framework to motivate specific hypotheses. Hence, we have designed Table 1.2 where we present what we expect to find on reasonable grounds.

Table 1.2 Expectable relations for concurrent validity

		Criterion Variables			
		Personal Initiative	Identification with Organization	Interpersonal Harmony	Conscientiousness
Predictor Variables	PLAY	<i>Negative</i>	<i>Negative</i>	<i>Positive</i>	<i>Negative</i>
	SEEK	<i>Positive</i>	<i>Positive</i>	-	-
	CARE	-	<i>Positive</i>	<i>Positive</i>	-
	FEAR	<i>Negative</i>	-	-	-
	ANGER	-	<i>Negative</i>	<i>Negative</i>	<i>Negative</i>
	SADNESS	<i>Negative</i>	-	-	<i>Negative</i>

We have filled the table considering each dimension conceptualization and its specific items. In this way we have consider three possible situations: positive influence of ANPS-s dimensions on OCB; negative influence of ANPS-s dimensions on OCB; and undefined situation. This last position is identified with “-” symbol and was used whenever we have

TESTING THE PORTUGUESE VERSION OF ANPS-S

considered there was no strong reason to foresee a direction or it is plausible to admit a non-linear relation. For example, we believe that CARE is unrelated to Personal Initiative, at least considering the way these dimensions are operationalized. At the same time if we think about ANGER, it is possible to admit that it could increase or decrease behaviours of Personal Initiative and we don't have theoretical background to take a specific position.

As regards positive relations, we can hypothesize five possible situations:

PLAY is able to positively predict Interpersonal Harmony. We believe that a person with a high sense of PLAY is more capable to contribute for a good environment, as it is good mood person and someone that enjoys sharing activities with others. Also, we have seen that PLAY has a role in the improvement of social relationships (Panksepp, 2010).

SEEK is able to positively predict Personal Initiative. SEEK is highly related to curiosity and initiative for action. Thus, it is plausible to assume that if a person has a strong SEEK system, he or she will probably demonstrate high personal initiative in job context. Personal Initiative has a component of finding alternative solutions and solving problems, and these characteristics are similar to Davis et al. (2003) conceptualization of SEEK.

SEEK is able to positively predict Identification with the Organization. Again, SEEK can be seen as representing a great need for taking initiative, being driven by curiosity, and being able to accomplish (Davis et al., 2003). We believe that a person with this characteristic will be more available to embrace behaviours described as Identification with the Organization, very close to altruistic behaviours.

CARE is able to positively predict Identification with the Organization. The system CARE is responsible for a strong sense of being emotionally linked to others, as defined by Davis et al. (2003). This kind of worry and need to protect lead us to assume the connection between this system and behaviours of Identification with the Organization.

CARE is able to positively predict Interpersonal Harmony. Considering what has been described in the last paragraph, it is also expectable that "CARE people" are more orientated to perform behaviours that promote Interpersonal Harmony.

Concerning negative relations, we foresee six possible situations:

PLAY is able to negatively predict Personal Initiative. We support this relation based on the idea that a playful person is probably more distracted about and less available for "extra duties".

TESTING THE PORTUGUESE VERSION OF ANPS-S

PLAY is able to negatively predict Identification with the Organization. The same distraction we have just described may be also responsible for less altruistic behaviours, here described as Identification with the Organization.

PLAY is able to negatively predict Conscientiousness. We believe that a “PLAY person” will probably waste more time with issues not related to job tasks.

FEAR is able to negatively predict Personal Initiative. We believe that a “FEAR person”, someone that resists taking decisions and is tense (Davis et al., 2003) will be probably less available to take initiative and worry about “extra duties”.

ANGER is able to negatively predict Interpersonal Harmony. It seems acceptable that someone with a more ANGER functioning won’t probably give a good contribution for Interpersonal Harmony, as ANGER, as defined by Davis et al. (2003) can imply expressing anger verbal and physically.

ANGER is able to negatively predict Identification with the Organization. Given what has been described, this kind of person will probably not perform altruistically.

ANGER is able to negatively predict Conscientiousness. It seems reasonable to admit that someone with an ANGER profile will probably be more careless with job tasks and less mentally fresh.

SADNESS is able to negatively predict Personal Initiative. In a similar way to what (we believe) happens to FEAR, a “SADNESS person” will not probably be available and attentive to perform “extra duties”.

SADNESS is able to negatively predict Conscientiousness. We believe that a SADNESS person will be less attentive and more careless about job tasks and, at the same time, won’t be mentally fresh.

It is important to note that doing this “prediction exercise” we have never considered situations of extreme (positive and negative) basic systems functioning. We know that excessive or great deficit of functioning has clinical consequences (e.g. Panksepp, 1998, 2010) and will probably modify the relations we have presented.

Objective 4: to check if ANPS-s gives us more information on organizational citizenship behaviour than an instrument from the most used approach in this context – **Incremental Validity**

TESTING THE PORTUGUESE VERSION OF ANPS-S

Incremental validity is used to verify if one measure is able to give more information than what is already known (Groth-Marnat, 2003). We have seen that Big-Five instruments are widely used for selection purposes (e.g. Rothstein & Goffin, 2006). So, if we want to introduce a new instrument in this field we must ensure it brings something new, or has the ability to give a better explanation than an existing one.

During our literature review, we have presented some arguments (e.g. Newman, 2014) that allow us to presume that ANPS is going to be a more specific personality measure than those from Big-Five approach. As we believe ANPS is a better personality measure, we hypothesise that:

H4: ANPS-s has specific variance in OCB prediction.

Figure 1.2 illustrates our research model, considering hypotheses H3 and H4. Please note that this represents a general model, where it is not possible to see the valence of the relations, and the relation between specific dimensions of each construct.

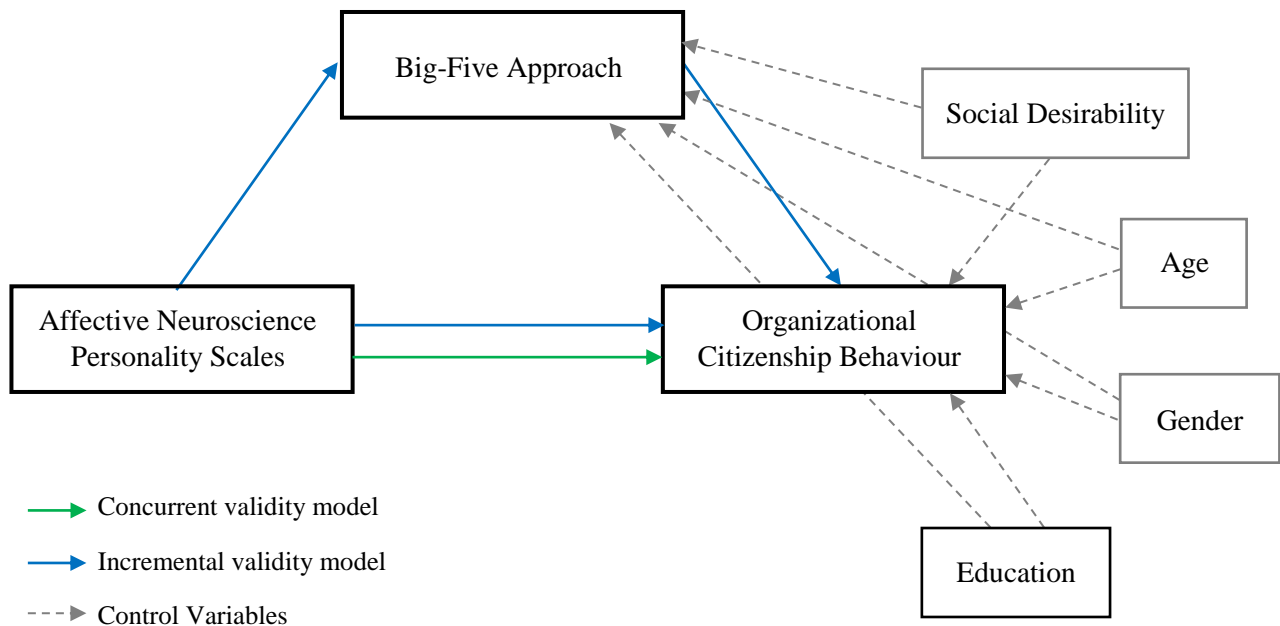


Figure 1.2 Research model

CHAPTER II. METHOD

2.1 Participants and Procedure

Our sample included 505 participants that have accepted to participate in an online survey, using Qualtrics software. For data collection we have opted for a convenience sample strategy, followed by a snowball procedure. Data analysis was conducted with IBM SPSS Statistics 20, AMOS 22, and PROCESS macro.

Firstly, following recommendations from Hair, Black, Babin & Anderson (2010) we have screened invalid entries in the database. Secondly, data screening procedures included multivariate outlier detection through Mahalanobis D^2 (Mahalanobis, 1936). For $p < .001$ and 36 degrees of freedom the critical X^2 value is 67.985. We kept 483 cases that failed to achieve Mahalanobis D^2 above the threshold. Next we proceeded with analyzing missing values, searching for its extension, and corrective actions. At the end we preserved 442 cases.

For the first part of our study (H1 and H2) we used the whole sample. For the last part of the study (H3 and H4) the sample was reduced for 341 cases because, as has been described before, OCB measure has only been used with participants with professional experience.

For the whole sample the mean age was 32.4 years, $SD=13.12$, with 65.4% of women (289 cases) and 34.6% of men (153 cases). Considering the education level, 1.1% attended school until the second stage of basic education, 11.3% attended high school, 83.7% finished graduation or masters and 3.8% have PhD. Analysing professional experience, 22.9% have none, 17% have less than 1 year, 24.4% between 2 and 5 years, 9.7% between 6 and 10 years, 8.4% between 11 and 20 years, and 17.6% more than 20 years of professional experience.

Considering the subsample of 341 cases the mean age was 35.18 years, $SD=13.72$, with 66% of women (225 cases) and 34% of men (116 cases). Considering the education level, 1.5% attended school until the second stage of basic education, 7.6% attended high school, 86.2% finished graduation or masters and 4.7% have PhD. Analysing professional experience 22% have less than 1 year, 31.7% between 2 and 5 years, 12.6% between 6 and 10 years, 10.9% between 11 and 20 years, and 22.9% more than 20 years of professional experience.

2.2 Measures

We have used a survey comprehending four scales that we will later describe: ANPS-s, 11 item-Short form of the Marlowe-Crowne Social Desirability Scale, Mini-IPIP, and OCB (see Appendix C). In first place we decided to check the psychometric quality of each scale, by

TESTING THE PORTUGUESE VERSION OF ANPS-S

checking factorial validity. These results are presented in this section with exception for ANPS-s, as this analysis already represents part of our study results (so, for ANPS-s see Results section).

With this procedure our purpose was to control if all items were measuring the same construct (for each factor of each scale). So, we expected items measuring the some construct to fall in the same factor and items measuring different constructs to load in different constructs (Spector, 2012).

For all scales, firstly we conducted a confirmatory factor analysis (CFA). For CFA we have applied Hair et al. (2010) indicators of model fit, represented in Table 2.1.

Table 2.1 Fit indices for goodness-of-fit (from Hair, et al., 2010)

No. of Stat vars. (m)	N < 250			N > 250		
	m ≤ 12	12 < m < 30	m ≥ 30	m ≤ 12	12 < m < 30	m ≥ 30
χ^2	Insignificant p-values expected	Significant p-values with good fit	Significant p-values expected	Insignificant p-values with good fit	Significant p-values expected	Significant p-values expected
CFI or TLI	.97 or better	.95 or better	Above .92	.95 or better	Above .92	Above .90
SRMR	Biased upward, use other indices	.08 or less (with CFI of .95 or higher)	Less than .09 (with CFI above .92)	Biased upward; use other indices	.08 or less (with CFI above .92)	.08 or less (with CFI above .92)
RMSEA	Values < .08 with CFI of .97 or higher	Values < .08 with CFI of .95 or higher	Values < .08 with CFI above .92	Values < .07 with CFI of .97 or higher	Values < .07 with CFI of .92 or higher	Values < .07 with CFI of .90 or higher

When facing invalid fit indices, we have conducted an exploratory factor analysis (EFA). For EFA we used the following values: KMO >.500, MSAs >.500 (Cleff, 2014), Bartlett's test (χ^2 sig. $p < .001$) (Field, 2013), communalities > .500, eigenvalues >1 and eventually analysing crossloadings (whenever an orthogonal rotation is suitable). We have also analysed, and judged on items permanence, with internal consistency, given by Cronbach's alpha. Values above .70 indicate good reliability and values between .60 and .70 are acceptable just for exploratory research (Hair, Black, Babin & Anderson 2010). After EFA, we have conducted, again, a CFA for robustness sake.

TESTING THE PORTUGUESE VERSION OF ANPS-S

Within factorial validity, convergent validity was assessed by AVE values. AVE should be greater than .500 to ensure convergent validity. However, if AVE fails to meet this value it is possible to use composite reliability (CR) that should be greater than .70 (Fornell & Larcker, 1981, p. 46). This value is also important for scale reliability (Hair, et al., 2010). For discriminant validity testing we used Fornell-Larcker criterion, where the squared root of each construct's AVE is required to be higher than any bivariate correlation of that construct with any other construct.

Normality of the distributions was assessed by skewness and kurtosis analyses with cut values of 3 and 8 respectively (Kline, 1998). When there was no normality in the distribution, we took Hair et al. (2010) recommendations for data transformations.

2.2.1 ANPS-s

ANPS-s was translated from English to Portuguese by two knowledgeable researchers and previously back translated following Brislin (1980) procedure. The original structure of ANPS-s was preserved with six scales (SEEK, PLAY, CARE, SADNESS, FEAR, and ANGER), each with six items, in a total of 36 items. This scale has already been described in literature review section.

We have decided for a six-point Likert scale instead of the four-point Likert scale presented in the original and other ANPS versions as it offers higher sensitivity which we deemed a cautionary position in newly translated or developed scales.

2.2.2 11-item short form of the Marlowe-Crowne Social Desirability Scale

In ANPS original study (Davis et al., 2003) it was possible to see how easy it can be to give social desired answers. Actually, it is not difficult to fake a personality inventory, and within a selection context it may be very tempting to do it (Taylor, 2008; Morgeson, Campion, Dipboye, Hollenbeck, Murphy & Schmitt, 2007).

To avoid these situations we included a scale of social desirability amongst the ANPS-s items. Marlowe-Crowne social desirability scale (Crowne & Marlowe, 1960) has 33 dichotomous items and a Cronbach alpha of .88. The aim of this scale is to assess people's tendency to exacerbate their own qualities and lessen their weaknesses. We have used the 11-item short form of the Marlowe-Crowne Social Desirability Scale developed by Ballard (1992), recommended by Loo & Loewen (2004). These authors consider the importance of

TESTING THE PORTUGUESE VERSION OF ANPS-S

using short versions to save time, especially when the empirical design contains several self-report measures, as happens in the present study. In our study we present these items in a six point Likert scale and not as in the original version (True or False). This happens because we have introduced this scale together with ANPS-s and especially because dichotomous scales are less sensitive than ordinal ones. Ballard (1992) has found a Cronbach alpha of .69 and loadings $>.40$ for the 11-item scale. Coincidentally with other studies she wasn't able to find a unidimensional solution for this measure. For example Nolte, Elsworth & Osborne (2013) have studied the 13-item short form and found a two-factor solution (defensiveness and self-presentation). Factor loadings and Cronbach alpha values were also generally low: loadings between .33 and .77 and a Cronbach alpha of .59.

We have tested the short mentioned version but we didn't find a valid solution. We have tried different factorial solutions but none of them was able to fulfil minimum criteria. The loadings were very low, making impossible to keep the scale.

2.2.3 Mini-IPIP

Mini-IPIP (Donnellan, Oswald, Baird & Lucas, 2006) is a short version from the International Personality Item Pool – Five Factor Model (Goldberg, 1999). Mini IPIP has 20 items, four for each personality factor (Extraversion, Agreeableness, Conscientiousness, Neuroticism and Intellect/Imagination) instead of the 50 items presented in the IPIP-FFM. Each scale has two items in negative direction and two items in positive direction with exception for the Intellect/Imagination scale that has three items keyed in negative direction. The authors of Mini-IPIP concluded this version is psychometrically adequate and usable as a short measure of the Big Five personality factors.

Considering the expected use of the Big-Five personality scale, both for convergent and incremental validity test purposes, we have opted to subject to empirical analysis exclusively the scales where a previous theoretic relation has been well established in the literature. At the same time, we decided to avoid the possible bias of having a personality trait predicting its behavior. Thus, we tested a confirmatory factor analysis of four personality factors (Conscientiousness scale was excluded, i.e. 16-item Mini-IPIP). The Confirmatory factor analysis showed unacceptable fit indices for the original four-factor solution (CMIN/DF=6.102, $p<.001$, CFI=.774, PCFI=.632, RMSEA=.108, SRMR=.0787). The ensuing exploratory factor analyses show, after removal of five items, a valid solution

TESTING THE PORTUGUESE VERSION OF ANPS-S

(KMO=.703, .582<MSA<.821, Bartlett's $X^2=1215.560$, 55 df, $p<.001$) accounting for 67.9% of total variance with a Varimax rotation, thus retaining 11 items that achieved criteria as stated in the Analysis Strategy section above. These loaded as follows in Table 2.2.

Table 2.2 Mini-IPIP factors from EFA (Rotated Component Matrix^a)

	Component			
	1	2	3	4
E1 _I am the life of the party.	.843	-.007	.023	-.001
E3 _I talk to a lot of different people at parties.	.784	-.159	-.011	.087
E2 _ I don't talk a lot. (RE)	.755	.150	.289	-.013
E4 _ I keep in the background. (RE)	.709	.078	.044	.198
N3 _ I get upset easily.	.022	.847	-.087	-.038
N1 _ I have frequent mood swings.	-.049	.790	-.069	.072
N2 _ I am relaxed most of the time. (RE)	.056	.761	.112	-.068
A2 _ I'm not interested in other people's problems. (RE)	.039	-.018	.897	.077
A4 _ I am not really interested in others. (RE)	.162	-.032	.844	.189
I2 _ I am not interested in abstract ideas. (RE)	-.016	-.062	.130	.827
I4 _ I do not have a good imagination. (RE)	.219	.034	.106	.752
Cronbach Alpha / r_{sb}	.787	.725	.754	.486
Composite reliability	.856	.842	.863	.769

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

The ensuing confirmatory factor analysis showed acceptable fit indices (CMIN/DF=3.192, $p<.000$, CFI=.932, PCFI=.642, RMSEA=.071, SRMR=.055) with average loadings reaching .69 but average AVEs at .479 which implied the exclusion of Openness subscale due to low AVE (.324) and CR (.489). The renewed Confirmatory Factor Analysis for the remaining eight items showed a valid three factor solution (CMIN/DF=2.236, $p=.002$, CFI=.973, PCFI=.625 RMSEA=.053, SRMR=.0427) covering Extraversion, Agreeableness, and Neuroticism. Mini-IPIP CFA model is represented in Figure 2.1 and summarized in Table 2.3. Table 2.4 indicates good discriminant validity of the scales.

TESTING THE PORTUGUESE VERSION OF ANPS-S

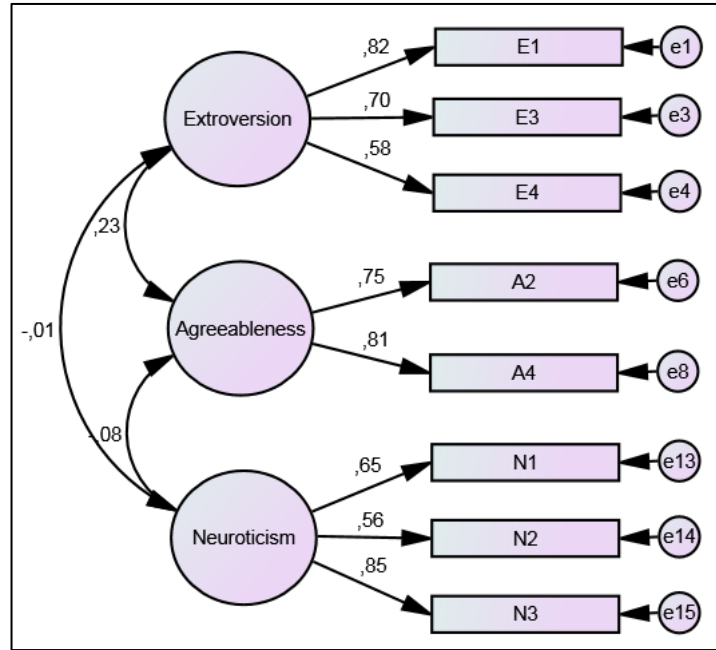


Figure 2.1 Mini-IPIP CFA results

Table 2.3 Mini-IPIP CFA results

Dimension	Items	λ	CR	AVE	Fit indices
Extraversion (E)	E1	.820	.744	.497	CMIN/DF=2.236 p=.002 CFI=.973 PCFI=.625 RMSEA=.053 SRMR=.043
	E3	.696			
	E4	.578			
Agreeableness (A)	A2	.751	.758	.611	
	A4	.811			
Neuroticism (N)	N1	.647	.735	.488	
	N2	.565			
	N3	.853			

Table 2.4 Mini-IPIP discriminant analysis via AVE^a

	Extraversion	Agreeableness	Neuroticism
Extraversion	.704		
Agreeableness	.228***	.781	
Neuroticism	-.011	-.085	.698

*** p<.001

^a Diagonals show squared root AVE for each construct. *** p<.001

2.2.4 Organizational Citizenship Behaviour

OCB was measured with the scale used by Rego and Cunha (2010), which comprises four factors measured with 15 items: five for Interpersonal Harmony, three for Conscientiousness, four for Personal Initiative, and three for Identification with the Organization.

The original version of this instrument was not designed to be a self-evaluation report. Given the goals of the present research, we decided to modify the original structure to get a self-report scale. Doing this we took in account Carpenter, Berry & Houston (2014) meta-analysis findings, where there seem to be no relevant score differences between self-reported and other-reported answers on OCB assessment. However, it was necessary to slightly change some items that we have considered to contain some pressure for a social desirable answer within a self-evaluation context.

The confirmatory factor analysis of the four subscales showed liminal acceptable fit indices (CMIN/DF=2.305 $p < .001$, CFI=.893, PCFI=.715, RMSEA=.062, SRMR=.0692) but some lambdas were unacceptably low (e.g. $\lambda_{1.1}=.33$ or $\lambda_{4.3}=.39$) and a covariance between two factors (Interpersonal Harmony and Conscientiousness) was too high (.91) which suggested a possible factor fusion. This renders the model untrustworthy. Considering literature review about OCB dimensions, we decided to follow Le Pine, Erez & Johnson (2002) recommendation and treat OCB as a 2nd order latent construct as other researches did (e.g. Yen, Li & Niehoff, 2008). This analysis showed similar fit indices with the same underlying problems.

Thus, we have proceeded with exploratory factor analysis. Findings showed a valid solution preserving 10 items (KMO=.785, $.576 < \text{MSA} < .845$, Bartlett's $X^2=742.539$, 45 df, $p < .001$) and accounting for 58.9% of total variance. In this solution two of the Interpersonal Harmony items fell into Conscientiousness, which corroborates the suspected fused factor. These were "IH3 - Sometimes I don't put enough effort when I have unpleasant or difficult tasks to do and I try to pass them to others." and "IH5 - When something does not work out for me I justify myself with the mistakes of others". All items loaded as depicted in Table 2.5.

TESTING THE PORTUGUESE VERSION OF ANPS-S

Table 2.5 OCB factors from EFA (Rotated Component Matrix^a)

	Component		
	1	2	3
PI3 _When something doesn't work, I try to find alternative solutions.	.789	.076	.045
PI1 _I keep informed about what is going on in the organization.	.707	.107	.059
PI2 _When there are problems to solve, I try to solve them before presenting them to the manager.	.679	.234	.150
PI4 _Voluntarily, I try to improve my knowledge, skills and abilities.	.664	.254	.162
IH3 _Sometimes I don't put enough effort when I have unpleasant or difficult tasks to do and I try to pass them to others. (RE)	.185	.739	.183
C1 _Im'm careless about my work (it doesn't matter whether the work is done correctly or not). (RE)	.200	.701	-.079
C3 _I waste time in matters unrelated to work. (RE)	.007	.661	.173
IH5 _When something doesn't work out for me, I justify myself with the mistakes of others. (RE)	.304	.659	-.131
IO1 _I think in the first place about my duties, more than about my own interests.	.070	-.003	.885
IO2 _I make extra effort to benefit the organization, even with personal sacrifices.	.216	.115	.818
Cronbach Alpha / rSB	.725	.674	.705
Composite reliability	.823	.785	.860

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

The emergence of the new fused factor can be partially explained by the change in focus where in the original scale individuals were assessed by someone else while in this situation it has a self-report nature. This is also a plausible reason for having seen some items excluded such as “IH1 - I could complain less about trivial matters (that is, with little importance)” and “IH2 - Sometimes I feel I can contribute to some instability in the team (with tittle-tattle and intrigue)”. Thus, the only workable subscales were Personal Initiative (4 items) and Identification with the Organization (2 items), which we preserved.

A confirmatory factor analysis of this two-factor solution showed acceptable fit indices (CMIN/DF=2.720, $p=.004$, CFI=.963, PCFI=.578, RMSEA=.071, SRMR=.0428) with average loadings reaching .667. OCB CFA model is represented in Figure 2.2 and summarized in Table 2.6. Although RMSEA is slightly above the cut value (0.71 instead of 0.70) taking into consideration all other values, we opted to accept this as a valid solution.

TESTING THE PORTUGUESE VERSION OF ANPS-S

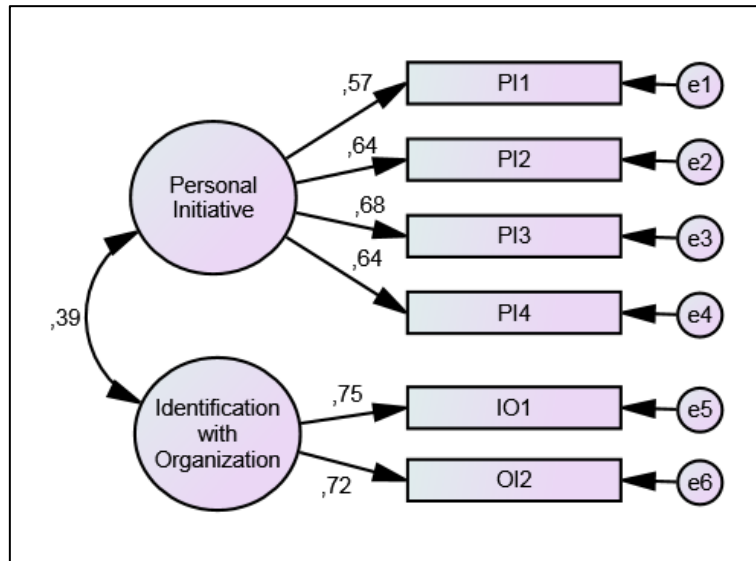


Figure 2.2 OCB CFA results

Table 2.6 OCB CFA results

Dimensions	Items	λ	CR	AVE	Fit indices
Personal Initiative (PI)	PI1	.569	.729	.403	CMIN/DF=2.720 p=.004 CFI=.963 PCFI=.578 RMSEA=.071 SRMR=.0428
	PI2	.642			
	PI3	.679			
	PI4	.643			
Identification with the Organization (IO)	IO1	.749	.703	.543	
	IO2	.724			

The “Personal Initiative” factor achieved the CR threshold (.729) although not the AVE threshold, and “Identification with Organization” meets both AVE and CR thresholds. The squared root of each factor’s AVE (.635 and .737, respectively) is larger than the correlation between factors (.394) which means there is both convergent and discriminant validity.

2.3 Data Analysis Strategy

A factorial analysis (see objective 1 in Literature Review section) of ANPS-s was conducted in the same way, and following the same criteria as those used in the other scales.

TESTING THE PORTUGUESE VERSION OF ANPS-S

Validation of ANPS-s followed Hair et al. (2011) conceptualization. Content validity was achieved by a subjective analysis of the items and we considered that it was statistically tested by factorial analysis. Construct validity was assessed through both convergent and divergent validity. For convergent validity (see objective 2 in Literature Review section) we tested ANPS-s correlations with Mini-IPIP. As it was our intent to test incremental validity, we decided not to use another instrument to test divergent validity. We believe that by studying incremental validity (see objective 4 in Literature Review section) with a mediation process we would be able to see how different ANPS-s is from other personality instrument. Concurrent validity (see objective 3 in Literature Review section) was measured to anticipate predictive validity. Given methodological constrains, for practicality sake, it was not possible to measure predictive and criterion variable with a time lag.

For concurrent validity, we used Structural Equation Modeling (SEM) as our aim was to find possible causal effects between variables (e.g. Jöreskog & Sörbom, 1982). We fulfil the rule of thumb of a sample size of 200 (e.g. Hoelter, 1983) and we used the same fit indices presented for factorial validity.

For incremental validity we have used PROCESS model 4 (Hayes, 2013). We have opted for this procedure as there was the need to consider multiple mediations. PROCESS has the restriction of individual testing for independent and dependent variables (IV and DV). For this reason we had to test 12 mediation models (6 IV and 2 DV).

For SEM models, we have included the control variables as direct predictors of criteria variables. For mediation using PROCESS Macro (Hayes, 2013) we insert these as covariates. For parsimony sake only those covariates that have been found to significantly associate with criteria variables are reported. Table 2.7 presents correlations between variables.

TESTING THE PORTUGUESE VERSION OF ANPS-S

Table 2.7 Correlation matrix to determine control variables

	Gender ^a	Education	Age
Gender ^a	1		
Education	-.087	1	
Age	.019	-.001	1
Extraversion	.052	.010	.008
Neuroticism	-.667**	-.008	.008
Agreeableness	-.355*	.004	.081
Play	.628**	.004	-.226**
Fear	.035	.012	-.025
Sadness	.258	-.051	.082
Seek	-.163	.125*	-.233**
Anger	-.326*	.030	.146**
Care	-.229	-.048	.001
Personal_Init	-.041	.080	.016
Identif_Org	.025	.118*	.239**

*p<.05; **p<.01

^a Considering the categorical nature of gender, for control purposes and in order to identify its association with the remaining variables we conducted a logistic regression to test for significant predictors. Gender: 1=female, 2=male

Considering that all variables are perceptive in nature and have been collected simultaneously from the same source we have considered some remedies when designing this research (Podsakoff, MacKenzie, Lee & Podsakoff, 2003): some temporal separation by placing the scales in different pages, and one at the beginning and the other at the end of the survey; some psychological separation by changing the scale introduction, trying to transmit that what was going to be measured is different from what has been measured before; and guarantee complete anonymity from the respondents. We have also proceeded with Harman's single factor test with both ANPS-s and OCB. From the exploratory factor analysis with principal axis factoring we have not found a single first factor, mixed in nature, and explaining more than half of the variance before rotation. Therefore, we trust there was no variance bias due to common method and we decided to proceed with data analysis.

TESTING THE PORTUGUESE VERSION OF ANPS-S

CHAPTER III. RESULTS

In this section we will present our results for factorial, convergent, concurrent, and incremental validity testing.

3.1 Factorial Validation of Portuguese ANPS-s

As a strategy for testing psychometric quality of ANPS-s we have opted to start by conducting a confirmatory factor analysis on the theoretically driven six factor structure although we believe it is also worthy to test the two factor structure that has been emerging recurrently across studies. For parsimony sake, we started by testing the two factor structure and then proceeded to the six factor structure analysis.

The confirmatory factor analysis of the two-factor ANPS 36 item questionnaire, for the aggregated positive (SEEK, PLAY, CARE) and negative (FEAR, ANGER, SADNESS) emotional systems showed unacceptable fit indices (CMIN/DF=6.609, $p < .001$, CFI=.469, PCFI=.441, RMSEA=.113, SRMR=.1041) in a similar manner of the CFA for the original 6 factor model which also showed unacceptable fit indices (CMIN/DF=3.930, CFI=.729, PCFI=.670, RMSEA=.082, SRMR=.0783). Thus we have proceeded with exploratory factor analyses that, after removal of 15 items, showed a valid 6 factor solution ($KMO=.817$, $.575 < MSA < .925$, Bartlett's $X^2=3866.423$, 210 df, $p < .001$) accounting for 68% of total variance with a Varimax rotation, thus retaining 21 items that achieved criteria as stated in the Analysis Strategy section above. These loaded as depicted in Table 3.1.

TESTING THE PORTUGUESE VERSION OF ANPS-S

Table 3.1 ANPS.s factors from EFAs (Rotated Component Matrix^a)

	Component					
	1	2	3	4	5	6
FEAR3 _I would not describe myself as a worrier. (RE)	.863	.240	-.021	.140	-.022	.045
FEAR2 _I am not frequently jittery and nervous. (RE)	.851	.190	-.015	.111	.020	.017
FEAR1 _People who know me well would say I am an anxious person.	.824	.212	-.029	.113	-.061	.034
FEAR6 _There are very few things that make me anxious. (RE)	.775	.137	-.088	.156	-.083	-.022
SAD1 _I often feel sad.	.267	.840	-.141	.072	-.167	.034
SAD4 _I often feel lonely	.082	.800	-.012	.033	-.016	-.043
SAD2 _I often have the feeling that I am going to cry.	.245	.779	-.098	.148	-.106	.044
SAD3 _I rarely become sad. (RE)	.275	.675	-.049	.237	-.057	-.028
SEEK3 _My curiosity often drives me to do things.	-.023	-.047	.761	-.047	.033	.123
SEEK2 _I am usually not highly curious. (RE)	-.006	.003	.743	-.003	-.006	-.082
SEEK1 _I really enjoy looking forward to new experiences.	-.029	-.100	.724	.026	.235	.178
SEEK4 _I rarely feel the need just to get out and explore things. (RE)	-.098	-.128	.709	.015	.209	.078
ANGER4 _People who know me well would say I almost never become angry. (RE)	.164	.118	.002	.836	-.056	-.041
ANGER2 _My friends would probably describe me as hotheaded.	.093	.120	.021	.803	-.009	-.043
ANGER6 _I hardly ever become so angry at someone that I feel like yelling at them. (RE)	.174	.115	-.037	.798	.050	-.021
PLAY3 _I am very playful.	.036	-.061	.144	-.002	.847	.095
PLAY1 _I am a person who is easily amused and laughs a lot.	-.068	-.291	.202	-.082	.748	.091
PLAY2 _I do not particularly enjoy kidding around and exchanging "wisecracks." (RE)	-.084	.008	.069	.040	.743	.007
CARE2 _I like taking care of children.	.005	.001	.032	-.053	.059	.912
CARE4 _I do not especially like being around children. (RE)	-.101	-.086	.035	-.034	.039	.873
CARE1 _I often feel a strong need to take care of others.	.212	.099	.247	-.021	.090	.514
Cronbach Alpha	.888	.841	.747	.785	.721	.706
Composite reliability	.898	.857	.824	.853	.824	.822

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

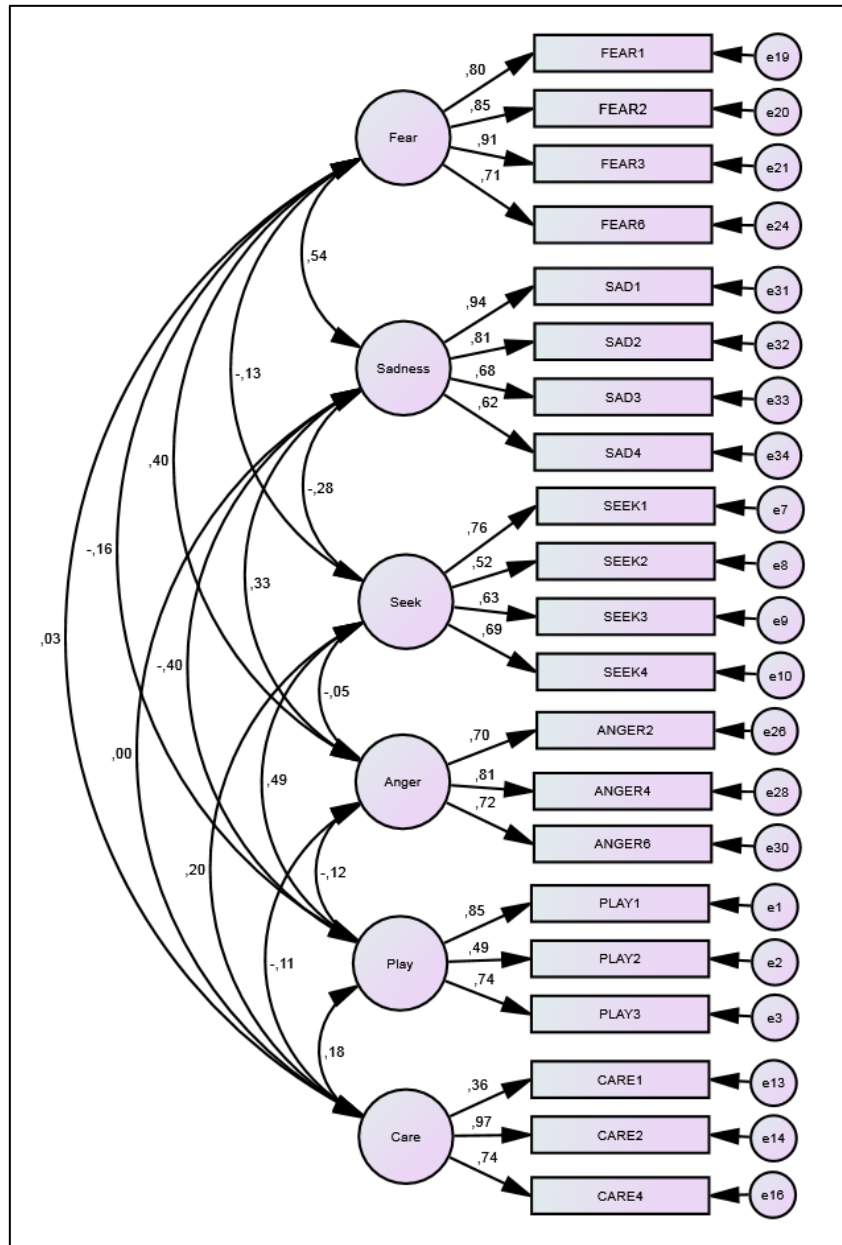
a. Rotation converged in 6 iterations.

The ensuing confirmatory factor analysis showed acceptable fit indices (CMIN/DF=1.758, $p < .001$, CFI=.965, PCFI=.799, RMSEA=.041, SRMR=.053) with average loadings reaching .73 and average AVEs at .548. Although one case (SEEK scale) showed an AVE =.430, CR value was acceptable (.748). Hence, all constructs in the analysis present acceptable indication

TESTING THE PORTUGUESE VERSION OF ANPS-S

of convergent validity. ANPS-s CFA model is represented in Figure 3.1 and summarized in Table 3.2. Table 3.3 indicates good discriminant validity of the scales.

Figure 3.1 ANPS-s CFA results



TESTING THE PORTUGUESE VERSION OF ANPS-S

Table 3.2 ANPS-s CFA results

Dimensions	Items	λ	CR	AVE	Fit indices
FEAR	FEAR1	.798	.890	.672	CMIN/DF=1.758 p<.001 CFI=.965 PCFI=.799 RMSEA=.041 SRMR=.053
	FEAR2	.845			
	FEAR3	.914			
	FEAR6	.707			
SADNESS	SAD1	.937	.851	.594	
	SAD2	.811			
	SAD3	.678			
	SAD4	.617			
SEEK	SEEK1	.758	.748	.430	
	SEEK2	.520			
	SEEK3	.628			
	SEEK4	.693			
ANGER	ANGER2	.699	.787	.553	
	ANGER4	.810			
	ANGER6	.717			
PLAY	PLAY1	.849	.741	.500	
	PLAY2	.487			
	PLAY3	.736			
CARE	CARE1	.365	.757	.539	
	CARE2	.967			
	CARE4	.741			

Table 3.3 ANPS-s discriminant analysis via AVE^a

	PLAY	SEEK	CARE	FEAR	ANGER	SADNESS
PLAY	.707					
SEEK	.487***	.656				
CARE	.180**	.203**	.734			
FEAR	-.160**	-.126*	.030	.820		
ANGER	-.124*	-.054	-.108	.398***	.744	
SADNESS	-.405***	-.284***	-.003	.543***	.328***	.771

^a Diagonals show squared root AVE for each construct. *** p<.001; **p<.01; *p<.05

3.2 Convergent Validation of Portuguese ANPS-s

Convergent validity was tested with a SEM model where latent variables of both ANPS-s and Mini-IPIP were linked with covariances. The full correlation model (all latent variables linked among themselves) showed valid fit indices (CMIN/DF=2.068, $p < .001$, CFI=.933, PCFI=.786, RMSEA=.049, SRMR=.0556), and is represented in Figure 3.2. The covariances and respective significance levels are showed in Table 3.4.

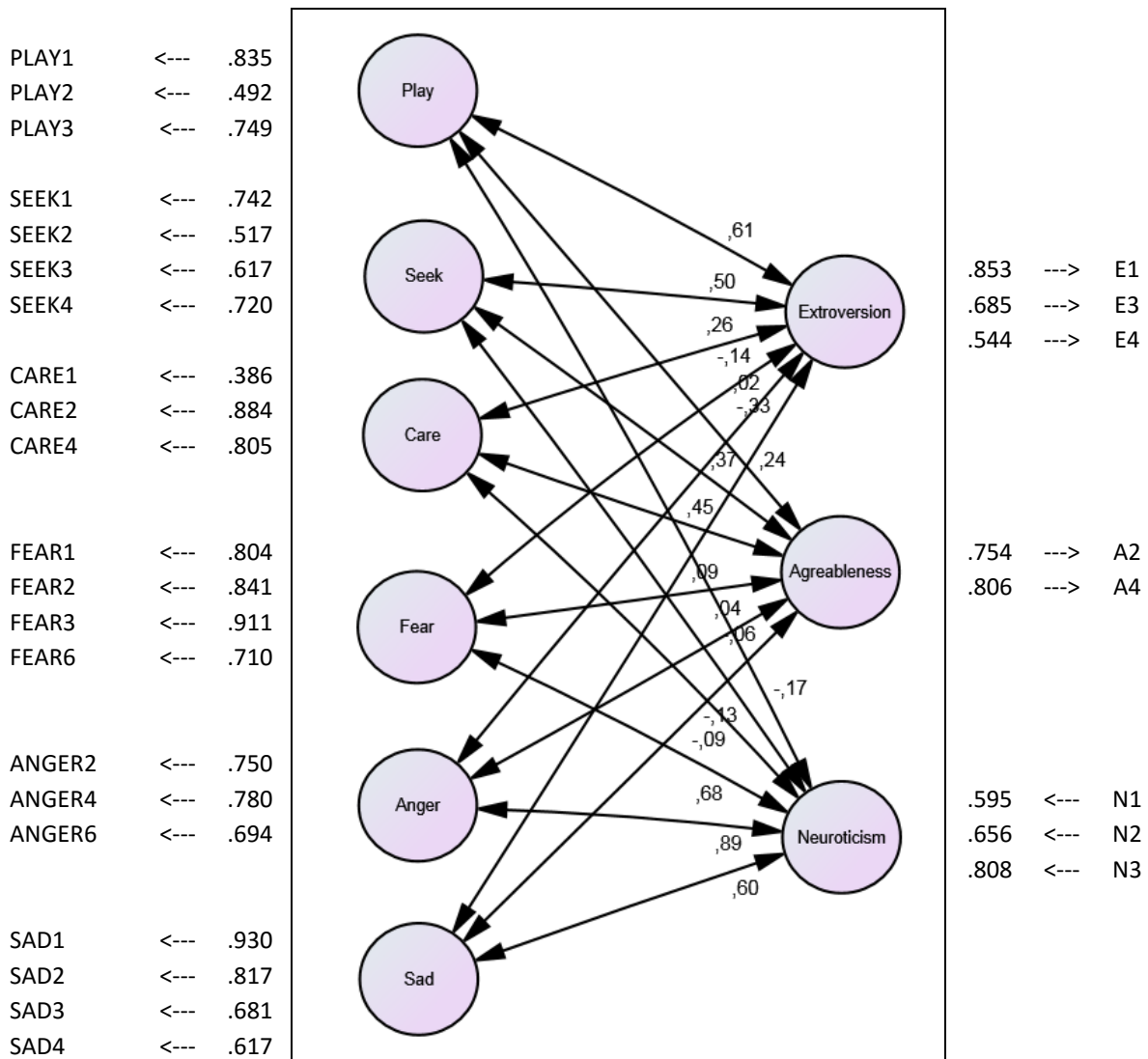


Figure 3.2 Convergent validity SEM model

TESTING THE PORTUGUESE VERSION OF ANPS-S

Table 3.4 ANPS/Mini-IPIP covariances

	PLAY	CARE	ANGER	SEEK	SADNESS	FEAR
Extraversion	.540***	.130***	-	.430***	-.458***	-.181*
Agreeableness	.142***	.151***	-	.216***	-	-
Neuroticism	-.105**	-	.727***	-.080*	.606***	.644***

*** p<.001; **p<.01; *p<.05

Our results show significant positive relations between all positive systems and positive Big-Five factors (Extraversion and Agreeableness). Negative systems are positively related to Neuroticism. We were also able to find significant negative relations between PLAY-Neuroticism, SEEK-Neuroticism, SADNESS-Extraversion, and FEAR-Extraversion.

3.3 Concurrent Validation of Portuguese ANPS-s

Concurrent validity was tested with a SEM where latent variables of both ANPS-s and OCB were linked with covariances. At first we have considered age and education as control variables, as we expected them to be correlated to our dependent variable (see Table 2.7). However, education was not statistically significant in our concurrent validity model. Thus, we only present age as a control variable.

The full correlation model (all latent variables linked among themselves) showed valid fit indices (CMIN/DF=1.848, p<.001, CFI=.920, PCFI=.786, RMSEA=.050, SRMR=.0644).

TESTING THE PORTUGUESE VERSION OF ANPS-S

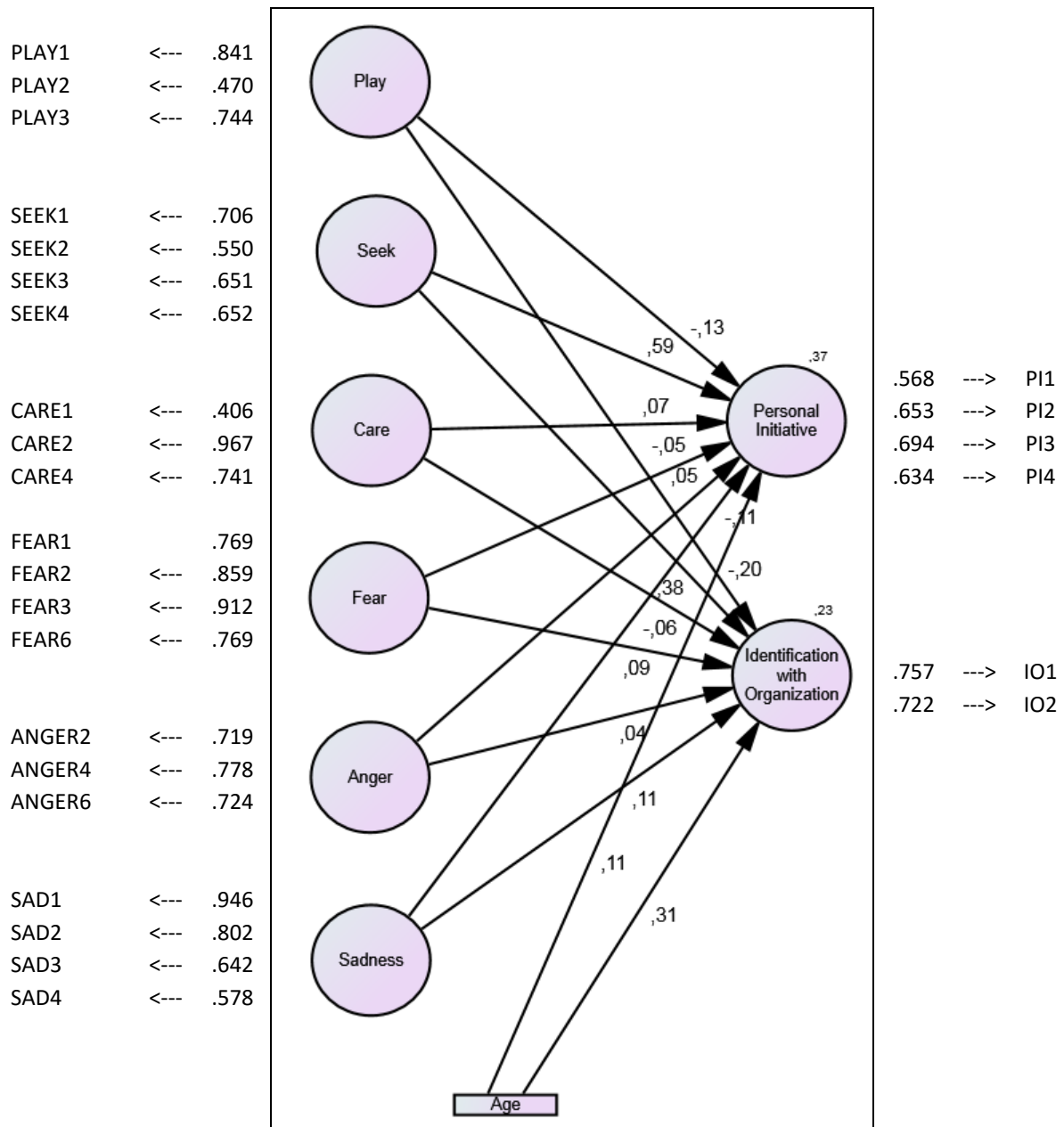


Figure 3.3 Concurrent validity SEM model

Our results are significant ($p < .001$) for SEEK-Personal Initiative, and SEEK-Identification with the Organization. Our control variable, age, is also statically significant ($p < .001$) for Identification with the Organization. The other dimensions aren't able to predict any of OCB dimensions. However, PLAY- Identification with the Organization is not far from being valid from a negative significant relation ($p = .021$).

After all, our model explains 37% of Personal Initiative variability and 23% of Identification with the Organization variability.

3.4 Incremental Validation of Portuguese ANPS-s

As we have mentioned before, incremental validity was tested using a mediation model in PROCESS. Whenever the dependent variable was Identification with the Organization we have controlled education level and age as they are significantly correlated to this dependent variable (see Table 2.7). We have also decided to control gender as it is significantly correlated to Neuroticism and Agreeableness. Although these two dimensions represent mediators, they take place as dependent variables in one of the model relations (a_1 , a_2 , and a_3 in Figure 3.4).

We briefly summarize our results in Table 3.5. For more information about the other results, please see Appendix D.

Although our previous test seems to indicate SEEK as the only OCB predictor, we have decided to test all variables again. Hayes (2013) claims that statistical results should not be taken as ultimate criteria to proceed this kind of analyses, if we have some theoretical support for the relations we want to study. Although we don't have strong theoretical support, as we have seen, we have some expectations on some relations. Also, one can easily imagine a situation where we can have direct and indirect effects very close in value but with different signals. In a case like this the total effect would be 0. However, a direct effect would, in fact, exist. So, maybe there is a possibility that some relations have escape from our analysis.

Moreover, as PROCESS software operates in a different way from AMOS we were expecting some apparently different results in what takes to the predictive ability of ANPS-s to OCB. An explanation for this situation may be the fact of AMOS work with all variables at the same time and PROCESS with one IV/DV pair at each time.

TESTING THE PORTUGUESE VERSION OF ANPS-S

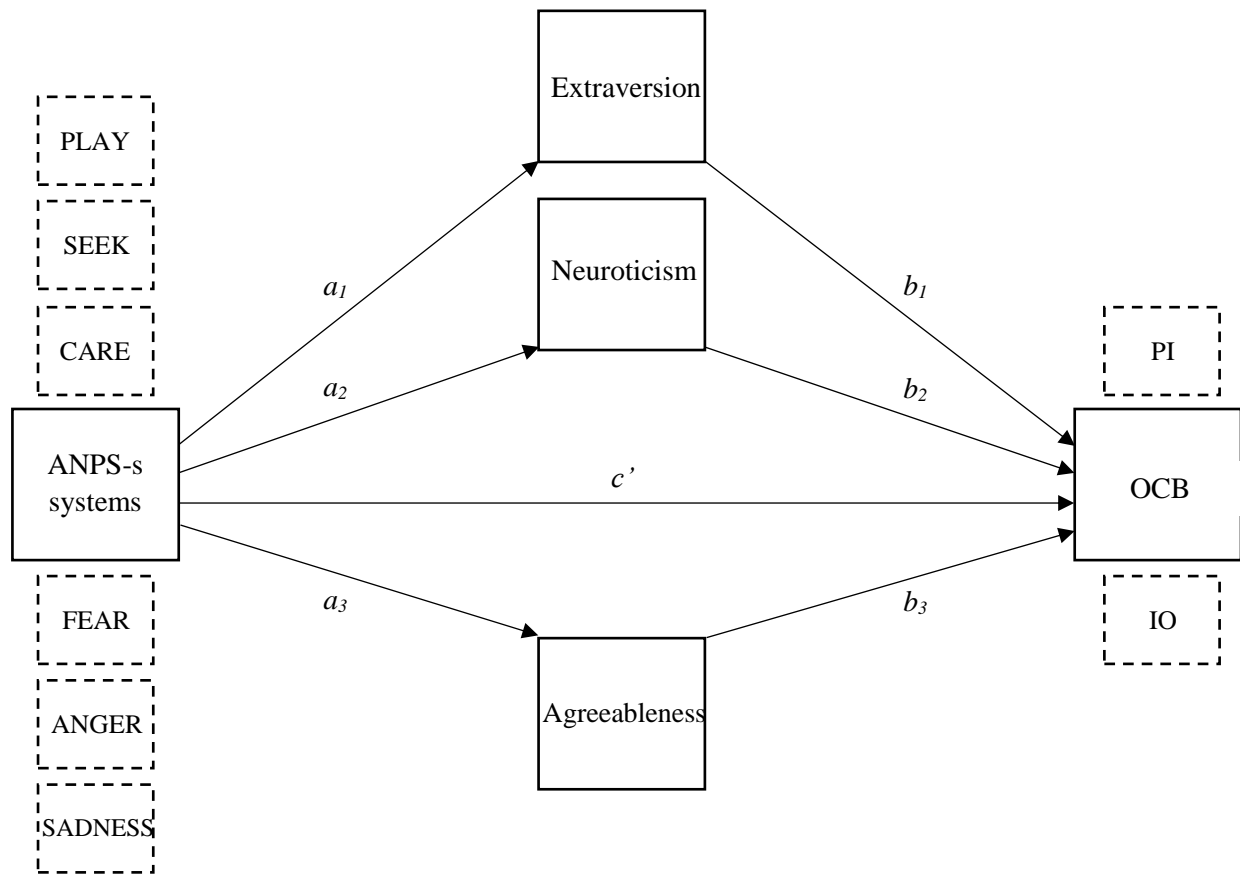


Figure 3.4 Mediation model

TESTING THE PORTUGUESE VERSION OF ANPS-S

Table 3.5 Mediation results

I.V.	D.V.	M.V.	Results
PLAY	Personal Initiative	Agreeableness	Total Mediation There is no evidence that PI is positively influenced by PLAY considering the block of mediators and especially Agreeableness and Extraversion.
		Neuroticism Extraversion	
PLAY	Identification with the Organization	Agreeableness	No Relation No total, direct or indirect effects.
		Neuroticism Extraversion	
SEEK	Personal Initiative	Agreeableness	Partial Mediation PI is positively influenced by SEEK taking into consideration the block of mediators and especially Agreeableness (see Tables 3.6-3.7).
		Neuroticism Extraversion	
SEEK	Identification with the Organization	Agreeableness	Partial Mediation IO is positively influenced by SEEK even when Neuroticism is controlled (see Tables 3.8-3.9).
		Neuroticism Extraversion	
CARE	Personal Initiative	Agreeableness	Total Mediation There is no evidence that PI is positively influenced by CARE considering the block of mediators and especially Agreeableness and Extraversion.
		Neuroticism Extraversion	
CARE	Identification with the Organization	Agreeableness	No Relation No total, direct or indirect effects.
		Neuroticism Extraversion	
SADNESS	Personal Initiative	Agreeableness	Partial Mediation PI is positively influenced by SADNESS even when Extraversion is controlled (see Tables 3.10-3.11).
		Neuroticism Extraversion	
SADNESS	Identification with the Organization	Agreeableness	Inconsistent There is a total effect but no direct or indirect effects.
		Neuroticism Extraversion	
FEAR	Personal Initiative	Agreeableness	Total Mediation There is no evidence that PI is positively influenced by FEAR when Extraversion is controlled.
		Neuroticism Extraversion	
FEAR	Identification with the Organization	Agreeableness	Inconsistent There is a total effect but no direct or indirect effects.
		Neuroticism Extraversion	
ANGER	Personal Initiative	Agreeableness	Total Mediation There is no evidence that PI is positively influenced by ANGER when Neuroticism is controlled.
		Neuroticism Extraversion	
ANGER	Identification with the Organization	Agreeableness	No Relation No total, direct or indirect effects.
		Neuroticism Extraversion	

TESTING THE PORTUGUESE VERSION OF ANPS-S

There are some ANPS-s dimensions with specific variance for some OCB dimensions even when we control the relation through a mediation process using other personality instrument (Mini-IPIP). This was the case of SEEK-Personal Initiative; SEEK-Identification with the Organization; SADNESS-Personal Initiative. The specific variance from these relations allows us to claim for incremental validity for the aforementioned basic systems. These mediation models are summarized in tables 3.6-3.11. Although all values we present in these tables took into consideration the control variables, for clarity sake we decided not to present them. For comprehensiveness sake they are presented in the outputs (Appendix D).

Table 3.6 SEEK-PI mediation

Antecedent	Consequent															
	<i>M</i> ₁ (Extraversion)			<i>M</i> ₂ (Neuroticism)			<i>M</i> ₃ (Agreeableness)			<i>Y</i> (PI)						
	Coeff.	<i>SE</i>	<i>p</i>	Coeff.	<i>SE</i>	<i>p</i>	Coeff.	<i>SE</i>	<i>p</i>	Coeff.	<i>SE</i>	<i>p</i>				
<i>X</i> (SEEK)	<i>a</i> ₁	.476	.064	<.001	<i>a</i> ₂	-.203	.066	.002	<i>a</i> ₃	.294	.056	<.001	<i>c'</i>	1.976	.367	<.001
<i>M</i> ₁	-	-	-	-	-	-	-	-	-	-	-	-	<i>b</i> ₁	.362	.279	.194
<i>M</i> ₂	-	-	-	-	-	-	-	-	-	-	-	-	<i>b</i> ₂	-.445	.272	.1022
<i>M</i> ₃	-	-	-	-	-	-	-	-	-	-	-	-	<i>b</i> ₃	.848	.321	.009
Constant	<i>i</i> _{<i>M</i>₁}	1.077	.307	<.001	<i>i</i> _{<i>M</i>₂}	4.002	.315	<.001	<i>i</i> _{<i>M</i>₃}	3.503	.268	<.001	<i>i</i> _{<i>Y</i>}	12.737	2.250	<.001
		<i>R</i> ² = .140				<i>R</i> ² = .076				<i>R</i> ² = .090				<i>R</i> ² = .183		
		<i>F</i> (2,338) = 27.400, <i>p</i> = <.001				<i>F</i> (2,338) = 13.836, <i>p</i> = <.001				<i>F</i> (2,338) = 16.645, <i>p</i> = <.001				<i>F</i> (5,335) = 14.961 , <i>p</i> = <.001		

From Table 3.6 we can see that 18.3% of variance in PI is accounted by mediators (Agreeableness, *p*<0.01) and the SEEK system.

TESTING THE PORTUGUESE VERSION OF ANPS-S

Table 3.7 SEEK-PI mediation (total, direct and indirect effects)

Total effect of X on Y ($c' + a_1b_1 + a_2b_2 + a_3b_3$)					
Effect	SE	t	p	LLCI	ULCI
2.4875	.3324	7.4842	.0000	1.8337	3.1412
Direct effect of X on Y (c')					
Effect	SE	t	p	LLCI	ULCI
1.9758	.3666	5.3901	.0000	1.2548	2.6969
Indirect effect of X on Y (a_i*b_i)					
	Effect	Boot SE	BootLLCI	BootULCI	
TOTAL	.5117	.1913	.1553	.9139	
Extraversion	.1722	.1434	-.0945	.4720	
Neuroticism	.0901	.0746	-.0147	.2860	
Agreeableness	.2493	.1209	.0567	.5349	

Table 3.7 shows the existence of a valid direct between SEEK and PI, even considering some indirect effect provided by Agreeableness.

Table 3.8 SEEK-IO mediation

Antecedent	Consequent															
	M_1 (Extraversion)			M_2 (Neuroticism)			M_3 (Agreeableness)			Y (IO)						
	Coeff.	SE	p	Coeff.	SE	p	Coeff.	SE	p	Coeff.	SE	p				
X (SEEK)	a_1	.510	.066	<.001	a_2	-.206	.068	.003	a_3	.338	.057	<.001	c'	1.411	.602	.197
M_1	-	-	-	-	-	-	-	-	-	-	-	-	b_1	-.402	.439	.3598
M_2	-	-	-	-	-	-	-	-	-	-	-	-	b_2	1.258	.425	.003
M_3	-	-	-	-	-	-	-	-	-	-	-	-	b_3	.521	.508	.306
Constant	i_{M1}	.942	.487	.054	i_{M2}	4.001	.502	<.001	i_{M3}	3.180	.421	<.001	i_Y	-6.145	4.596	.182
	$R^2 = .150$			$R^2 = .076$			$R^2 = .115$			$R^2 = .110$						
	$F(4,336) = 14.871,$			$F(4,336) = 6.889,$			$F(4,336) = 10.939,$			$F(7,333) = 5.873,$						
	$p = <.001$			$p = <.001$			$p = <.001$			$p = <.001$						

From Table 3.8 we can see that 11% of variance in IO is accounted by mediators (Neuroticism, $p < 0.01$) and the SEEK system.

TESTING THE PORTUGUESE VERSION OF ANPS-S

Table 3.9 SEEK-IO mediation (total, direct and indirect effects)

Total effect of X on Y ($c' + a_1b_1 + a_2b_2 + a_3b_3$)					
Effect	SE	t	p	LLCI	ULCI
1.1229	.5364	2.0932	.0371	.0676	2.1781
Direct effect of X on Y (c')					
Effect	SE	t	p	LLCI	ULCI
1.4113	.6023	2.3431	.0197	.2265	2.5961
Indirect effect of X on Y (a_i*b_i)					
	Effect	Boot SE	BootLLCI	BootULCI	
TOTAL	-.2884	.3360	-.9747	.3508	
Extraversion	-.2054	.2381	-.6954	.2498	
Neuroticism	-.2594	.1168	-.5508	-.0775	
Agreeableness	.1764	.2295	-.2344	.6712	

Table 3.9 shows the existence of a valid direct between SEEK and IO, even considering some indirect effect provided by Neuroticism.

Table 3.10 SADNESS-PI mediation

Antecedent	Consequent															
	M_1 (Extraversion)			M_2 (Neuroticism)			M_3 (Agreeableness)			Y (PI)						
	Coeff.	SE	p	Coeff.	SE	p	Coeff.	SE	p	Coeff.	SE	p				
X (SAD)	a_1	-.220	.050	<.001	a_2	.484	.042	<.001	a_3	-.016	.043	.710	c'	-.893	.307	.004
M_1	-	-	-	-	-	-	-	-	-	-	-	-	b_1	.657	.280	.020
M_2	-	-	-	-	-	-	-	-	-	-	-	-	b_2	-.134	.331	.686
M_3	-	-	-	-	-	-	-	-	-	-	-	-	b_3	1.305	.324	<.001
Constant	i_{M1}	3.933	.158	<.001	i_{M2}	1.660	.133	<.001	i_{M3}	4.924	.137	<.001	i_Y	20.387	2.013	<.001
		$R^2 = .055$				$R^2 = .320$				$R^2 = .016$				$R^2 = .134$		
		$F(2,338) = 9.802,$				$F(2,338) = 79.629,$				$F(2,338) = 2.703,$				$F(5,335) = 10.328,$		
		$p < .001$				$p < .001$				$p = .069$				$p < .001$		

From Table 3.10 we can see that 13.4% of variance in PI is accounted by mediators (Extraversion, $p < 0.05$; Agreeableness, $p < .001$) and the SADNESS system.

TESTING THE PORTUGUESE VERSION OF ANPS-S

Table 3.11 SADNESS-PI mediation (total, direct and indirect effects)

Total effect of X on Y ($c' + a_1b_1 + a_2b_2 + a_3b_3$)					
Effect	SE	t	p	LLCI	ULCI
-1.1228	.2582	-4.3493	.0000	-1.6306	-.6150
Direct effect of X on Y (c')					
Effect	SE	t	p	LLCI	ULCI
-.8927	.3067	-2.9107	.0038	-1.4960	-.2894
Indirect effect of X on Y (a_i*b_i)					
	Effect	Boot SE	BootLLCI	BootULCI	
TOTAL	-.2301	.2167	-.6467	.2113	
Extraversion	-.1445	.0775	-.3335	-.0229	
Neuroticism	-.0647	.1797	-.4178	.2912	
Agreeableness	-.0209	.0561	-.1529	.0753	

Table 3.11 shows the existence of a valid direct between SADNESS and PI, even considering some indirect effect provided by Extraversion.

CHAPTER IV. DISCUSSION

Hypotheses result from our goals in articulation with what has been reported in earlier researches. In this section we will discuss findings, considering each goal we have presented.

4.1 To check if the Portuguese version of ANPS-s is able to assess 6 of the seven emotional systems presented in Neuroaffective Theory

We confirmed the original factorial solution, testing convergent and discriminant validities within factorial validation (H1). However, it was necessary to eliminate some items in order to get a valid final solution. A detailed examination on each item, suggests margin for improvement in some items' nature. We believe that some items are far from a good description of the affective system to each they belong. Also, CARE system is operationalized in a way that is biased to favour traditional women's role in protecting children, although no correlation with gender was found in this study. Moreover, there is a considerable number of items formulated in a negative way. Considering these observations, reformulating some of the ANPS-s items may be advantageous. Even considering the described limitations we were able to get some interesting results.

Our results have shown discriminant validity for ANPS-s six factors. Some previous studies (e.g. Davis et al., 2003) have found two factors (positive and negative). Although we haven't found this factorial structure it is possible to analyse that some systems are more correlated than others. In a general way the positive systems are positively correlated to each other and the negative systems are also positively correlated to each other. At the same time, positive systems are negatively correlated to negative ones (with exception for CARE correlations with negative systems).

Before our results, in Data Analysis Strategy section, we have presented a correlational matrix (Table 2.7) where we have seen that gender is significantly correlated to PLAY (positively) and ANGER (negatively). Women seem to have less PLAY and higher ANGER. Previous gender findings for ANPS highlighted differences especially for CARE and SADNESS (e.g. Davis, et al., 2003; Geir et al., 2014), however, some studies found results similar to those we did (Geir, et al., 2014; Pingault, et al., 2011).

Considering age, Özkara-Gradwohl et al. (2014) have observed that the power of systems (exception for CARE) seems to decrease with age. In our study, we have only found significant correlations between age and PLAY (negative), SEEK (negative), and ANGER

(positive). So, in our sample only PLAY and SEEK seem to decrease with age and ANGER seems to increase with age. We haven't found significant associations with education level.

4.2 To check if ANPS-s is a good personality measure

Studying convergent validity we have found correlations between ANPS-s and Mini-IPIP (H2). As reported in previous studies (e.g. Davis et al., 2003), our results show that each ANPS scale is related at least to one of the Big Five dimensions (H2.1). Our findings meet previous researches (Pahlavan et al., 2008; Abella et al., 2011), as we have found correlations between positive basic emotional systems and Big-Five positive dimensions (H2.2), and between negative basic systems and the negative Big-Five dimension (H2.3).

Also, PLAY and SEEK did show negative significant correlations with Neuroticism (H2.4) although CARE did not. We believe this is possibly explained by a curvilinear relation between care and Neuroticism once care-focused behaviour can also be neurotically motivated (e.g. it has been related with parental over protection, Coplan, Reichel & Rowan (2009). FEAR and SADNESS are negatively related to Extraversion. However we didn't find positive relations between ANGER and Extraversion neither negative relations between Agreeableness and negative ANPS dimensions. So H2.5 was only partially supported. We were not able to test H2.6 due to Openness dimension failure.

All in all, associations found between ANPS-s and Mini-IPIP follow the expected pattern especially between the same-valence emotional variables (positive ANPS-s – positive Mini-IPIP, and negative ANPS-s – negative Mini-IPIP). Therefore we conclude that ANPS-s shows good convergent validity taking as comparison variable the Mini-IPIP measure.

Although our results show that ANPS-s has adequate convergent validity taking as comparison variable the Mini-IPIP measure, we should note that we were not able to test this validity with all Big-Five dimensions. So, it wasn't possible to test correlations with Conscientiousness and Openness to Experience. This happened because, as is explained in Method section, we have discarded these dimensions.

4.3 To check if ANPS-s is able to predict organizational citizenship behaviour, a proxy measure of contextual performance

When testing the predictive ability of ANPS-s for OCB, we were able to confirm some previous expectations (Table 4.1). The neutral relations were verified, as it wasn't possible to

TESTING THE PORTUGUESE VERSION OF ANPS-S

find out linear relations in that situations. SEEK-Personal Initiative, and SEEK-Identification with the Organization were found just as it was expected.

Table 4.1 Concurrent validity results

		Criterion Variables	
		Personal Initiative	Identification with Organization
Predictor Variables	PLAY	<i>Negative</i>	<i>Negative</i>
	SEEK	<i>Positive*</i>	<i>Positive*</i>
	CARE	<i>-*</i>	<i>Positive</i>
	FEAR	<i>Negative</i>	<i>-*</i>
	ANGER	<i>-*</i>	<i>Negative</i>
	SADNESS	<i>Negative</i>	<i>-*</i>

*verified relations

However, we didn't meet some other expectations:

PLAY is able to negatively predict Personal Initiative. PLAY is operationalized in an interpersonal way and maybe it can work as a distractor for situations where this kind of PLAY can be verified. The way in which Personal Initiative is operationalized focus on individual activities. Thus, PLAY may not play an important role here as this kind of person may distracts with others and not necessarily alone.

PLAY is able to negatively predict Identification with the Organization. We believe that the inexistence of a significant relation may be due to the same reasons we have presented above. However, we should note that this relation is almost significant ($p=.021$) and is established in the expected way (negative).

CARE is able to positively predict Identification with the Organization. According to our results there is no linear relation between these two variables. This situation maybe means that CARE, at least in the way it is operationalized, doesn't give us clear information about behaviours close to altruism towards an organization. So, CARE probably is an emotional system more linked to interpersonal relations and maybe works as a better predictor of behaviours towards others.

FEAR is able to negatively predict Personal Initiative. Our results showed no linear relation between these two variables, although we still believe that our supposition is sound.

TESTING THE PORTUGUESE VERSION OF ANPS-S

So, one can conceive that may be, for some people, or at a given intensity of FEAR, this emotional system may induce “defensive behaviours” like those described in Personal Initiative. But for other people, or other intensity of FEAR, this system may reduce people’s availability.

ANGER is able to negatively predict Identification with the Organization. Our findings may show we are, again, in presence of a non-linear relation because it still makes sense to think that ANGER and Identification with the Organization can be negatively related. However, as we expect to happen with FEAR and Personal Initiative, behaviour (Identification with the Organization) may differ between individuals or with ANGER intensity. So, sometimes, ANGER may act like a booster for behaviours of Identification with Organization, for example for self-protection.

SADNESS is able to negatively predict Personal Initiative. Given the absence of the expected results we can question whether for some people, or intensity of SADNESS, Personal Initiative and job dedication may serve to deal with sadness in job context. Again, this may happen if we are dealing with nonlinear relations.

Our model shows that, controlling age, only SEEK is able to predict OCB dimensions: 37% of Personal Initiative variability and 23% of Identification with the Organization variability (for IO, age is also a valid predictor).

It is quite interesting that our results isolate SEEK system for OCB prediction. We can see SEEK system as being particularly related to Openness dimension (FFM), as they seem to share some characteristics in their definitions. There are two other important arguments (biological and empirical) that, taken together, led us to this comparison: both dimensions are highly linked to dopaminergic function (Panksepp, 1998; DeYoung et al., 2005), and previous studies (Davis et al., 2003, Davis & Panksepp, 2011 Özkara-Gradwohl et al., 2014) were able to isolate SEEK and Openness in an unique factor. Given what has been described and some evidence that links Openness to some cognitive functions and IQ (DeYoung et al., 2005), we can ask whether SEEK system can be a powerful dimension able to predict both contextual performance (studied in the present research) and task performance. It will be interesting to explore this in future researches.

Our results are valid results but we were expecting stronger ones. Actually there is a lot of OCB variability that has not been explained. However, we should note that: a) we were not able to test all OCB dimensions, what could have changed some of our results. Maybe some

of ANPS-s dimensions are able to explain some of the OCB dimensions that were not present; b) we have only tested linear relations. As we have seen, some of these relations may have a more complex interpretation and might be explained by nonlinear relations.

4.4 To check if ANPS-s gives us more information on organizational citizenship behaviour than an instrument from the most used approach in this context

When testing incremental validity, we have used three mediators that represent constructs from the Big-Five personality approach. These constructs had been pointed out as predictors of contextual performance/OCB before (Hurtz & Donovan, 2000; Organ, et al., 2006; Elanain, 2007). So our intent was to test if ANPS-s was able to go beyond this already studied dimensions.

Our incremental validity test has shown some mixed results. SEEK and Agreeableness (both positively) predict 18.3% of Personal Initiative variability, SEEK and Neuroticism (both positively) predict 11% of Identification with the Organization variability. SADNESS, Extraversion, and Agreeableness (the first negatively and the other two positively) explain 13.4% of Personal Initiative variability. Although these values come from predictor and mediators contribution, as we have seen, there is evidence to support specific contribution of SEEK and SADNESS to these OCB dimensions (SADNESS only to Personal Initiative). Comparing these results to those we have found when testing concurrent validity, we can see that R^2 values decreased. This can probably be explained because test isolates all variables and so we may have lost some results that we believe are due to interactions between variables. We should also note that in this test a new relation emerged, when we compare these results to those found in concurrent validity: SADNESS-Personal Initiative. This may be due, again, to the fact that we have used different data analysis techniques that handle variables in different ways.

Total mediation shows that mediators can retain ANPS-s predictive ability. So, in these situations we didn't find specific ANPS-s variance.

We have also found situations of no relation. In these cases our results show that for this sample, there is no evidence for relations between those systems and OCB dimensions. However, one should note that this situation only occurs for Identification with the Organization prediction. For this reason we cannot conclude that those systems are not

adequate for OCB prediction. Rather, we can only conclude that maybe this OCB dimension is better predicted by different constructs.

Our results also present some situations of inconsistency. We have decided for this label as we can't explain the existence of a total effect without either direct or indirect effects. Although we have no sustained explanation for these cases, we can point out some possible directions: a) the inexistence of some linear relations doesn't necessarily mean that there is no relation, maybe there are some nonlinear relations; b) neither Mini-IPIP nor ANPS-s would be able to singly explain OCB and so no indirect or direct effects appear. However, maybe together they can explain something and then a total effect emerges; c) again, it is interesting to note that this inconsistencies happen with Identification with the Organization dimension. As presented in Method section, this factor only comprises two items, and this may be compromising our results.

Again, it is important to note that we weren't able to test all OCB dimensions. Also, for mediation test, we didn't use all Mini-IPIP dimensions, as described in Method section.

Although we have found incremental validity (H4) we were expecting ANPS-s to explain more specific variance in OCB because this instrument is a measure of personality based on actual neurobiological processes (Neuman, 2014).

Although it is not the aim of our research, it is interesting to note that there are some relevant results in what takes to the ability of ANPS-s to explain Mini-IPIP. These results can be seen in R^2 values for a_1 , a_2 , and a_3 in Tables 3.6, 3.8, and 3.10, which led us to think that Affective Neuroscience basic systems might be so basic that can be able to explain other personality constructs.

So, we believed that ANPS-s would give us more specific information and would be able to survive to Big-Five dimensions. We have verified this situation for some systems but, as we have described, we have also found some other results. However, as mentioned, there are some limitations that may have contributed to our results.

4.5 Limitations and Suggestions for Future Research

Our study implied many stages, specific goals and statistical analyses in order to match the requirements of the empirical design consistent with the purpose of the research. When we try a different approach and take risk to go further, we know we can face with some obstacles. So, although we recognize the importance of some results we have achieved, we must also acknowledge some important limitations.

Measures

Jaak Panksepp's conceptualization of personality, based on the functioning of basic systems (e.g. Panksepp, 2005) is definitely a new and promising approach. In this research we have had the opportunity to specify what is new and the gains we believe this approach can bring. Personality as it's seen, comes from basic systems, which leads us to believe that it has a more genetic basis and temporal stability. Of course we admit that some variations in systems functioning may occur, and we also know that behaviours may change through learning, involving relations between more subcortical areas and more cortical ones (e.g. Panksepp, 1998).

Analysing ANPS (and ANPS-s too) items, we reason that some of them represent a poor operationalization of basic systems functioning. In our opinion some items fail to express really basic functions, such as "I am known as one who keeps work fun" (ANPS 2.4), "I love being around baby animals" (ANPS 2.4). Other items seem to be gender biased, like "I like taking care of children (ANPS 2.4 and ANPS-s). Although acknowledging weaknesses we still believe ANPS-s has content validity. However, we think it must be improved.

As we have described in Method section each instrument was psychometrically tested to ensure valid and reliable measures. During these processes we experienced some problems related to factorial structure and loadings. These difficulties led us to delete some items and sometimes suppress some dimensions. Our decisions were important to ensure the technical quality of the measures and the trustworthiness of results. However, we know that this situation may have weakened our results, as we weren't able to test some dimensions of OCB, and Mini-IPIP.

Another possible problem is the fact that some dimensions are assessed mostly by items in a negative format. This is the case, for example, of FEAR and ANGER in ANPS-s, and Interpersonal Harmony in OCB. We believe that this option may have also contributed to some difficulties during the psychometric validation of the scales.

Also, due to problems with the short version of the Marlowe-Crowne Social Desirability Scale factorial validity, we were not able to use this scale. The difficulties we faced led us to believe that we probably haven't chosen the most adequate instruments.

We have changed OCB scale from other-report to self-report. Although this procedure shouldn't have contaminated results (cf. Carpenter et al., 2014), and we took care in changing some items to avoid social desirability, we believe the other-self shift can explain some problems with the factorial validation.

TESTING THE PORTUGUESE VERSION OF ANPS-S

Sample

Our sample comes from a convenience strategy, followed by a snowball effect. To maximize our results we believe it would be important to have a random sample even though extraneous variables are controlled for. At the same time it would be important to have a larger sample, particularly to answer OCB measure.

Data analysis software

Another limitation in this study is the use of different data analysis techniques and software. These may represent a limitation for this study as it may lead to different interpretations on ANPS-s predictive ability. However, judging on techniques previously used in the same sort of study focusing on ANPS, we believe that the present study represents a further step for future researches.

Future Research

The limitations we have just presented can be important to set new goals and design new researches. Therefore, firstly it is important to rethink ANPS-s. This new personality measure should try to reflect the basic processes intrinsic to each basic system. By doing this, content validity would be improved with possible better subsequent results.

After building a new ANPS-s it would be interesting to replicate the present study and analyse possible differences in results. This new study should also consider the other limitations we have presented. Thus, it would be important to: chose a different Big-Five, and Socially Desirability measures; collect information from different sources (e.g. get OCB assessment from supervisors); and enlarge the sample in order to get more congruent results.

After overcoming these limitations, we believe it would be interesting to introduce one more step in this research:

Relation between Emotional and Cognitive Systems

As we know, an important characteristic for humans is the link between subcortical areas and cortex, in particular the frontal cortex (Panksepp, 2005; Panksepp & Watt, 2011; Panksepp, 2015), that is highly developed in humans. Emotions are all around us, and even a fly has its own (Damasio, 2003), however, the ability to feel, learn, reflect or verbalize them is where brain development makes a difference. So, when studying an emotion-based theory we believe it is important to consider the relation between subcortical and cortical areas, in particular emotion regulation processes.

TESTING THE PORTUGUESE VERSION OF ANPS-S

Some authors assumed that emotional and cognitive systems are independent and located in totally separated brain areas, but this doesn't correspond to what actually happens. For example, from Damasio researches (e.g. 2003) we know that the stimulus assessment is made at higher order association cortices and triggering occurs in the amygdala.

More than just being connected, cognitive and emotional systems seem to share some brain areas. Hippocampus is seen as part of the emotional system but it also plays a critical role for memory, which is a cognitive function. The relation between thinking and feeling has been discussed over the time, for example with Aristotle, Socrates, Plato, Descartes, among others (Forgas, 2001).

Emotions, as we have seen, may have consequences in cognitive processes and how these can translate in better adjustment to some tasks (Fiedler, 2001). Gilligan & Bower (1984) also present the idea of cognitive process biases by emotional factors. By recognizing the importance of emotions for cognition one should not disregard "the other side of the story": the ability to control emotions through cognitive processes. This issue is quite important and, within this research context, we should consider that regulatory mechanisms may comprise or influence the way we "read" emotional states assessment, or in this case, ANPS results.

Damasio (2003), revisiting Spinoza's ideas about emotions, reflects on what can be seen as a kind of emotion regulation. Spinoza believed that in order to overcome a negative affect one should be able to feel a stronger positive affect enabled by rationality. The truth is that sometimes we can't avoid some stimulus and our adaptive response should be drawn by emotions' regulation, as "The ability to regulate one's emotions is one of the keys to leading a healthy and productive life" (Silvers, Buhle & Ochsner, 2013, p. 54). In accordance to this, defence mechanisms, in psychodynamic studies, are presented as the first attempt to study emotion regulation (Ochsner & Gross, 2008). Although emotion regulation is largely related to mental health and illness - it seems that half of mental disorders belonging to DSM Axis I (except substance related disorders) and all personality disorders (Axis II) are related to emotion dysregulation - sometimes it is healthy and socially desirable to control emotions' expression (Gross & Levenson, 1997).

Nowadays imaging studies play an important role concerning understanding the interactions between the systems involved in emotions generation and emotions regulation (Ochsner & Gross, 2008). Regulatory processes are located in pre-frontal areas while the subsequent response is essentially formulated in subcortical areas, like insula or amygdala (Silvers et al., 2013). Thus, the interaction between cortical and subcortical areas is of huge

importance for affect (Davidson, 2003a). Burgdorf & Panksepp (2006) also highlight the importance that cortex may have in emotion regulation. Although our cortex doesn't have a very active participation in emotional systems functioning, it can regulate emotional activations, for example by inhibiting them (Panksepp, 2010). As so, it is important to know how this regulation occurs. Emotion regulation is especially important when one needs to modulate negative emotions possibly reducing the duration of negative affect (Davidson, 2003a).

Gross & John (2003) present two styles of emotion regulation in which people may differ: suppression, and cognitive reappraisal. For both styles there is an important contribution of frontal brain areas that modulate amygdala reactivity (Banks, Eddy, Angstadt, Nathan & Phan, 2007). Each of these have different consequences in affect, well-being, and social relationships. Suppression has negative consequences in all the three levels and appears to be negatively related to Extraversion, Openness to Experience, Agreeableness, and Conscientiousness, while reappraisal represents the solution with positive consequences, being negatively related to Neuroticism and positively related to the other four dimensions of the Big Five Model (Gross & John, 2003). Reappraisal corresponds to the idea that "We can change the way we feel by changing the way we think (...)" (Ochsner, Bunge, Gross & Gabrieli, 2002, p. 1215).

While analysing several studies, Barsade & Gibson (2007) concluded that emotion regulation is a relevant process for organizations. The authors refer, for example, that when people, at work, try to mask something they are feeling, in order to show something different, this can have negative consequences. However, they say, this doesn't happen all the time, and a possible explanation for this may be the difference between the two emotion regulation styles presented by James Gross. Another important clue while considering emotion regulation for organizational purposes is that inhibiting emotions seems to negatively affect cognitive performance (Gross & Levenson, 1997; Richards & Gross, 1999)

Gross (1998) keeps the logic that emotion circuits seem to not overlap completely and suggests that "circuits involved in regulating these emotions also may not overlap completely, and that there may be important differences in emotion regulatory processes across emotions" (p. 275).

Considering what has been described, we believe that emotion regulation will probably play an important role when we consider the relation between ANPS (subcortical processes) and OCB (behaviour). Thus, future research in this field may consider this interaction.

CONCLUSION

Basic emotional processes study seems to be a promising approach in personality research. Knowing the importance of personality to performance, particularly contextual performance (e.g. Borman & Motowidlo, 1993), we believe that assessing basic processes comprised in personality development can be a powerful resource for professional selection processes.

Our research represents a first attempt to study the impact of basic personality functioning on contextual performance. We decided to use an approach that studies subcortical basic processes because we believe this way we can get more specific and trustworthy information.

Our hypotheses have been supported, however, we have found some important limitations. In a general way, we were able to find:

- The six theoretical ANPS-s dimensions suggested by Affective Neuroscience Theory, as happened with other studies (e.g. Pingault et al., 2011);
- ANPS-s as a good personality measure, considering the correlations between basic emotional systems and Big-Five dimensions. These correlations had already been reported by other researches (e.g. Pahlavan et al., 2008);
- SEEK system as a valid predictor of two OCB dimensions (Personal Initiative and Identification with the Organization);
- Specific variance for OCB prediction in SEEK and SADNESS systems.

As described, we have found some important limitations and thus we must be cautious when interpreting results. Despite it, we must finally conclude that ANPS-s is a promising measure that requires further investigation in order to get robustness. We strongly believe our best results will be corroborated and new important ones may emerge in future researches with a different ANPS-s and better measures of Big-Five approach and social desirability. As mentioned before, it will be important to assess OCB in other-report way. Once we have a robust measure it will be interesting to study possible interactions with emotion regulation processes.

Our results show that there is still much of OCB variance to be explained and we believe there is plenty to do in this research field. This study represents a first step. There is still a long way to go but...*“The secret of getting ahead is getting started. The secret of getting started is breaking your complex overwhelming tasks into small manageable tasks, and starting on the first one.”*

Mark Twain