Original Papers

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Types of anxiety and depression:
toward overlapping and distinctive features in affective and attentional functioning

Abstract: Studies based on the most common diagnostic categories do not bring conclusive results concerning the overlapping and distinctive features of anxiety and depression, especially in the areas of attentional functioning, structure of affect, and cognitive emotion regulation. However, a new typology has been proposed which treats anxiety and depression as personality types (Fajkowska, 2013). These types – arousal and apprehension anxiety as well as valence and anhedonic depression – are constructed based on two criteria: specific structure and functions (reactive or regulative). The present paper critically examines the empirical evidence related to this approach. The data mostly confirmed the prediction that the similarities and differences in attentional and affective functioning among the anxiety and depression types would be related to their shared and specific structural and functional characteristics. The new typology turned out to be suitable for integrating the existing research findings by relating them to the structure and functions of anxiety and depression. As a result, it is useful in explaining some of the inconsistencies in literature, as it allows to identify the overlapping and distinctive features of the anxiety and depression types. It also helps to understand the mechanisms contributing to the development and maintenance of anxiety and depression, which might be useful in diagnosis and treatment. However, even though Fajkowska's approach is an important contribution to the understanding of anxiety and depression, it is not exhaustive. Its limitations are discussed, along with proposed modifications of the theory, as well as further research directions.

Keywords: anxiety, depression, structure of affect, attentional biases, cognitive emotion regulation, personality types

Introduction

Affective and cognitive functioning seem to be at the core of anxiety and depression formation and maintenance, which is reflected in the diagnostic criteria, as well as in the scientific literature on the topic (American Psychiatric Association, 2013; Spielberger, 1983; Steer, Ball, Ranieri, & Beck, 1999; World Health Organization, 1992). Nevertheless, the field still faces numerous inconsistencies regarding the attentional biases, structure of affect, as well as cognitive emotion regulation in anxiety and depression, hindering the effectiveness of diagnosis and treatment (see column 1 in Table 1). Apart from the fact that various authors report different effects (e.g., concerning the attentional biases to threat vs. all negative stimuli in

anxiety; e.g., Matsumoto, 2010; Mogg, Garner, & Bradley, 2007), these inconsistencies include failure to replicate previous findings (e.g., attentional vigilance-avoidance in anxiety; Mogg, Bradley, Miles, & Dixon, 2004), an overlap/lack of differentiation in the attentional and affective functioning between anxiety and depression, and lack of temporal stability of these results (e.g., in the use of emotion regulation strategies; Garnefski & Kraaij, 2007). Even though other areas of functioning are also affected in anxiety and depression, the focus of the current paper are the three aforementioned issues.

Despite the fact that anxiety and depression are treated categorically, the diagnostic criteria assume heterogeneity of symptoms within these categories. As a result, two people can receive the same diagnosis, even though

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Table 1. Summary of the inconsistencies related to attentional and affective functioning in anxiety and depression, possible answers from the new typology, and issues requiring further research

	Issues not resolved in existing literature	Possible answers provided by the new typology	Issues still unresolved
Attentional functioning	Attentional vigilance[1] to and problems with disengagement[2] from *threatening stimuli* or *all negative stimuli*[3] in anxiety?	Attentional functioning is related mostly to the functional role of the types in processing stimulation: the attentional patterns of processing emotional material (grouped into reactive and regulative) are consistent with the functions (reactive, regulative or mixed) of the anxiety and depression types	Causal role of attentional biases in anxiety and/or depression development and maintenance
	Avoidance of threatening stimuli in anxiety (the vigilance-avoidance pattern was not confirmed in all studies[4])		Attentional functioning in valence depression
			Avoidance of positive and sad stimuli in arousal anxiety
	Vigilance to sadness[5] or *delayed disengagement* from sadness[6] in depression?		Attentional biases in context of other than social affective stimuli
Structure of affect	Mixed evidence concerning the relationship of anxiety and depression with NA and depression with lowered PA, especially in non-clinical groups[7]	The types cannot be differentiated by the valence of affect (PA and NA)	Structure of affect in clinical population
		Content of affect shows specific, differentiating patterns related to the structure and functions of particular types	Dynamics of affect in anxiety and depression types
	Mixed results concerning specific emotions related to anxiety and depression[8]	Reactive emotions are characteristic for reactive types, and regulative emotions are typical for regulative types of anxiety and depression	
Cognitive emotion regulation	Large overlap and inconsistencies in the use of strategies between anxiety and depression[9]	The overlap in strategies use can be explained by the structural and functional similarities between the types (e.g. lowered attentional control in apprehension anxiety and anhedonic depression is related to increased rumination)	Other types of emotion regulation strategies (e.g. behavioral strategies), especially in arousal anxiety which was unrelated to any cognitive strategies
	Few and inconclusive results concerning adaptive strategies in depression[10]	Particular structural elements of the types are related to specific strategies (e.g. hostility in valence depression related to other-blame)	Positive emotion regulation in anxiety and depression
		Regulative types use more strategies than reactive types of anxiety and depression	Emotion regulation goals and their influence on strategies choice

Note: NA – Negative Affect; PA – positive affect.

Literature: [1]Fajkowska & Krejtz, 2007; Juth, Lundqvist, Karlsson, & Öhman, 2005; Matsumoto, 2010; Mogg et al., 2000; [2]Fox, Russo, Bowles, & Dutton, 2001; Fox, Russo, Bowles, & Dutton, 2002; Georgiou et al., 2005; Leleu, Douilliez, & Rusinek, 2014; Schofield, Johnson, Inhoff, & Coles, 2012; [3]Bradley, Mogg, Millar, & White, 1995; Mogg, Bradley, Williams, & Mathews, 1993; Mogg, Garner, & Bradley, 2007; Reinholdt-Dunne et al., 2012; [4]Mogg, Bradley, Miles, & Dixon, 2004; Fox et al., 2002; Mogg & Bradley, 2006; [5]Sears, Newman, Ference, & Thomas, 2011; [6]Bradley, Mogg, & Lee, 1997; Caseras, Garner, Bradley, & Mogg, 2007; Gotlib, Kasch, et al., 2004; [7]Clark & Watson, 1991; Clark, Watson, & Mineka, 1994; Watson, Clark, & Stasik, 2011; Watson & Tellegen, 1985; Burns & Eidelson, 1998; Fajkowska & Marszał-Wiśniewska, 2009; [8]Fajkowska & Marszał-Wiśniewska, 2009; Power & Tarsia, 2007; Watson et al., 2011; [9]D'Avanzato, Joormann, Siemer, & Gotlib, 2013; Garnefski & Kraaij, 2007; Garnefski, Legerstee, Kraaij, van den Kommer, & Teerds, 2002; Joormann & Gotlib, 2010; Loey, Oggel, Braem, Vanbrabant, & Geenen, 2014; Martin & Dahlen, 2005; Min, Yu, Lee, & Chae, 2013; [10]Garnefski, Kraaij, & Spinhoven, 2002; Martin & Dahlen, 2005; Min et al., 2013; Wang et al., 2014.

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the overlap in their symptoms is minimal (Gross & Jazaieri, 2014). It is likely one of the potential reasons underlying the inconsistencies in results concerning the attentional and affective functioning in anxiety and depression. To address this issue, a recently proposed categorization of anxiety and depression suggests that they can be treated as dimensional personality types, characterized by specific structure and functions (Fajkowska, 2013; Fajkowska, Domaradzka, & Wytykowska, 2018b). The aim of this paper is to critically review evidence related to this approach and discuss potential modifications and further directions of research. As a result, we can expect to better understand the nature of anxiety and depression as well as the mechanisms of their development and maintenance. This might lead to more effective treatment of the conditions which not only often co-occur but are considered one of the most common and burdening in the modern world (Baxter, Vos, Scott, Ferrari, & Whiteford, 2014; Ferrari et al., 2013; Gorman, 1996; Mathers, Fat, & Boerma, 2008).

Types of anxiety and depression

A review of the literature on attentional processing, structure of affect, and cognitive emotion regulation shows that studies based on the existing diagnostic categories do not allow for a clear differentiation between anxiety and depression even in these crucial areas of functioning, which are key in diagnostics and scientific research. Apparently, the most commonly used approaches and diagnostic criteria based on them (e.g., American Psychiatric Association, 2013; Beck, Steer, & Brown, 1996; Spielberger, 1983) do not allow to clearly distinguish patterns of attentional and affective functioning in anxiety and depression (see the first column of Table 1.). As a result, even though they are treated as separate disorders, the differentiation is difficult, and observed comorbidity is high. The co-occurrence of anxiety and depression can be an obstacle in identification of their distinctive features, which should be the basis for their differentiation. Therefore, it seems important to account for this co-occurrence by controlling the levels of both conditions. In addition, often the studies do not compare anxiety and depression but focus on only one of these phenomena, which makes the examination of the overlapping and distinctive features even more difficult. The type of studied sample also seems to make difference, as clinically depressed patients often show different patterns of affective and attentional functioning than non-clinical groups.

The most commonly used diagnostic typologies are generally symptom-based. Such an approach has its advantages – for example it is relatively straightforward and easy to use – but it is not helpful in determining the causes of anxiety and depression formation or their co-occurrence. A recently proposed dimensional approach aims to tackle this problem by creating types of anxiety and depression (Fajkowska, 2013). In this approach, anxiety and depression are treated as dimensional personality types, constructed based on two criteria: structural complexity and dominant functions in processing stimulation

(transformation of arousal and activation that result from the incoming stimulation, both internal and external, and cause changes in various systems in the organism, e.g., cognitive or affective; Fajkowska, 2018). These types (arousal and apprehension anxiety; valence and anhedonic depression) are defined in detail in Table 2 and further elaborated in the next paragraphs. Fajkowska claims that taking into account the structure and functions of anxiety and depression can be helpful in examining and explaining the similarities and differences between them. Treating anxiety and depression as personality types allows us to use a theoretical framework – in this case, a systemic perspective – that encompasses several levels, from processes to behaviors, and to establish connections among them. Considering the mechanisms and processes related to anxiety and depression allows us to view the heterogeneous and multilayered nature of these phenomena and gives us an insight to the aspects in which they can be similar or different. Some behaviors/reactions which are commonly treated as anxiety or depression symptoms might be considered relatively stable individual characteristics which can become maladaptive or pathological in certain constellations or beyond a certain intensity. It might be assumed that while some symptoms may be shared, they can result from various causes or they can have more than one aspect (for example negative affect can be expressed as either sadness or fear). Fajkowska's theory provides tools to explore anxiety and depression in broader contexts of functioning and to study the underlying mechanisms, as well as similarities and differences occurring among them on different levels.

It is assumed that personality types are characterized by a three-level hierarchical composition. These levels are: basic mechanisms, structures/components, and behavioral markers. The behavioral markers can be used to determine the dominant functions (reactive or regulative) in processing stimulation of particular types, as these functions are rooted in structures and observable in behaviors. The reactive function is connected to the individual differences in reception of stimulation and automatic readiness to activity. For example, hypervigilance to threat in anxiety (Mogg, Millar, & Bradley, 2000) suggests that it is characterized by a reactive dominant. The regulative function is related to more strategic reactions to incoming stimulation. For example, the innovative strategies used to pursue goals in openness (DeYoung, 2010) suggest a regulative dominant in this trait. Because of the structural complexity of traits, both functions can be identified in one trait, however, usually one of them is dominant. Both functions are related to energy expenditure in a particular time range (Fajkowska, 2013, 2015). Table 2 presents the structure (in column 2) and functions (column 3) of the types. The types of anxiety and depression proposed based on the above-mentioned criteria are described below.

Fajkowska (2013, 2015) assumes that – according to the literature – cognitive (connected with working memory and attention) and somatic (related to motivational and affective systems) processes contribute to

the formation of anxiety types. Their constant interactions lead to the formation of somatic-related arousal and cognitive-related apprehension. As a result, when arousal dominates over apprehension, the Arousal Type is formed on the level of structures, and in the opposite case – Apprehension Type appears. If arousal and apprehension are on similar levels, the Mixed Type occurs (see Fig. 1A). Physiological hyperarousal and somatic tension are characteristic for arousal anxiety (Watson, 2000), which comprises diagnostic categories such as state anxiety, phobias or panic attacks (Heller & Nitschke, 1998; Watson, 2000). Apprehension anxiety is related to worry (Barlow, 1991; Heller, 1993b, 1993a), and it encompasses self-reported trait anxiety and Generalized Anxiety Disorder (American Psychiatric Association, 2013; Heller & Nitschke, 1998). The structure of arousal anxiety includes somatic reactivity, panic/phobia, and attentional vigilance/avoidance, while apprehension anxiety consists of worrisome thoughts, attentional control, and somatic reactivity (see Table 2).

Examination of the behavioral markers of the types suggests that the reactive function dominates in arousal anxiety (because it is related to elevated autonomic reactivity and the attentional vigilance-avoidance pattern that indicates more automatic stimulation processing), while apprehension anxiety shows a dominance of the regulative function (because of reduced attentional control which is exhibited in a more strategic – but

Table 2. Definitions of the anxiety and depression types

Type		Structure	Function
Arousal anxiety	Somatic reactivity	elevated autonomic reactivity, psychophysiological arousal, and somatic tension – e.g. trembling hands, heart pounding – resulting from the occurrence of negative and threatening stimuli	Reactive
	Panic/phobia	panic symptoms, distress, phobias	
	Attentional vigilance/ avoidance	"early" vigilance to threat, usually in the clinical form of anxiety, and "late" attentional avoidance of threat, usually in the non-clinical form	
Appre-hension anxiety	Worrisome thoughts	concerning physical, emotional or symbolic threat to the self; connected with the social appraisal of one's behavior or competence, real or anticipated physical threat, or general problems of the world	Regulative
	Attentional control	problems in attention switching and concentration, inability to disengage attention from negative experiences, giving in to distracting thoughts, impaired inhibition, especially in processing negative emotional material connected with failure or a negative event	
	Somatic reactivity	elevated reactivity of the autonomous nervous system while facing threat, or as a result of worrisome thoughts	
Valence depression	Negative affect	elevated level of anxiety, tension, hostility, anger, sadness, high sensitivity to the self, and social avoidance	Reactive
	Attentional avoidance	insensitivity to the valence of the emotional material and insensitivity to social stimuli	
Anhedonic depression	Emotional- -motivational deficits	inability to experience pleasure and a lowered reactivity to pleasurable events, difficulties in goal pursuit and taking up activity in order to attain them, inability to attain pleasure or reward oneself by appetitive behaviors	Regulative
	Positive affect	very low level of positive feelings, such as self-confidence, happiness, or hope	
	Negative affect	very high level of negative feelings and emotions, such as sadness, guilt, disappointment or anxiety	
	Attentional control	inability to sustain attention on emotional material, slower and inaccurate reactions to emotional material, lowered ability to sustain effort in processing emotional material regardless of its valence, problems with concentration of attention	

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ineffective – stimulation processing pattern; Fajkowska, 2013, 2015). The Mixed Type's stimulation processing patterns are the subject of future research.

Further, basing on the literature review, Fajkowska claims that emotional (connected with negative emotionality), motivational (related to reduced attentional control, anhedonia, reduced reward sensitivity, and deficits in appetitive behaviors), and cognitive (related to valence insensitivity) mechanisms are responsible for the development of depression types. As a result of the constant interactions among these processes, valence insensitivity and anhedonia appear. On the level of structures, Valence Type of depression is formed if valence insensitivity dominates over anhedonia; in the opposite case we speak of Anhedonic Type. If valence insensitivity and anhedonia levels are similar, mixed depression is formed (see Fig. 1B). Valence insensitivity is characteristic for nonmelancholic depression, and anhedonia is typical for the anhedonic depression (Heller & Nitschke, 1998; Watson, 2000). Therefore, valence depression encompasses the nonmelancholic, while anhedonic depression – the melancholic (e.g., Major Depressive Disorder) types from DSM-5 (APA, 2013). Valence depression is treated as a state-like, exogenous type, connected with biases in processing valence and content of stimulation, as well as high negative affect (for a review see Fajkowska, 2013). The anhedonic type is considered endogenous and trait-like and is related to impaired control in stimulation processing, as well as motivational deficits, high negative affect, and low positive affect (Fajkowska, Domaradzka, & Wytykowska, 2018b; for a review see: Fajkowska, 2013). Structurally, valence depression is composed of negative affect and attentional avoidance, while anhedonic depression includes emotional-motivational deficits, positive affect, negative affect, and attentional control (see Table 2).

The behavioral markers related to the depression types allow to establish their dominant functions in processing stimulation: reactive in Valence Type (as it includes attentional avoidance, indicating more automatic stimulation processing), and regulative in the Anhedonic Type (because of a more strategic, however ineffective,

patterns of stimulation processing revealed in reduced attentional control and problems with sustained attention). The functionally balanced Mixed Type's stimulation processing patterns are yet to be determined.

This typology, which to some degree benefits from existing models of anxiety and depression (e.g., Heller, 1993a, 1993b; Watson, 2000), allows to analyze anxiety and depression in a broader perspective, taking into account various areas of functioning. Because this approach is based on an extensive literature review (Fajkowska, 2013), to some extent it includes elements that existed in other approaches to anxiety and depression. For example, the arousal and apprehension anxiety or anhedonic depression have been proposed before (Sharp, Miller, & Heller, 2015; Watson, 2000). However, at the same time, Fajkowska's approach has several features that make it new and distinct from the previous theories. First, it assumes that anxiety and depression are dimensional personality types because a relative dominance of a particular structural element leads to the formation of a particular anxiety or depression type (similarly as in the case of dimensional temperament types based on the intensity of extraversion and neuroticism; e.g., Eysenck, 1970; Strelau, 2014, p. 44–45; see Fig. 1). Second, as a result, they can be studied in general population, where, as research shows, the subclinical states are similarly detrimental to health and well-being as in the clinical groups (Ayuso-Mateos, Nuevo, Verdes, Naidoo, & Chatterji, 2010). This in itself is not new: for example, the attentional control theory (M. W. Eysenck, Derakshan, Santos, & Calvo, 2007) also referred to the general population. However, in addition, Fajkowska also assumes that anxiety and depression types are structurally complex and serve specific functions in stimulation processing. Previous models did not offer these possibilities: for example, the cognitive approach to depression (Beck et al., 1996) was aimed at clinical populations, while Spielberger's (1983) anxiety conceptualization lacked the structural and functional elements. Therefore, Fajkowska's theory is more comprehensive and allows to study anxiety and depression, make predictions about them and interpret the results on

Figure 1. The dimensional elements leading to the formation of anxiety (A) and depression (B) types. Adapted from Fajkowska & Domaradzka (2018b). Copyright Hogrefe Publishing. Reprinted with permission.
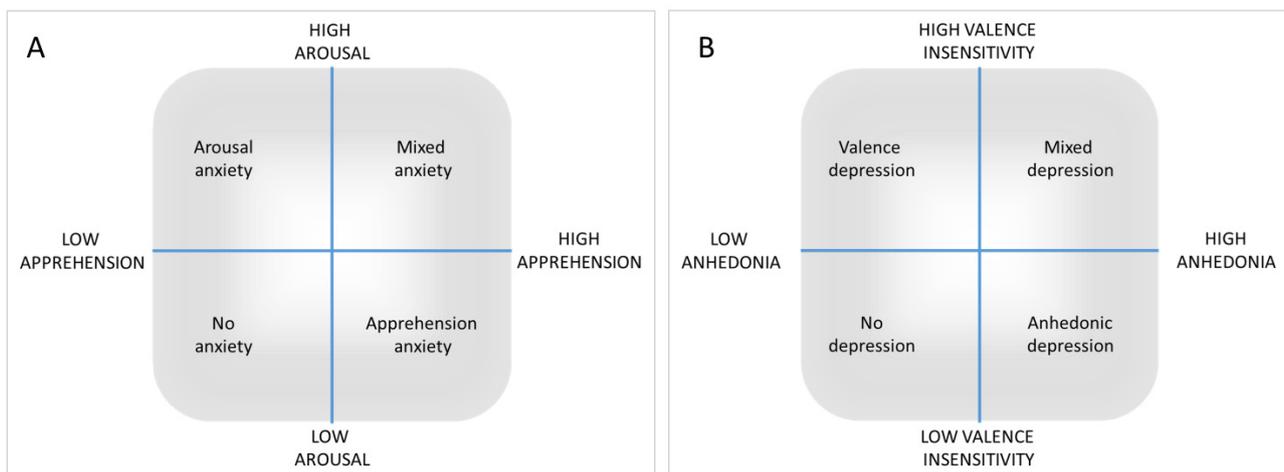
multiple levels and in various areas of functioning and to compare the types within one model.

This typology is also in line with the recent approaches to psychopathology which underline the need of switching from categorical to dimensional models, such as Research Domain Criteria proposed by the National Institute of Mental Health (Insel et al., 2010; Krueger & DeYoung, 2016) and Hierarchical Taxonomy of Psychopathology (Kotov, Krueger, & Watson, 2018). The four types of anxiety and depression can be assessed via a self-report Anxiety and Depression Questionnaire (ADQ), which was developed based on the underlying theory (Fajkowska et al., 2018b). Its psychometric properties including satisfactory reliability and validity were confirmed, and it was used in the further presented research concerning the attentional and affective functioning in anxiety and depression types.

How does the new typology advance our understanding of cognitive and affective functioning of anxiety and depression?

As noted in the beginning, the presented approach aims to deal with the problem of inconsistencies in results concerning the affective and cognitive functioning in anxiety and depression. One of the reasons for these inconsistencies might be the fact that, as literature shows, anxiety and depression are related to various patterns of functioning (Fajkowska, 2013). The review of the literature on anxiety and depression might lead to the conclusion that anxiety and depression are complex phenomena which should be viewed and studied multidimensionally. Perhaps, instead of trying to find single, explicit patterns concerning the structure of affect, emotion regulation or attentional biases, we should look for coherent configurations of behaviors and reactions that can point to subtypes of anxiety and depression, as Fajkowska (2013) suggests. A question therefore can be asked what this new approach gives us: whether it brings us closer to the understanding of the similarities and differences between anxiety and depression, their causes and consequences, and whether the benefits of this "complication" of anxiety and depression operationalization outweigh the costs. Below, I discuss the evidence related to this approach in the context of existing literature, taking into account the added value of the new theory as well as its shortages.

I argue that the main advantage of Fajkowska's approach is the fact that the types of anxiety and depression are treated as complex constructs within one framework which allows us to compare them, taking into consideration their structural and functional elements. The fact that some of these elements are shared among some types might help explain the overlap in results, and, similarly, the fact that some elements are unique helps understand the differences. It can be expected that the similarities and differences among the anxiety and depression types will be related to their structure and functions. First, the distinctive and common structural elements can be used as a basis for between-type comparisons and for

explaining the similarities and differences among them. Second, the anxiety and depression types can also be grouped according to their dominant functions in stimulation processing. In-group (e.g. between reactive arousal anxiety and valence depression) similarities and out-group (e.g. between reactive valence depression and regulative anhedonic depression) differences can be expected as a result of this grouping. In the section that follows, I refer to empirical data concerning the relationships between the structure and functions of the anxiety and depression types on one side and the attentional processing, structure of affect, and cognitive emotion regulation on the other side. The results seem to form coherent patterns and confirm the typology-based expectations, leading to a better understanding of the similarities and differences among types of anxiety and depression. Most importantly, however, they also help explain the inconsistencies in the results of earlier studies, which relied on the most common categorizations of anxiety and depression (see Table 1).

Possible explanation of inconsistencies in results on attentional functioning in anxiety and depression

Previously, for example, the attentional control theory (M. W. Eysenck et al., 2007) proposed that the deficits in cognitive functioning in anxiety, including attentional biases, are related to the impairments of the attention functions such as inhibition and shifting. However, even though this theory can be used to explain the previously reported effects related to vigilance to threatening stimuli (Fajkowska & Krejtz, 2007; Juth, Lundqvist, Karlsson, & Öhman, 2005; Matsumoto, 2010; Mogg et al., 2000) or problems with disengagement from them (Fox, Russo, Bowles, & Dutton, 2001; Fox, Russo, & Dutton, 2002; Georgiou et al., 2005; Leleu, Douilliez, & Rusinek, 2014; Schofield, Johnson, Inhoff, & Coles, 2012), it is less helpful in explaining attentional biases related to other than threatening negative stimuli (Bradley, Mogg, Millar, & White, 1995; Mogg, Bradley, Williams, & Mathews, 1993; Mogg, Garner, & Bradley, 2007; Reinholdt-Dunne et al., 2012). Attentional biases to threat have also been described by the vigilance-avoidance pattern (Mogg et al., 2004) but it has not been confirmed in some studies (Fox et al., 2002; Mogg & Bradley, 2006). These inconsistencies may be caused by the fact that anxiety and depression are treated as homogeneous constructs. These results additionally suggest that the "purely cognitive" approach to anxiety might not be comprehensive. Our study based on the new typology (Fajkowska et al., 2017) revealed that the attentional processing of emotional material shows different patterns across the types and that these patterns can be related to the structure and functions of the types. The reactive arousal anxiety was related to avoidance of all emotional stimuli and to impulsive strategy of processing threat and happiness. The avoidance of threatening stimuli can be explained by the attentional vigilance-avoidance element in its structure, however the avoidance of the remaining types of stimuli cannot be explained so easily. In apprehension anxiety, the attentional biases were related to processing sadness; the impaired attentional control and ineffective

selectiveness can be related to worrisome thoughts and lowered attentional control element in the structure of this type. We also found vigilance and cautious strategy of processing threatening and happy faces, as well as impaired attentional control and ineffective selectiveness of sad faces in the mixed anxiety.

Similarly, previous research on attentional biases in depression showed mixed results. They included the early (Sears, Newman, Ference, & Thomas, 2011) versus late (Bradley, Mogg, & Lee, 1997; Caseras, Garner, Bradley, & Mogg, 2007; Gotlib, Kasch, et al., 2004) biases toward sad stimuli, with some studies not confirming these findings (Hammar, Kildal, & Schmid, 2012; Karparova, Kersting, & Suslow, 2005; Mogg et al., 2000; Sears, Thomas, LeHuquet, & Johnson, 2010) or even reporting larger biases toward threat in depression than in anxiety (Mogg, Bradley, & Williams, 1995). Our findings (Fajkowska et al., 2018a) showed that the (regulative) anhedonic depression was related to regulative attentional processing patterns. The enhanced attentional control and effective selectiveness in case of sadness might be related to (1) its regulative nature and (2) sadness as the dominating affect (Fajkowska et al., 2018a). Even though anhedonic depression includes impaired attentional control as part of its structure, it is enhanced for sadness. The (reactive) Valence Type was unrelated to any attentional processing patterns. However, the mixed depression was connected with avoidance of threat and impulsive strategy of processing happiness, as well as impaired attentional control and ineffective selectiveness of threatening and sad stimuli.

These results show that various patterns of attentional functioning might be revealed depending on the anxiety or depression type studied. This, in turn, suggests that the main building elements, namely arousal and apprehension in case of anxiety and anhedonia and valence insensitivity in depression, lead to various behavioral outcomes (depending on which one dominates in a particular type). Therefore, Fajkowska's approach provides a framework which allows to interpret seemingly inconsistent results in a meaningful way. It offers the advantage of being broader than some of the existing models, such as the attentional control theory, which referred to the cognitive processes involved in attentional processing and therefore did not allow to explain some of the inconsistencies in research results that might be related to other than cognitive systems. In the light of Fajkowska's theory, the attentional control theory would be applicable to the apprehension anxiety but not necessarily to the Arousal Type which is less influenced by the cognitive components.

Possible explanation of inconsistencies in results on valence and content of affect in anxiety and depression

According to previous studies on the structure of affect, both anxiety and depression were related to negative affect, while lowered positive affect was characteristic for depression (Clark & Watson, 1991; Clark, Watson, & Mineka, 1994; Watson, Clark, & Stasik, 2011; Watson & Tellegen, 1985), however, not all researchers were able to replicate these findings (Burns & Eidelson, 1998; Fajkowska & Marszał-Wiśniewska, 2009). Besides, various studies have shown that specific emotional states, such as fear, joviality, happiness, sadness, fatigue, shyness, and hostility are related to anxiety, depression, or both disorders (Fajkowska & Marszał-Wiśniewska, 2009; Power & Tarsia, 2007; Watson et al., 2011). Our study (Domaradzka & Fajkowska, 2018b) also showed that anxiety and depression cannot be differentiated by the valence of affect. However, we found that the types are related to specific affective states (content of affect) which can be associated with their structure and functions. This finding suggests that even though the general factors of negative and (lowered) positive affect might be common to both anxiety and depression, the underlying specific emotional states are different. Using the presented perspective, the lower-level content of affect helps to differentiate the anxiety and depression types because it is related to their structure and functions. For example, various aspects of the negative affect component might help differentiate the two depression types: valence depression includes mostly hostility, while anhedonic depression is primarily characterized by sadness and guilt. In addition, worrisome thoughts can be connected to the finding that apprehension anxiety is characterized by fear and lowered joviality (Domaradzka & Fajkowska, 2018b). Sadness – a regulative emotion – was also a part of the structure of affect in this type (Domaradzka & Fajkowska, 2018b). Again, Fajkowska's theory helps explain the existing inconsistencies in results and the problems with replication of the original findings. Studying the content of affect in types of anxiety and depression is also useful in differentiating these types.

Possible explanation of inconsistencies in results on cognitive emotion regulation in anxiety and depression

Numerous studies concerning cognitive emotion regulation showed that anxiety and depression were related to more use of the maladaptive catastrophizing, self-blame, and rumination and less use of the adaptive positive reappraisal (D'Avanzato, Joormann, Siemer, & Gotlib, 2013; Garnefski & Kraaij, 2007; Garnefski, Legerstee, Kraaij, van den Kommer, & Teerds, 2002; Joormann & Gotlib, 2010; Martin & Dahlen, 2005; Min, Yu, Lee, & Chae, 2013; Van Loey et al., 2014). In addition, depression was related to catastrophizing, other-blame, positive refocusing or refocus on planning but these results were inconsistent (Garnefski, Kraaij, & Spinhoven, 2002; Martin & Dahlen, 2005; Min et al., 2013; Wang et al., 2014). Our results (Domaradzka & Fajkowska, 2018a) showed that the use of cognitive emotion regulation strategies is related to the structure and functions of the anxiety and depression types. For example, impaired attentional control which is present in both regulative types (apprehension anxiety and anhedonic depression) might explain why rumination is a strategy used in both types and why both are negatively related to positive refocusing. Anhedonic depression showed relationships with all cognitive emotion regulation strategies (except other-blame). Its specificity

was revealed in this aspect by the fact that its strongest predictors were the adaptive strategies (related negatively), which points to the emotional-motivational deficits and lowered attentional control (Domaradzka & Fajkowska, 2018a). On the other hand, the reactive, "physiological" arousal anxiety was unrelated to any strategies, which is coherent with the finding that this type is characterized by impulsive strategy of attentional processing of threatening and positive social stimuli (Fajkowska et al., 2018a). The specific structural element in apprehension anxiety are the worrisome thoughts, which, together with impaired attentional control, might be related to using more rumination and less positive refocusing (Domaradzka & Fajkowska, 2018a). Moreover, the regulative types were related to a larger number of strategies than the reactive types.

Additional benefits

Furthermore, it was shown that – as predicted – in some aspects the similarities occur to a larger extent between the types grouped by the dominant function in processing stimulation (i.e. between the reactive arousal anxiety and valence depression or regulative apprehension anxiety and anhedonic depression) than "within" types of anxiety or types of depression. For example, regulative patterns of attentional processing were found in the regulative apprehension anxiety and anhedonic depression (Fajkowska et al., 2018a). Moreover, these regulative types were more strongly related to positive affect and to sadness (positively) and joviality (negatively), which are more regulative emotions (Domaradzka & Fajkowska, 2018b). Additionally, the regulative types were related to a larger number of cognitive emotion regulation strategies. In contrast, the reactive arousal anxiety and valence depression were related to more reactive emotions, such as fear or hostility (Domaradzka & Fajkowska, 2018a). Importantly, Fajkowska's approach allows to interpret the obtained results in a broader perspective: how the various areas of functioning are interrelated and how they might influence one another. The three-level hierarchical theory of personality structure provides a tool for understanding these interrelations.

Overall, Fajkowska's approach gives important and interesting insight into the mechanisms and processes involved in the formation and maintenance of anxiety and depression, such as attentional processes, dominant affect, and strategies of emotion regulation, which are at least to some extent specific to particular types. Her theory responds to the need of alternative approaches to psychopathology, including their dimensionality and complexity on various levels, as well as functional significance. It has an explanatory potential and is comprehensive, covering a wide range of elements related to anxiety and depression and considers their interrelations. Importantly, it helps to answer several critical questions concerning the causes and underlying mechanisms, processes, structures, and functional role of anxiety and depression types.

Critical remarks and future research directions

However, this approach might not be exhaustive, and several limitations need to be mentioned. First of all, as I mentioned before, a new questionnaire, the ADQ, was created based on the theory but research revealed that the questionnaire scales are highly correlated, which further shows how related these types are (Domaradzka & Fajkowska, 2018b; Fajkowska et al., 2018b). Additionally, it makes it difficult to study "pure" types (i.e. when the co-occurrence is accounted for) which are not very widespread but can be used to study the specific mechanisms governing the formation of the types. However, it is important to note that these correlations among scales, albeit high, are still lower than the ones usually found between anxiety and depression with the use of traditional measures (Clark & Watson, 1991; Fydrich, Dowdall, & Chambless, 1992; Hill, Musso, Jones, Pella, & Gouvier, 2013; Steer et al., 1999). At the same time, this typology can provide information about how and why anxiety and depression co-occur so frequently by showing the common processes and mechanisms that underlie them. Still not much is known about the mixed types, which seem to be most common. Another limitation is the fact that the effects sizes in research involving the types of anxiety and depression are small to moderate (Domaradzka & Fajkowska, 2018a, 2018b; Fajkowska et al., 2018a), which points to the complexity of the studied phenomena and suggests that many factors interact in anxiety and depression. The effects were especially small in the attentional processing results. Therefore, a question might be asked if attentional mechanisms are crucial in the functioning of the types. Attentional biases are well-documented in anxiety and depression (e.g., Bar-Haim et al., 2007; Caseras et al., 2007; Gotlib, Kasch, et al., 2004), but on the other hand, the results are not very consistent (Derakshan, Salt, & Koster, 2009; Gotlib, Krasnoperova, Yue, & Joormann, 2004; Hammar et al., 2012; Mogg et al., 1995). In addition, attentional trainings do not clearly show long-term benefits, especially in case of depression (Clarke, Notebaert, & MacLeod, 2014; Cristea, Kok, & Cuijpers, 2015; Hallion & Ruscio, 2011; Mogoaşe, David, & Koster, 2014), which might suggest that their causal role in maintaining anxiety and depression is limited. It is also possible that the task used in the Fajkowska et al.'s study did not fully capture the specific biases related to anxiety and depression. Perhaps other ways of operationalization and studying the attentional processes – for example tasks designed to examine more dynamic attentional processes, such as disengagement or affective stimuli other than emotion expressions – are needed.

Another question that might be asked based on the results reported above concerns the valence depression. It showed clearly distinct patterns of functioning in all studied areas: lack of specific patterns of attentional functioning, domination of hostility and other-blame, and consistently lower relationships with both the structure of affect and cognitive emotion regulation variables. According to the most common diagnostic criteria, persisting sadness

is necessary to diagnose depression. However, in case of valence depression, no relationship to sadness was found (Domaradzka & Fajkowska, 2018b). Given that previous attempts to finding depression subtypes have not been successful (van Loo, de Jonge, Romeijn, Kessler, & Schoevers, 2012), one might ask whether the Valence Type is indeed a type of depression. It could be hypothesized that it is the loss of energy rather than sadness that could be characteristic for depression; for example, it was shown that depression was related to low energetic arousal (Matthews, Jones, & Chamberlain, 1990). However, in our study concerning the structure of affect we found no relationship of valence depression to fatigue (Domaradzka & Fajkowska, 2018b). On the other hand, Fajkowska's theory directly assumes that the main element in this type is valence insensitivity. It might therefore be the case that high valence depression scores mean that the "access" to one's emotional states or the sensitivity to emotional information is impaired and not accessible by standard measurement methods.

This brings us to the question of what future directions of research should be considered and how the theory could be modified or expanded as a result. It should be noted here that perhaps before advancing with further studies, replications of the previous results – including from other labs – would be useful. Nevertheless, I see four main areas which I think should be investigated: neuropsychological functioning, psychophysiological differences among the types, broader perspective on emotion regulation, and the dynamics of affective functioning. First of all, Fajkowska's theory already includes reference to neuropsychological functioning, such as the role of left and right hemisphere in stimulation processing in specific types. Based on the literature review, it has been proposed that valence depression is related to increased right hemisphere activity, and anhedonic depression – to decreased left hemisphere activity in stimulation processing, while arousal anxiety is characterized by right-hemisphere involvement in threat processing and apprehension anxiety – by left hemisphere involvement in stimulation processing (Fajkowska, 2013). However, these hypotheses have not been tested so far. Contemporary approaches underline the utility of neuropsychological data in studying psychopathology so testing the hypotheses related to this area of functioning would be an important step in validation of the theory.

Further, there is some evidence showing that depression and anxiety are related to decreased heart rate variability (HRV), but the results are again inconsistent (Carney, Freedland, & Stein, 2000; Chalmers, Quintana, Abbott, & Kemp, 2014; Henje Blom, Olsson, Serlachius, Ericson, & Ingvar, 2010; Kemp et al., 2010). While the reduction in HRV seems to be related to both somatic and cognitive – especially worry – symptoms in anxiety (Brosschot, Van Dijk, & Thayer, 2007; Chalmers et al., 2014), in case of depression lower HRV is more strongly related to the somatic (e.g. sleep problems) than cognitive symptoms (de Jonge, Mangano, & Whooley, 2007). Differentiating worrisome thoughts and rumination, as well as the somatic reactivity in the anxiety and depression types could help explain the inconsistencies in results. Other measures of somatic reactivity (such as skin conductance levels), both at baseline and in reaction to stimulation, could also be useful in differentiating the types. It has been shown that depression is related to lowered skin conductance levels and fewer fluctuations, especially in "retarded" (as opposed to "agitated") patients characterized by "slowness of thought, speech, and activity, proceeding to apathy and finally stupor" (Noble & Lader, 1971; Ward & Doerr, 1986). It could be hypothesized, then, that anhedonic depression, characterized by anhedonia and emotional-motivational deficits, would be related to lower skin conductance and its variability than valence depression. The neuropsychological and psychophysiological correlates of the anxiety and depression types could be useful in further development of the typology and would serve as a more objective measurement than the questionnaire method. As a result, at the level of structures, perhaps the somatic reactivity (in arousal and apprehension anxiety) could be operationalized more precisely in order to differentiate the types better. Possibly, the types of depression would also show differentiating patterns of somatic reactivity, which would lead to expanding their definitions/proposed structure.

In relationship to affective functioning, such aspects as positive emotion regulation, behavioral emotion regulation strategies, emotion goals/motivation or flexibility of strategies use could also be an interesting area of research. For example, arousal anxiety seems to be dominated by fear, as well as avoidance and impulsive processing of emotional stimuli. In addition, no cognitive emotion regulation strategies are related to this type. One might therefore ask whether this type involves any other types of coping or regulatory strategies and whether they are used effectively. Does arousal anxiety predispose to other, maladaptive strategies, for example behavioral ones (Larsen, 2000), such as abusing alcohol, smoking, comfort-eating? Similarly, in case of anhedonic depression, it can be suspected that the effective attentional processing of sadness coupled with less use of adaptive emotion regulation strategies might lead to maintaining the sad mood. Some studies indicate that depressed participants are able to implement emotion regulation strategies, such as reappraisal, but use them to maintain or increase their sad mood rather than to decrease it (Millgram, Joormann, Huppert, & Tamir, 2015). Perhaps the emotional goals in valence and anhedonic depression differ, which leads to various dominating emotions in these types.

Another area that is open to investigation is the dynamics of the types that can be reflected for example in mood variability which has been related to psychopathology (Houben, Van Den Noortgate, & Kuppens, 2015). New research methods, supported by modern technology, such as experience sampling (Crowe, Daly, Delaney, Carroll, & Malone, 2018; Kircanski, Thompson, Sorenson, Sherdell, & Gotlib, 2017), allow to study such issues quite easily, and they can provide important information about the affective functioning related to the types. The regulative types are related to more

regulative emotions (Domaradzka & Fajkowska, 2018b), which are more long-lasting, but can show some amount of variability during the day. On the other hand, the reactive emotions (such as fear or hostility) characteristic for the reactive types last for a shorter time but they might appear with varying frequency. It would be interesting to see whether these emotional states show patterns of dynamics related to the functional characteristics of the types. Research shows that rumination is predicted by everyday events, and in turn it leads to increases in negative affect and decreases in positive affect (Kircanski et al., 2017). Therefore, it can be expected that using the experience sampling method would be helpful in examining the complex relationships between various triggering events, mood, emotion regulation strategies, and other aspects of functioning in the anxiety and depression types.

Conclusions

To sum up, Fajkowska's theory, which conceptualizes anxiety and depression as dimensional personality types, has received considerable empirical support. The available results suggest that its main assumptions, including the particular structure and particular functions of arousal and apprehension anxiety, as well as valence and anhedonic depression, are valid. Specifically, patterns of attentional functioning were related to the functional characteristics of the types. On the other hand, affective functioning (including the structure of affect and cognitive emotion regulation) was related to both structural and functional characteristics of the types.

Fajkowska's theory can be very useful for integrating the existing research findings and interpreting them via their relationships to the structure and functions of the anxiety and depression types. The possible future areas of research described above can contribute to further validation of the theory and might lead to inclusion of even broader range of aspects of functioning related to the anxiety and depression types. The identification of the variables with unique and/or strong contribution could further lead to addressing them in therapeutic interventions that could be tailored to the specific anxiety and depression types. Since the theory assumes a dimensional approach, it can be applied to general population and contribute to identification of early warning signs for anxiety and depression.

The ultimate test of the theory would be establishing its applicative utility, i.e., testing whether it would be useful in clinical practice and contribute to better diagnosis and therapy. At this stage, even though this approach is theoretically well-grounded and its predictions were largely confirmed by empirical data, the small effect sizes and the strength of the correlations among the types might cast doubts about it. However, at the same time I believe that further research might lead to new results and modifications and/or extensions which will benefit both the theory and its applicative potential.

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