

The lexicon of emotions and personality traits

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Abstract

Introduction: The aim of the present study was to examine the relationship between the emotion lexicon and the Big Five personality traits. This is the first psycholexical study to analyse the convergence of individual differences in personality traits and emotions.

The aim and methods: The study employed a list of emotion descriptors presented as short sentences, allowing the measurement of predispositions to experience eleven emotions. Personality traits were assessed using the IPIP-50 questionnaire in its Polish adaptation. A total of 360 participants took part in this cross-sectional study.

Results: Canonical analysis revealed four statistically significant, non-redundant canonical roots explaining the variance in personality traits and predispositions to experience emotions. There were two roots dominated by a single trait, whereas the other two represented personality types associated with different patterns of emotional experience. Emotional stability was linked to less frequent experiences of anxiety, sadness, distress, and shame. Intellect co-occurred with the experience of interest. Combinations of low versus high levels of Extraversion and Agreeableness correlated with individual differences in contempt, shame, and emotion regulation.

Conclusions: The observed patterns partially confirm previous findings and highlight new relationships that had not been detected previously due to the use of tools measuring a limited range of emotions. The Big Five model explains only a part of the predispositions to experience emotions. A more comprehensive understanding of individual differences in emotions requires personality models developed from psycholexical research using a high-dimensional and inclusive approach.

Keywords: psycholexical approach, emotions, personality

Streszczenie

Wprowadzenie: Celem zrealizowanych badań było ustalenie związku pomiędzy leksykonem emocji a cechami osobowości z modelu Wielkiej Piątki. Są to pierwsze badania psycholeksykalne analizujące zbieżność różnic indywidualnych w zakresie cech osobowości i emocji.

Cel i metody: W badaniach wykorzystano listę deskryptorów emocji ujęte w formie krótkich zdań, która pozwoliła zmierzyć predyspozycje do doświadczania jedenastu emocji. Do pomiaru cech osobowości użyto kwestionariusz IPIP-50 w polskiej adaptacji. W badaniach przekrojowych wzięło udział 360 osób.

Wyniki: Wyniki analizy kanonicznej wykazały istnienie czterech statystycznie istotnych nieredundantnych pierwiastków kanonicznych wyjaśniających wariację cech osobowości i predyspozycji do doświadczania emocji. Dwa pierwiastki są zdominowane przez pojedynczą cechę, a dwa wyznaczają typ osobowości, który współwystępuje z innym wzorcem doświadczania emocji. Stabilność emocjonalna wiązała się z rzadszym doświadczaniem lęku, smutku, dystresu i wstydu. Intellect współwystępował z doświadczaniem zainteresowania. Kombinacje niskiego vs. wysokiego nasilenia Ekstrawersji i Ugodowości korelowały z różnicami indywidualnymi w zakresie pogardy, wstydu i kontroli emocji.

Wnioski: Ustalone prawidłowości znajdują potwierdzenie w części dotychczasowych badań oraz wskazują nowe zależności, które wcześniej nie były odkryte z powodu stosowania narzędzi mierzących wąski zakres emocji. Wykazano, że model Wielkiej

Piątki jest w stanie wyjaśnić tylko część predyspozycji do doświadczania emocji. Pełniejsze wyjaśnienie różnic indywidualnych w zakresie emocji wymaga modeli osobowości opracowanych na podstawie badań psycholeksykalnych w podejściu wysokowymiarowym i inkluzywnym.

Słowa kluczowe: podejście psycholeksykalne, emocje, osobowość

Introduction

Personality is the enduring pattern of thoughts, feelings, and behaviours that distinguish individuals from one another [1]. The starting point for psycholexical research on the structure of personality traits is to adopt a definition that specifies the scope of the concept of a trait and, consequently, its potential observable indicators. Essentially, two approaches can be distinguished here: exclusive and inclusive [2]. The exclusive approach – historically earlier – adopts narrower boundaries for the definition of personality traits and includes words that describe individual differences in relatively stable psychological characteristics of a person as descriptors of traits [3, 4, 5]. In the inclusive approach, on the other hand, it is pointed out that personality can also be expressed through a specific predisposition to manifest unstable psychological and behavioural reactions [2, 6, 7]. Therefore, its proponents include a much broader (even 2-5 times broader) range of indicators in personality descriptors, including words describing emotional states. The aim of the research presented in this article is to determine whether and to what extent the lexicon of emotions is related to personality structure, using the Polish language. To date, this issue has not been addressed in research on the lexicon of individual differences in any of the several thousand languages in the world.

The psycholexical approach has contributed to the achievement of taxonomic consistency regarding the most important personality traits [8]. It is based on the assumption that all individual differences are encoded in natural language, and the more important these differences are for human social functioning, the more words have been invented to describe this difference [9, 10]. These statements determine the unique exploratory value of this approach: (a) the lexicon of individual differences constitutes an objective (easy to replicate) and at the same time closed set of indicators of latent variables (e.g. key personality traits and emotions), (b) factor analysis is a basic analytical tool that can identify those latent variables that have the most indicators in natural language. However, the result of the analysis is not determined by the theoretical framework [11], but by the natural structure of the phenomenon under study, which allows for the development of ecologically valid

theoretical models, the best examples of which are the Big Five [12] and HEXACO [13].

So far, the psycholexical approach has been most useful in the field of personality trait taxonomy, but the lexical assumption is not limited to personality differences and opens up possibilities for the taxonomy of all individual differences available to human observation [4, 14]. One of the least explored categories of individual differences from the perspective of the psycholexical approach was the lexicon of emotions. The lack of research on this important part of every language's lexicon was due to the fact that the vast majority of psycholexical studies are limited to analyses of the adjectival lexicon, which, although most valuable in the study of personality traits, is insufficient to describe emotions, where attributive nouns play a greater role. This gap in knowledge was first filled on the basis of an analysis of the Polish lexicon of emotions [15]. The results of two comprehensive studies conducted on large samples of respondents showed that in the high-dimensional approach, both in self-description and in the perception of others, eleven predispositions to experiencing emotions systematically emerge: sadness, distress, anger, fear-anxiety, panic-loss of control, enjoyment-relaxation, interest, shame, contempt, regret-guilt, and love. The established taxonomy constitutes a psycholexical alternative to other attempts at taxonomising emotions that refer to various modalities, in particular through facial [16], bodily [17], and vocal [17] expressions. The question arises as to whether and to what extent the lexicon of individual differences in personality is related to the lexicon of differences in the experience of emotions at the level of latent variables.

Since previous psycholexical studies have not answered this question, non-lexical studies of emotions have observed a number of cross-correlations with personality traits. Research clearly shows that all Big Five traits correlate with how often and what emotions are experienced [29]: lower neuroticism and higher extraversion, openness, agreeableness, and conscientiousness are associated with greater adaptive emotion regulation strategies and lower maladaptive strategies. In particular, it has been shown that extroverts more often experience positive emotions, including joy and happiness [18, 19, 20]. Neuroticism is most strongly associated with more frequent experiences of negative

emotions such as anxiety, sadness, stress, and anger [18, 19, 20]. Agreeableness is associated with avoiding negative emotions and a lower tendency to anger [18, 19, 20, 21]. Conscientiousness is correlated with less frequent experiences of sadness and prevents the emergence of negative emotions due to more adaptive strategies for regulating emotions [18, 20]. Openness to experience is associated with lower sensitivity to surprise and greater openness to new emotions, as well as better adaptation to stress [18, 19, 20].

This raises the question of whether personality traits, as defined by the exclusive approach, exhaust all relatively stable patterns of experiencing emotional states, or whether there are predispositions to experiencing certain groups of emotions that go beyond known personality traits. Therefore, the main objective of the study is to establish a relationship between the personality lexicon represented in the exclusive approach by the Big Five model and the emotion lexicon.

Method

List of emotion descriptors

The procedure for identifying the lexicon of emotions was modelled on the German taxonomy [4]. The selection of person-descriptive terms was carried out independently by eight judges from the electronic version of the Universal Dictionary of the Polish Language [22], which contains 100,000 entries. The final list, representing all word classes (adjectives, participles, adverbs, attribute-nouns, type-nouns; and verbs), contained 27,819 person-descriptive terms. These terms then were classified by 13 trained judges into 16 categories/subcategories. As a result, 2,360 terms were recognised as descriptors of experiential states. A more detailed description of selection can be found in Gorbaniuk et al. [23]. Then, within each group of words with the same root and meaning (e.g., *złość* [anger], *rozczłuszczony* [angry], *złościć się* [to get angry]), eleven trained judges selected the word that most accurately described a given experiential state. Subsequently, five trained judges with specialisation in the psychology of emotions determined which experiential state terms described emotional states. The list of 233 emotion descriptors was next reformulated to describe the emotions in very short expressions, so that through minimal context they would indicate the meaning of the word corresponding to a given emotional state. As a result, each descriptor of an emotional state was presented to respondents in the form of sentences commonly used in colloquial speech.

Respondents rated emotional state descriptors on a 7-point frequency scale from 'not at all' (0) to 'very often' (6) to indicate how often they had experienced the state (self-rating) in the past two weeks. Due to the

cross-sectional nature of the study and the assessment of frequency, the object of measurement was the predisposition to experience 11 emotional states: sadness, distress, anger, anxiety, panic-loss of control, enjoyment-relaxation, interest, shame, contempt, regret-guilt, and love. The components measuring these predispositions were identified using principal component analysis with Equamax rotation [15] and calculated using regression analysis as the sum of the products of the respondent's answers and the regression coefficient of a given descriptor established on the basis of its correlation (factor loading) with a given emotional component, i.e. the degree to which a given descriptor is an indicator of the measured latent variable.

The measurement of personality traits

The Polish adaptation of Goldberg's IPIP-BFM-50 [24] questionnaire for measuring the five personality traits in the lexical tradition [25] was used to measure the Big Five traits. Participants responded to the 50 items on a 5-point Likert scale from 1 (very inaccurate) to 5 (very accurate). Based on the collected data, the internal consistency of the scales was as follows: Extraversion ($\alpha = 0.90$), Agreeableness ($\alpha = 0.81$), Conscientiousness ($\alpha = 0.80$), Emotional Stability ($\alpha = 0.89$), and Intellect ($\alpha = 0.79$).

Sample and data collecting

The vast majority of studies prefer to examine student samples due to the possibility of using a broader lexicon, which is the essence of psycholexical research. For this reason, the study was conducted on a sample of 360 full-time and part-time students (57.8% female; mean age = 23.58, standard deviation = 6.97). The participants were enrolled in several dozen Polish universities. The sample size allows for the identification of population correlations of $|r| > 0.15$ with a power of $1 - \beta > 0.90$ and a Type I error probability of $\alpha = 0.05$.

The data was collected in the form of a computer questionnaire completed off-line. After individual contact with each respondent and an explanation of the goals of the research, the questionnaire was sent to the respondent as a Microsoft Word file, with all fields blocked except for the space to type in the answers. Participants did not receive any reward for participating in the research.

Results

In order to establish a relationship between the lexicon of emotions and the personality trait structure represented by the Big Five, canonical analysis was used, which allows non-redundant components to be identified within two sets of variables. The analysis showed that they are linked by four statistically significant canonical roots, with the Big Five explaining 12% of the variance

contained in the eleven-factor structure of predisposition to experience emotions (see Table 1).

As expected, the largest proportion of explained variance in emotions belongs to emotional instability (5%), which is associated with more frequent experiences of anxiety (0.55), sadness (0.41), and distress (0.41). The second canonical root (3% of explained variance in emotions by personality traits) describes the relationship whereby introverts with high agreeableness are predisposed to experience shame more frequently (0.51), while extroverts with low agreeableness are more likely to lose control of their emotions (0.58) and react with contempt towards others (0.47).

The third canonical root (3% of explained variance of emotions) concerns a different combination (type) of Extroversion and Agreeableness traits. People who are friendly and sensitive to others, yet extroverted, are more prone to experiencing curiosity (0.40), less likely to experience shame and embarrassment in situations of social exposure (0.48), but more prone to despair/distress (0.41).

The last, fourth statistically significant root (2% of explained variance of emotions) with higher scores on the Intellect scale more often reacts with interest to stimuli in the environment (0.57), is predisposed to experiencing sadness more often (0.42) and are less likely to react with anger (0.41).

Table 1. Canonical correlation between the lexicon of emotions and personality traits

Traits/Components	Canonical roots (loadings)				
	1	2	3	4	5
Personality (P)					
Emotional Stability	-0.98	0.07	0.07	0.06	-0.18
Extraversion	-0.16	-0.66	0.67	0.12	-0.27
Conscientiousness	-0.37	-0.05	0.37	0.15	0.84
Agreeableness	-0.04	0.50	0.86	-0.02	-0.06
Intellect	-0.05	-0.20	0.29	-0.93	0.12
Emotions (E)					
Anger	0.31	-0.29	0.14	0.41	0.65
Joy/Relax	-0.26	0.10	0.27	0.12	0.15
Sadness	0.41	0.06	-0.18	-0.42	-0.03
Fear/Anxiety	0.55	-0.08	0.31	-0.27	0.12
Distress	0.41	0.02	-0.41	0.02	-0.27
Love	0.10	0.02	0.20	0.35	-0.46
Loss of Control	0.02	-0.58	-0.16	0.16	-0.02
Contempt	0.11	-0.47	-0.39	-0.24	-0.24
Shame	0.24	0.51	-0.48	0.03	0.29
Interest	-0.27	-0.03	0.40	-0.57	0.21
Regret/Guilty	0.21	0.28	0.07	0.19	-0.26
Canonical Correlations	0.71*	0.59*	0.53*	0.43*	0.18
Explained variance of E by P	0.05	0.03	0.03	0.02	0.00

* $p < 0.001$; canonical loadings are bolded $|r| \geq 0.40$.

Discussion

According to the psycholexical assumption, the content of the natural language lexicon is directly proportional to the social significance of experienced emotions, and thus the lexicon primarily reflects what is important in social interactions. In turn, personality traits, specifically the Big Five, play a significant role in shaping individuals' intrapersonal and interpersonal emotion regulation styles, including identification, selection, and implementation [34].

Canonical analysis was used to identify four non-redundant roots between personality traits and predispositions to experience specific pattern of emotions. Four such roots were identified. Two roots are dominated by a single trait, and two determine a personality type (i.e., combinations of two different traits) that co-occurs with specific pattern of emotional experience.

According to numerous previous studies, the key trait linking personality to the experience of negative emotions is neuroticism, or emotional instability [18, 19,

20]. In the present study, this pattern was fully confirmed: individuals characterised by greater emotional instability more frequently experienced anxiety, sadness, distress, as well as anger and shame. These emotions constitute the core of the negative emotionality typical of this personality trait. The root defined by this configuration also proved to be dominant within the entire personality-emotion system. The specificity of the psycholexical approach helps to explain why the lexicon of emotions in the Polish language – similarly to other languages – is dominated by descriptors of negative emotions; hence, negative emotions prevail in the taxonomy of emotions [15]. It is also worth noting that descriptors of emotional instability, within the exclusive approach, are by no means dominant in the personality lexicon and occupy only the fourth or fifth position compared with other traits of the Big Five or the HEXACO model [26].

The second trait that dominated the personality-emotion root is Intellect. The study results confirmed earlier, albeit limited, reports indicating that individuals with higher Intellect scores respond to environmental stimuli with greater interest [27, 28]. However, previous research has not demonstrated any association between Intellect and a higher frequency of experiencing sadness [18, 29]. The relationship identified in the present study may be explained by greater reflectiveness and emotional self-awareness [30], or by potentially higher cognitive engagement with challenging content [31]. Previous research has not found any correlations between Intellect and the experience of anger. If it is assumed that Intellect is associated with greater control over behaviour and emotions, this may in turn lead to the suppression of emotions arising from impulsive reactions, such as anger [31].

Meta-analyses of previous studies indicate that higher Extraversion and higher Agreeableness are associated with greater use of adaptive emotion regulation strategies and lower use of maladaptive ones. In the present study, two independent factors emerged, highlighting the significance of four personality types formed by combinations of low versus high levels of these personality traits, which are crucial for an individual's social functioning, and which display specific patterns of emotional responses. Previous research has demonstrated that Extraversion and Agreeableness independently predict relationship satisfaction, although the underlying mechanisms differ [21]. Extraversion is associated with a tendency to seek out and engage in socially rewarding activities that elicit positive emotions, whereas Agreeableness operates primarily through the avoidance of negative interactions and the consequent reduction of negative affect. The present findings refine our understanding of emotional predispositions among

individuals with high Extraversion and Agreeableness: this combination of traits is characterised by a higher frequency of experiencing interest, lower levels of contempt, and a reduced tendency to experience shame, a self-conscious emotion.

In the subsequent factor, a consistent pattern emerged indicating that extraverted individuals with lower levels of Agreeableness tend to experience contempt toward others more frequently and to display emotions of greater intensity. This finding corresponds with previous research demonstrating that individuals with such particular combination of personality traits are more prone to interpersonal conflict [21, 32]. The emotions experienced by such individuals may, in turn, facilitate a deeper understanding of the dynamics and outcomes of these social interactions.

In summary, it should be noted that the Five-Factor Model, which represents the exclusive approach in personality psychology, is capable of explaining only a small proportion of the predisposition to experience emotions (12%). Although personality traits and emotional experiences can be conceptualised in terms of predispositions to exhibit consistent patterns of reactions and behaviours, it is necessary, following the high-dimensional [33] and inclusive [7] approaches, to develop more detailed personality models encompassing potentially several dozen traits in order to more fully account for the richness of individual differences in relatively stable patterns of emotional responses. While the exclusive approach is characterised by greater parsimony, it is inevitably limited in its ability to capture the full range of personality trait differences: in psycholexical research, the five-factor structure explains at most 25% of the variance in personality differences represented in the personality lexicon [14].

Perspectives and limitations

The present study represents the first attempt to comprehensively examine the interrelationships between personality traits and the lexicon of emotions within the same methodological framework. Consequently, it opens new opportunities for research, but it also has notable limitations. Similar to personality traits, the psycholexical approach allows for the classification only of emotions that are perceptible to the average person and whose descriptors are encoded in natural language. Therefore, it must be acknowledged that the reality captured in the present study represents only a portion of the whole, which is not fully accessible to the unfamiliar observer — a limitation shared by both questionnaire-based and self-report research. An important extension of the present cross-sectional research, which focused on predispositions to experience emotions, would be

longitudinal studies that allow for the examination of the dynamic interrelations between personality and the lexicon of emotional states.

An inevitable limitation at this stage is that only a single language was studied, which precludes large generalisation of the findings. Establishing culturally universal dimensions of emotions within the psycholexical approach requires the identification of the emotional lexicon structure in other languages using a compatible research methodology. This, in turn, may contribute to the development of a cross-cultural taxonomy of emotions within both low- and high-dimensional approaches and to the determination of their interrelations with personality traits.

Conflict of interest

The authors have declared no conflict of interest.

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