# Describing a critical life event and its psychological consequences: The type of language used by patients suffering from depression and its relationship with personality development

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## Abstract

Information on personality development (and its linguistic predictors) in the aftermath of a critical life event among depressive patients is relatively limited. The study's aim was to verify two hypotheses: (1) Participants with depression will use concrete rather than abstract language to describe their most recent critical life event and its psychological consequences and (2) The more abstract the language used, the higher the level of personality development. 16 Cognitive Behavioral Therapy patients suffering from depression participated in the study ($M = 34$ years old; $SD = 4.02$). Their level of personality development was assessed qualitatively by two independent coders. The coding system was based on the Positive Disintegration Theory (Dąbrowski 1964). We used typology from the Linguistic Category Model (Semin and Fiedler 1991) to analyse the level of abstractness vs. concreteness. Depressed patients were classified as either abstract language speakers or concrete language speakers. There were equal numbers of both types of speakers. Moreover participants consistently used one type of language, regardless of whether they were describing the critical life event itself or its psychological consequences. As expected, using higher levels of language abstractness when speaking correlated with possessing higher levels of personality development. Our findings provide practitioners with useful knowledge on the benefits of using abstract language to improve supportive strategies when dealing with people in crisis and modify the psychotherapeutic protocols used to treat depression.

**Keywords** Abstractness · Concreteness · Depression · Language · Personality development

## Theoretical Background

Existing studies indicate that factors with the greatest impact on psychological consequences of critical life events (CLE; parting with a partner, serious illness, death of a close family member, losing a job, moving to a new flat, etc.) are not only based on the number of stressors or their diversity, but also the meaning ascribed to these events by persons experiencing them (Sariusz-Skąpska et al. 2003). In mental disorders, life

events may play a significant role if they are related to the individual's "area of self-determination" (Francis-Raniere et al. 2006). As a result of CLE, people's worldviews are challenged and their core beliefs may be shattered (Tedeschi and Calhoun 2004). Assumptions that are particularly prone to being undermined include an individual's self-esteem and how benevolently and meaningfully they perceive the world (Janoff-Bulman 1989, 1992). As Kaźmierczak et al. (2016) demonstrated in a longitudinal study, the increase of negative cognitions regarding the self constitutes the basic mechanism underlying the development and maintenance of post-traumatic psychological consequences.

The Meaning Making Model (Park and Folkman 1997) pertains to the process of how people construe, understand, or make sense of stressful events. CLE can cause a discrepancy between situational meaning and one's global beliefs or goals (Wortmann and Park 2009). The former makes reference to meaning concerning specific occurrences while the latter refers to individuals' system of values and views of situations. The discrepancy between the two constructs can create distress and may lead to particular mental disorders,

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such as mood or anxiety disorders. However, having such an experience may also serve as motivation to reduce both the discrepancy and the resulting distress (Park 2013). Specifically, it forces individuals to reconsider their previously held assumptions about the world. When their appraised meaning of an event is (or becomes) consistent with its global meaning, the event is effectively assimilated into one's existing cognitive structure. Consequently, the negative event that is experienced may bring about some positive implications (Cann et al. 2010). Resolving such a discrepancy may involve spiritual, religious or personality growth (Park 2010, 2013; Tedeschi and Calhoun 2006). A review of empirical studies suggests that although it very often takes time, between 75% and 90% of patients who experienced a specific CLE report certain benefits that stem from it (Davis 2001; Tedeschi et al. 1998). There is a "silver lining" to some forms of trauma, and personality growth occurs in such life spheres as self-perception, relationships with others and one's personal life philosophy (Tedeschi and Calhoun 1995).

An interesting perspective on personality development in persons who lived through CLEs comes from Positive Disintegration Theory (PDT; Dąbrowski 1964). It postulates that CLEs lead to the complete fragmentation of one's personality structure. By extension, the disintegration of primitive structures destroys the psychic unity of the individual. However, such a process can end in three possible ways: (1) Recessive: in such cases personality structure reverts back to how it was before the event (The development level remains the same). (2) Regressive: In such an instant the individual reverts back to a lower level of development (e.g. mental illnesses such as depression disrupting developmental processes (negative disintegration)); (3) Progressive: in this situation the person advances towards a higher level of personal development. 'As the individual loses their cohesion (which is necessary for feeling a sense of meaning and purpose in life) they become motivated to develop themselves. This developmental instinct contributes to personality reconstruction at a higher level after one's disintegration of the existing personality structure' (Dąbrowski 1964, p. 3). This process is called positive disintegration, because the final sort of personality structure is more complex and adaptive (Dąbrowski 1964). Paradoxically, the regressive character of the CLE (causing depression) may transform into a contrasting positive disintegration under favorable conditions. The presented study analyses precisely this type of change.

A question arises at this stage of consideration: are patients with depression able to decrease the discrepancy between situational and global meaning and climb up to a higher rung on the personality development ladder? Research on the matter has shown that the discrepancy between situational and global meaning does indeed motivate an individual to reduce it (though not in clinical groups) (Crumbaugh 1977). One might lack both meaning in life and the motivation to find it, because

a variety of factors might neutralise or distort this Frankl's postulated "universal need". In depression, it is likely that pathological influences such as cognitive bias, negative self-schemas or the negative triad (Beck 1976) hinder one's motivation to recover purpose in life. Assimilating a CLE, changing basic schemas and meaning-making are mental operations that demand strong cognitive abilities (Janoff-Bulman 1989). At the same time, depression is associated with numerous cognitive distortions, especially over-generalisation, filtering, polarised thinking and emotional reasoning (Beck 2011; Beck 1976). These mechanisms make the positive appraisal of an event even more difficult for this group.

This clinical observation is reflected in the analytical rumination hypothesis (Andrews and Anderson Thompson 2009), which in essence highlights both the rumination and a narrowing of the attentional focus that take place in depression. Depressive rumination involves giving episode-related problems priority access to limited processing resources. Because they are limited, the inability to concentrate on other things is a tradeoff that must be made to sustain analysis of the triggering problem. Although the study by Brzezicka et al. (2012) has shown rather the defocused attention in lowered mood (when presenting neutral materials), there is also scientific evidence that depression is characterised by increased attention to dysphoric stimuli (Armstrong and Olatunji 2012) and slower disengagement from negative information (e.g. Ferrari et al. 2016) compared to nonclinical groups. What is more, Holas et al. (2018) demonstrated that a depressive tendency to selectively focus on negative stimuli leads to more frequent ruminating and worse long-term psychological functioning. Finally, cognitive processes relating to attention and memory are found to be dependent on mood (e.g. Grol et al. 2014; Rokke and Lystad 2015; Wegbreit et al. 2015). In depression, mood is (by definition) permanently lowered for most of one's day, almost every day (DSM V; Morrison 2014). In this way, a negative feedback loop is created between lowered mood and deficits in cognitive processes, preventing both from improving.

Taking into account the belief that the way we think is reflected in our language, it is interesting to analyse how people with depression speak, especially when considering aspects other than semantic information. Linguistic structure of patients' verbalizations occurred to be a good diagnostic marker of mild depression (Bernard et al. 2016; Rude et al. 2004; Smirnova et al. 2019) distinguishing it from normal sadness and euthymic state (Smirnova et al. 2018), a predictor of future depressive symptoms (Zimmerman et al. 2017) and a predictor of suicide (Stirman and Pennebaker 2001). One of the most important psychological theories about language use is the Linguistic Category Model (LCM) introduced by Semin and Fiedler (1988, 1991). They distinguished among four categories of words that are used to describe interpersonal behaviour and communication. These four categories include three

types of verbs and adjectives. The general role is that the same behavioural episode may be described by the speaker or writer at four different levels of abstraction. The most abstract category in LCM are adjectives (ADJ), such as "aggressive" or "nice", which are often used to describe highly conceptual dispositions or personality traits. Adjectives enable generalizations across situations, objects or specific behavioural events. Every type of verb in the LCM is assumed to be less abstract and more concrete than an adjective. The first type of verb is the state verb (SV), the most abstract type among the three types of verbs. SVs are used to describe psychological, emotional or mental states (e.g. "love", "desire"). They do not contain a clear beginning and end and have no direct reference to a specific behavioral episode or situation although they do refer to a specific object. The second type of verb is the interpretative action verb (IAV). IAVs are used to describe a general class of behaviors without identifying the specific behaviour to which they refer in a given context (e.g. "help"). Thus, IAVs are more concrete than SVs in the LCM. The most concrete type of verb is the descriptive action verb (DAV). DAVs refer to verbs that describe a single and observable event defined by at least one physically invariant feature and with a clear beginning and end (e.g. "call"). With the development of the LCM, language abstraction becomes an indicator that can assess the degree to which people reveal their abstract or concrete thoughts in language usage. The tool has implications e.g. for Construal-Level Theory (CLT; Liberman and Trope 1998; Trope and Liberman 2003, 2010) which examines the abstractness with which people mentally represent objects, events, and other people as a function of subjective closeness or distance in different dimensions.

According to the CLT, people tend to use more abstract language to describe things that are psychologically distant and more concrete language to describe issues that are psychologically proximal (e.g. Fujita et al. 2006). Moreover, a happy mood is associated with more global and abstract processing. In contrast, an unhappy mood is associated with a more local focus and concrete processing in which the person pays close attention to detailed, external information (e.g. Beukeboom and Semin 2005, 2006; Gasper and Clore 2002). Updegraff and Suh (2007) found that happier people tend to describe themselves using more abstract language than less happy people (even after controlling for the overall valence and internality of their construals).

Taris (1999) showed that when describing behaviours, people generally use different levels of language abstraction depending on the target described (self versus others) and valence (positive versus negative). Specifically, participants generated more positive behaviours ("moral/intelligent") when referring to the self than when referring to others. These positive behaviours were also reported using more abstract language than when describing similar behaviours in others. Regarding negative behaviours ("immoral/ unintelligent"), participants reported fewer of them about themselves compared to others, and did so using more concrete language.

Based on the analytical rumination hypothesis (Andrews and Anderson Thompson 2009) as well as the aforementioned clinical observation and research results, the following hypothesis 1 was formulated: Participants with depression are more likely to use concrete rather than abstract language to describe their most recent critical life event and its psychological consequences.

The relationship between reporting a CLE and positive health and psychological outcomes is supported by a growing body of research evidence. For example, Campbell and Pennebaker (2003) found health benefits associated with writing or speaking about traumatic experiences. Similar findings were reported by Pennebaker (1995). Using Linguistic Inquiry and Word Count (LIWC) to analyse written essays from his six studies on expressive writing, he isolated three linguistic findings relating to subjects' health improvement following a traumatic event. First, the more individuals used words exuding positive emotions (such as "happy", "love", "good" or "laugh"), the better was their subsequent health. Second, a moderate number of negative emotion words (examples included "angry", "hurt" or "ugly") predicted health improvements (an interesting side note is that both very low and very high use of negative emotion words correlated with poorer health). Pennebaker's most important finding however was a third category of words: namely cognitive and thinking words. The two primary cognitive dimensions tapped causal thinking (words such as "cause", "reason" or "effect"), and insight or self-reflection words ("understand", "know"). The extent to which people increased their usage of such words was more important than how often they actually used them overall. People who displayed health improvements went from using very few cognitive words when the study began to using many more by the end of it. Pennebaker (1995) therefore concluded that people who construct coherent and meaningful stories benefit the most when translating their experiences into language. People reach an understanding of the CLEs and in turn that motivates them to form a resolution.

Stockton et al. (2014) found that post-traumatic growth significantly increased in an expressive writing group, from baseline to an eight-week follow-up. There was no significant change in the control group. It is important to mention that intrusive and avoidant cognitions did not differ between the two writing groups. However, analyses of their language use revealed that a greater use of insight words was associated with an increase in post-traumatic growth. LIWC analyses conducted by Lanning et al. (2018) revealed increasing complexity (and to some extent range of perspective) to be correlated with higher levels of development. The characteristic language of each of the model's 5 ego levels for example suggests a shift from consummatory to appetitive desires at

the lowest stages, a dawning of doubt at the self-aware stage, the centrality of achievement motivation at the conscientious stage, an increase in mutuality and intellectual growth at the individualistic stage and some renegotiation of life goals and reflection on identity at the highest levels of development. In an experiment conducted by Updegraff and Suh (2007), people randomly assigned to think about themselves in abstract rather than concrete terms reported greater pre-manipulation to post-manipulation increases in reports of life satisfaction. The research results led to the formulation of the following hypothesis 2: The more abstract the language used, the higher the level of personality development.

In summation this paper focuses on the type of language used by patients suffering from depression and its relationship with their personality development level. Our findings supplement related existing literature and provide practitioners with useful knowledge - applicable in the context of adjustment to CLEs. Moreover, our study combines qualitative research methods with linguistic and clinical perspectives.

## Method

### Participants

We collected narratives about a recent CLE and its consequences from $N = 16$ patients undergoing Cognitive Behavioural Therapy (15 women and 1 man). Participants were aged 28 to 45 years ($M = 33.85$; $SD = 4.02$). They were all Caucasian. They were recruited by three psychotherapists who had previously diagnosed them as going through an episode of major depression in accordance with DSM-IV criteria (First and Gibbon 2004).

The study was conducted between four and nine months after the CLE occurred: five patients participated between four and six months after the event (inner-crisis phase; Hopson and Adams 1976) while 11 of them participated from seven to nine months after the event (re-construction phase; Hopson and Adams 1976). The CLE was defined as: a situation of significant imbalance between the individual's resources and elements of their environment that required immediate changes to their so-called "normal pattern of life" (Sęk 1991). Such situations demand special effort to readapt in the face of existing ways of coping which turn out to be ineffective.

The research focused on negative critical life events that were associated with a significant loss for the majority of the participants. These included the termination of a long-term relationship ($N = 5$); personal health complications or those of a loved one ($N = 3$), losing a flat ($N = 1$); or of work resulting from challenging professional change/burnout ($N = 6$) or harassment ($N = 1$). Critical life events were distinguished from traumatic ones. People who had recently experienced a traumatic event were not included in the survey.

### Measures

Psychological outcomes were assessed using qualitative methods. In the first step, participants were assessed and recruited for the survey if they were found to be suffering from depression according to structured clinical interviews which diagnose DSM-IV Axis I Disorders (SCID-I) (First and Gibbon 2004).

Next, they were interviewed about their most recent CLE and its psychological consequences. To minimise the impact of the conversation between psychotherapists and their participating patients, therapists were trained by the investigators and given a structured interview form (see Appendix 1). The interview was created by the first author. It was based on the ABC Technique of Irrational Beliefs (A-Activating Event, B-Beliefs, C-Consequence; Ellis 1957) and the Cognitive Triad (Beck 1976): negative view of the self, the world and the future. Both of them constitute the theoretical basis of the Cognitive Behavioural Therapy. Therefore this tool could easily be applied to this form of psychotherapy. It began by asking the participant to describe the event itself, followed by a series of questions about whether the event had affected the way patients thought about the following: themselves, other people, the future, the world, what is most important in life, the meaning of life, relationships with other people, behaviour, emotions and physical well-being. If they had observed a change in any of these areas, they were asked to explain how the event had affected it and to give an example. The interview took from nine minutes to an hour to complete ($M = 21.63$, $SD = 13.04$).

Each tape-recorded interview was transcribed verbatim. All coding was carried out by two independent coders. To assess personality development, we used a coding system based on the PDT (Dąbrowski 1964, 1975). The main dimensions for assessing personality development level are as follows: the functions and structure of (1) feeling, (2) drives (3) values; (4) level of self-awareness; (5) ability to solve internal conflicts; (6) ability to manage interpersonal conflicts; (7) aspiration for development; and (8) reaction to stress. These in turn are characterised and operationalised by specific dynamics operating on six levels of personality development: (Ia) primary integration – unsocialized type, (Ib) primary integration - an "average", normally socialized type, (II) unilevel disintegration, (III) spontaneous multilevel disintegration, (IV) directed multilevel disintegration and (V) secondary integration (Dąbrowski 1964, 1975).

Each narrative was coded on the eight dimensions. Coders then determined whether or not the story contained evidence of each of the six levels of personality development separately for each dimension. If the narrative displayed evidence of a developmental level, it was given a score from 0 to 5. A 0 denoted primary integration – unsocialized type while a 5

denoted secondary integration. The narrative wasn't scored if no evidence was found.

Since this construct is rated on a six-point ordered scale to reflect different levels of personality development, the Intraclass Correlation Coefficient (ICC) was chosen (Shrout and Fleiss 1979) to assess inter-rater reliability. Aside from functions and structure of drives (the ICC(2,k) = .66), managing interpersonal conflicts (the ICC(2,k) = .7) and level of self-awareness (the ICC(2,k) = .73), the ICC(2,k) was above the acceptable level of reliability according to ICC standards (.75; Cicchetti 1994; Orwin 1994) for all other aspects of personality development (functions and structure of feelings, functions and structure of values, solving internal conflicts, reaction to stress, and aspiration for development), ranging from .8 to .85. In further analyses, total scores from the two independent coders were then averaged and used as a mean total score of personality development. The ICC(2,k) for overall personality development level was .87, which represents a very good level of agreement (Cicchetti 1994; Orwin 1994).

To analyse participants' language we used LCM (Semin and Fiedler 1991) typology. In our study we used the Polish LCM dictionary (Wawer and Sarzyńska 2018), which contains the 6000 most frequent Polish verbs. For each participant, the number of tokens (an individual occurrence of a linguistic unit) of a given word type (DAVs, IAVs, SVs, ADJs) in the whole interview was added up. We calculated the level of abstraction according to the weighted summation formula recommended by the LCM's authors (DAV + IAV*2 + SV*3 + ADJ*4).

In order to analyse the language samples we employed a natural language-processing (NLP) pipeline. The architecture is typical of morphologically rich languages such as Polish and consists of a number of connected modules:

- the morphosyntactic analyser Morfeusz: Its main task is to assign possible lemmas and morphosyntactic features to each word or token in a text. This assignment is performed by a dictionary compiled in the form of a finite state automaton (Woliński 2014). Morfeusz also performs tokenisation: the process of splitting input strings into tokens and punctuation marks.
- the morphosyntactic disambiguation module Concraft-pl: it seeks to resolve morphosyntactic interpretation disambiguities by using contextual, sentence-level information. The module uses a conditional random fields (CRFs) algorithm adapted to tagging highly inflectional languages such as Polish (Waszczuk 2012). We applied this module to find word lemmas, frequency counts of morphological tags, grammatical classes, and sentiment-carrying vocabulary.
- dependency parser: This analyses sentences' grammatical structure, establishing relationships between 'head' words and words that modify those heads (Jurafsky and Martin

2008). It is based on a Polish-language MaltParser engine model (Wróblewska 2014). We used the dependency parser to find adjectives belonging to verb phrases rather than noun phrases, as required by LCM scoring principles.

The pipeline we used contained modules that communicate via the Thrift framework, an environment for cross-language services that allows services implemented in different programming environments to efficiently and seamlessly interoperate. The implementation we used has been integrated into the Multiservice NLP toolbox (Ogrodniczuk and Lenart 2012). A diagram illustrating all of the elements of the NLP pipeline is presented on Fig. 1.

To determine word sentiment we used a dictionary of 3276 lemmas, divided into 1494 positive words and 1774 negative ones. It was compiled as a part of the Sentipejd tool (Buczyński and Wawer 2008). Lemma-level sentiments avoid the issues raised by word sense disambiguation errors and are more universal than sense-level sentiment dictionaries. Lemmas in this dictionary were compared with morphologically disambiguated lemmas provided for input texts by the Concraft-pl module.

The intensity of abstract language was calculated separately for narratives on a recent CLE and its psychological consequences. All variables were divided into two categories based on the median: concrete language (outcomes below the median) and abstract language (outcomes above the median). Examples of using abstract language by participants were as follows: "Wydaje mi się, że jestem towarzyską osobą, I guess I am a sociable person", "Zaczęłam myśleć o pewnych rzeczach, I started to think about certain things", "Chcę się rozwijać i pomagać innym, I want to develop and help others",
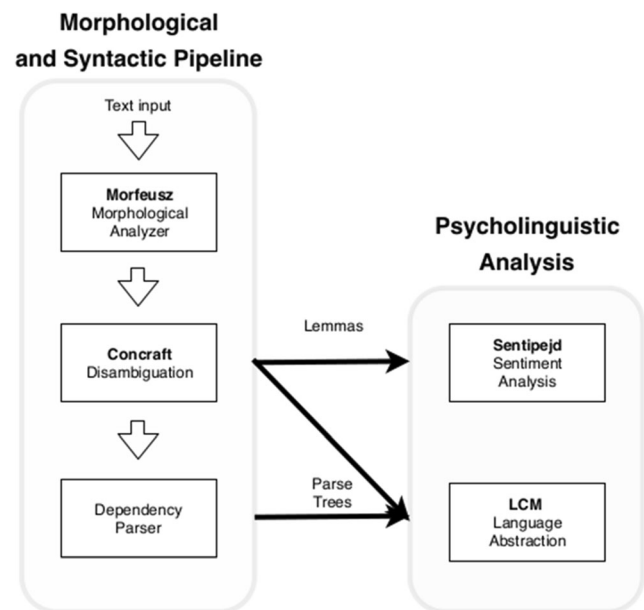


**Fig. 1** NLP pipeline

"Nie żałuję tego, staram się znajdować spełnienie tak czy inaczej, I do not regret it, I am trying to find fulfilment anyway". Examples of using concrete language include: "Grałem na puzonie na koncercie, I played the trombone in a concert", "Zostałem uderzony pięścią w twarz tak mocno, że złamały mi się okulary, I was punched in my face so hard that my glasses broke", "Po raz pierwszy w życiu napisałem skargę na mojego przełożonego, For the first time in my life I wrote a letter of complaint about my superior".

Study materials, codes and data will be posted to the university repositorium.

## Statistical Analyses

The intensity of abstract language used in narratives on a recent CLE and its psychological consequences constituted independent variables. The level of personality development was a dependent variable. Statistical data evaluation was performed with IBM's SPSS Statistics 25 software ($p < .05$, significant) and included a chi-squared test, a Cochran's Q test, some nonparametric (Spearman's rank correlation) and parametric (Pearson correlation) methods with bootstrapping to measure relationship between variables. The family-wise error rate was controlled with Bonferroni correction for alpha.

## Results

### Descriptive Information

Before testing hypotheses some descriptive analyses were performed (see Table 1).

The Kolmogorov-Smirnov test was carried out for all correlation variables. The distribution of results was found to be significantly different from the norm ($p < .05$) when assessing the intensity of abstract language in narratives on a recent CLE itself and such psychological consequences of the event as changes in thinking about the world, the meaning of life, what is most important in life and changes in behaviour and emotions. That is why we used both non-parametric tests and parametric tests with bootstrapping in the Data Analysis section.

## Data Analysis

To test the hypothesis of whether patients with depression will use concrete rather than abstract language, we performed a series of chi-squared tests. For narratives on a recent CLE and such its psychological consequences as changes in thinking about oneself, others and the world, what is most important in life, the meaning of life, and changes in relationships, behaviour, emotions and body sensations, the analyses showed that the same proportion of depressed patients used abstract language as those who used concrete language: $\chi^2 (1) = 0$; $p = 1$. Similar result was obtained for describing changes in thinking about the future ($\chi^2 (1) = .25$; $p = 1$). In the next step, Cochran's Q test was performed to determine whether there were differences in the type of language used between all narratives (on a recent CLE and ten areas of psychological consequences of the event). Participants occurred to use either abstract or concrete language consistently, regardless of what they were asked: $\chi^2 (10) = .36$; $p = 1$.

To test the hypothesis concerning the relationship between the language abstractness and personality development level,

**Table 1** Descriptive analyses and Spearman rho linear correlations between variables included in the survey

|  | M | SD | MIN. | MAX. | PD Level | p |
|---|---|---|---|---|---|---|
| AL critical life event | 428.24 | 548.69 | 89.32 | 2257.36 | **.7** | **.003** |
| AL changes in thinking about self | 91.82 | 83.98 | 0 | 328.48 | .42 | .10 |
| AL changes in thinking about others | 52.71 | 33.71 | 12.21 | 132.34 | .35 | .18 |
| AL changes in thinking about the future | 43.59 | 32.58 | 0 | 108.37 | .58 | .018 |
| AL changes in thinking about world | 62.82 | 69.59 | 0 | 226.45 | .42 | .10 |
| AL changes in thinking about what is most important in life | 52.67 | 55.47 | 0 | 233.29 | .37 | .15 |
| AL changes in thinking about the meaning of life | 53.98 | 53.34 | 0 | 165.41 | **.68** | **.004** |
| AL changes in relationships | 47.58 | 30.92 | 5 | 115.39 | .47 | .06 |
| AL changes in behaviour | 65.03 | 84.09 | 1 | 342.41 | **.69** | **.003** |
| AL changes in emotions | 44.16 | 50.07 | 0 | 190.47 | .43 | .10 |
| AL changes in body sensations | 40.72 | 38.60 | 0 | 151.36 | **.79** | **.001** |
| PD Level | 2.47 | .85 | .56 | 3.88 |  |  |

Note: AL – Level of language abstractness while describing the most recent critical life event and its psychological consequences, PD Level – Personality Development Level, bold – Statistical significance with Bonferroni correction of alpha

we conducted a Spearman rho linear correlation. For narratives on a recent CLE the result was statistically significant: $rho = .7$; $p = .003$, also controlling the family-wise error rate with Bonferroni correction for alpha (see Table 1). Next, Pearson's linear correlation was conducted using bootstrapping. Linear correlations performed with both the non-parametric test and the parametric test with bootstrapping were found to be positive and could be classified as strong because their values were within the range of $.5 < |r| < .7$.

The relationship between personality development level and language abstractness level that was used while speaking about the psychological consequences of the recent CLE was also statistically significant in such areas as changes in thinking about the meaning of life: $rho = .68$; $p = .004$, changes in behaviour: $rho = .69$; $p = .003$, changes in body sensations: $rho = .79$; $p = .001$, changes in thinking about the future: $rho = .58$; $p = .018$ and changes in relationships: $rho = .47$; $p = .06$ (statistical tendency). Applying Bonferroni correction for alpha, rho Spearman correlation coefficients remained statistically significant for three first areas (see Table 1). Next, Pearson's linear correlations were conducted with bootstrapping. The linear correlations performed with both the non-parametric test and parametric tests with bootstrapping were positive and could be classified as strong ($.5 < |r| < .7$) or very strong ($.7 < |r| < .9$).

Abstractness of used language was not correlated with personality development level in the case of describing changes in what is the most important in life, thinking about the world, others and self, and emotions (see Table 1). Pearson's linear correlations with bootstrapping also showed no significance.

## Discussion

The current study examined the type of language used by patients describing their recent CLE and its psychological consequences. These were patients undergoing Cognitive Behavioural Therapy who had suffered an episode of major depression. We formulated the following hypotheses based on published scientific literature: 1) Depressed participants will be more likely to use concrete rather than abstract language to describe their most recent CLE and its psychological consequences. 2) The more abstract the language used, the higher their level of personality development.

Our analyses revealed that the same proportion of depressed patients used abstract language as those that used concrete language. Taking into account that all the participants were psychotherapy patients, it can be assumed that suffering from depression does not seem to affect this formal aspect of language. The study also indicates that people use one type of language consistently, suggesting that this formal aspect of language constitutes a relatively stable feature. The result was inconsistent with our hypothesis. However, the

hypothesis was formulated based on research results that were obtained predominantly from healthy individuals' samples. It should be noted that there is evidence that depressed patients exhibited also a high level of abstract processing (Watkins 2008, 2010). What is more, Galfin and Watkins (2011) found that palliative patients and their carers reported significantly more abstract thinking than controls. This particular research dealt with patients' psychological distress. Moreover, as Taris (1999) found, people tend to report their own positive behaviours in more abstract terms (thereby indicating a personality trait rather than a singular behaviour). Their motivation for doing so is to enhance their self-esteem. Applying this finding to our study, perhaps those depressed patients who used abstract language were reporting more positive behaviours. Further research is necessary to answer this question.

As expected, higher levels of personality development directly correlated with how abstract the language used was. Abstract language is characterised by the use of state verbs, referring to either a cognitive ("to think", "to understand", etc.) or an affective ("to hate", "to admire", etc.) state (Wawer and Sarzyńska 2018). Describing a CLE and its consequences in an abstract way requires the mental inclusion of the event into former cognitive structures and, as Dąbrowski (1964) stated, the presence of cohesive elements integrated into one system. This type of language is related to both complexity and range of perspective, which correlates positively with levels of personality development (Lanning et al. 2018). In other words, abstract language suggests both the reporting of an event and its interpretation. It can be a sign of a transition from ruminating to formulating a CLE in broader categories. This occurs when discrepancies between its situational and global meanings are reduced (Park and Folkman 1997).

Moreover, abstract language uses expressions (verbs, adjectives) that are poorly verifiable and disputable or ambiguous (Semin and Fiedler 1991). These categories of expressions are used to create our own judgments (which are the result of thoughts, valuations, choices and decisions) and thus the result of the inference process for creating one's own vision of the world and self. This type of linguistic analysis is related to the development of the personal ideal, which is a determinant of personality development according to Dąbrowski (1964, 1967).

Finally, abstract language consists of using verbs to describe interpersonal states: either short-term relationships which are induced by the subject's action (type SAV- e.g. "anger") or long-term ones (type SV- e.g. "hate") and adjectives to describe a person's disposition (type APJ- e.g. "aggressive") (Semin and Fiedler 1991). The use of this type of expression, indicating mental states (i.e. emotional, feelings, attitudes, commentary), is the result of a mentalisation process. The mind theory is used to perceive or interpret one's own and others' behaviours (Alle et al. 2008). It results in

statements about one's own attitudes, feelings, thoughts, desires, goals and aspirations in the context of one's own autobiography. It is also expressed in statements about others that take into account their needs, intentions, feelings and beliefs. Concurrently, the ability to reflect on various states of mind (the ability to mentalise) is an indicator of a mature personality.

Applying these results practically, using abstract language to describe negative events (and their consequences) could be utilised as a resource for balancing various encountered stressors. Consequently an individual (regardless of their current standing on the "health-ease-disease" continuum) can work their way towards the health-ease end of it (Antonovsky 1996). In this context, it is significant that Stockton et al. (2014) research suggests that certain formal aspects of language can be trained through expressive writing.

The contribution of narrative processes for the development of patients' "heightened reflection" has increasingly been studied in psychotherapy (Salvatore et al. 2012; Santos et al. 2009). In addition, a growing number of clinical and counselling psychological approaches are beginning to fundamentally perceive therapy as a process of story reformulation and new understanding (Angus and McLeod 2004). Narrative psychotherapy concerns one of the main healing processes as a reconstruction of meaning, i.e. giving new meanings to traumatic, difficult, and problematic events by reinterpreting them (White 1991, 2007; Chrząstowski and de Barbaro 2011). By definition: reinterpretation is formed using abstract language by referring to thinking and assessing facts. The presented study allows to draw a conclusion about the developmental character of thinking (or speaking) in abstract or "authorial" categories. Therefore, figuring out: "What does it mean to me?", "What do I think about it?", "How does this event change my worldview?", "How do I understand it?", "How do I feel about it?" causes a transition to a more abstract level of language and narrative creation. According to narrative psychology, self-narratives define the identity of the individual. Thus, the use of such constructions is associated with the development of identity or personality.

Several limitations necessitate a degree of care when interpreting these findings. First of all, the sample size was small. Furthermore, participants' self-reports of the psychological changes they experienced as a result of CLEs formed the basis for assessing their level of personality development. In other words we cannot be certain whether or not they changed after the events. It is worth pointing out that while using abstract language might lead to personality development, level of personality development itself might affect the type of language used. This potential conclusion could result from performing a cross-sectional study. Consequently, as the present study cannot establish causal inference between the different variables, similar analyses could be performed in a longitudinal study. It is also important to note that the study

relies on retrospective self-report measures. Therefore, the findings may have been influenced by recall bias and intervening events (Heir et al. 2009). Moreover, the results are limited to depressed, Caucasian, Cognitive Behavioral Therapy patients and may not be generalisable to other groups and populations. Finally, it should be noted that the relationship between the language abstractness and personality development level was statistically significant for narratives about a recent CLE and only such psychological consequences as changes in thinking about the meaning of life, changes in behaviour, changes in body sensations.

In spite of these important limitations, it is interesting to note that findings on positive change (arising from negative events) have potentially significant implications for practicing clinicians. They suggest a cognitive mechanism underlying the personality development in the aftermath of CLEs that is reflected in language, undisturbed by depressive symptoms, that might be intentionally stimulated through the usage of the abstractive language. In practice, the results imply encouraging patients with depression to think conceptually in order to interrupt the ruminating process and take control over their own thoughts. On sessions, the abstract language can be stimulated e.g. through the Socratic Dialog (Beck and Dozois 2011), aimed at examining the meaning of events or discussing negative thoughts. It can also support other cognitive techniques, particularly cognitive restructuring, which require a broad perspective and a psychological distance from patients. Between sessions, the abstract language can be trained through expressive writing exercises, giving the material to reflect on. Summing up, the presented results could potentially improve supportive strategies when dealing with people in crisis and modify the Cognitive Therapy protocols used to treat depression.

## Compliance with Ethical Standards

**Conflict of Interest**   The authors declare that they have no conflict of interest.

**Inform Consent**   Informed consent was obtained from all individual participants included in the study.

**Ethical Approval**   The study has been approved by the University Research Ethics Committee.

# Appendix

## Critical Life Events Interview

I would like to ask you about a conversation on a negative critical event that has happened in your life recently and its psychological consequences.

A critical life event might be for example parting with a partner, serious illness, death of a close family member, losing a job, moving to a new flat, etc. It can be compared to an earthquake as it usually undermines the previous order, changes the way of thinking about yourself, the world and relationships with other people. It can negatively affect both mental and physical functioning. As a result of this earthquake, however, there may be also some positive changes in life.

The conversation will last about 15–30 min. At any time, when you feel tired, we can interrupt it and finish next time. Do you have any questions?

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Let's start with this negative critical life event that you have experienced in the last few months. What comes to your mind? Please tell me about it providing the following information:

- When did this event take place?
- What exactly happened?
- Who else was involved in this event? How?
- What did you think, feel, and what did you want during this event?

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Thank you very much for telling the story about this difficult experience As I mentioned at the beginning, a critical life event can change the way we think, our emotions, behaviour and how our body reacts. I would like to ask you some questions about potential consequences of the event you have just told about.

- How has this critical life event changed the way you think about yourself? Please give an example.
- How has this critical life event changed the way you think about other people? Please give an example.
- How has this critical life event changes the way you think about the future? Please give an example.
- How has this critical life event changed the way you think about the world? Please give an example.
- How has this critical life event changed your perception of what is most important in life? Please give an example.
- How has this critical life event changed the way you think about the meaning of life? Please give an example.
- How has this critical life event changed your relationships with other people? Please give an example.
- How has this critical life event changed your behaviour? Please give an example.
- How has this critical life event changed your mood or emotions? Please give an example.
- How has this critical life event changed your physical well-being? Please give an example.

Thank you very much for sharing your experience.

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