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The affective tone of narration and posttraumatic growth in organ transplant recipients

Abstract: The aim of the study was to verify the hypothesis that positive affective tone of narratives is connected to the experience of posttraumatic growth among transplant patients. Kidney transplant patients ($N = 51$) and liver transplant patients ($N = 48$) participated in the study. In the first stage, about 10 weeks after transplant, the participants told two stories about important, freely chosen events from their lives. During the second meeting 10–12 months later we measured posttraumatic growth. Results indicated that the affective tone of narratives about past events was associated with the level of post-traumatic growth measured 10–12 months later. This proves that the affective tone of narratives about life, understood as a relatively constant individual characteristic, promote posttraumatic growth.

Key words: narratives, affective tone, posttraumatic growth

Introduction

Numerous studies indicate that the process of coping with a traumatic life event can lead to positive transformations of personality (Linley & Joseph, 2004; Tedeschi & Calhoun, 2012). Posttraumatic growth may include enhanced personal strength, improved relationships with others, greater appreciation of life or spiritual development (Calhoun & Tedeschi, 2006, 2013; Ogińska-Bulik, 2013). These positive changes were observed in empirical studies investigating the so-called “seismic events”. The name “seismic” indicates that these events have the ability to shatter hitherto understanding of the world and oneself (Calhoun & Tedeschi, 2004). Seismic events can be connected to life-threatening or health-threatening situations, but they may also pertain to events that create a strong need to adapt (Park, Cohen, & Murch, 1996). One particular variety of event that can lead to posttraumatic growth is the experience of illness, whether chronic or acute (Park, 2009).

Organ transplant is an exceptional life event. It usually follows a long-lasting illness, that gradually limits the ability to function normally and is accompanied by chronic stress. A successful transplant gives hope for health but the surgery itself, as well as risks surrounding it, including death, may be extremely stressful. The transplant is a turning point in the patient’s individual story. This experience may coincide with significant cognitive effort – the patient may ask important, existential questions. Tedeschi and Calhoun (2004) conceptualize posttraumatic growth as positive psychological change experienced as a result of dealing with challenging life events, but the difficulty or threat caused by the situation in itself is not the main issue here. The process of posttraumatic growth may be started by events or circumstances resulting from trauma, and in turn lead to existential openness, self-reflection, interpretation of events or evaluation of meaning of life. Organ transplant may, but does not have to, become such an event for the patient.

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Calhoun and Tedeschi (2006) stress that posttraumatic growth is experienced only by some of those who went through a trauma or crisis. Depending on the sample, the proportion of those experiencing posttraumatic growth was estimated at 20% to 80% (Linley & Joseph, 2004). In their posttraumatic growth model, Calhoun and Tedeschi (2006; Tedeschi & Calhoun, 2004; Tedeschi, Park, & Calhoun, 1998) describe a complex process of coping with a seismic event and they include elements such as individual and situational characteristics, coping strategies and final outcomes, i.e. posttraumatic growth. From among the individual characteristics, traits such as hope or optimism (Schaefer & Moos, 1998; Tennen & Affleck, 1998) and basic trust (Trzebiński & Zięba, 2013) play a significant role, as well as the types of cognitive processes active when the cognitive representation of the seismic event is being constructed (Calhoun & Tedeschi, 2006; Janoff-Bulman, 2006; Payne, Joseph, & Tudway, 2007).

Empirical studies conducted during the last couple of years indicate that the experience of positive emotions is an important factor facilitating successful search for significance and meaning in life is (e.g., Hicks & King 2007; King et al. 2006; King & Hicks, 2012). Global positive affect is connected to finding meaning also when other variables, such as self-esteem, religious commitment, autonomy, competence, and relatedness are controlled for (King et al. 2006). The fact that positive emotions influence the process of shaping positive opinions about meaning and significance of life can be explained with the broaden and built model of positive emotions described by Fredrickson (1998, 2001). Positive emotions, such as joy, contentment, interest, pride and love build enduring personal intellectual, physical, social and psychological resources. These resources can be used in facing seismic events and they can play a positive role in the processes and outcomes of posttraumatic adaptation. A separate mechanism is connected to the influence of positive emotions on the way we think. In a broader mindset, individuals see a global picture of the reality, and they don't miss the forest for the trees (Fredrickson, 1998). A series of studies conducted by King and colleagues (2006) indicated that when people think broadly they may be more likely to see how their existence is connected to a larger system of meaning. This effect was detected in studies, where the level of positive affect was manipulated in different ways. It was, however, not confirmed in prospective studies (King et al., 2006, Study 4).

As stated by Watson (2000), individuals have a specific, dominant mood, i.e. a stable affective tendency, which underlies basic emotions, feelings and unspecified emotional states. According to cognitive theory of emotion, the tendency to experience positive or negative mood is connected to typical, individual cognitive schemata of experience representation, and these are called scripts (Tomkins, 1979). People have their relatively stable schemata of integrating experience into one story (Averill et al., 1994). These schemata are influenced by emotional experiences from the childhood and it is this period of

life that is the source of stable individual affective tone (McAdams et al, 2006), i.e. the tendency to interpret current experiences by using narratives saturated with specific affect (in terms of affect valence; McAdams, 1993; Tomkins, 1979).

According to McAdams and colleagues (2004) the affective tone of the narrative is weakly associated with personality traits: positive with agreeableness and conscientiousness, negative with neuroticism. Research results revealed that introverts and extraverts did not differ in the level of positive affective tone of their accounts. The affective tone of the narrative is connected to satisfaction with life and psychological well-being (McAdams et al., 2001).

Positive affective tone influences the construction of those narratives about one's own life, which have a presence of the positive affect: a positive outcome is expected (for current events) or positive aspects of the experience or search for positive consequences is stressed (for past events) (McAdams & Bowman, 2001). People who have a tendency to create narratives strong in affective tone often find positive sides to negative or traumatic life events (Pals, 2006a; Pals & McAdams, 2004). McAdams and Bowman (2001, p. 28) wrote: „There exists, therefore, a complex relationship between what ‘really happens’ in a person's life and how the person chooses to remember and understand it”. A particular tendency to interpret life events in a form of a story with a particular affective tone does not only pertain to the past, but also to events happening in the present or expected to happen in the future. A positive affective tone of the narrative makes people more likely to expect positive outcomes of events, even the negative ones (Pals, 2006b).

Important life events, and life- or health-saving transplants surely fall into this category, can be a turning point in individual life story and can serve as a trigger for rebuilding conceptions about oneself and the world. An individual's characteristic affective tone can serve as a moderator in this process. Studies suggest, that positive affective tone can facilitate positive transformation of personality and posttraumatic growth. There is, however, a dearth of studies on this issue among transplant recipients. In the present study we aimed to verify the hypothesis that positive affective tone of the narratives is connected to the experience of posttraumatic growth among transplant patients.

Method

Participants

Two groups of patients participated in the study: kidney and liver transplant recipients. 51 kidney transplant patients (72.5% men) aged 19 to 70 ($M = 45.57$; $SD = 14.97$) and 48 liver transplant patients (58.3% men) aged 20 to 64 ($M = 46.73$; $SD = 13.02$).

For 40 kidney transplant patients and 46 liver transplant patients this was their first transplant.¹ Among kidney transplant patients, 48 were treated with hemodialysis and for

¹ Controlling for first-time/ subsequent transplant did not impact the results in any significant way.

an average of 39.69 months ($SD = 36.85$). 3 patients declared that they were treated with peritoneal dialysis. The duration of the illness (as declared by patients) was between 6 and 480 months ($M = 109.91$; $SD = 113.01$) among liver transplant patients and between 18 and 420 months ($M = 133.94$; $SD = 104.03$) among kidney transplant patients.

Patients were recruited during their first post-transplant control visit. This took place in transplant clinic a several weeks after the transplant ($M = 77.46$ days, $SD = 33.34$) and we invited all patients to participate in the study except a) patients diagnosed with acute transplant rejection; b) patients with cognitive (intellectual) or emotional disorders (endogenous depression); c) patients, who received a living donor organ; d) *urgent* and *pre-emptive* kidney transplant patients. During their first visit, patients were well enough to attend a standard control visit. More than 80% of them said, that their physical and mental state was “good” or “very good”, and none of the patients reported worse than “average” physical well-being. Three patients were excluded at second survey, because we suspected that immunosuppressants significantly affected their mental state. Among 14 kidney transplant patients (27%) and among 12 liver transplant patients (25%) there were post-op complications resulting in the need for further surgery or significant delays in the introduction of immunosuppression protocols. This resulted in longer hospital stays.²

Procedure and materials

We conducted the study at the Outpatient Clinic of Department of Immunology, Transplantology and Internal Diseases, Medical University of Warsaw. We had two individual meetings with each of the participants: during the first four weeks after the transplant (1st survey) and between 10 to 12 months later (2nd survey). The meetings took place at one of the hospital’s doctor’s offices. An experienced clinical psychologist held the meetings, trained to conduct interviews according to the narrative approach, in which the psychologist listens to a story told by the study participant. Before joining the study, the participants were informed of its aims, procedures, anonymity and expected benefits and they were told that they could withdraw from the study at any time without giving reasons. They then signed an informed consent form. Both meetings were divided into two parts: patients filled out questionnaires and were interviewed according to the narrative method.

The narrative interview was conducted according to McAdams’ Life Story Interview (1993) adapted into Polish by Magdalena Budziszewska (2013). We limited the number of episodes to be told to three, so as not to burden the participants. During the first meeting we asked the participants to report two important events from their lives. The events were chosen at will but one had to have taken place during adulthood more than a year before the

study and the second needed to have happened within one year preceding the study. In the last part of the study the participants were asked to visualize their futures and speak of their plans and dreams. The interviews were preceded by a task, in which the patients were asked to draw a “line of life” and talk about the main chapters and important events in their lives. This part of the interview was used instead of questions about “chapters of life” that are usually asked in the Life Story Interview, where the participants need to divide their lives into chapters and label those chapters. In our pilot study, we found that the “line of life” task made it easier for the participants to get used to the role of narrators and telling events of their lives. This part was not analyzed, since its aim was to prepare the participants for the main part of the interview.

During the second meeting the participants were asked to report three events, which took place after the first meeting: the best event from that period, the worst (most difficult) event, and one event that was a turning point, i.e. an episode where something important changed or where they went through a personal change. In the last part of the interview, the participants were asked to think about: “the consequences of this important event – the transplant– and all that surrounded it, not meaning changes to health or material situation but changes in self-perception and perceptions of the world. People who went through experiences such as serious illness or surgery often notice that these experiences lead to personal change. They change the way they think about themselves, about what is important, about what brings joy and what brings sadness. Sometimes their life goals or their values change. Did you notice such changes in yourself? What were they?”

At the end of the second meeting, the participants filled out Stress-Related Growth Scale (SRGS) designed to measure posttraumatic growth (Park, Cohen, & Murch, 1996). In our study the questionnaire started with the sentence “Think of the consequences that the transplant had for you and your life”³.

Both meetings were held by an experienced clinical psychologist with more than ten years clinical experience, trained to conduct interviews according to the narrative method (the psychologist listens to the story told by the interlocutor). The psychologist was not a member of the research team and did not know the hypotheses formulated in the study.

Analysis and interpretation of the interviews

The interviews were transcribed before the analyses. We used a simplified system of data transcription, where we noted elements such as pauses, rises and falls in intonation, arrested statements, raising the voice and increased tempo of speech.

The affective tone of the narratives was coded on a 5-point scale according to instructions given by

² No significant correlations were found between hospital stay duration and posttraumatic growth. This relationship was also not found between the numbers of visits in the nephrology clinic 12 months after the transplant and posttraumatic growth.

³ In the study we also controlled for personal variables (e.g., hope, mindfulness, self-esteem) and we monitored physiological adaptation to transplant (as per written consent of the patient and the clinic) basing on eight physiological parameters. We do not present analyses of these data in this paper.

McAdams, Reynolds, Lewis, Patten and Bowman (2001). The subsequent points denote:

- 1 – a definitely negative ending, a very unhappy story
- 2 – a negative ending, a generally unhappy story
- 3 – a vague or neutral ending, the story was neither happy nor unhappy
- 4 – a positive ending, a generally happy story
- 5 – a definitely positive ending, a very happy story.

The analysis was conducted independently by two competent judges, who only had access to the transcribed interviews and did not have any information on the research participants (apart from a general characteristic of the group) or their questionnaire data.

According to McAdams and colleagues (2001), the affective tone of the narrative is a characteristic of the author (subject) and not the event. It is expressed in the emotional meaning ascribed to the story. Obviously, the events described by the author could have evoked negative or positive emotions at the time, but telling the story after a while leaves room for interpretations consistent with the narrative's affective tone characterizing the subject. This may happen in different ways and we give examples in the analyses of materials gathered during our study, especially when the stories are complex in terms of valence of feelings experienced by the story's protagonist (in this case the protagonist and author are the same person). Stories about suffering may include hope for the future and stories of events that seem fortunate can include descriptions of anxiety and worry experienced by the protagonist (narrator) despite the positive events. Oftentimes, the participants told the story in such a way that its ending changed the interpretation of the described experiences. The story about diagnosing cancer could include later events, such as favorable outcomes of the treatment or positive changes in the subject's life, which were caused by the illness, e.g., greater intimacy with close ones. The story about a promotion could exceed descriptions of pride and joy experienced at the time of the promotion and include later disappointment or negative consequences of the promotion for family life (or expectations that such consequences may take place in the future). Research participants sometimes added conclusions or morals, which could change the interpretation of the story (e.g., a frequent notion that "suffering ennobles"). The affective tone of a cognitive representation of the narrated experience may have depended more on the meaning ascribed by the narrator, rather than on the feeling experienced at the time. The competent judges had to make evaluations based on the general affective tone expressed by the narrator and not on the negative or positive emotions experienced by the protagonist (subject).

We conducted additional lexical analyses in order to broaden the interpretative possibilities. The aim of those analyses was to determine the emotional undertone of the narrative at a more basic level. Whereas assessments of the affective tone, according to the instruction of McAdams and colleagues (2001), concentrate on the general meaning of the story and the interpretations given by the narrators, the lexical analysis allows for determinations about the emotional undertone of the story at a linguistic level.

Studies conducted by linguists in the area of verbal expression of emotions point to various methodological issues (Awdziejew & Habrajska, 2006; Data, 2000; Fussell, 2002; Kövecses, 2004; Szumska, 2000). Analyses of experienced (or reported) emotions, which are based on verbal statements are very complicated because:

- emotions are rarely manifested explicitly in statements, they are more often expressed in emotionally marked vocabulary, choice of syntax, morphology and, most of all, prosody;
- emotions are introduced into communication in a non-explicit way, through implicature;
- expressed emotions are not necessarily congruent with experienced emotions;
- emotional acts are often connected to evaluative acts;
- nonverbal communication and pragmatic context are significant in decoding emotions expressed verbally.

In the present study, the material that we gathered (transcriptions of interviews) allowed for analyses based mainly on emotional vocabulary. We decided that the best results could be achieved if we concentrate on:

- words and phrases denoting emotions (e.g., „[there was] joy”, „[to have] hope”, „fear”, „regret”, „happiness”) and performative verbs denoting emotions (e.g., „I am glad”, „I regret”, „I fear”)
- figurative phrases (e.g., „I was shaking like a leaf”, „I went weak at the knees”).

Vocabulary was coded according to the valence of emotion – positive or negative. Words and phrases denoting emotions typically ranked as positive (admiration, hope, contentment, joy, love, positive surprise) were categorized as expressions of positive affect; the same was done for negative valence usually ascribed to emotions such as: fear, irritation, regret, gloom (see Russell et al. 1989). In the lexical analyses, affective tone index was computed as a proportion of positive words and phrases to all emotional words and phrases (negative and positive) used in the narrative.

We then carried out qualitative analyses of the content of structured interviews conducted during the second meeting (10–12 months after the transplant), where the research participants were asked to think about the consequences of the experience of transplant, in terms of changes in self-perceptions and perceptions of the world. The aim of the analysis was to separate those statements, which could signify posttraumatic growth in each of the areas listed by Tedeschi and Calhoun (2004). Those areas are: enhanced personal strength, improved relationships with others, greater appreciation of life, openness to new possibilities and spiritual development. Most participants did not mention any such changes. For 24 participants we could find statements suggesting that they experienced changes in terms of personal strength, greater appreciation of life and (less often) improved relationships with others, openness to new possibilities or spiritual development.

We then noted how intense the theme of posttraumatic growth was in the statements of each participant. The assessments were made on a 4-point scale, where the points denote:

- 0 – the theme of posttraumatic growth was not present
 1 – the theme of posttraumatic growth was minimally present
 2&3 – intermediate levels
 4 – the statements concentrated on posttraumatic growth (it was the main topic of statements in this part of the interview).

The judges were two competent psychologists with several years of experience in clinical practice. They had no access to any other patient data.

Results

U Mann-Whitney rank test indicated, that kidney transplant recipients did not differ from liver transplant recipients in terms of affective tone or posttraumatic growth indicators. Table 1 shows mean and standard deviations of the measured variables and U values.

To verify the relationship between the level of affective tone and posttraumatic growth, we conducted pairwise correlations. The results are presented in Table 2.

The affective tone measured at 1st survey, ca. 4 weeks after the transplant, was positively correlated with the level of posttraumatic growth 10–12 months later, measured with Stress-Related Growth Scale (SRGS). We observed similar results when the level of posttraumatic growth was assessed basing on the prevalence of statements about positive changes in at least one of the five areas of posttraumatic growth described by Tedeschi and Calhoun (2004): enhanced personal strength, improved relationships with others, greater appreciation of life, change of priorities and spiritual development. We found content describing the experience of posttraumatic growth in unprompted statements from 24 respondents (31.2%). The affective tone characterizing the respondents' narratives (measured at 1st survey) was more positive among those patients, in

whose statements we found posttraumatic growth indices 10–12 months later ($M = 3.17$; $SD = .70$), as compared to those patients, whose statements did not include notions of posttraumatic growth ($M = 2.75$; $SD = .68$). Mann-Whitney's U test indicated that the differences between the groups were statistically significant $U = 430.00$, $p = .018$ (asymptotic significance, 2-tailed).

The data also indicated that positive emotional undertone of the narratives about past events, expressed in the frequency of statements that pertained to positive emotions, was positively connected to the number of statements indicating posttraumatic growth, expressed by patients 10–12 months later. We did not observe analogous results when posttraumatic growth was measured with the SRGS questionnaire. Levels of the two indices of posttraumatic growth were positively correlated with the affective tone measured with narratives formulated during the second meeting, where the patients talked about their experiences from the past 10–12 months.

Discussion

The results of the study confirm the main hypothesis that the affective tone of the narratives constructed by the patients is connected to the experience of posttraumatic growth. It should be emphasized that the results were obtained in a longitudinal study. The affective tone was assessed basing on narratives about past events and the narratives were constructed 10–12 months prior to our measuring of posttraumatic growth. The affective tone was relatively stable – its levels measured in two surveys 10–12 months apart had positive, moderate to high correlations. This result is congruent with that showed by McAdams and colleagues (2004), where the correlations of affective tone measured twice, 3 months apart was .59, and for surveys 36 months apart, the correlations were .47.

Table 1. Comparison of affective tone a few weeks after transplantation (1st survey) and affective tone and posttraumatic growth measured 10–12 months later (2nd survey) in the groups of kidney and liver transplant patients (Mann-Whitney U test)

	Kidney transplant patients (N = 51)		Liver transplant patients (N = 48)		U	p
	M	SD	M	SD		
1. Affective tone (1 st survey)	2.73	.69	2.91	.72	913.50	.22
2. Positive affect – vocabulary analyses (1 st survey)	.58	.36	.45	.35	721.00	.08
3. Negative affect – vocabulary analyses (1 st survey)	.41	.35	.52	.35	753.00	.14
4. Affective tone (10–12 months later)	3.06	.80	3.12	.67	712.50	.79
5. Posttraumatic growth – Stress-Related Growth Scale (10–12 months later)	115.63	22.10	114.28	19.28	691.50	.54
6. Posttraumatic growth – interview (10–12 months later)	.40	.85	.81	1.21	610.00	.12

In general, we found that higher levels of posttraumatic growth were reported by those patients, whose narratives about their chosen recent experiences had a more positive affective tone. These results would not be surprising if the construction of the narratives and the measurement of posttraumatic growth were conducted at the same time. If that was the case, the relationships might be explained by the impact of mood on the availability of content congruent with current mood (Isen, 1987). This does not apply if we compare data on affective tone and posttraumatic growth measured 10–12 months apart. If we assume that we chose an accurate way to measure affective tone characteristic for an individual and the style of constructing narratives about life that was formed in childhood (McAdams, 1993), then the results should be interpreted similarly to interpretations made in any longitudinal study, where the level of a given characteristic can be used to predict the level of another characteristic after a given period of time. The correlational design does not allow drawing conclusions about causality between the affective tone of the narratives and posttraumatic growth. It seems, however that the hypothesis about the relationship between positive affective tone in narratives about oneself and outcomes of a process of posttraumatic growth was confirmed in our study. Similar results were also obtained in the study of people who have lost mobility (Zięba, 2015).

This study has some practical implications. According to a number of authors, creating a narrative (cognitive representation) of a traumatic event facilitates positive adaptation (Pals, 2006a; Smyth, True, & Souto, 2001). Calhoun and Tedeschi (2013) state that the basic strategy of helping trauma or crisis survivors is to encourage them to retell their experiences and to assume the role of and interested listener. People differ in terms of their narrative competence – their dispositional tendency to structure their experience in a coherent story (Stemplewska-Żakowicz, Piotrowska, Szewczyk, & Wawrzyniecki, 2006). Pennebaker and Seagal (1999), however, introduced a method for psychological intervention based on

encouraging people (e.g., trauma victims) to describe their experiences in a form of narratives. This proved to be an effective method in supporting adaptation. The results of our study suggest, that the affective tone of the narrative, conceptualized as a relatively stable individual characteristic, facilitates posttraumatic growth. Therefore, two issues need to be addressed. Firstly, affective tone characteristic for a particular person may influence the effectiveness of interventions aimed at increasing cognitive involvement, including narrative methods. It seems that controlling for dispositional affective tone may be useful in estimating effectiveness of various methods aimed at supporting trauma victims. Secondly, activating narrative schemata, including positive affective tone, may prove to be an effective form of positive intervention.

We need to point out some limitations of the methodology. Firstly, a short version of the Life Story Interview that we used did not allow us to collect enough material for the analyses of the affective tone. Since the participants told us about only two (or three, during the second meeting) experiences, we cannot be sure if the way they told the stories was typical for them in terms of affective tone. Obviously, it would have been better if we had more narratives to analyze. This, however, was not possible because of the nature of the sample and the circumstances of the study. Numerous studies conducted by McAdams and colleagues (e.g., McAdams, Anyidoho, Brown, Huang, Kaplan, & Machado, 2004; McAdams, Reynolds, Lewis, Patten, & Bowman, 2001) showed that results obtained in studies where the procedure limited the number of narratives to three were later confirmed in other studies.

Another limitation was the way that we operationalized affective tone. As indicated in the instruction mentioned in the method section, the affective tone of the narratives was expressed mainly in the ending of the story. In some cases this led to interpretative difficulties – especially in those cases, where the story had a complicated dynamic and which started with an event

Table 2. Correlations (rho Spearman) between indicators of affective tone a few weeks after transplantation (1st survey) and affective tone and posttraumatic growth measured 10–12 months later (2nd survey)

	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Affective tone (1 st survey)	2.82	.70	–				
2. Positive affect – vocabulary analyses (1 st survey)	.51	.35	.30**	–			
3. Negative affect – vocabulary analyses (1 st survey)	.47	.35	-.31**	-.95***	–		
4. Affective tone (10–12 months later)	3.09	.73	.35***	.08	-.16	–	
5. Posttraumatic growth – Stress-Related Growth Scale (10–12 months later)	114.88	20.47	.22*	-.05	-.05	.33**	–
6. Posttraumatic growth – interview (10–12 months later)	.62	1.08	.28**	.21*	-.29**	.36***	.27**

Note: * $p < .05$; ** $p < .01$; *** $p < .005$.

described as initially negative (e.g., illness, getting fired) but which ended in a positive way (e.g., descriptions of overcoming illness, formulation of new goals) or events which started with a positive change in life but ended in disappointment or had negative consequences. Affective tone, operationalized according to suggestions of McAdams and colleagues (2001), appeared to be connected to the narrative sequence construct. Redemption (evil turns into good) and contamination (good turns into evil) sequences most frequently used in narrating one's own life story were initially described by McAdams, Diamond, de St. Aubin and Mansfield (1997). Redemption sequences in life narrative accounts were positively associated with self-report measures of psychological well-being, whereas contamination sequences predicted low levels of well-being among midlife adults (McAdams et al., 2001). According to instructions used in our study, affective tone assessed as high (positive) could have meant that the narrator chose to describe experiences, which evoked positive emotions only. This could also have meant that the narrator had a tendency to build stories basing on the redemption scenario, i.e. seeing a good ending or positive outcomes of difficult experiences. It seems that both interpretative tendencies can facilitate posttraumatic growth, but they base on different mechanisms. In future studies, the procedure should be modified in such a way, so as to allow for clear interpretations of the affective tone (conceptualized as a tendency to describe one's own experiences in a positive way) and the significance of using specific scenarios and narrative sequences that facilitate the creation of more complex cognitive representations of one's own positive experiences.

In our study, we also analyzed lexical indices of positive and negative emotional undertone of the narratives. The data pertaining to relationships between the frequency of terms describing positive or negative emotions and the level of posttraumatic growth are partly congruent with data on the significance of affective tone mentioned above. The more content pertaining to positive emotions was present in the narratives, the greater the posttraumatic growth observed 10–12 months later. Notably, the way we measured positive emotionality of the narrative did not allow us to distinguish between effects connected to changes of affect valence stemming from redemption or contamination sequences. High scores were observed among those people, whose descriptions of experiences contained the experience of positive emotions. Whether those emotions were connected to the ending or outcome of the story did not impact the score.

Another limitation was the way we analyzed the material, i.e. competent judges subjectively assessed statements made by participants. This pertained mostly to statements about the experience of posttraumatic growth and affective tone.

The sample was atypical and varied at the same time. Kidney or liver transplant must have been an important, shocking experience, but it was also preceded by a long period of illness. As a result, the process of posttraumatic growth might have been different from the process

experienced by people adapting to trauma, which resulted from an unexpected event. Among dialyzed patients, the transplant was connected to a significant improvement in the quality of life, mostly because they could give up dialysis. The liver transplant was typically the only way to save a patient's life, but it was also connected to a higher risk, i.e. if the transplanted organ failed to function the consequences would be much more severe (as compared to kidney transplant). Bigger patient samples and controlling for a multitude of variables is necessary in future analyses of the specificity of posttraumatic growth processes, the significance of affective tone and of other individual and situational factors. On the other hand, post-transplant patients' situation is distinctive, so generalizations onto other traumatic or critical experiences are not possible.

In this study, we did not control for a number of variables that could moderate posttraumatic growth processes, such as personality and temperament, level and type of social support, evaluation of the original stressor (transplant). We did not control for the etiology of the organ failure. Future studies should also investigate the differences in posttraumatic growth between groups of patients whose need for transplant was caused by different factors. It may be significant if the need for transplant was caused by acute and unexpected factors, which may be traumatic themselves, or if it resulted from a chronic illness and a gradual deterioration of organ function. Attribution of responsibility to the patients may also be significant, if e.g., transplant was necessary due to alcoholic liver disease. Longitudinal design could also have supplied additional information, if the first survey (measuring affective tone, personality traits) was conducted before the transplant.

Further studies are needed to confirm the obtained results and their methodology must be designed in such a way that the above issues are minimized or eliminated. Samples should also be bigger and more varied. Possibly, controlling for age and splitting samples into groups of participants at different stages of life may yield interesting results. Positive outcomes of affective tone for adaptation processes are usually detected in groups of participants in midlife or older. The present study mainly included older participants as well. Another interesting issue is the extent to which the affective tone of the narratives influences the process and outcomes of posttraumatic growth in other age groups. Prospective studies may be especially valuable if they include investigations of affective tone before a traumatic event and the posttraumatic adaptation is observed for a period of at least a couple of years.

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