

# Posttraumatic growth in long term breast cancer survivors: relation to coping, social support and cognitive processing

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## Abstract

Post-traumatic growth (PTG) has rarely been studied in long term breast cancer survivors using open interviews. In order to address the issue of how women integrate PTG in their overall cancer experience, 28 open interviews concerning changes after cancer were carried out with 5- to 15-year survivors. The analysis of results, performed using Alceste software, revealed one thematic class of PTG which was specific to women with high coping and social support and active cognitive processing. PTG theme appeared most often as a conclusion of interviews rather than in response to the question about changes after cancer.

## Keywords

breast cancer, cognitive processing, coping, posttraumatic growth, qualitative study

Posttraumatic growth (PTG) was defined as positive psychological changes experienced as a result of the struggle with highly challenging life circumstances (Tedeschi & Calhoun, 2004). Such changes have been reported in breast cancer (BC) survivor narratives within five years from diagnosis (Milne, Guilfoyle, Gordon, Wallman, & Courneya, 2007; Sadler-Gerhardt, Reynolds, Britton, & Kruse, 2010). These are mainly related to a greater appreciation of life, new priorities, an enhanced spirituality and deeper relationships with others. Long term after BC diagnosis PTG has also been revealed in inventories with the same themes of change (Brunet, McDonough, Hadd, Crocker, & Sabiston, 2010; Mols, Vingerhoets, Coebergh, & Van de Poll-Franse, 2009). However, there is

little research into long term positive changes after BC using open interviews. Indeed, the review by Hefferon, Grealy, & Mutrie (2009) on qualitative research into PTG in life-threatening physical illness listed 18 studies in BC women, but only two of them (Fredette, 1995; Sabiston, McDonough, and Crocker, 2007) deal with long term survivors (at least five years from diagnosis). In addition, one was specific to

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women involved in a sports program (Sabiston et al., 2007) and the other (Fredette, 1995) did not specifically focus on PTG. Consequently, if PTG domains have been largely documented, on the other hand, little is known on how female survivors integrate PTG in their overall cancer experience and current lives long term after diagnosis and treatment completion.

Therefore, our goal was to explore the emergence of PTG in BC survivor narratives concerning the changes caused by the cancer in their lives. We focused less on the PTG domains than on how women would mention PTG, and on the connection of PTG with other cancer-related themes. The Alceste method was chosen to analyze qualitatively the data with both a thematic and discourse analysis. Furthermore, since it is well documented that PTG is closely linked to the use of coping (Bussell & Naus, 2010; Karanci & Erkam, 2007; Rajandram, Jenewein, McGrath, & Zwahlen, 2011) and social support (Bozo, Gündoğdu, & Büyükaşik-Çolak, 2009; Bussell & Naus, 2010; Pinquart, Frölich, & Silbereisen, 2007; Schroevers, Helgeson, Sanderman, & Ranchor, 2010), we also set out to test the association of PTG with such psychological resources. Besides, since an internal locus of control (LOC) can help to take control over one's life, and has been related to PTG in various stressful events (Park & Fenster, 2004) and BC patients (Ho, Chan, Yau, & Yeung, 2011), we predicted internal LOC as a potential correlate of PTG in BC survivors.

## Method

### *Sample*

The interviewed women were selected from a larger sample study described in detail elsewhere (Lelorain, Bonnaud-Antignac, & Florin, 2010). They were all French cancer survivors, diagnosed with BC 5 to 15 years earlier and without recurrence at the time of the study. From this large sample, 32 women were chosen at random with the SPSS random sampling option and asked whether they would agree to be interviewed about their long-term remission.

One refused and the first three interviews were not retained because they had already participated in a pre-test screening of the questions to be asked. Finally, 28 interviews were carried out in exactly the same way and retained. "Saturation" was reached with the first 20 interviews, i.e. 20 interviews were enough for the software analysis to yield the same classes as those described in the Results section. However, to ensure that the associations between the introduced quantitative variables and classes were stable, the interviews were continued. The medical and demographic characteristics of the sample are described in Table 1. For most women, disease stages at diagnosis were Stage I or II. The majority were treated both with chemotherapy and radiotherapy. Twelve underwent a mastectomy. They were all treated at the Cancer Treatment and Research Center of Saint-Herblain (France) where support for social and psychological issues is available if necessary. The majority (75%) was working at time of diagnosis, and had to stop temporarily before resuming. By and large, women experienced few financial problems due to cancer (69%), since the French social insurance covers much of the medical expenses. However, 26% reported frequent troubles when requesting credits or loans. Currently, the majority are retired with a correct or comfortable financial situation. Half of them still report somewhat or very troublesome sequelae of cancer.

### **Procedure**

All data was anonymously recorded and all participants were fully informed about the research before signing a consent form. The whole study was approved by the ethics committee of St-Herblain Hospital where patients had been treated for their BC.

**Qualitative data.** The 28 interviews were carried out by phone or face-to-face in the interviewee's home. The mean length was 55 minutes (18 minutes to 178 minutes range) and everything was recorded with the agreement of

the participants and transcribed. The whole transcript is 194 pages long (single line spacing). For each interview, only three questions were asked and always in the same way. The first one was aimed at establishing rapport, helping the woman to feel at ease so that she could talk freely and openly: "Could you please tell me about the way you experienced your cancer? What was important to you? What do you remember the most? Just tell me what happened to you". The second question was the real question we were interested in:

Do you have the feeling that this cancer has changed something in your life or in yourself or, on the contrary, do you have the feeling that in the end nothing has really changed in your life or in yourself because of cancer?.

Finally, the last question was aimed at exploring what was really important to these women: "Would you like to add something else or something which you had forgotten or something you've already said but that you would like to emphasize?"

**Quantitative data.** The quantitative data included in the current article was gathered from the study by Lelorain and al. (2010). However, LOC and social support were not exploited in this previous publication which focused mainly on coping and PTG. The internal LOC was evaluated by Lumpkin's questionnaire (Lumpkin, 1985) which consists of six items extracted from the Rotter questionnaire (Rotter, 1966). In our sample, the Cronbach's alpha was .55. Coping was tapped with the Brief Cope (Carver, 1997) which encompasses 14 dimensions of coping. To have a more practical measure, we discarded the three original subscales of non-adaptive coping in cancer settings, i.e. substance use, blame, and behavioral disengagement (Amir & Ramati, 2002; Hack & Degner, 2004; Lebel, Rosberger, Edgar, & Devins, 2008), and computed a score of "adaptive coping" by adding the 11 original subscales of active, planning, distraction, positive reinterpretation, acceptance,

humour, emotional and instrumental support, expression of feelings, and denial. Although it may seem a little counterintuitive, we included denial in this adaptive coping because it has been proved to be helpful for psychological adjustment (Orr & Meyer, 1990) at diagnosis and during the treatment of cancer and has also been related to PTG (Helgeson, Reynolds, & Tomich, 2006; Park & Fenster, 2004). The alpha for adaptive coping was .83 in our total sample. Perceived social support was measured using the 16 items of the Bruchon-Schweitzer social support questionnaire (Bruchon-Schweitzer, 2005) which is made up of four subscales for emotional, instrumental, informational and esteem support. Only the total score was used here with an alpha of .93 for our total sample.

## Analyses

The interviews were analyzed using Alceste software (Reinert, 1986). Alceste splits the text into units of context (UC) which are formed of one or several consecutive sentences based on the punctuation and the number of significant words. Then, in a descending hierarchical classification, it classifies the UCs into lexical classes according to the distribution of words and lemmas, which are words containing the same lexical roots (e.g. psychologist and psychological) which are indicated by the symbol '+' in Alceste output: e.g. 'psycholog+'. The size of the association of the UCs to their class is given using chi-squared. Alceste output also provides the list of words/lemmas related to each class and again the size of the association of words/lemmas to their class with association chi-squared. Furthermore, a forward hierarchical classification (FHC) shows how words are linked. For example, FHC demonstrates that "psychological" is linked with "difficulties" according to the distribution of words/lemmas. Here again, the size of the association between words is given. Along with the output of representative words/lemmas and UCs of the

classes, and FHC, it is the responsibility of the researcher to identify the theme in each class (thematic analysis).

Two researchers (SL and ABA) carried out this task, first independently and then together to agree on the theme and label of each class. In addition, for each class, discourse indicators are presented according to the style of speech under the headings of *grammatical*, *temporal*, *intensity*, *punctuation*, etc. (discourse analysis).

Alceste analysis was chosen for three reasons. Firstly, it is a very quick way of extracting lexical classes and thus themes in a large corpus like this study, while a traditional thematic analysis would have been very tedious with so much material. This is also a very quick way of obtaining a discourse analysis. Secondly, it provides a correspondence factor analysis showing graphically how the classes are related to each other. This point is very important for this study in which our object was to examine how various themes of the different accounts are related to each other. Thirdly, it can take categorical variables related to the interviewees into account (e.g. low or high social support) and then gives chi-squared association between the categorical variables and each class. This latter feature, specific to Alceste software, enables qualitative and quantitative information to be connected at the same time and further justifies our choice of this method. The introduced categorical variables are displayed in Table 1 and described as follows.

For each participant, we noted which part of the interview correlated to which of the three asked questions (first open question, question related to changes, final open question). We also introduced adaptive coping, social support and the internal LOC with two modalities for each variable: quite low on this variable (score  $\leq$  percentile 35) versus quite high (score  $\geq$  percentile 65). We have selected this way of taking into account only the extreme scores in order to explore the effects of variables in spite of the small sample size. For people between these two modalities, the modality was not taken into account. Two medical variables were also introduced: chemotherapy treatment and current

perception of the cancer or treatment sequelae. Sociodemographic variables were not included as they were not the prime focus of this research. Moreover, the number of variables to introduce is limited by the software.

## Results

The software analysis yielded four classes encompassing 65% of the whole corpus. This means that 35% of the corpus could not be attached to one of the four classes due to the personal stories/elements of the women. This information confirms the open design of our interviews which allowed women to talk very easily about their story and their lives in general. First, we describe the four classes, paying particular attention to the first one which seems related to PTG, and secondly we provide the results about the links between classes. For reasons of clarity, an interpretation of the results will essentially be given in the discussion section.

### Nature of the four classes

**Class 1: PTG.** The major class contained 34% of the analyzed speech. As shown in Figure 1, the main words or lemmas—the latter were marked by a ‘+’ sign—of this class were (in descending order): thing+ ( $\chi^2$ : 81), life ( $\chi^2$ : 62), way ( $\chi^2$ : 53), psycholog+ ( $\chi^2$ : 52), positive ( $\chi^2$ : 48), people ( $\chi^2$ : 44), illness ( $\chi^2$ : 41), body ( $\chi^2$ : 39), standing back ( $\chi^2$ : 26), different ( $\chi^2$ : 23), think ( $\chi^2$ : 22), important ( $\chi^2$ : 21), appreciate ( $\chi^2$ : 21), hard ( $\chi^2$ : 20), health ( $\chi^2$ : 19), communicate ( $\chi^2$ : 18), fight ( $\chi^2$ : 16, with 100% of the occurrences of this latter word being in this class), fragil+ ( $\chi^2$ : 16, also 100% here), essential ( $\chi^2$ : 16). The ascending hierarchical classification revealed associations between ‘psycholog+ and thing, think and live, appreciate and way, try and positive+, important and life, illness and suffer.’ Somewhat surprisingly, this class was associated first with the answers to the last open question ( $\chi^2$ : 63) and to a lesser extent with the answers to the question about changes ( $\chi^2$ : 38). This class was characteristic of women with high adaptive coping ( $\chi^2$ : 44), having received

**Table 1.** Participant characteristics

Characteristics	Categories	N	%
Current age	<60 years	13	46.4
	From 60 to 70 years	13	46.4
	>70 years	2	7.1
Time since diagnosis	5 to 10 years	13	46.4
	11 to 15 years	15	53.6
Partner	No	7	25
	Yes	21	75
Current professional situation	Retired or housewife	18	64.3
	Working	9	32.1
	Looking for a job	1	3.6
Current perceived financial situation	Rather difficult	2	7.1
	Correct	15	53.6
	Comfortable	11	39.3
Professional situation at diagnosis	Retired or housewife	6	21.4
	Working	21	75
	Looking for a job	1	3.6
In the two years following diagnosis (among the 21 who were working at that time)	Never stopped working	2	7.1
	Stopped working and then resumed	15	53.6
	Lost or had to quit their job	2	7.1
	Decided to retire in advance	1	3.6
Had problems with insurance, loan, credit because of cancer	'Never', 'seldom' or 'sometimes'	19	69.4
	'About as often as not'	1	3.6
	'Frequently', 'very often' or 'always'	8	26
Had money problems from cancer	'Never', 'seldom' or 'sometimes'	24	85.8
	'About as often as not'	2	7.1
	'Frequently', 'very often' or 'always'	2	7.1
Education	Less than high school diploma	16	57
	High school diploma and some college	9	32
	College diploma or more	3	11
Chemotherapy*	Yes	17	60
	No	11	40
Radiotherapy	Yes	21	75
	No	7	25
Both radio and chemotherapy	Yes	16	57
Hormonotherapy	Yes	7	25
	No	21	75
Mastectomy	Yes	12	42.9
	No	16	57.1
Perceived sequelae of cancer or treatment*	No or not very troublesome	14	50
	Somewhat or very troublesome	14	50
Stage of cancer at diagnosis	Stage I	12	43
	Stage II	13	46
	Stage III	1	4
	Doesn't know	2	7

(Continued)

**Table 1.** (Continued)

Characteristics	Categories	N	%
Adaptive coping*	High adaptive coping $\geq$ percentile 65	17	60
	Low adaptive coping $\leq$ percentile 35	8	26
Perceived social support*	High social support $\geq$ percentile 65	14	50
	Low social support $\leq$ percentile 35	11	39
Internal locus of control* (LOC)	High internal LOC $\geq$ percentile 65	12	43
	Low internal LOC $\leq$ percentile 35	9	32

Note. \* variables entered in the Alceste analysis.

chemotherapy ( $\chi^2$ : 28), with high perceived social support ( $\chi^2$ : 21) and somewhat or very troublesome sequelae ( $\chi^2$ : 16). The category most strongly associated with this class was that of subjectivity indicators ( $\chi^2$ : 29; in descending order: all the same, it's true, no, maybe, I think, yes, nothing, never, I believe, probably, etc.). On the contrary, the temporal indicator category was the most distant from this class ( $\chi^2$ : -3; in descending order: then, after, always, now, before, already, since, today, right now, quickly, long time, etc.). Here are four examples of quotations provided by the software for this class:

I would say that, all the same, it gave me the chance to be more confident than before, I was telling myself that I was able to go through one ordeal again.

It has changed a lot of things in the way of thinking about things, to think that there is worse, to stand back, and to better understand people who are down too.

We don't recover completely and you have to come to terms with it. It's difficult because you wish you could do things like before, but there is before and there is after.

The most important thing now is to be here, to be alive.

All this information led us to name this class the PTG class because it revealed positive changes, mostly about a better appreciation of life, a feeling of personal strength, and a new sense of wisdom.

**Class 2: Disease and treatment.** The second class contained 32% of the analyzed speech. The main words/lemmas were: mammography ( $\chi^2$ : 137), remove ( $\chi^2$ : 123), appointment ( $\chi^2$ : 116), hospital ( $\chi^2$ : 114), breast ( $\chi^2$ : 99), tumor ( $\chi^2$ : 83), operate ( $\chi^2$ : 69), results ( $\chi^2$ : 69), gynecologist ( $\chi^2$ : 66), doctor ( $\chi^2$ : 63), chemotherapy ( $\chi^2$ : 57), radiation+ ( $\chi^2$ : 55). This class was strongly associated with the first open question ( $\chi^2$ : 305), women with little adaptive coping ( $\chi^2$ : 64) and low perceived social support ( $\chi^2$ : 25). The "months/days" indicator category was the most strongly associated with this class ( $\chi^2$ : 267). Here is a quotation belonging to this class:

My first chemotherapy was on the 18<sup>th</sup>, even if I don't have a good memory I remember all the dates you know, I thought about this so many times, 18<sup>th</sup> December, for my first chemotherapy, it was not easy.

Given the information to which the women of this class most often referred, it was named "disease and treatment".

**Class 3: People around: support and stress.** The third class contained 13% of the analyzed speech. Main words/lemmas were: sister+ ( $\chi^2$ : 138), children ( $\chi^2$ : 134), mother+ ( $\chi^2$ : 130), brother+ ( $\chi^2$ : 117), die+ ( $\chi^2$ : 76), daughter+ ( $\chi^2$ : 66), close+ ( $\chi^2$ : 57), young ( $\chi^2$ : 56), complain ( $\chi^2$ : 55), colleague ( $\chi^2$ : 53), family ( $\chi^2$ : 51), dad ( $\chi^2$ : 49), support+ ( $\chi^2$ : 46), cry ( $\chi^2$ : 35), cousin+ ( $\chi^2$ : 33). The ascending hierarchical classification revealed, among others, associations between 'sisters' and 'died', 'colleague' and 'support',

‘friend’ and ‘close’, ‘family’ and ‘surround’. The grammatical category most strongly related to this class was the ‘family’ category ( $\chi^2$ : 330). The least associated categories were those of days and months ( $\chi^2$ : -22) and temporal indicators ( $\chi^2$ : -11). Here are some examples:

In my family there are six siblings and everybody helped me.

I couldn't talk about this with my daughter; I had to protect her from that.

When my son was ten, one day a boy told him “anyway your mum is going to die, she has cancer”.

When you are told you have cancer, you think that you can die of it. My dad died of cancer, so you understand ...

This class was labeled “people around: support and stress”, because people around were often seen as supportive, but sometimes having close relatives who have had cancer and the memory of it was stressful for female cancer patients. Cancer survivors also worried sometimes for their relatives and tried not to be a burden to them, which becomes an additional difficulty in handling the disease.

**Class 4: Disruption and continuity.** The fourth class contained 21% of the analyzed speech. Main words/lemmas were: work ( $\chi^2$ : 116), home ( $\chi^2$ : 93), walk ( $\chi^2$ : 69), firm ( $\chi^2$ : 49), arm ( $\chi^2$ : 44), like ( $\chi^2$ : 43), stop+ ( $\chi^2$ : 42), action ( $\chi^2$ : 39), retirement ( $\chi^2$ : 36), boss ( $\chi^2$ : 36), disabled ( $\chi^2$ : 30), grandchildren ( $\chi^2$ : 30), job ( $\chi^2$ : 29), resume ( $\chi^2$ : 28). This class was characterized by women with a low internal locus of control ( $\chi^2$ : 60) and low social support ( $\chi^2$ : 21). Two quotations from this class are:

I got a disability pension, so since cancer I've worked only 110 hours a month.

I must be careful with my arm when doing something requiring physical effort.

We termed this class “disruption and continuity” since it was mostly about physical changes

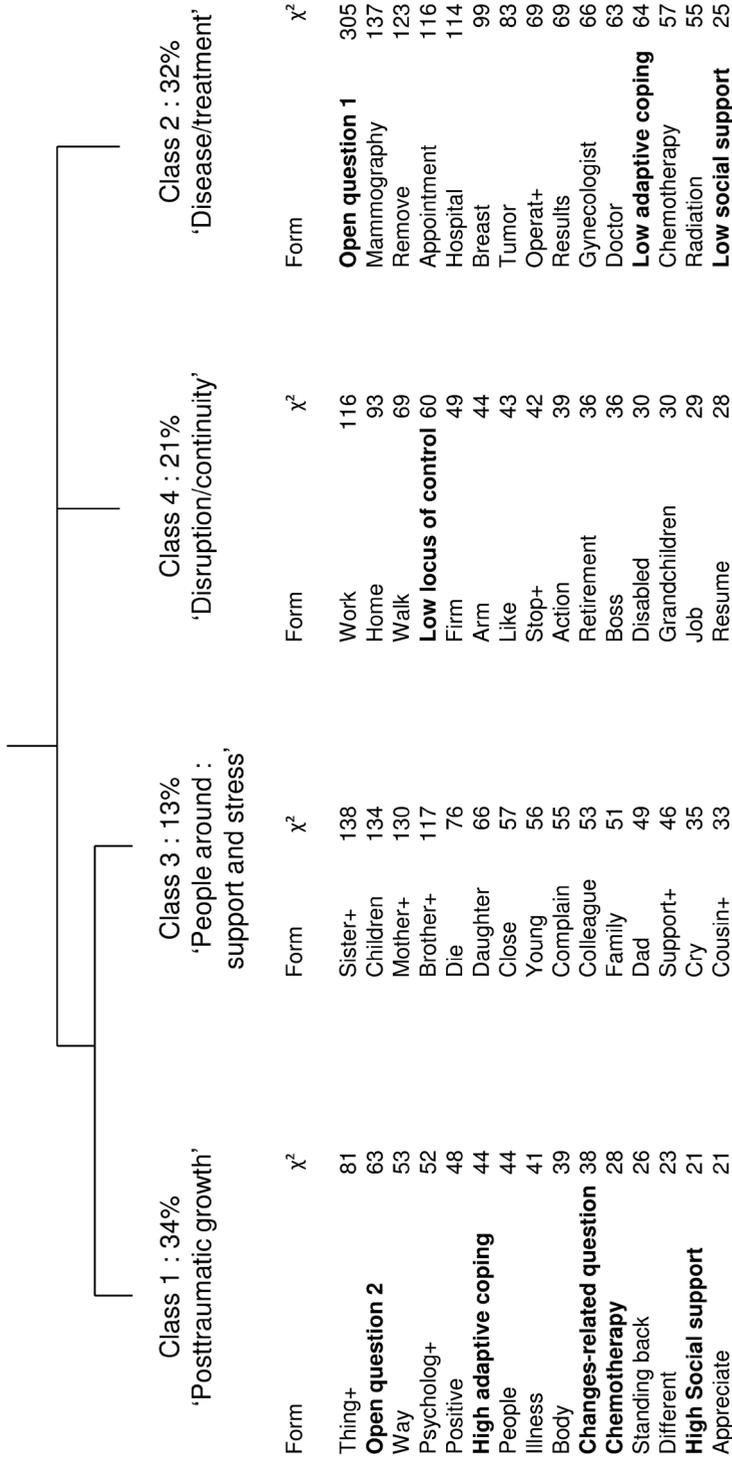
which had consequences on work or daily activities. Although this class was mainly about physical impairment, we included the “continuity” term because it also described how women tried to make up for their limitations by trying new activities like walking, or making grandchildren a priority, or resuming previous activities when possible.

### Links between classes

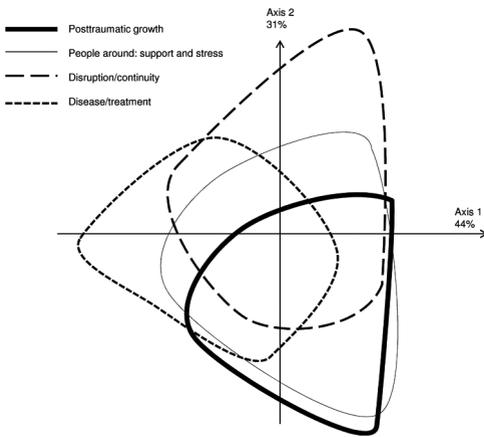
The DHC (see Figure 1 below) shows that the PTG class was associated with the “people around” class and, to a lesser extent, with the “disruption/continuity” one. Although related to the three other classes, the “disease/treatment” class appeared isolated. Correspondence factor analysis (see Figure 2 below) confirms these links, showing a real overlap between the PTG class and the “people around” one. The PTG class was really encompassed in the latter suggesting that PTG depended to a great extent on the people around. There was a kind of vertical opposition between the PTG class and the disruption/continuity one, as well as a kind of horizontal opposition between the PTG one and the disease/treatment one. As noted earlier, given that the PTG class was not time-related at all, contrary to the disease/treatment one which was strongly linked to time indicators, it was possible to interpret the horizontal axis as a temporal axis, with themes that had precisely defined times on the left and rather timeless themes on the right. Besides, given that the PTG class was essentially a class of positive change contrary to the disruption/continuity one, which was mostly characterized by disruption, it was possible to consider the vertical axis as a changes-related axis, rather positive toward the bottom and rather negative toward the top.

### Discussion

The analysis of interviews conducted using Alceste revealed a lexical class of positive changes after cancer, resulting for the most part in a better appreciation of the life which is no longer taken for granted, a feeling of personal



**Figure 1.** Descending hierarchical classification. Entered variables most strongly associated with each class are reported.



**Figure 2.** Correspondence factor analysis.

strength and a change in priorities. This class was characteristic of women with active cognitive processing, high adaptative coping and social support, and with experience of chemotherapy. It was closely related to a class of “people around” as both source of support and stress, and distant from the class dealing with the medical part of cancer.

The nature of the reported changes was in accordance with previous studies in female cancer survivors (Boot, Holcombe, & Salmon, 2010; Brunet et al., 2010; Kucukkaya, 2010; Mols et al., 2009; Sadler-Gerhardt et al., 2010) and in patients with various serious physical illnesses (Hefferon et al., 2009). Besides, congruent with the very definition of the PTG, the positive changes were often in conjunction with negative aspects of the cancer experience. The following quotation was very illustrative of the mix of positive and negative changes:

This cancer is very harmful, but it also brings a lot of happiness, really a lot of happiness. As far as I’m concerned, I have suffered a lot from this cancer, but I have experienced a lot of happiness too, and I’m not going to thank this cancer because it would be out of place, but I’m going to thank life for having opened my eyes to things I maybe no longer saw.

The association of the PTG class with having had chemotherapy and currently reporting somewhat or very troublesome sequelae, was another illustration of the link between stressful and unpleasant elements and growth (Cordova et al., 2007). From a clinical point of view, it suggests that to encourage women to process the cancer journey acknowledging both negative and positive aspects could lead to more PTG and a better adjustment as already seen in seropositive men (Taylor, Kemeny, Reed, & Aspinwall, 1991). This double integration has also been found to be essential in supportive-expressive group therapy for BC women (Kissane et al., 2004) and in a cognitive-behavioural intervention able to promote PTG in people suffering from posttraumatic stress disorders (Knaevelsrud, Liedl, & Maercker, 2010).

In spite of the co-occurrence of positive and negative aspects of the cancer experience, the correspondence factor analysis revealed a limited overlap between the PTG class, where the overtone was primarily positive, and the disruption/continuity class, where the overtone was primarily negative. This suggests that even if there is a real link between negative and positive changes, BC seems to be perceived as an essentially positive event by some women, and essentially negative by others, at least in long term remission in social-cultural samples similar to ours. The categorical variables associated with the PTG and “disruption/continuity” classes also support a certain inconsistency between really strong disruptions and PTG. Indeed, in line with our hypotheses, the PTG class was characteristic of women with high resources, i.e. high social support and high adaptative coping, whereas the disruption/continuity class was characteristic of women with low resources, i.e. low locus of control. Contrary to our hypothesis, internal LOC was not associated with PTG. Other authors have also found a lack of association between LOC and PTG (Cummings & Swickert, 2010). However, low LOC was associated with the “disruption/continuity” class, which is the opposite of the PTG. Due to the cross-sectional

design of the study, it could be that low internal LOC results in reporting more disruptions but also, conversely, that lasting impairments lead to less internal LOC. The class most distant from PTG (i.e. treatment/disease) was also characteristic of women with low resources, i.e. here low coping and social support, and referred to the disease and treatment period. Therefore, it seems that women without psychological and social resources remain trapped in their cancer and medical predicament and cannot process their experience to derive benefits from it. On the other hand, the total overlap of PTG and “people around” class (Figure 2) confirms the importance of other people for the positive process of the cancer experience. People with a history of cancer are particularly significant in this process. Through their empathic listening, survivors make emotional disclosure possible in cancer patients, which is a key component for the emergence of PTG within the theoretical framework of Calhoun and Tedeschi (2006). In addition, when they have successfully survived cancer resulting in PTG, they become models of PTG with whom women can identify and themselves develop (Morris, Campbell, Dwyer, Dunn, & Chambers, 2011), which is also a core component of the PTG theoretical framework (Calhoun & Tedeschi, 2006).

Regarding the way PTG emerged in female accounts, it is interesting to note that the PTG class was not, as could logically be expected, linked first to the question concerning changes but to the final open question. This means that even if women reported PTG spontaneously, they did not do so mostly in response to the changes-related question. One possible interpretation is that these positive changes are not so easily identified by women as opposed to negative changes (e.g. physical limitations, fatigue), probably because of the daily difficulty the latter involve. On the other hand, the mention of growth later in the speech reveals the demanding cognitive effort underlying the PTG, which requires thinking about and processing an event, even a long time after its occurrence. In the PTG class, the presence of words like “fight” or “try” associated with

“positive” shows that PTG is dependent on a cognitive effort and coping. Subjectivity indicators strongly associated with this class (e.g. “maybe”, “I think”, “I believe”) confirm the cognitive process or rumination of trying to make sense of the cancer. The importance of the cognitive treatment of the event to PTG as posited in the PTG model of Calhoun and Tedeschi (2006) received empirical support in various samples, including, for example, people having encountered miscellaneous stressful events (Cann et al., 2011), spouses of myocardial infarction patients (Senol-Durak & Ayvasik, 2010), or BC survivors (Cohen & Numa, 2011). More precisely and in agreement with our results, recent research has demonstrated the importance of a deliberate/active rumination to PTG compared to an intrusive/passive one (Stockton, Hunt, & Joseph, 2011; Taku, Cann, Tedeschi, & Calhoun, 2009). The fact that the PTG was not temporal at all, as revealed by the negative association with temporal indicators, also underpins the idea that perceived changes depend less on the real historical medical facts than on the cognitive engagement by which women distance themselves from the stressful period of disease and treatment.

Another interpretation of the association of PTG with the final open question is that it was a way for women to end the interview in a positive tone and outlook. This suggests that the growth aspect is important to them. That is what they want to remember and to communicate as a positive conclusion. This way of highlighting growth as a conclusion could also be an adaptive coping to counteract the negative aftermath of cancer, as suggested by other research (Morrill et al., 2008; Park, Chmielewski, & Blank, 2010; Widows, Jacobsen, Booth-Jones, & Fields, 2005; Zoellner & Maercker, 2006) and in line with the finding that PTG is inversely related to mental quality of life (Bellizzi et al., 2010) and good functional status (Leung et al., 2010), but positively to perceived threat in an experimental setting (McFarland & Alvaro, 2000).

This study has limitations that must be taken into account. Firstly, although Alceste software

was used to analyze speech, it is important to remember that the interpretation of the results obtained remains the product of the researchers. In particular, even if there was agreement between us about the PTG theme, from a reflexive standpoint, it should be acknowledged that the current trend of research into PTG might have influenced our processing of the data. Secondly, the results of this study have to be viewed as specific of our sample of relatively wealthy women treated in a cancer center providing a lot of resources for coping with the illness, and benefiting from the French supportive social system. Therefore, the generalization of our findings applied to people in other contexts remains limited, especially since PTG seems very dependent on social resources. Finally, our results regarding the associations of the responses with categorical variables should be treated with caution because of the small sample size.

In conclusion, our findings indicate the emergence of PTG themes in long term BC survivor accounts of post-illness changes and confirm the need of internal and social resources to derive benefit from BC. Using a specific methodology of analysis never used so far in the PTG research field, this study has enabled an examination of how PTG emerges in the narrative development of cancer-related changes. The results highlight the cognitive effort involved in the positive processing of the event. This information is important from a clinical point of view for the guidance of people in PTG development which helps them counteract distress and maintain a distance from the negative aftermath of cancer.

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