

## **How Social Sharing and Social Support Explain Distress in Breast Cancer After Surgery: The Role of Alexithymia**

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*Perceived social support has shown to be key to adjustment along the cancer trajectory, but results remain contradictory about the disclosure of the experience of the illness (social sharing) and may reflect the importance of patients characteristics. The authors explored the associations between social sharing, perceived social support, and emotional adjustment in nonmetastatic breast cancer patients and how alexithymia may impact these associations. One hundred and thirteen women with breast cancer from a cancer care center in Villejuif (France) were assessed after breast surgery. Participants completed measures of depression, negative affect, and alexithymia together with a self-description of social sharing of their disease experience and perceived social support. Higher depression and negative affect were related to a high level of emotional sharing, a low satisfaction with confidant's reactions, and a high perceived*

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*negative support. In comparison with low-alexithymia patients, those with high alexithymia showed positive associations between negative emotional outcomes and (1) negative social support and (2) emotional sharing. These results suggest that the relationships between social sharing/support and emotional outcomes depend also on individual characteristics, such as alexithymia. Assessing perceived social support and alexithymia in cancer patients is useful to identify who might benefit from social sharing. Interventions could focus on helping the social network and environment to adjust to the socioemotional characteristics of breast cancer patients along the cancer trajectory.*

**KEYWORDS** *breast cancer, social sharing, social support, alexithymia, distress*

## INTRODUCTION

Women facing breast cancer (BC) diagnosis and treatments may experience physical, psychological, and social difficulties along the trajectory of the disease (Baker, Denniston, Smith, & West, 2005; Hanson Frost et al., 2000; Mehnert, Berg, Henrich, & Herschbach, 2009). Approximately 10% to 30% of women suffer from high levels of anxiety or depressive symptoms after surgery and within the first year after diagnosis (Fann et al., 2008; Golden-Kreutz & Andersen, 2004; Millar, Purushotham, McLatchie, George, & Murray, 2005). This study aims at exploring potential predictors of this emotional adjustment by focusing on social sharing about the disease and perceived social support. We also were interested in exploring personal characteristics explaining why some people benefit from sharing and support and some do not.

Cognitive and emotional processing of the BC experience is critical in subsequent adjustment. One aspect that could help individuals process the cancer experience cognitively and emotionally is the expression of one's thoughts and feelings in a supportive social context (Creamer, Burgess, & Pattison, 1992; Lepore, 2001). *Social sharing* has been defined in psychology as a combination of the evocation of an emotion in a socially shared language, and, at least at the symbolic level, some addressee (Rimé, Philippot, Boca, & Mesquita, 1992). Social-cognitive processing model and empirical studies suggest that social sharing would allow us to "work through" the emotional experience, and the search for an acceptable meaning to the event (Clark, 1993; Lepore, 2001; Rimé, Finkenauer, Luminet, Zech, & Philippot, 1998; Silver, Boon, & Stones, 1983).

First, previous studies showed that the emotional benefits of talking may mainly depend on the quality of interactions and the attitudes of the support provider (Figueiredo, Fries, & Ingram, 2004; Manne et al., 2004).

For example, women after BC treatment reported lower levels of distress during cancer-issue discussions when partners responded to disclosure with reciprocal self-disclosure and humor and when partners were less likely to propose solutions (Manne et al., 2004). In contrast, greater levels of intrusive thoughts and depressive symptoms were found in BC survivors when they avoid sharing their cancer experience because they perceived their social environment as not receptive (Cordova, Cunningham, Carlson, & Andrykowski, 2001; Figueiredo et al., 2004).

Second, emotional benefits of talking may mainly depend on the type of perceived social support. Indeed, perceived social support has long been associated with better psychological adjustment to cancer (Arora, Finney Ruten, Gustafson, Moser, & Hawkins, 2007; Bloom, Stewart, Johnston, Banks, & Fobair, 2001; Maly, Umezawa, Leake, & Silliman, 2005; Nosarti, Roberts, Crayford, McKenzie, & David, 2002). Prospective studies have showed that greater emotional support predicted lower levels of distress and depression among BC patients (Alferi, Carver, Antoni, Weiss, & Duran, 2001; Talley, Molix, Schlegel, & Bettencourt, 2010).

Although several studies have emphasized positive associations between supportive social relationships and psychological adjustment to cancer, less attention has been given to the effects of negative interactions on the adjustment to the disease. The negative social support, also called social constraints (Lepore & Revenson, 2007), has been recently introduced to describe social interactions where support provider show behaviors such as not understanding the situation, acting uncomfortable when talking about the illness, changing subjects when trying to discuss the illness, and trivializing problems (Dakof & Taylor, 1990; Helgeson, Cohen, Schulz, & Yasko, 2000; Schmidt & Andrykowski, 2004). Unsupportive behaviors have been associated with distress and greater level of avoidance in thinking and talking about cancer (Cordova et al., 2001; Manne et al., 2004; Manne, Ostroff, Winkel, Grana, & Fox, 2005; Schmidt & Andrykowski, 2004).

Third, benefits of higher perceived social support may also depend on personality characteristics of patients but have been less documented. One study suggests that high emotional intelligence (defined as the ability to accurately perceive, understand, and regulate emotions) in BC survivors could buffer the potential negative impact of a toxic social environment, either high in social constraints or low in social support (Schmidt & Andrykowski, 2004). The results suggest that high emotional intelligence may enable some individuals to overcome the limitations posed by a poor social environment. It is thus possible that emotional deficits such as alexithymia (or the difficulty to identify and describe one's emotions) would increase the negative effects of social constraints.

In experimental studies on written disclosure, women with chronic pelvic pain with greater alexithymia showed increased pain in the disclosure group, but decreased pain in the control group (Norman, Lumley,

Dooley, & Diamond, 2004). Contrasting with these results, another randomized longitudinal study in patients hospitalized for papilloma resection showed that expressive writing was more beneficial (fewer postoperative days of stay in hospital, fewer physical and psychic symptoms) for individuals with a high degree of alexithymia (Solano, Donati, Pecci, Persichetti, & Colaci, 2003). Moreover, previous studies have shown that alexithymia was associated with less perceived social support, smaller social networks, and fewer close relationships (Kojima et al., 2007; Kojima, Senda, Nagaya, Tokudome, & Furukawa, 2003; Luminet, Zech, Rimé, & Wagner, 2000; Lumley & Norman, 1996; Posse, Hallstrom, & Backenroth-Ohsako, 2002). These associations are likely due to alexithymia-related deficiencies in social skills. Healthy people reporting more difficulties in describing feelings shared negative events less often and were less emotionally involved during the sharing period (Luminet et al., 2000).

No study has yet examined the impact of an emotional deficit such as alexithymia in a natural context on the association between social sharing, social support, and emotional adjustment to cancer. In practice, it would be useful to identify who could benefit from social sharing. To explore this aspect, we focused on the core aspects of social sharing: expression of emotion related to cancer experience (e.g., degree of emotional involvement during sharing); satisfaction with confidant's reaction, frequency of avoidance of sharing, the different dimensions of perceived social support (emotional, informative, instrumental support); and more particularly on negative support behaviors from natural caregivers (family members, friends).

Our objectives were (1) to examine the associations between social sharing, social support, depressive symptoms, and negative affect we expected that a higher negative support, less satisfaction with confidant's reactions, low emotional involvement during social sharing, and more avoidance of social sharing would be associated with higher levels of depressive symptoms and negative affect; (2) to explore the moderator effect of alexithymia on the associations between social sharing, social support, depressive and negative affect: because they are less competent in social interactions we expected that women with higher alexithymia will show positive associations between higher emotional involvement during social sharing and depressive/negative affect and between negative support and depressive/negative affect.

## METHOD

### Design and Sample

Participants were consecutively recruited at the French Cancer Center Gustave Roussy Institute. Eligible women were screened by a team of physicians with respect of the following inclusion criteria: (1) older than age 18, (2) first diagnosis of BC, (3) after surgery, (4) no recurrence or metastases, (5) ability

to read and write in French, and (6) no psychiatric diagnosis or serious personality disorders. Women were presented the study after surgery, during the in-person nurse consultation (delivery of information about adjuvant treatment). The investigator contacted by phone outpatients who accepted to participate to the study. Questionnaires and informed consent forms were mailed to participants. Participants were enrolled after surgery because the immediate postoperative state of distress, and the lack of social support at this time had been identified as significant predictors of psychological morbidity in the year following BC surgery (Millar et al., 2005; Nosarti et al., 2002). The study received full Institutional Review Board approval from the Gustave Roussy Institute and Individual Protection Committee of Bicêtre.

To estimate the minimum sample size in this association study with seven predictors variables (e.g., three control variables and a maximum of four predictors for the perceived social support and, alternatively, three predictors for the core aspects of social sharing), we used recommendations from Tabachnik and Fidell (2003) for hierarchical multiple regression models ( $n \geq 50 + 8m$ ;  $m$  = number of predictors variables) yielding a minimum sample size of 106.

Among the 217 women approached by nurses, 114 returned the questionnaire (52%). Fifty nine refused to participate mainly because of lack of interest ( $n = 42$ ), or because they had no caregiver ( $n = 10$ ), or were too tired ( $n = 7$ ). Forty four first gave a verbal consent but finally did not return the questionnaire. Among the returned questionnaires, one was not valid therefore leading to a final study sample of 113 described in Table 1. Participants were younger than nonparticipants ( $t = 2.96$ ,  $p < 0.05$ ). However, there was no difference, on tumor grade ( $\chi^2 = .037$ , ns) and type of surgical treatment ( $\chi^2 = .178$ , ns).

## Measures

Measures included demographics and medical description, depression and negative affect (outcomes), reported social sharing and perceived social support (predictors), and alexithymia (moderator). The description of these measures is available on Table 2.

*Depressive symptoms.* We used the Beck Depression Inventory Short Form (BDI-SF) (Beck & Beck, 1972; Beck, Ward, Mendelson, Mock, & Erbaugh, 1962). The BDI-SF has 13 items covering depressive symptoms over a 7-day period. Patients rate (0–3) the severity of each symptom. The results are summed, giving a possible range of 0 to 39. As suggested by research in medical settings, we computed a cognitive and affective symptom score excluding for physical symptoms to evaluate core depressive symptoms in cancer (BDIcog) (Sultan, Luminet, & Hartemann, 2010). BDIcog score range to 0 to 24. Subsequent analyses are very similar with both scores, with stronger patterns appearing with BDIcog, and therefore only results for the

**TABLE 1** Sample Description of Study Participants with Breast Cancer Following Surgery ( $N = 113$ )

	<i>n</i> (%)
Mean age ( <i>SD</i> )	52.8 (10.17)
Marital Status	
Married/living with someone	83 (73.4)
Divorced/separated/widowed	22 (19.5)
Single	8 (7.1)
Educational level	
No degree	9 (8)
Primary	39 (34.5)
High school degree	18 (15.9)
Second year university level	18 (15.9)
Degree level or higher	29 (25.7)
Tumor grade	
1	14 (12.4)
2	59 (52.2)
3	40 (35.4)
Surgery	
Conservative	78 (69)
Mastectomy	35 (31)
Axillary node dissection	
Yes	88 (77.9)
No	25 (22.1)
Mean time since surgery in days ( <i>SD</i> )	47.7 (17.7)

**TABLE 2** Means, Standard Deviations, and Ranges for Emotional and Social Variables ( $N = 113$ )

	<i>M</i>	<i>SD</i>	Median	Minimum	Maximum	$\alpha$
Depressive symptoms (BDI)	5.57	3.59	5	0	22	.70
Depressive symptoms (BDIcog)	2.86	2.68	2	0	15	.69
Negative affect (PANAS NA)	16.92	6.24	16	10	39	.86
Alexithymia (TAS Total)	46.64	10.6	46	25	74	.76
Social support						
Emotional support	36.53	6.56	38	9	45	.89
Instrumental support	18.44	4.65	19	5	25	.85
Informational support	6.66	2.18	6	2	10	.88
Negative support	7.55	3.05	7	4	18	.73
Social sharing						
Emotional involvement	4.53	1.51	6	10	6	—
Satisfaction with confidant's reaction	5.27	1.21	6	0	6	—
Frequency of avoidance (times)	—	—	1–2	0	> 10	—

BDI = Beck Depression Inventory; BDIcog = core depressive symptoms in cancer; PANAS NA = Positive and Negative Affect Schedule – negative affect subscale; TAS = Toronto Alexithymia Scale.

latter scale are given. The BDI-SF has been established as a valid and reliable measure of depressive symptoms in BC women (Love, Grabsch, Clarke, Bloch, & Kissane, 2004) and high consistency reliability ( $\geq 0.80$ ) in various populations (Reynolds & Gould, 1981). The scale reliability (Cronbach's alpha) for this study was 0.70.

*Negative affect.* We used the negative affect subscale (PANAS NA, 10 items) of the Positive and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988). Rating is on a 5-point Likert-type and higher sum scores indicate increasing level of current affect. Scores range from 10 to 50. A high NA score indicates a state of higher distress, stress, and guilt during the last week. Published data support the reliability and validity of the PANAS (Watson et al., 1988). Cronbach's alpha of 0.86 for NA has been reported in a previous study with cancer patients (Schroevers, Kraaij, & Garnefski, 2008). In this study, we also found  $\alpha$  coefficient of 0.86 for negative affects.

*Social sharing.* Social sharing of the cancer experience following the diagnosis was assessed through a set of three questions taken from previous work on social sharing of emotional experiences (Rimé, 2005). Participants answered the following questions in reference with the confidant they had chosen in their social network:

1. Emotional involvement during social sharing ("Following the diagnosis, to what extent did you talk about your feelings (emotions) with your confidant?")
2. Satisfaction with confidant's reactions ("Overall, are you satisfied with the reactions of your confidant?")
3. Frequency of avoidance of social sharing ("Following the diagnosis, how many times have you avoided certain subjects about your disease experience with your confidant?")

Rating is on a 7-point Likert-type scale, and higher scores indicate increasing level of one of these three dimensions of social sharing. The validity of these questions is documented in several reports on social sharing (Luminet et al., 2000; Pennebaker, Zech, & Rimé, 2001; Rimé et al., 1998; Zech & Rimé, 2005).

*Perceived social support.* To estimate the intensity of perceived social support during the last week, we used a cancer-specific questionnaire of social support (Segrestan-Crouzet, 2010; Segrestan, Rascle, Cousson-Gélie, & Trouette, 2006). This 20-item scale rates on a 5-point Likert-type scale and provides a quantitative assessment of four distinct components of perceived social support in the context of cancer: emotional (9 items: "one or more persons took time to reassure me"; range = 9–45), instrumental (5 items: "one or more persons have helped me in the tasks that I could not achieve"; range = 5–25), informational (2 items: "one or more persons took the time to explain the disease"; range = 2–10), and negative support (4 items: "one

or more persons have distanced themselves from me"; range = 4–20). Negative support is measured in this scale by withdrawn reactions, an exclusive focus on disease, and dramatization. Higher scores are indicative of more frequent social support perceived on any of these dimensions. Previous results indicate good–excellent consistency of the scales in cancer patients: 0.86 for emotional support, 0.78 for instrumental support, 0.92 for informational support, and 0.70 for negative support (Segrestan-Crouzet, 2010). In the current sample, we found  $\alpha$  coefficients of 0.89 for emotional support, 0.85 for instrumental support, 0.88 for informational support, and 0.73 for negative support. We confirmed the original factor structure through a confirmatory factor analysis and found four independent factors that are treated as separate variables in subsequent analyses (results and original instrument available on request).

*Alexithymia.* We used the total score of the 20-item Toronto Alexithymia Scale (TAS-20) to estimate alexithymia (Taylor, Bagby, & Parker, 1997). This self-report scale measures three characteristics of the alexithymia construct (difficulty identifying feelings, difficulty describing feelings, and externally orientated thinking) and produces a total alexithymia score. Each item rated on a 5-point Likert-type scale. Scores range from 20 to 100. Previous studies have demonstrated that the TAS-20 has adequate validity and reliability (Bagby, Parker, & Taylor, 1994). Cronbach's alpha of 0.89 has been reported in a previous study with BC patients (Servaes, Vingerhoets, Vreugdenhil, Keuning, & Broekhuijsen, 1999). In this study, we found an  $\alpha$  coefficient of 0.76.

### Statistical Analyses

We investigated associations between predictors and outcomes using hierarchical regression models. In these models predicting for distress measures, Block 1 included demographic and clinical variables, and two alternate Block 2s were then entered exploring relationships with social sharing and social support alternatively. A correlation matrix among variables included in the hierarchical regression models is presented in Table 3.

To investigate the impact of alexithymia on associations between social support or social sharing of the disease and emotional variables, we compared patterns of associations in two subsamples determined by a median split of the score of alexithymia (Christopher & Thomas, 2009; Suslow & Junghanns, 2002) using a z-test procedure developed to compare regression coefficients in independent samples (Paternoster, Brame, Mazerolle, & Piquero, 2006). We also performed moderator analysis following Baron and Kenny's procedure (1986). This did not yield any significant results and thus is not presented.



**TABLE 3** Intercorrelations Between Psychological Variables ( $N = 113$ )

	Depressive symptoms (BDIcog)	Negative Affect (PANAS NA)	Alexithymia (TAS Total)	Emotional Support	Instrumental Support	Informational Support	Negative Support	Emotional Involvement	Satisfaction with Confidant's Reactions	Frequency of Avoidance
Depressive symptoms (BDIcog)	1.00	.576***	.142	-.007	-.080	-.034	.219*	.125	-.280**	.098
Negative affect (PANAS NA)	—	1.00	.163†	.086	.077	.043	.242**	.090	-.192*	.091
Alexithymia (TAS Total)	—	—	1.00	-.005	-.018	-.027	.056	-.041	-.010	-.011
Social support	—	—	—	—	—	—	—	—	—	—
Emotional support	—	—	—	1.00	.568***	.624***	-.172†	.252***	.217*	-.206*
Instrumental support	—	—	—	—	1.00	.438***	-.128	.242†	.137	-.270**
Informational support	—	—	—	—	—	1.00	-.035	.182†	.238*	-.235*
Negative support	—	—	—	—	—	—	1.00	-.067	-.260**	.345***
Social sharing	—	—	—	—	—	—	—	—	—	—
Emotional involvement	—	—	—	—	—	—	—	1.00	.353***	-.182†
Satisfaction with confidant's reactions	—	—	—	—	—	—	—	—	1.00	-.225*
Frequency of avoidance	—	—	—	—	—	—	—	—	—	1.00

BDI = Beck Depression Inventory; BDIcog = core depressive symptoms in cancer; PANAS NA = Positive and Negative Affect Schedule – negative affect subscale;

TAS = Toronto Alexithymia Scale.

† $p < 0.10$ , \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

## RESULTS

### Relations Between Social Sharing or Social Support and Depressive Symptoms

The results of regression analyses are summarized in Table 4 (full sample). When controlling for age, education, and time since surgery, social sharing variables accounted for about 14% of the variance of the outcome. Higher depressive symptoms were associated with less satisfaction with confidant's reactions ( $\beta = -.356, p < 0.001$ ) and tended to be associated with higher emotional involvement during social sharing ( $\beta = .257, p < 0.10$ ). We also observed a significant association between higher perceived negative support and higher depressive symptoms ( $\beta = .236, p < 0.05$ ).

### Relations Between Social Sharing or Social Support and Negative Affect

Social sharing variables tended to account for about 6% of the variance of the outcome. Higher negative affect were associated with less satisfaction with confidant's reactions ( $\beta = -.240, p < 0.05$ ) and tended to be associated with higher emotional involvement during social sharing ( $\beta = .172, p < 0.10$ ). Social support variables accounted for about 7% of the variance of the outcome. Higher negative affect were associated with higher perceived negative support ( $\beta = .259, p < 0.01$ ). Results are presented in Table 5 (full sample).

### Impact of Alexithymia on These Associations

*Associations with depressive symptoms.* In the high-alexithymia subgroup (middle and right part of Table 4), higher depressive symptoms were significantly associated with higher self-reported negative support ( $\beta = .426, p < 0.01$ ), more emotional involvement during social sharing ( $\beta = .321, p < .05$ ) and less satisfaction with confidant's reactions ( $\beta = -.311, p < 0.05$ ). In low alexithymia participants, higher depressive symptoms were also associated with less satisfaction with confidant's reactions ( $\beta = -.363, p < 0.05$ ). When examining the differential patterns of associations between the two subgroups, we observed a significant difference on the role of negative support on depression with this association being stronger in people with high alexithymia ( $z = -3.29, p < 0.01$ ), which suggests a moderator effect of alexithymia on the negative support–depression link.

### Associations with Negative Affect

In the high alexithymia subgroup, social sharing variables accounted for about 12% of the variance of the outcome. Higher negative affect were

**TABLE 4** Hierarchical Multiple Regression of Depressive Symptoms (BDI-SF cog) on Social Support and Social Sharing of the Disease in the Full Sample and in High and Low Alexithymia Subsamples

Step	Full sample ( <i>n</i> = 113)			Low Alexithymia group ( <i>n</i> = 55)			High Alexithymia group ( <i>n</i> = 58)			<i>Z</i>	<i>p</i>	
	$\Delta R^2$	<i>b</i>	<i>SE</i>	$\beta$	$\Delta R^2$	<i>b</i>	<i>SE</i>	$\beta$	$\Delta R^2$			<i>b</i>
Block 1	.004				.063				.039			
Age		-.048	.101	-.048		-.126	.116	-.153		.008	.178	.007
Educational level		-.003	.099	-.003		.087	.133	.091		-.070	.160	-.065
Time since surgery		-.034	.097	-.034		.173	.134	.183		-.202	.140	-.195
Block 2(a) Social support	.063				.082				.168*			
Emotional support		.127	.135	.127		.182	.172	.221		.100	.210	.083
Instrumental support		-.106	.118	-.106		-.202	.158	-.240		-.107	.180	-.092
Informational support		-.049	.124	-.049		-.087	.156	-.097		.066	.188	.061
Negative support		.236	.098	.236*		-.257	.159	-.258		.424	.133	.426**
Block 2(b) Social sharing	.137***				.113				.174*			
Emotional involvement		.257	.099	.257†		.169	.146	.184		.340	.139	.321*
Satisfaction with confidant's reactions		-.356	.098	-.356***		-.349	.139	-.363*		-.317	.142	-.311*
Frequency of avoidance		.069	.094	.069		-.055	.116	-.066		.168	.160	.140
												.140
												-.123
												.131

BDI SF-cog = Beck Depression Inventory Short Form - core depressive symptoms in cancer. Coefficients' values of Block 1 indicated are the one when Block 2a is entered. They remain in the same interpretative range when Block 2b is entered. The equality of unstandardized regression coefficients between the two subsamples was tested using the procedure recommended by Paternoster et al. (2006). †*p* < 0.10, \**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < 0.001.

**TABLE 5** Hierarchical Multiple Regression of Negative Affect (PANAS NA) on Social Support and Social Sharing of the Disease in the Full Sample and in High and Low Alexithymia Subsamples

Step	Full sample ( <i>N</i> = 113)			Low Alexithymia group ( <i>n</i> = 55)			High Alexithymia group ( <i>n</i> = 58)			<i>Z</i>	<i>p</i>	
	$\Delta R^2$	<i>b</i>	<i>SE</i>	$\beta$	$\Delta R^2$	<i>b</i>	<i>SE</i>	$\beta$	$\Delta R^2$			<i>b</i>
Block 1	.049				.054				.140*			
Age		-.054	.098	-.054		-.162	.119	-.192		.125	.166	.106
Educational level		.187	.097	.187†		.069	.137	.071		.370	.149	.347*
Time since surgery		-.073	.095	-.073		.123	.137	.126		-.178	.131	-.174
Block 2(a) Social support	.068†				.016				.123†			
Emotional support		.144	.132	.144		.125	.183	.148		.255	.200	.215
Instrumental support		.011	.115	.011		-.093	.169	-.108		.014	.171	.012
Informational support		-.045	.120	-.045		.001	.166	.001		-.061	.179	-.057
Negative support sharing	.065†			.259**	.091			.076	.122*			.352
Block 2(b) Social involvement		.172	.100	.172†		-.004	.152	-.004		.342	.133	.327*
Satisfaction with confidant's reactions		-.240	.099	-.240*		-.304	.145	-.309*		-.214	.136	-.213
Frequency of avoidance		.064	.095	.064		-.028	.121	-.033		.105	.153	.089

PANAS NA = Positive and Negative Affect Schedule – negative affect subscale.

Coefficients' values of Block 1 indicated are the one when Block 2a is entered. They remain in the same interpretative range when Block 2b is entered. The equality of unstandardized regression coefficients between the two subsamples was tested using the procedure recommended by Paternoster et al. (2006). †*p* < 0.10, \**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < 0.001.

significantly associated with higher emotional involvement during social sharing ( $\beta = .327, p < 0.05$ ). When examining the differential patterns of associations between the two subgroups as reported in Table 5, this association appeared to be significantly different across the two groups ( $z = -1.71, p < 0.05$ ) suggesting a moderator effect of alexithymia on the emotional involvement–negative affect link.

## DISCUSSION

Our results show that negative social support, less satisfaction with confidant's reactions, and higher levels of emotional involvement during the social sharing about the disease were uniquely associated (although association sizes were small) with depressive symptoms/negative affect above and beyond age, education, and time since surgery. More important, we found that these associations differed across groups determined according to their level of alexithymia, a widely studied emotional deficit.

Specific features of social sharing and social support are associated with symptoms of depression and negative affect. First, the link between a lower satisfaction with confidant's reactions during the social sharing of the disease and higher levels of depressive symptoms and negative affect is in line with previous studies in clinical samples including cancer patients (Christophe & Di Giacomo, 2003; Figueiredo et al., 2004). Our results are also in line with studies highlighting the associations between negative support and psychological adjustment in cancer patients (Cordova et al., 2001; Figueiredo et al., 2004).

Second, contrary to our hypothesis, higher levels of emotional involvement during the sharing tended to be related to higher levels of distress. These findings challenge the common sense suggesting that frequent sharing emotions would systematically contribute to better adjustment. As emotional nonexpression is related to higher distress, emotional expression is often thought to be related with better emotional adjustment. However, previous studies in somatic patients have showed higher psychological distress in relation to emotional nonexpression rather than lower distress in relation to emotional expression (Panagopoulou, Kersbergen, & Maes, 2002). Moreover, findings from experimental studies using the writing paradigm of Pennebaker and Beall (1986) in BC samples near the diagnosis failed to find consistent effects of written emotional disclosure on mood or self-reported distress. Indeed, results from these studies showed more beneficial effects on physical adjustment (decreased physical symptoms, fewer medical appointments for cancer related morbidities) and more subjective benefits as a better understanding of the experience of cancer (Stanton et al., 2002; Walker, Nail, & Croyle, 1999). Randomized controlled trials of emotional disclosure with nonclinical participants have suggested that verbalizing an

emotional experience does not lead systematically to emotional recovery (Zech & Rimé, 2005). Our result of relationship between higher emotional involvement during the social sharing and higher levels of distress replicate prior findings of an earlier study with BC patients assessed close to diagnosis in natural settings (Compas *et al.*, 1999). Their results showed that the use of more frequent emotional expression was associated with greater symptoms of anxiety and depression. According to the authors, the potential benefits of expressing emotion as a way to cognitively organize, assimilate, and make sense to reduce the emotional load of the diagnosis of BC may not be realized by the only expression of emotions and shortly near the diagnosis. In this study, it is possible that the emotional involvement during the social sharing may encourage self-recognition of distress and increase more affective distress expression. Alternatively, it is also possible that more emotional distress may lead to the use of more emotional involvement during social sharing. In contrast with previous studies (Alferi *et al.*, 2001; Bloom *et al.*, 2001; Maly *et al.*, 2005), we did not find any association between higher emotional or instrumental support and lower distress in BC patients: if negative support was related to higher distress, positive interactions (acceptance, understanding, and sympathy) were not systematically associated to lower distress.

This study provides important new information on the associations between social sharing/support and emotional adjustment underlining the role of personal characteristics.

A major result was the significant difference between the high- and the low-alexithymia group as regards to the link between negative support and depressive symptoms. When comparing associations in low- and high-alexithymia participants, our results showed that higher negative support was related to higher depressive symptoms only in the high-alexithymia group. High-alexithymia individuals are defined by their difficulties in identifying and expressing their emotions and by their difficulties in affective self-regulation (Taylor & Bagby, 2004). On the one hand, some authors have hypothesized that their deficit in emotional regulation may lead them to rely mainly on others to compensate for their deficits and to regulate negative affects (Corcos & Speranza, 2003; Taylor *et al.*, 1997). Because they may rely on this external regulation to manage their affects, patients with high alexithymia would then be more vulnerable to negative support. This interesting hypothesis would need additional research to be confirmed. On the other hand, previous studies with BC patients showed significant positive associations between alexithymia and depression (Luminet, Rokbani, Ogez, & Jadoulle, 2007) and relationships between failure to disclose, low social support, high unsupportive social interactions, and low emotional well-being (Figueiredo *et al.*, 2004). So, a viable alternate hypothesis is that patients with a high degree of alexithymia would be more depressed and consequently would tend to more frequently perceive their social support as negative.

Given the cross-sectional design used here, we cannot rule out the later hypothesis, although we considered social support and social sharing as predictors here.

The results of the current study also showed that a high level of reported emotional involvement during social sharing was positively associated with negative affect only in patients with a high degree of alexithymia. This result could be explained by the fact that deficits in the cognitive processing and regulation of emotion are more salient during emotional social sharing. High-alexithymia individuals would meet strong difficulties in social interactions involving high emotional content. It is also possible that emotional sharing about the disease could make high-alexithymia patients more acutely aware of their distress, which may lead to increased distress report. According to our results, we can hypothesize that high-alexithymia individuals, in contrast with low-alexithymia ones, would be particularly vulnerable to negative and unsupportive social environment and to situations where they would have to express their feelings. In this case, the social network of high-alexithymia individuals might be more supportive by helping them in daily activities than by expecting mere emotional expression.

The limitations of the study mainly deal with the cross-sectional design preventing us from interpreting associations as causal relationships. Nevertheless, the use of multivariate models and the exploration of moderator effects shed light on new interesting phenomena not yet observed in BC and rarely described in other clinical samples. Second, assessments relied on self-reports that may limit the study to explicit verbal measures of social support and distress. Finally, despite levels of significance, the correlation coefficients presented in results are small or moderate. The limited variance accounted for by the predictor variables included in the models suggest that other potential factors, such as severity of physical symptoms during treatment (Vahdaninia, Omidvari, & Montazeri, 2010) or illness perception (Millar et al., 2005) could explain the variance of depressive and negative affect.

To conclude, this study explored to what extent important aspects of social sharing and social support may relate to emotional adjustment in BC patients after surgery. Depressive symptoms and negative affect were uniquely related to a high perceived negative support and low satisfaction with confidant's reactions and tended to be related to a high level of emotional involvement during the social sharing of the disease. Interestingly, we found arguments for a moderating effect of alexithymia with patients. This effect could be interpreted as people with high alexithymia may be more vulnerable to negative social support and benefiting less from emotional sharing of the disease experience. Although these findings need to be confirmed in a longitudinal design, they suggest it is worth considering different patterns in individual emotional regulation when offering psychological treatment based on emotional involvement or emotional confrontation along the cancer trajectory. Specialized interventions may then be adapted to

address the needs of patients exhibiting alexithymia or other emotional deficits. So, emotional social sharing could not be a systematic recommendation. Interventions could focus on helping the social network and environment to adjust to the socioemotional characteristics of BC patients along the cancer trajectory during but also after treatment.

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