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# Personality and Individual Differences

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## Quality of life and level of functioning in cancer patients: The roles of behavioural inhibition and approach systems

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### ABSTRACT

Psychosomatic medicine shows that individual differences in psychological factors are implicated in physical disease. However, the influence of personality on cancer-related psychological outcomes has not been clarified. The aim of this article is to contribute to this literature in terms of the reinforcement sensitivity theory (RST) approach to personality. Measures of the Behavioural Inhibition System (BIS) and the Behavioural Approach System (BAS) were examined in relation to quality of life (QoL) and level of functioning (LoF) in 48 cancer patients (compared with non-clinical controls). Personality differences were measured by the Carver and White (1994) BIS/BAS Scales; and QoL and LoF by the EORTC QLQ C30. Both BAS Fun Seeking (BAS-Fun) and BAS Reward Responsiveness (BAS-RR) interacted with the cancer-control factor on LoF, with higher scoring individuals on both sub-scales reporting higher LoF in the cancer group. BAS-RR interacted with cancer-control factor on QoL, with higher scoring individuals reporting a higher QoL in the cancer group. As expected, on both QoL and LoF, scores were significantly lower in the cancer group. Implications of this study for future personality-based cancer research are discussed.

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### 1. Introduction

Psychosomatic medicine has revealed a number of psychological factors implicated in physical disease, and individual differences in these psychological factors have attracted research attention (for an overview, see Elovainio & Kivimaki, 2009). The aim of this article is to relate personality factors from one major neuropsychological model of personality, namely reinforcement sensitivity theory (RST; Corr, 2008), to one major class of physical disease, namely cancer. We focus on the effects of cancer, and the roles played by personality, on two psychosocial factors: (a) quality of life (QoL), and (b) level of functioning.

Cancer is one of the leading causes of death (Karim-Kos et al., 2008), and the World Health Organisation (WHO) estimate that, by 2020, globally more than 100 million will die from it each year (Higginson & Costantini, 2008). Current incidence rates suggest that one in three European citizens will develop cancer during their lifetime, and cancer is currently the 4th most frequent cause of death, with 1.2 million cancer-related deaths occurring in 2006 (Albrecht, McKee, Alexe, Coleman, & Martin-Moreno, 2008). With the development of newer and more effective therapies, the mean age of the population affected by cancer is increasing (Higginson &

Costantini, 2008). QoL has, therefore, become a primary issue for the increasing number of young and older people who survive and live with a diagnosis of cancer. In general, cancer has a significant detrimental and long-lasting effect on physical and psychological QoL (Dow, Ferrell, Leigh, Ly, & Gulasekaram, 1996; Hensch, Bergman, Gustafsson, Gaston-Johansson, & Danielson, 2007), even on those who are successfully treated (Ganz, Rowland, Desmond, Meyerowitz, & Wyatt, 1998; Ganz et al., 2002; Robb et al., 2007).

#### 1.1. Personality and cancer

There is considerable variation in how patients react to illness and, consequently, there is considerable variation in levels of health-related QoL (Birkhaug, Aarstad, Aarstad, & Olofsson, 2002; Carver et al., 2005; Chochinov et al., 2006; Hensch et al., 2007; Kurtz, Kurtz, Given, & Given, 2008; Llewellyn, McGurk, & Weinman, 2005; Millar, Purushotham, McLatchie, George, & Murray, 2005; Rolke, Bakke, & Gallefoss, 2008; Schwarzer, Boehmer, Luszczynska, Mohamed, & Knoll, 2005). A patient's ability to adjust is an important factor in determining their eventual psychological and physiological outcomes. Evidence suggests that this variation in coping ability is not due to the nature or the severity of the illness alone, but may also be attributed, at least in part, to personality

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factors (e.g., Carver, Meyer, & Antoni, 2000; Llewellyn et al., 2005; Millar et al., 2005).

The nature of the type and influence of personality on cancer-related psychological outcomes has not been clarified. The major aim of this article is to contribute to this clarification in terms of one major approach to personality, namely reinforcement sensitivity theory (RST; Gray & McNaughton, 2000.; for a summary, see Corr, 2008). RST is a theory which aims to provide a framework with which to understand the major dimensions of personality by taking neural and psychological processes into account (Corr, 2009). It is the direct descendant of Hans Eysenck's theory of personality, which had initially looked at levels of arousal and arousability as factors underlying individual differences in personality (Corr, 2008). Jeffrey Gray (1975), revising Eysenck's theory, postulated that Eysenck's Extraversion and Neuroticism scales should be rotated to form axes reflecting individual differences in conditioned reward and punishment sensitivity: these systems are referred to as the Behavioural Inhibition System (BIS; said to regulate the passive avoidance of conditioned punishment), and the Behavioural Approach System (BAS; said to regulate approach to conditioned reward). More recently (Gray & McNaughton, 2000), the details of these systems have been substantially revised (for a detailed exposition of these systems, see Corr, 2008).

Traits such as optimism, planning, and neuroticism are fundamental constituents of the BAS and BIS elements of RST – the FFFS has received much less attention. These traits have been shown to have a significant effect on the perceived QoL of cancer patients (Chochinov et al., 2006; Humphris & Ozakinci, 2006; Kurtz et al., 2008; Llewellyn et al., 2005; Schwarzer et al., 2005). RST, therefore, provides a well-developed theoretical framework to guide the study of patients' fundamental judgments of, and reactions to, aversive and ambiguous (e.g., in terms of outcome) situations, such as those seen in cancer patients' day-to-day QoL. The major aim of this article is to explore these possibilities.

Winefield (1995) describes QoL as being a multidimensional construct of a person's well-being, composed of physical and objective parameters, as well as subjective psychological ones. The subjective or objective nature of these parameters does not undermine their importance, since quality of life is a complex relationship between life events, their contexts, and self-evaluation. Measures of QoL can, therefore, reflect the perceived effect of a disability or disease on an individual's life, based on his/her own account of the experience. Consequently, inter-individual variation in reported levels of QoL is, in part, due to cognitive styles and, thus, possibly personality factors.

For example, Millar et al. (2005) investigated the correlation between psychological morbidity and the major dimensions of personality 3, 6 and 12 months after surgery in a sample of 371 female breast cancer patients. These data revealed that, although mean levels of stress dropped over time, over a quarter of the sample maintained a significant level of distress for the entire duration of the study. Those who reported continuing distress at the 6 and/or 12 month check-up (medium and long-term distress groups) had significantly higher scores on neuroticism, fatalism, and anxiety, and reported that they perceived greater symptom impact and had significantly poorer general health. These short-term, medium-term, and long-term patient groups did not differ in terms of their surgical allocation, treatment, or long-term clinical outcome. Therefore, this study shows that high-levels of neuroticism are associated with lower levels of QoL; and, importantly, it provides evidence to support the claim that it is not merely the severity of the cancer that determines QoL but also patients' *perception and appraisal* of the severity and consequences of the cancer. Similarly, personality and cognitive components have been related to different QoL evaluations (Secchi & Strepparava, 2001). For example, Carver et al. (2005) showed, in a longitudinal study, that

personality factors and initial well-being were strong predictors of subjective long-term well-being (medical factors had a much lower predictive value).

## 1.2. Research hypotheses

There is very little research linking RST constructs to the psychology of cancer patients and, to our knowledge, never in relation to the quality of life of cancer patients. In this respect, our work is largely exploratory. However, our preliminary hypotheses were that BIS levels would be negatively correlated with quality of life (QoL) and level of functioning (LoF), and positively correlated with symptom severity (SS; it is expected that individuals with a greater tendency of making negative attributions would be prone to over-reporting their symptomatology). We also expected that the three subcomponents of the BAS, namely, BAS Drive (BAS-D), BAS Fun Seeking (BAS-Fun) & BAS Reward Responsiveness (BAS-RR), would be positively correlated with QoL and LoF.

## 2. Methods

### 2.1. Participants

Ninety-six people participated in the study. Forty-eight had recently received a diagnosis of bowel, breast, esophageal, or lung cancer, with the time of diagnosis ranging from two months to two years prior to the initiation of the study (mean age of 59.21, S.D = 12.2; range: 28–86). In many cases, the gender of these participants was not made known to the researchers due to concerns over privacy.

Patients were contacted either at the Lemesos New General Hospital's Oncology Department, via the Cyprus Association of Cancer Patients and Friends, or at private clinics. The forty-eight non-cancer participants were drawn from the general public (mean age of 41.1, S.D = 12.85; range: 23–66). The only exclusion criterion was a diagnosis of cancer at any point throughout their lifespan. Their gender was omitted from the analysis in lieu of the lack of such information for the patient sample. All participants were treated in accordance with the Ethical Principles of Psychologists and Code of Conduct (American Psychological Association, 1992).

### 2.2. Materials

Participants completed the **European Organization for Research and Treatment of Cancer (2001) Quality of Life Questionnaire (EORTC QLQ) C30** (version 3), which is one of the most widely used measures of cancer-related quality of life (QoL). It is a 30-item instrument measuring level of functioning (LoF), symptom severity (SS), and quality of life (QoL).

We employed the well-established and widely-used **Carver and White (1994) BIS-BAS Scales** to measure the two main systems of RST, namely the Behavioural Inhibition System (BIS) and the Behavioural Approach System (BAS). Broadly speaking, these may be defined as psychometric measures of individual differences in reactions to reward and punishment (Corr, 2008), or, more broadly defined, individual differences in perception of loss and gain, respectively (Hall, Chong, McNaughton, & Corr, in press). The BIS/BAS scales are composed of three BAS sub-factors (Drive, Fun-Seeking & Reward Responsiveness) and one BIS scale.

The materials were selected due to their validity, relevance and extensive prior application. The general consensus regarding the accuracy of the two questionnaires, as well as the frequent use of the EORTC QLQ in clinical settings, meant that it would be possible for future studies or clinicians to replicate these methods. The

variables measured were considered to have the ability to provide an indication of the self-perceived harm caused by the disease and the treatment, thus providing clinicians and health care professionals with classification tools to devote more resources to specific patients in order to alleviate a cascade of possible mental health risks.

### 2.3. Procedure

After each patient had been contacted, either by their private physician, or through the Lemesos New General Hospital Oncology Department, or the Cyprus Association of Cancer Patients and Friends, a meeting was arranged in order for the questionnaires to be completed. In many cases the questionnaires were not completed in the presence of the researchers due to concerns regarding privacy. Control participants were informed about the study via email, telephone or mailing lists, and a meeting was arranged with those who agreed to participate in the study.

A consent form, along with a brief description of the study, was presented to each participant. They were then asked to read the relevant instructions and complete the Carver and White (1994) BIS/BAS Scales. Each was then asked to read the relevant instructions and complete the EORTC (2001) QLQ-C30 questionnaire. Participants were debriefed once the task was complete. This study was approved by the ethics committee of the Department of Psychology, Swansea University.

### 2.4. Statistical Analysis

The statistical analysis consisted of a series of t-tests and Pearson's product moment coefficients, following by a series of between-subjects univariate analyses of covariance (ANCOVAs), with age as a covariate, and median splits taken on the BIS and BAS sub-scales in order to explore their possible interactions with the cancer group (vs. a control group). QoL, LoF, and SS served as the dependent variables.

## 3. Results

Table 1 provides the descriptive statistics for all variables, and Tables 2 and 3 shows their intercorrelations. The BIS/BAS scores are similar to data reported by Kasch, Rottenberg, Arnow, and Gotlib (2002) contrasting depressed and non-depressed patients.

Patients scored significantly lower than controls on Behavioural Approach System (BAS) Reward Responsiveness (BAS-RR) ( $t(94) = 2.02, p < .05$ ), and they were significantly lower on quality

of life (QoL) ( $t(94) = 4.53, p < .001$ ) and level of functioning (LoF) ( $t(94) = 5.92, p < .001$ ), as well as being significantly higher on symptom severity (SS) ( $t(94) = 4.22, p < .001$ ), as expected. Patients were also older than controls ( $t(94) = 7.08, p < .001$ ).

Age was significantly and negatively correlated with BAS Fun Seeking (BAS-Fun) in the control group, therefore it was decided to enter age as a covariate in the following analyses of covariance (ANCOVAs). Due to the exploratory nature of this work, and the inherent violations of the assumptions for regression analysis (i.e. homoscedasticity and linearity) in our data, it was decided to perform median splits on the measures of BAS-Fun, BAS-RR, and BAS Drive (BAS-D), and Behavioural Inhibition System (BIS).

### 3.1. Level of functioning

There was a significant BAS-Fun x Group interaction,  $F(1, 91) = 6.01, p < .05$ . Fig. 1 shows that the low BAS-Fun cancer patients reported a lower level of LoF than those in the high group ( $t(46) = -2.26, p < .029$ ), whereas in controls, the low BAS-Fun group reported higher LoF than the high BAS-Fun group ( $t(46) = 2.24, p < .05$ ).

In a similar manner, a significant BAS Reward Responsiveness x Group interaction,  $F(1, 91) = 4.84, p < .05$ , was found. Fig. 2 shows that controls with low BAS Reward Responsiveness scores reported a higher level of LoF than the high group ( $t = 2.21, df = 46, p < .05$ ), whereas in the patient group there was no formally significant difference ( $t = -1.67, df = 46, p > .10$ ), but the relationship approached trend and may be seen as showing as the opposite pattern of effects seen in the control group.

None of the other personality measures interacted with the Group factor.

### 3.2. Quality of life

There was a significant BAS Reward Responsiveness x Group interaction,  $F(1, 91) = 3.40, p < .05$ . Fig. 3 shows that patients with low BAS Reward scores reported a lower level of QoL than those in the high group ( $t = 2.02, df = 46, p < .05$ ).

None of the other personality measures interacted with the Group factor.

### 3.3. Symptom severity

No significant interaction effects were observed for any of the personality measures.

## 4. Discussion

The primary aim of this study was to investigate if an association existed between RST personality factors and psychosocial indices of cancer. Patients' quality of life (QoL) and level of functioning (LoF) were significantly associated with scores on psychometric measures of the Behavioural Approach System (BAS). Specifically, patients with lower BAS Fun Seeking (BAS-Fun) scores reported lower levels of LoF; and patients with lower BAS Reward Responsiveness (BAS-RR) scores reported lower levels of LoF and QoL. As expected, patients reported lower levels of LoF and QoL, and higher levels of symptom severity (SS), than the non-patient control group. LoF was found to be significantly negatively correlated with SS; and QoL was found to be significantly positively correlated with LoF, and significantly negatively correlated with SS.

The findings suggest that personality factors do, indeed, play a role in influencing patients' perceived QoL and LoF. The positive correlations between BAS-RR and QoL in cancer patients may be due to the tendency of high BAS-RR scorers to draw positive

**Table 1**  
Descriptive statistics for Carver & White scales, EORTC QLQ C30, and age, in patients and controls.

Variable	Patients (n = 48)		Controls (n = 48)	
	M	SD	M	SD
BAS-D	10.81	2.33	11.13	2.35
BAS-Fun	10.13	2.89	11.08	2.43
BAS-RR	16.63	2.28	17.54	2.17
BIS	19.69	3.6	20.75	2.64
Quality of life	61.58	24.53	79.34	11.66
Level of functioning	66.02	18.23	84.17	10.89
Symptom severity	30.88	22.23	15.7	11.24
Age	59.21	12.21	41	12.84

Note: Total listwise  $N = 96$ . EORTC QLQ C30 = European Organization for Research and Treatment of Cancer (2001) Quality of LIFE Questionnaire (version 3); BAS = Behavioral Approach Scale; BAS-D = BAS Drive; BAS-RR = BAS Reward Responsiveness; BAS-Fun = BAS Fun-Seeking; BIS = Behavioral Inhibition Scale.

**Table 2**  
Correlation matrix of Carver & White scales and EORTC QLQ C30 scores of patients.

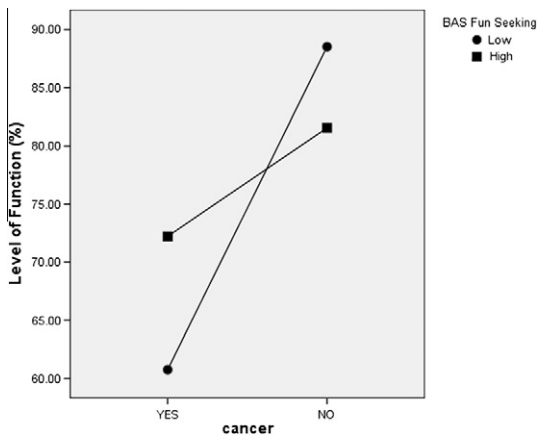
Measures	1	2	3	4	5	6	7
1 BAS-D							
2 BAS-Fun	.152						
3 BAS-R	.263	.422*					
4 BIS	.156	.022	.378*				
5 Quality of life	.156	.263	.220	-.184			
6 Level of functioning	.066	.284	.245	-.089	.534*		
7 Symptom severity	-.094	-.007	-.067	.054	-.544*	-.723*	
8 Age	-.006	.101	.083	-.049	.169	.185	-.206

Note: n = 48. EORTC QLQ C30 = European Organization for Research and Treatment of Cancer (2001) Quality of Life Questionnaire (version 3), BIS = Behavioral Inhibition Scale; BAS = Behavioral Approach Scale; BAS-RR = BAS Reward Responsiveness; BAS-Fun = BAS Fun-Seeking.  
\* = p < .05. (2-tailed).

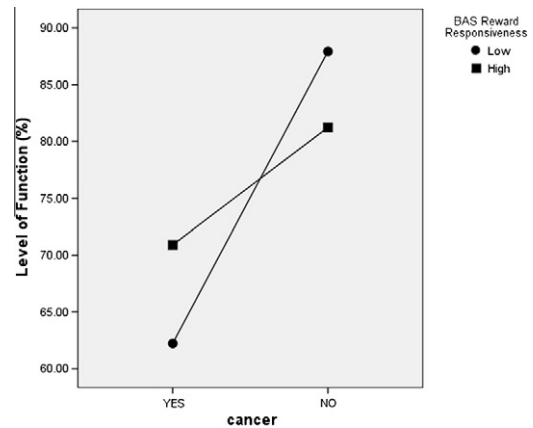
**Table 3**  
Correlation matrix of Carver & White scales and EORTC QLQ C30 scores of controls.

Measures	1	2	3	4	5	6	7
1 BAS-D							
2 BAS-Fun	.490*						
3 BAS-R	-.043	.040					
4 BIS	-.046	.149	.069				
5 Quality of life	-.066	-.270	-.144	-.062			
6 Level of functioning	-.102	-.278	-.373*	-.254	.376*		
7 Symptom Severity	.149	.164	.140	.170	-.558*	-.589*	
8 Age	-.048	-.381*	-.111	-.092	.221	.353*	-.175

Note: Total listwise N = 96. EORTC QLQ C30 = European Organization for Research and Treatment of Cancer (2001) Quality of Life Questionnaire (version 3); BAS = Behavioral Approach Scale; BAS-D = BAS Drive; BAS-RR = BAS Reward Responsiveness; BAS-Fun = BAS Fun-Seeking; BIS = Behavioral Inhibition Scale.  
\* = p < .05. (2-tailed).



**Fig. 1.** Interaction between BAS Fun Seeking and Group on Level of Functioning (LoF).



**Fig. 2.** Interaction between BAS Reward Responsiveness and level of functioning.

cognitive appraisals of a situational outcome (Corr, 2008); that is, they have a greater tendency to evaluate their situation favorably. In contrast, low BAS-RR scorers may tend to evaluate the outcome of a situation negatively. An individual with high BAS-RR levels may be more disposed to evaluate living with cancer as being an opportunity for personal growth (Andrykowsky, Lykins, & Floyd, 2008) rather than simply a heavy burden to be tolerated. A similar line of reasoning holds for BAS-RR and LoF, which revealed an additional effect of BAS-Fun – perhaps in hindsight, it is not surprising that having a disposition to fun seeking is associated with LoF, although its lack of association with QoL is less easy to explain.

Assuming that the relations of the BAS are related to cognitive appraisals, and this has still yet to be determined, these findings could be integrated into psychological interventions. Because they

suggest that the evaluation of an outcome plays a role in determining an individual's perceived level of QoL, psychotherapeutic interventions could focus on changing the cognitive schemas surrounding cancer and its symptomatology. As noted by Carver et al. (2000), it is difficult to change underlying biologically-based temperament, but it is easier to promote confidence concerning the future. This target of intervention is especially important because cancer patients who are most prone to distress combine doubt about the future with a higher level of dispositional threat sensitivity. If patients were urged to focus on the positive aspects of engaging in chemotherapy or surgery, as opposed to the negative aspects, or to focus on the possibility that cancer has offered an opportunity for personal growth, an increase in perceived QoL should be expected. Group psychotherapy for instance, which relies on promoting personal growth and expressing one's self openly

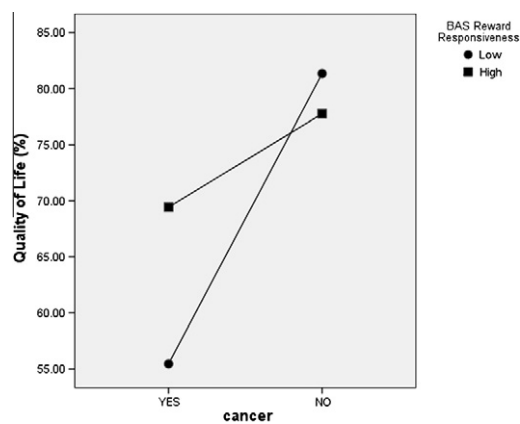


Fig. 3. Interaction between BAS Reward Responsiveness and Group on quality of life (QoL).

in the presence of group support, has been shown to be particularly effective in improving the QoL of cancer patients (Blake-Mortimer, Gore-Felton, Kimerling, Turner-Cobb, & Spiegel, 1999).

There were a number of notable limitations to this study. Many variables were not measured in the design, notably sex, socioeconomic status, ethnic background, tumor site, temporal duration of illness, different treatments, phase of treatment, and social support. It is possible that the diagnostic and therapeutic heterogeneity of the current cancer sample might well explain why some hypotheses (especially concerning the BIS) were not supported. Future research will need to correct these limitations. On the theoretical front, it would also be informative to apply revised RST to this problem, which defines the BIS in terms of goal-conflict rather than punishment sensitivity per se. However, we do not believe that these limitations compromised the reported results, which in an exploratory manner set out to examine, at a very broad level, whether RST-related constructs related to important psychosocial clinical measures in cancer patients.

## 5. Conclusions

The above findings are novel and point to a role played by theoretically-cogent individual differences on important psychosocial factors in cancer patients. They add to the literature on the relationship between personality and psychological outcomes, and suggest that the constructs of the reinforcement sensitivity theory (RST) of personality are relevant to the understanding of health-related outcomes. Clearly further work is needed to replicate and extend these findings, using more rigorous experimental designs, without which it would be premature to offer theoretical speculation as to the ultimate value of these observations. Follow-up research should include consideration of the role played by cognitive appraisals in mediating the effects of the BIS and BAS on psychosocial and clinically-relevant outcomes, and the implications of these mediating variables for therapeutic intervention.

## References

- Albrecht, T., McKee, M., Alexe, D., Coleman, M. P., & Martin-Moreno, J. M. (2008). Making progress against cancer in Europe in 2008. *European Journal of Cancer*, 44, 1451–1456.
- American Psychological Association. (1992). Ethical principles of psychologists and code of conduct. *American Psychologist*, 47, 1597–1611.
- Andrykowsky, M. A., Lykins, E., & Floyd, A. (2008). Psychological health in cancer survivors. *Seminars in Oncology Nursing*, 24, 193–201.
- Birkhaug, E. J., Aarstad, H. J., Aarstad, A. K. H., & Olofsson, J. (2002). Relation between mood, social support and the quality of life in patients with laryngectomies. *European Archive of Oto-Rhino-Laryngology*, 259, 197–204.

- Blake-Mortimer, J., Gore-Felton, C., Kimerling, R., Turner-Cobb, J. M., & Spiegel, D. (1999). Improving the quality and quantity of life among patients with cancer: A review of the effectiveness of group psychotherapy. *European Journal of Cancer*, 35, 1581–1586.
- Carver, C. S., Meyer, B., & Antoni, M. H. (2000). Responsiveness to threats and incentives, expectancy of recurrence, and distress and disengagement: Moderator effects in women with early stage breast cancer. *Journal of Consulting and Clinical Psychology*, 68, 965–975.
- Carver, C. S., Smith, R. G., Antoni, M. H., Petronis, V. M., Weiss, S., & Derhagopian, R. P. (2005). Optimistic personality and psychosocial well-being during treatment predict psychosocial well-being among long-term survivors of breast cancer. *Health Psychology*, 24, 508–516.
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology*, 67, 319–333.
- Chochinov, H. M., Kristjanson, L. J., Hack, T. F., Hassard, T., McClement, S., & Harlos, M. (2006). Personality, neuroticism, and coping towards the end of life. *Journal of Pain and Symptom Management*, 32, 332–341.
- Corr, P. J. (2008). Reinforcement sensitivity theory (RST): Introduction. In P. J. Corr (Ed.), *The reinforcement sensitivity theory of personality* (pp. 1–43). Cambridge: Cambridge University Press.
- Corr, P. J. (2009). The reinforcement sensitivity theory of personality. In P. J. Corr & G. Matthews (Eds.), *The Cambridge handbook of personality psychology* (pp. 347–376). Cambridge: Cambridge University Press.
- Dow, K. H., Ferrell, B. R., Leigh, S., Ly, J., & Gulasekaram, P. (1996). An evaluation of the quality of life among long-term survivors of breast cancer. *Breast cancer research treatment*, 39, 261–273.
- Elovainio, M., & Kivimaki, M. (2009). Models of personality and health. In P. J. Corr & G. Matthews (Eds.), *The Cambridge handbook of personality psychology* (pp. 205–227). Cambridge: Cambridge University Press.
- European Organization for Research and Treatment of Cancer (2001). EORTC QLQ-C30 Scoring Manual. Brussels: EORTC.
- Ganz, P. A., Desmond, K. A., Leedham, B., Rowland, J. H., Meyerowitz, B. E., & Belin, T. R. (2002). Quality of life in long-term, disease-free survivors of breast cancer: A follow-up study. *Journal of the National Cancer Institute*, 94, 39–49.
- Ganz, P. A., Rowland, J. H., Desmond, K., Meyerowitz, B. E., & Wyatt, G. E. (1998). Life after breast cancer: Understanding women's health-related quality of life and sexual functioning. *Journal of Clinical Oncology*, 16, 501–514.
- Gray, J. A. (1975). *Elements of a two-process theory of learning*. London: Academic Press.
- Gray, J. A., & McNaughton, N. (2000). *The neuropsychology of anxiety: An enquiry into the functions of the septo-hippocampal system* (2nd ed.). Oxford: Oxford University Press.
- Hall, P. J., Chong, W., McNaughton, N., & Corr, P. J. (in press). A neuroeconomic perspective on the reinforcement sensitivity theory of personality. *Personality and Individual Differences*.
- Henoch, I., Bergman, B., Gustafsson, M., Gaston-Johansson, F., & Danielson, E. (2007). The impact of symptoms, coping capacity, and social support on quality of life experience over time in patients with lung cancer. *Journal of Pain and Symptom Management*, 34, 370–379.
- Higginson, I. J., & Costantini, M. (2008). Dying with cancer, living well with advanced cancer. *European Journal of Cancer*, 44, 1224–1241.
- Humphris, G. M., & Ozakinci, G. (2006). Psychological responses and support needs of patients following head and neck cancer. *International Journal of Surgery*, 4, 37–44.
- Karim-Kos, H. E., de Vries, E., Soerjomataram, I., Lemmens, V., Siesling, S., & Coebergh, J. W. W. (2008). Recent trends of cancer in Europe: A combined approach of incidence, survival and mortality for 17 cancer sites since the 1990s. *European Journal of Cancer*, 44, 1345–1389.
- Kasch, K. L., Rottenberg, J., Arnow, B. A., & Gotlib, I. H. (2002). Behavioral activation and inhibition systems and the severity and course of depression. *Journal of Abnormal Psychology*, 111, 589–597.
- Kurtz, M. E., Kurtz, J. C., Given, C. W., & Given, B. A. (2008). Patient optimism and mastery: Do they play a role in cancer patients' management of pain and fatigue? *Journal of Pain and Symptom Management*, 36, 1–10.
- Llewellyn, C. D., McGurk, M., & Weinman, J. (2005). Are psycho-social and behavioural factors related to health related-quality of life in patients with head and neck cancer? A systematic review. *Oral Oncology*, 41, 440–454.
- Millar, K., Purushotham, A. D., McLatchie, E., George, W. D., & Murray, G. D. (2005). A 1-year prospective study of individual variation in distress, and illness perceptions, after treatment for breast cancer. *Journal of Psychosomatic Research*, 58, 335–342.
- Robb, C., Haley, W. E., Balducci, L., Extermann, M., Perkins, E. A., Small, B. J., et al. (2007). Impact of breast cancer survivorship on quality of life in older women. *Critical Reviews in Oncology/Hematology*, 62, 84–91.
- Rolke, H. B., Bakke, P. S., & Galleffoss, F. (2008). Health related quality of life, mood disorders and coping abilities in an unselected sample of patients with primary lung cancer. *Respiratory Medicine*, 102, 1460–1467.
- Schwarzer, R., Boehmer, S., Luszczynska, A., Mohamed, N. E., & Knoll, N. (2005). Dispositional self-efficacy as a personal resource factor in coping after surgery. *Personality and Individual Differences*, 39, 807–818.
- Secchi, G., & Strepparava, M. G. (2001). The quality of life in cancer patients: A cognitive approach. *European Journal of Internal Medicine*, 12, 35–42.
- Winefield, H. R. (1995). Quality of life in chronic diseases. *Proceedings of the 8th Annual Conference of the European Health Psychology Society*, Spain.