An exploratory study of the psychological content of writing produced by women recovering from surgery for gynaecological cancers.

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Overview

Part 1 is a methodological literature review of the ways in which emotional content in writing has been analysed for clinical purposes. The multidisciplinary background to this area is described, incorporating both psychological and linguistic perspectives. Twenty-five studies are identified in which four types of emotional content analysis are applied. Each method is described in terms of its characteristics, strengths and limitations.

Part 2 reports on the content analysis of writing from a study comparing an emotional daily writing task with a non-emotional daily writing task among women recovering from surgery for gynaecological cancer. This study formed part of a joint project with two other researchers (see Delmar Morgan, 2008; and Saunders, 2008); Appendix 1 sets out the contributions of the three researchers to the overall data collection. The analysis in Part 2 explores the psychological content of the women's writing, in terms of emotional and cancer-related themes. Two computerised methods of content analysis were applied and the results compared to self-report ratings of content. Differences in content between emotional and neutral writing were analysed, and the consistency of measurement across the different methods of content analysis was assessed. The findings are discussed in terms of their clinical relevance for this population.

Part 3 is a critical appraisal of the study and focuses on the role of meaning in framing the conceptual and practical aspects of this study. Issues discussed include the extent to which patients' beliefs about the meaningfulness of the writing task influenced their participation, and the methodological challenges involved in capturing the emotional meaning of what participants wrote.

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Part 1: Literature Review

Written expression of emotion: Methods of analysis.

Abstract

This paper reviews the different methods that have been applied to the analysis of written emotional content. The core focus is on the type of data generated by clinical application of the "expressive writing" paradigm (Pennebaker & Beall, 1986) in which participants write on emotional topics for 20 minutes, for three or four days. Twenty-five studies were identified, in which four broad types of analysis were applied: computerised word count analysis, computerised psychiatric content analysis, varieties of thematic coding and self-report essay evaluation rating scales. The different methods of analysis are presented in terms of their theoretical background, analytic features, findings in emotional writing and their limitations. The four methods varied in terms of the degree to which they applied psychological theories of emotion and in terms of their psychometric qualities. The need for methodological triangulation in future research is highlighted, both to deepen understanding of written emotional expression as well as to develop the evidence base on the psychological validity of these methods.

Written expression of emotion: Methods of analysis

The Expression Of Emotion In Writing

The expression of emotion forms a core component of most psychological therapies. Therapeutic rationales for emotional expression can be found across the psychological spectrum, from psychoanalytic mechanisms of catharsis (Freud, 1901/1960), to behavioural concepts of emotional processing and habituation (Rachman, 1980), to more recent models of emotional self-regulation (King, 2002; Lepore, Greenberg, Bruno & Smyth, 2002). The therapeutic expression of emotion has been widely examined via the transcription of spoken language in psychotherapy process research (e.g. Russell & Stiles 1979; Russell, 1989). Structured therapeutic interventions have also been developed that facilitate emotional expression though writing (Esterling, L'Abate, Murray & Pennebaker, 1999; Kerner & Fitzpatrick, 2007). The most systematically studied emotional writing intervention is the "Pennebaker paradigm" (Pennebaker & Beall, 1986), also known as "expressive writing" or "written disclosure", in which participants write about difficult or traumatic experiences for twenty minutes a day over the course of three or four days. In comparison to non-emotive control writing tasks, expressive writing has consistently shown health-related gains, in terms of fewer health complaints and medical visits (e.g. Frattaroli, 2006; Frisina, Borod & Lepore, 2004; Pennebaker, 1997; Smyth, 1998). More recently, expressive writing research has sought to understand the nature of its effects, including what role can be attributed to the types of words participants write when articulating their emotional worlds. This paper reviews the literature on the analysis of emotional content in written data, focussing on the different methods that have been applied to the task among clinical populations.

Overview of this Review

The analysis of emotion in language has diverse theoretical roots; the introductory section of this review begins by considering the multidisciplinary nature of the field, and the challenges this presents. Next, developments in content analysis are charted and the theoretical background in linguistics and psychology is outlined. At the end of the Introduction, previous reviews in this area are noted and the rationale and focus of this review are explained, with consideration given to issues of cultural specificity. The Method section describes the scope, search strategy and inclusion criteria applied. In the Results section, methods which have been applied to obtain clinically meaningful analyses of emotional content are reviewed. For each method, the theoretical background, analytic features, and key studies in which it is applied are given. Consideration is also given to the limitations of each method. Finally, the Discussion section summarises the themes and challenges identified in this review and suggests ways in which these may be addressed in future research.

The Multidisciplinary Literature on Emotion in Language

Identifying the different methods that have been applied to the analysis of emotional content in written data is a task greatly complicated by the fact that the research on emotion in language has been generated across a diverse range of disciplines, including literature, philosophy, sociology, ethnology, linguistics, and psychology (Coan & Allen, 2007a; Fussell, 2002; Niemeier & Dirven, 1997). Even within psychology, the social, biological, cognitive, psychometric and clinical fields diverge in a way that obstructs the straightforward identification and comparison of related techniques. Coan and Allen (2007a) describe affective science as a puzzle whose pieces are contributed by many disciplines, because emotions distribute their "echoes and effects" across a multitude of levels (p. 3). As such, they note that the

study of emotion has long served as a magnet for interdisciplinary collaboration. Where the analysis of emotion in written language is concerned, the major tools in use represent an intersection between psychological theory of emotion, linguistics theory and computer technology. This cross-fertilisation can present challenges. For example, in tracing the development of the field, the question is raised as to where the strongest theoretical roots lie: in psychological theory or in linguistics? Moreover, the literature in both psychological and linguistic camps seems to be underdeveloped and the number of methods with a clinical utility is few. A recent interdisciplinary overview of the tools and technologies of emotion research did not dedicate a section to emotion in verbal data, written or otherwise (Coan & Allen, 2007b). Arguably the challenge of systematically assessing what is felt via what is said may be too complex: it seems a tall order that the conceptual validity of any psychological theory of emotion may survive being transposed onto a linguistic framework (or vice versa), and the resulting data be captured by a tool both reliable and efficient enough for clinical use. The development of any such tool therefore presents a triple-hurdle challenge, and it is one that few have cleared.

Roots in Linguistics and Relationship to Techniques of Text or Content Analysis

Shapiro and Markoff (1997) define content analysis as "any systematic reduction of a flow of text (or other symbols) to a standard set of statistically manipulable symbols representing the presence, the intensity, or the frequency of some characteristics relevant to social science" (p. 14). Popping (2000) describes the development of methods of quantitative text analysis, which dates back to studies of religious symbols in songs conducted in 18th century Sweden. From the early 20th century methods of text analysis were applied to newspaper text and evolved through a number of phases of increasing sophistication over the course of the 1950s and

1960s. Until the 1950s, the main mode employed was very basic frequency analysis of words or themes. Next, "valence" analyses focussed on whether words or themes were valued positively or negatively, or themes as pro or contra. "Intensity" analysis saw concepts being weighted according to the relative strengths of meanings expressed. From 1960, increasing sophistication of correlational statistics allowed text analysis to advance beyond the merely descriptive. This change was marked by the emergence of "contingency" analysis from 1960, looking at associations between textual characteristics. From the late 1960s the emergence of computer analysis enabled advances in the speed and quantity of data that could be analysed. The "General Inquirer" was a mainframe computer programme that allowed the classification and counting of words and phrases (see Pennebaker, Mehl & Niederhoffer, 2003). However, the facility of computer analysis resulted in the misuse of text analytic methods, such as removal of words and phrases from context (Popping, 2000). Such flaws in analytic method led to a decline in confidence in text analysis research and its application. Since then, there has been a trend towards mixed approaches among social science researchers, using both descriptive analyses (counting the incidence of items) and theory-driven analyses (which use a dictionary as its base). Neimeir (1997) notes that the language of emotions has yet to be examined systematically by linguists and that studies of emotion from a linguistic perspective have tended to focus on the ways in which emotions are differently conceptualised across languages and cultures.

Theoretical Roots in Emotion Research

For a time the scientific status of the field of "emotionology" tended to be criticised, especially among psychologists because of the lack of objective methods of evaluating or comparing emotions. A return to fashion over the past decade or so, in

psychology, philosophy, ethnology, sociology and linguistics, has been linked to the possibilities provided by interdisciplinary approaches to generating new hypotheses and theories (Neimeir, 1997). To what extent has this enabled an integration of theory and methods? In a cross-disciplinary overview of the research on verbal communication of emotion, Fussell (2002) draws a line under a large canon of research on emotional taxonomy by summarising as "theoretically infinite" the number of emotional states that the English language can express. Thus, it seems that the complexity of theories may be too overwhelming to translate across disciplines. It may therefore come as no surprise that the diversity of psychological theories of emotion (e.g. structural, functional, or dynamic systems (e.g. Power, 2006; Witherington & Crichton, 2007)) or even emotion in language (e.g. Peake & Egli, 1982) receive only scant representation among the methods of emotional content analysis that have been put to clinical use in expressive writing. This is despite the fact that expressive writing, generally produced under controlled conditions, is the type of affect-laden verbal data that may be most apposite for systematic measurement or analysis.

Theoretical Roots in Psychology

In discussing the construction of self-report tools to measure affect, Gray and Watson (2007) describe two primary approaches to the structure of emotion: a "specific-affect" model (focussing on discrete affect states e.g. fear, anger, sadness and joy) and a "dimensional" model (composed of a smaller number of general dimensions). These models can be used to distinguish approaches to measuring emotion in language e.g. in terms of words or phrases being coded either to specific-affect categories, or in terms of broad dimensions of emotion (e.g. positive or negative emotion). The function served by measuring emotion in text will also

influence the method adopted and may range from the descriptive (e.g. to explore individual differences, Pennebaker & King, 1999), to the diagnostic (e.g. Gottschalk, 2000). At the descriptive end, the frequency of dictionary-defined emotion keywords may indicate emotional states or traits. Alternatively, a qualitative approach to description may apply inductive or theory-driven approaches. A task with a diagnostic purpose may analyse the text to infer theory-specific emotional processes (e.g. psychodynamic concepts of projection or denial; cognitive aspects of processing). Such analyses are described as "instrumental"; they use text to analyse characteristics about which the person writing the text may be unaware (Popping, 2000, p. 20).

Previous Reviews

A number of previous reviews have explored aspects of analysing emotion in writing, from a range of perspectives.

Reviews relating to content analysis methods: Viney (1983) reviews techniques for content analysing spoken and written verbal data and describes the potential application of these methods to the recognition of psychological states. Gottschalk (2000) describes his research on the content analysis of speech from a psychiatric perspective and discusses the computerisation of this approach. More recently, Pennebaker et al. (2003) reviewed the most commonly-used tools for exploring word use, and summarised findings linking word use to social, psychological and health phenomena.

Reviews relating to the Pennebaker paradigm: Pennebaker and Chung (2007) give an overview of the expressive writing paradigm, summarising the evidence on health outcomes and procedural moderating variables, and review the theories on

mechanisms. A number of meta-analyses of the expressive writing literature have been conducted, notably by Fratarolli (2006), Frisina et al. (2004) and Smyth (1998).

Reviews relating to writing, emotional expression and therapy: Esterling et al. (1999) review studies applying writing as a preventive or psychotherapeutic intervention, and consider mental and physical health outcomes. Kerner and Fitzpatrick (2007) examine the differential effects of variously structured writing tasks as components of psychotherapy. The importance of narrative content in mediating the mental health outcomes of emotional writing is raised by Kaufman and Sexton (2006), who link the prevalence of depression among poets to an absence of narrative structure in emotionally expressive poetry. Littrell (1998) reviews the research on the therapeutic expression of emotion, noting an associated risk of increased distress. To reduce this risk, she recommends that the clinical elicitation of distressing emotion is accompanied by strategies for new, adaptive responses to the emotion-evoking stimulus.

Reviews from psychotherapy process literature: The emotional content of language has received significant attention in the psychotherapy process literature. Russell and Stiles (1979) review frameworks for categorising and coding language in psychotherapy, including pragmatic strategies for coding affective states such as anxiety and aggression, or for coding processes such as defence mechanisms. Russell (1989) attributes slow progress in psychotherapy process research to an atheoretical, bottom-up approach; instead, he advocates a top-down approach in which instruments for analysing psychotherapy process are based both in theories of language as well as in theories of process.

Rationale and Focus for this Review

Between these literatures, a significant gap exists around the methodology of analysing written emotion from a clinical perspective, which is the focus of the current review. Due to the high degree of methodological heterogeneity in the study of emotion in language, the scope of this review is not an exhaustive survey of all methods of probing the emotional aspects of any written data. Instead, the scope is restricted to studies in which the expression of emotion is clinically relevant and the interpretation of that content may be clinically meaningful. The core focus is on the type of data produced by the Pennebaker paradigm, which has been extensively analysed to explain its effects in terms of emotional or cognitive mechanisms. In order to broaden the range of methods under consideration, the scope of this review is extended beyond the Pennebaker paradigm, to include clinical studies which examine writing of an essentially similar kind. Non-Pennebaker paradigm writing was included if it was produced as part of an instructed task in which the writer explored emotional or personal subject matter. Within clinical studies, such writing tasks were likely to form part of a psychosocial intervention or evaluation. Examples include writing about difficulties that formed a comparison condition for a trial of email therapy for eating disorders (Robinson & Serfaty, 2007), or writing produced as an outcome measure in psychological therapy (Lane & Viney, 2005).

Cultural Specificity

Culture has a considerable influence on the way in which emotions are conceptualised, displayed and interpreted (van Hemert, Poortinga & Vijver, 2007). It has been suggested that even the concept of emotion itself is culturally-bound (Wierzbicka, 1995, cited in Niemeier, 1997). Fussell (2002) notes the cultural embeddedness of the emotion lexicon. For example, within the English language,

metaphors for depression are rooted within Western concepts of the self (McMullen & Conway, 2002, cited in Fussell, 2002). This review is limited to English language studies; the generalisability of its findings is therefore likely to be restricted to Western conceptions of emotional phenomena.

Method

Scope of this review

The literature search was limited to published studies where an analysis of the emotional features of a text in the English language had been performed. The text needed to have been produced by an instructed writing task that aimed to explore emotional or personal content, as seen most distinctly in the Pennebaker expressive writing paradigm. The scope was restricted to studies among clinical populations in which the rationale for either the writing task or the text analysis was clinically relevant, i.e. closely related to physical or psychological health or functioning.

Search strategy

An initial search to capture studies of the content analysis of written emotion was conducted using PsycINFO, Medline and Science Direct databases. A broad date range was set, which considered all papers from the earliest publications up to February 2008. Table 1 shows the search keywords employed, which were based on those used in the meta-analysis of expressive writing moderators by Frattaroli (2006). A number of generic descriptors for emotional writing were also included, in order to capture studies of writing outside the Pennebaker paradigm. A backward search of the reference lists of key papers and reviews was also performed, and additional literature was identified by hand searches of key journals relating to cognition, emotion, and computational linguistics.

Table 1.

Search string keywords.

Emotionally expressive writing	**Analysis**
emotional disclosure, emotion* express*, experimental disclosure, expressive writing, Pennebaker, scriptotherapy, trauma writing, writing therapy, written communication, written disclosure, written emotion*, written expression.	content analys*, emotional content, linguistic analys*, text analys*.

Note: * denotes a wildcard term.

Inclusion and exclusion criteria

Studies identified by the searches were screened for those in which an analysis had been conducted on the text samples. The screening criteria applied are summarised in Table 2. A backward search using the reference lists of these studies was then performed to identify the papers which explicated the text analysis methods.

Table 2.

Inclusion and exclusion criteria for the literature review.

Criterion	**Included**	**Excluded**
Population	Any clinical population within mental or physical healthcare settings, including caregivers.	Non-clinical populations e.g. healthy students.
Data type	Written verbal samples.	Transcribed speech e.g. psychotherapy process accounts.
Writing type	Pennebaker paradigm or similar structured writing task on a personal or emotional topic produced following instructions.	Writing produced without any instruction and/or not of an emotional or personal nature.
Emotional content analysis	Measurement of linguistic features relevant to emotional expression or processing.	No exclusion criterion specified.

Results

Twenty-five studies meeting the search criteria were identified. Sixteen were in the Pennebaker paradigm, and nine analysed other kinds of emotionally expressive writing tasks. Cancer was the most common study population (N=10). A total of four different types of emotional content analysis were applied, which are summarised in Table 3. Details of the individual studies applying each method are shown in Table 4. Each method is then discussed in terms of its theoretical background and development, its analytic features and any psychometric properties, its application in expressive writing analysis, and its limitations.

Table 3.

Methods of emotional content analysis applied in expressive writing.

Methods	**Characteristics of Methods**	**Clinical Populations Studied**	**N Studies (N in the Pennebaker paradigm)[a]**
LIWC: Linguistic Inquiry and Word Count.	Quantitative (word counting).	Breast cancer; sexual abuse; fibromyalgia; ankylosing spondylitis; psychotic illness; eating disorders; leukaemia; lymphoma; carers; asthma.	16 (8)
PCAD: Psychiatric Content Analysis and Diagnosis.	Quantitative summaries of qualitative ratings of clauses.	Breast cancer.	1 (0)
Thematic coding.	Coding of written content according to particular themes.	Urological surgery; breast cancer.	2 (2)
Self-report Essay Evaluation Rating Scales.	Likert-type rating scales measuring writing content.	Cancer-related bereavement; breast cancer; lower-limb amputation; carers; chronic pelvic pain; rheumatoid arthritis.	6 (6)

Note: [a] The Pennebaker paradigm is defined as expressive writing administered over at least three days, rather than a one-off task (Pennebaker & Chung, 2007).

Table 4.

Summary of clinical studies in which the emotional content of expressive writing was analysed.

Authors	Clinical Population	Description of Writing type[a]	Primary Outcomes (where writing was an intervention)
LIWC: Linguistic Inquiry and Word Count [b]			
Alpers et al. (2005).	Women with breast cancer.	Messages posted to a semi-structured internet-based discusion forum, designed for emotional expression and social support.	None, linguistic analysis only.
Batten et al. (2002).	Adult female survivors of childhood sexual abuse.	Written emotional disclosure.	Physical and psychological health.
Broderick et al. (2005).	Female fibromyalgia patients.	Written emotional disclosure.	Physical and psychological health.
Gillis et al. (2006).	Male and female fibromyalgia patients.	Written emotional disclosure.	Physical and psychological health.
Hamilton-West & Quine (2007).	Male and female patients with ankylosing spondylitis.	Written emotional disclosure.	Physical and psychological health.
Junghaenel et al. (2008).	Male and female psychiatric outpatients with psychotic symptoms.	One-off expressive writing task.	None, linguistic analysis only.
Laccetti (2007).	Women with advanced breast cancer.	Expressive writing.	Quality of life (including emotional wellbeing).

Authors	Clinical Population	Description of Writing type[a]	Primary Outcomes (where writing was an intervention)
Low et al. (2006).[c]	Women with breast cancer.	Written emotionally expressive disclosure vs. "benefit finding" (positive emotional disclosure).	Physical health.
Morgan et al. (2008).	Male and female adult leukaemia and lymphoma patients.	One-off, expressive writing task.	Quality of life, psychological distress.
Owen et al. (2005).	Women with early stage breast cancer.	Messages posted to a semi-structured internet-based discusion forum, designed to facilitate emotional expression as part of coping skills training.	Quality of life, physical and psychological health.
Owen et al. (2006).	Male and female cancer patients.	Written narrative about cancer experience.	Psychological health.
Robinson & Serfaty (2007).	Males and female adults meeting criteria for bulimia nervosa or binge eating disorder.	Twice weekly writing about difficulties (as a comparison condition vs. email therapy).	Psychological health.
Schwartz & Drotar (2004a).	Caregivers of hospitalized children and adolescents with chronic illness.	Written emotional disclosure.	Quality of life, physical and psychological health.
Smith et al. (2005).	Women newly diagnosed with breast cancer.	12-week expressive journaling intervention.	Psychological health.

Authors	Clinical Population	Description of Writing type[a]	Primary Outcomes (where writing was an intervention)
Warner et al. (2006).	Adolescents with asthma.	Written emotional disclosure.	Physical symptoms, functional disability, internalising behaviour and psychological health.
Wolf et al. (2007).	Female and male adults receiving inpatient treatment for eating disorders.	Weekly journaling sessions.	None, linguistic analysis only.
PCAD: Psychiatric Content Analysis and Diagnosis			
Lane & Viney (2005).	Breast cancer survivors	One-off expressive writing exercise as a therapy evaluation measure.	Psychological health (in response to Group therapy intervention).
Thematic Coding			
Creswell et al. (2007).[c]	Early stage breast cancer survivors.	Written emotionally expressive disclosure vs. "benefit finding" (positive emotional disclosure).	Quality of life, psychological and physical health.
Solano et al. (2007).	Male urology patients after surgery.	Written emotional disclosure.	Post-operative recovery.
Self-report Essay Evaluation Rating Scales[b]			
Bower et al. (2003)	Bereaved women who had lost a close relative to breast cancer.	Written emotional disclosure.	Psychological health, immunological status.

Authors	Clinical Population	Description of Writing type[a]	Primary Outcomes (where writing was an intervention)
Broderick et al. (2004)	Male and female rheumatoid arthritis patients	Standard vs. enhanced meaning written emotional disclosure.	Physical health.
Gallagher & Maclachlan (2002).	Lower-limb amputee patients.	Written emotional disclosure.	Quality of life, psychosocial adjustment, psychological and physical health.
Norman et al. (2004).	Women with chronic pelvic pain	Written emotional disclosure vs. positive emotional writing.	Psychological and physical health, functional disability.
Schwartz & Drotar (2004b).	Caregivers of hospitalized children and adolescents with chronic illness.	Written emotional disclosure.	Quality of life, physical and psychological health.
Stanton et al. (2002).[c]	Women with early stage breast cancer.	Written emotionally expressive disclosure vs. "benefit finding" (positive emotional disclosure).	Psychological and physical health.

Notes: [a] Most studies used a type of non-emotive control writing condition, the details of which are not stated in this table.
[b] Several LIWC studies also used a self-report rating as a manipulation check. These studies are listed under LIWC as that was the primary measure of content. (Studies are listed under self-report if self-report was the primary content measure).
[c] Three studies in the review used different methods to analyse the same writing dataset (Creswell et al., 2007; Low et al., 2006; Stanton et al., 2002).

Linguistic Inquiry and Word Count

Sixteen studies used the computer program "Linguistic Inquiry and Word Count" (LIWC: Pennebaker, Francis & Booth, 2001; Pennebaker, Booth & Francis, 2007) to analyse the emotional characteristics of expressive writing texts in clinical

populations. This is the content analysis tool most closely linked to the Pennebaker paradigm; eight of the 16 LIWC studies followed the paradigm while eight studied other types of writing, including: internet postings, one-off expressive writing tasks, and weekly journaling sessions.

Theoretical Background and Development of LIWC

Evidence exists to suggest that expressive writing has health benefits (e.g. see reviews by Frattaroli; 2006; Frisina, Borod & Lepore, 2004; Smyth, 1998). In order to investigate what was going on in expressive writing that may give rise to these benefits, Pennebaker and colleagues began analysing the language that individuals used in writing about emotional topics (Pennebaker, 1997). Their initial approach used simple judge-ratings of the content of essays, which suggested that the essays of people who benefited from writing were rated as "smarter", "more thoughtful" and "more emotional". However, these subjective judge-assessments suffered from poor reliability. In order to develop more reliable assessments of content, the computer program LIWC was developed (Pennebaker et al., 2001; Pennebaker et al., 2007) as an objective means of measuring content. LIWC categorises and counts the words in an essay, to quantify levels of word-use in various domains, including emotion, cognition, and multiple other linguistic or thematic categories. By quantifying content at the word level, Pennebaker and colleagues hoped to "begin to capture the underlying emotional processes that occur during writing" (Pennebaker & Chung, 2007, p. 275).

In brief, LIWC analyses of essays produced within the expressive writing paradigm have identified relationships between quantified emotion-related word use and physical health outcomes. Although findings are mixed, an association has been identified between higher levels of positive emotion words and better health

outcomes. A curvilinear relationship has been seen between negative emotion words and health, whereby very low or very high levels of negative emotion words correlate with poorer health, and moderate levels of negative words are associated with optimal outcomes (see Pennebaker & Chung, 2007 for a review of findings). Latterly, attention has been drawn away from emotion words towards the role of cognitive processes in expressive writing, due to a strong association between improved physical health at follow up and an increase in "insight" or "causal" words over the course of the writing intervention (Klein & Boals, 2001; Pennebaker & Francis, 1996; Pennebaker, Mayne & Francis, 1997; Ullrich & Lutgendorf, 2002). LIWC studies have also found that clinically relevant emotional states can be predicted by usage of words which at face value may not seem to represent "emotional" content (such as pronouns, prepositions and articles). In particular, the use of first person singular correlates with depression, and is a better marker for the condition than negative emotion word use (Rude, Gortner & Pennebaker, 2004).

Data produced via word content analysis has contributed to the development and exploration of a series of theories linking expressive writing benefit to emotion and cognition-related mechanisms (for reviews see Sloan & Marx, 2004; Baikie & Wilhelm, 2005; Pennebaker & Chung, 2007). The theories linking most closely to language usage are those which relate to cognitive and emotional processing. Cognitive processing theories posit that expressive writing may help the writer organise and structure traumatic or stressful memories leading to more adaptive, integrated schemas regarding internal and external stressors (e.g. Pennebaker & Francis, 1996). Emotional processing theories (e.g. Pennebaker & Chung, 2007) describe how simply converting an emotional experience into language can help an individual to assign meaning, coherence, and structure to emotional memories. This

may allow the event first to be assimilated and then ultimately resolved, thus alleviating the maladaptive health effects of incomplete emotional processing (such as the low-level physiological strain associated with inhibiting distressing emotions (Pennebaker & Beall, 1986)). Some work has pinpointed the importance of developing a coherent narrative, to organise and structure memories and enhance health benefits (Pennebaker & Seagal, 1999; Smyth, True & Souto, 2001). The emotional self-regulation theory (e.g. King, 2002; Lepore et al., 2002) brings together several elements of other theories and suggests that expressive writing may facilitate adaptation to stressors via interrelated emotional regulatory processes: attention; habituation to stressful stimuli and negative emotions; and cognitive restructuring regarding stressors and stress responses. According to the emotional self-regulation theory, people who observe themselves expressing and controlling their emotions during expressive writing may go on to experience increased self efficacy and improved regulation of emotion-related experience, physiological responses, and behaviour which in turn can enhance physical and mental health outcomes.

Supporting and contradictory evidence has emerged for each theory (see Sloan & Marx, 2004), with some studies showing cognitive or linguistic changes unaccompanied by physical or psychological improvements (Walker, Nail & Croyle, 1999; Batten, Follette, Rasmussen-Hall & Palm, 2002; Park & Blumberg, 2002). The emerging consensus is that no single theory explains the effectiveness of writing (Pennebaker, 2004). Baikie and Wilhelm (2005) conclude that the action of expressive writing is a complex combination of "immediate cognitive and/or emotional changes, longer-term cognitive and/or emotional changes, social processes and biological effects" (p. 342).

Analytic Features of LIWC

LIWC is based on a dictionary of 4,500 words or word stems, which were evaluated by judges for the degree to which each word was related to one or more of 80 linguistic or meaning-related categories. When a text sample is entered, LIWC counts the incidence of words in each category. It then computes the percentage of total words per category for that text sample. Examples of the categories most relevant to emotional content are listed in Table 5. Most of the categories are arranged hierarchically, and a single word may increment scores across several categories. For example, "cried" appears in the categories of: "sadness", "negative emotion", "overall affect", "verb", and "past tense verb".

Table 5.

Properties of the emotion-word categories in LIWC 2007 (adapted from Pennebaker, Chung, Ireland, Gonzales & Booth, 2007)

The Psychometric Properties of LIWC

Establishing the internal consistency of LIWC variables was not straightforward (Pennebaker, Chung, Ireland, Gonzales & Booth 2007, p. 8). The authors point out that the psychometrics of natural language and discourse do not match up with reliability testing procedures such as would be used for a mood questionnaire. Once something is written in an essay, the writer generally doesn't need to say it again, thereby rendering difficult the repeat measurement of a given concept within a text. In assessing the internal reliability of LIWC categories, Pennebaker et al. (2007) note that depending on the method of measurement, LIWC is vulnerable either to overestimation (using binary, occurrence-based estimates) due to the variability in the length of texts, or underestimation (using "raw", uncorrected, percentage-based estimates) due to the variability of base rates of word usage within any given category. The variable internal consistency values measured by coefficient Alpha in Table 5 illustrate this issue.

Table 5 also cites validity ratings where given in the LIWC 2007 manual. These were calculated from judge ratings of emotional, cognitive, content and composition dimensions that corresponded with selected LIWC dictionary variables (Pennebaker & Francis, 1996). On the whole, acceptable criterion validity for LIWC as a measurement of emotional content was suggested by correlations between LIWC scales and judge ratings of the magnitude of psychological processes within a text. Exceptions to this were LIWC categories of anger and sadness which fell below a threshold for acceptable validity coefficients set at .30 (Barker, Pistrang & Elliott, 2002, p.70).

Studies which apply LIWC

Table 4 details 16 studies in which LIWC was applied to explore a range of different aspects of expressive writing by clinical populations.

LIWC analyses in clinical studies of the Pennebaker paradigm: Eight studies applied LIWC to writing in the Pennebaker paradigm. Two of these used LIWC as a manipulation check on writing content in the experimental groups (Broderick, Junghaenel & Schwartz, 2005; Gillis et al., 2006), while the rest explored the relationship between essay content and physical or psychological outcomes. Findings varied in comparison to the standard Pennebaker results (e.g. Pennebaker, Mayne & Francis, 1997). In line with the previous findings on word use in the Pennebaker paradigm, two studies linked high positive word use with beneficial outcomes. Lacetti (2007) found that women with breast cancer who used more positive than negative emotion words showed gains on measures of psychological wellbeing. Hamilton-West and Quine (2007) analysed word use over the course of writing sessions among patients with ankylosing spondylitis, and found that improvements in physical health were associated with increased use of positive emotion words, while improvements in functional status were associated with decreased use of sadness or depression words. Contrary to the standard Pennebaker paradigm findings, Batten et al. (2002) found higher levels of positive emotion words to be associated with *increased* psychological and physical distress in women who were survivors of childhood sexual abuse.

Whereas Pennebaker et al. (1997) identify moderate negative word use as optimal, patterns of high negative word use were associated with benefit in four studies. Warner et al. (2006) studied the expressive writing of adolescents with asthma, and found that predictors of physical and emotional health benefits included

higher mean levels of negative emotion words and decreased use of positive emotion words over the course of the daily writing intervention. Low, Stanton and Danoff-Burg (2006) re-analysed data from the expressive writing trial among women with early stage breast cancer by Stanton et al. (2002) (see section on Self-report Essay Evaluation Rating Scales). The trial compared two different expressive writing conditions (an emotional "deepest thoughts and feelings" writing task; and a "benefit finding" condition, exploring positive thoughts and feelings about the experience of cancer) with a third, non-expressive condition as a control (factual writing about cancer). Low et al. found that across groups, greater use of negative emotion words was associated with lower physical symptoms over time. Given this finding, it is interesting to note that over the course of the four emotional writing sessions, the emotional expression group showed a significant decrease in negative emotion word use, no significant change was found for the benefit finding condition, while for the factual control condition the level of negative words significantly increased.

In a study among caregivers of chronically ill children (Schwartz & Drotar, 2004a), a decrease in negative word use only predicted health benefits when accompanied by an increase in cognitive processing words. This latter finding supports the view that emotional expression is not the sole mechanism in mediating expressive writing health benefits.

LIWC analyses of single-session expressive writing interventions: Three studies were identified which analysed expressive writing produced as a one-off exercise or intervention (Junghaenel, Smyth & Santner, 2008; Morgan, Graves, Poggi & Cheson, 2008; Owen et al., 2006). Junghaenel et al. (2008) analysed the word use of psychiatric patients in relation to controls; psychiatric patients used significantly fewer optimism-related words, while on negative word use the study found

equivalence between groups. Neither the Morgan et al. (2008) nor Owen et al. (2006) studies found word use as measured by LIWC to be associated with key outcomes among cancer patients. Owen et al. (2006) attribute their null findings to a lack of sensitivity in the LIWC method (p. 343).

LIWC analyses of journaling interventions among clinical populations: In a study by Wolf, Sedway, Bulik, and Kordy (2007), LIWC was used to describe word use in therapeutic journals produced by an inpatient eating disorder population. The journals were found to include higher rates of negative emotion and anxiety words and lower rates of positive emotion words in comparison to writing by recovered anorexia nervosa patients or student controls. In a study of a journaling intervention among women with breast cancer, Smith, Anderson-Hanley, Langrock, and Compas (2005) found that increased levels of anxiety and depression post-intervention were predicted by higher levels of negative emotion word use in the journals.

LIWC analyses in studies of clinical interventions via the internet or email:

Writing posted to internet sites for breast cancer support groups was analysed by LIWC in two studies in this review. Owen et al. (2005) found associations between higher levels of words in negative emotion LIWC categories and improvements in quality of life and emotional wellbeing. Alpers et al. (2005) compared human rater and LIWC measures of word use in support group postings. They found evidence of good construct and concurrent validity, which supported the use of LIWC in analysing such material.

In a trial of an email-based intervention for students with eating disorders, text generated by email therapy was pooled with that of a Pennebaker-type comparison condition writing task exploring difficulties; beneficial changes in body mass index

were found to correlate positively with positive emotion word use (Robinson & Serfaty, 2007).

Limitations of LIWC

LIWC has clearly fuelled and facilitated a range of explorations into the relationships between language use and health, and the psychological and linguistic processes which mediate and moderate these. However, such correlational findings should be interpreted with caution, as it is possible that the health effects may be associated with some other mechanism of change (Sloan & Marx, 2004). More fundamentally, the technology has inherent liabilities due to the crudity of the word counting approach. Little consideration is afforded to context, irony, or metaphors and as a result, miscoding of certain phrases is inevitable. As Chung and Pennebaker (2007) note, "word count programs are ultimately probabilistic" (p. 345).

The Gottschalk-Gleser Content Analysis Scales

One study used "Psychiatric Content Analysis and Diagnosis" (PCAD; Gottschalk & Bechtel, 2002; GB software, 2003) the computerised application of the Gottschalk-Gleser Content Analysis Scales, to analyse the emotional characteristics of expressive writing texts in clinical populations. This was not a study of the Pennebaker paradigm; it was a brief single-session writing task of a similar nature, used as a pre and post-intervention outcome measure for a trial of group therapy. Although clinical application of the Gottschalk-Gleser scales has been wide-ranging, the majority of their studies were conducted on verbal data acquired from speech rather than writing, and hence were excluded from this review.

Theoretical Background and Development of the Gottschalk-Gleser Scales

PCAD is little-used in the field of expressive writing analysis, where LIWC is arguably the companion tool of choice for the Pennebaker paradigm. Content

analyses scales originally developed by Gottschalk and Gleser (1969) were in recent years developed into the PCAD computer program. Interestingly, although used by only one study in this review, the scales are significant as they go some way towards addressing the limitations of LIWC. The PCAD authors point out that single-word analyses (like LIWC) discard much pertinent information, such as who did or felt what about whom. Emotionally charged words can lose their meaning out of context, such as "get" as in "I'll get you", or "bucket" as in "he kicked the bucket" (Gottschalk & Bechtel, 2002). To avoid this, the Gottschalk-Gleser analyses are applied to the grammatical clause, which enables a greater degree of meaning to be considered in the scoring. In PCAD, meanings across a range of psychological dimensions are rated at the clause level and summed across the text sample to produce total scale scores, which are then compared to "healthy" norms.

The Gottschalk-Gleser scales would sit at the "diagnostic" end of a content analytic function continuum; they were originally developed to enable objective and valid clinical psychiatric evaluations from the analysis of verbal data, largely that produced by natural (i.e. unstructured) speech. The authors considered speech to already be a major source of information in the clinic, but noted that it was analysed in a generally impressionistic way and was subject to error and distortion on the part of both speaker and listener, such as that generated by psychological defence mechanisms. The scales were developed to enable objective, uniform and consistent inferences from verbal data samples, the rationale being that a content analytic approach to measuring psychological dimensions could harness the strengths of both the self-report approach and the observer rating scale approach. At the same time, the researchers anticipated minimal measurement errors due to the fact that participants, unaware of the analyses to be conducted, would not conceal or

emphasise aspects of their presentation. Participants' emotions, self-reflections, doubts, and defensive manoeuvres could therefore be inferred and quantified within their scores on various content analysis scales.

Unlike LIWC, the Gottschalk-Gleser scales were founded in psychological theory. As Gottschalk and Bechtel (2002) describe, the first stage of development involved precisely defining the psychological dimensions to be measured, such as anxiety, hostility and depression. The theoretical framework was eclectic (Gottschalk & Gleser, 1969, p. 10), encompassing psychoanalytic, behavioural, linguistic and psychobiological ideas. However, the prominence of concepts such as defence mechanisms, separation anxiety, and unconscious communications clearly illustrate the strong psychoanalytic influence on this approach (e.g. Freud, 1936; Bowlby, 1960, both cited in Gottschalk & Gleser, 1969). Existentialist concepts in the form of death and mutilation anxiety subscales are also present (e.g. Kierkegaard, 1944, cited in Gottschalk & Gleser, 1969). The second stage of scale development involved pinpointing the lexical and linguistic cues from which emotional and psychological phenomena could be inferred at varying intensities. The magnitude of each subjective experience was then quantified by a series of weights assigned to the cues, with correction made for the number of words per verbal sample. A series of weighted thematic subscales were specified for every psychological dimension to be measured. In the resulting content analytic procedure, trained technicians rated individual clauses against the weighted subscales, then calculated a final scale score representing the magnitude of the psychological dimension in question. In PCAD, both rating and scaling processes are automated.

Analytic Features of the Gottschalk-Gleser Scales

Table 6 describes the Gottschalk-Gleser Content Analysis Scales relevant to emotional content. The influence of psychoanalytic theory is evident. Age, gender and ethnicity-specific norms have been established for most of the scales using human-rated scores of five-minute speech samples from mentally and physically healthy participants. Scores within one standard deviation of the mean are considered within the normal range; scores above or below this are suggestive of emotional or psychiatric disturbance. Based on reference to the norms, PCAD output also generates candidate diagnoses for consideration based on the criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994). The aim here is not to bluntly diagnose mental illness, but rather to draw attention to the expression of feelings and thoughts "consistent with a variety of neuropsychiatric dimensions, if not syndromes" (Gottschalk & Bechtel, 2005, p. 215).

The Psychometric Properties of the Gottschalk-Gleser Scales

Over the past four decades, a voluminous quantity of construct-validation studies have compared the Gottschalk-Gleser scales with a wide range of psychological, biological, physiological, neuropsychological and pharmacological correlates (Gottschalk, 1974; Gottschalk, 1979; Gottschalk, 1995; Gottschalk & Bechtel , 1989; Gottschalk & Bechtel, 1995; Gottschalk & Gleser, 1969; Gottschalk, Hausmann & Brown, 1975; Gottschalk & Hoigaard-Martin, 1986a; Gottschalk, Winget & Gleser, 1969). This doggedly intricate approach to validation allows the scales to be nested within a multi-disciplinary model of emotional phenomena. While it is beyond the scope of this review to summarise this exhaustive body of work, to take one

Table 6.

Brief descriptions of the Gottschalk-Gleser Content Analysis Scales, adapted from the PCAD 2000 Manual (Gottschalk & Bechtel, 2002)

psychiatrically oriented example, Gottschalk, Hoigaard, Birch and Rickels (1979) compared correlations between the Gottschalk-Gleser "Anxiety" scale scores and the self-report Hopkins Symptom Checklist (Derogatis, Lipman, Rickels, Uhlenhuth & Covi, 1974, cited in Gottschalk et al., 1979) and several clinician ratings such as the Hamilton Anxiety Rating Scale (Hamilton, 1959, cited in Gottschalk et al., 1979). Several dozen analyses of the overall scales and component subscales of the various measures were metaphorically labelled a "Rosetta Stone" search for points of common meaning among the different methods. This particular study showed no correlation between Hamilton Anxiety Rating scales scores and Gottschalk-Gleser "Total Anxiety" scores, although dissections at the subscale level revealed a number of significant correlations. A mixed, but slightly more encouraging validation was found in comparison to the self-report measures.

The validity of PCAD ratings has been assessed in comparison to human ratings. Results are promising, with correlations of at least .80 for total scale and most subscale scores (Gottschalk & Bechtel, 1989).

Studies which Apply the Gottschalk-Gleser Scales

The clause-level analysis of the Gottschalk-Gleser approach provides an alternative to LIWC, which is liable to miss contextual information beyond the word level. Given this, it is surprising that neither the PCAD software, nor the manual scales are much applied in expressive writing research, for example as a complement to LIWC. Furthermore, although equivalence has been established between the Gottshalk-Gleser norms derived from speech and the Gottshalk-Gleser norms derived from written text (Gottschalk & Gleser, 1969; Gottschalk, 1995), few studies of their application on emotional writing were identified in the search, and only one met the criteria for this review.

In a randomised controlled trial of brief personal construct group therapy for breast cancer survivors, Lane and Viney (2005) used the Gottschalk-Gleser Content Analysis Scales to analyse text produced by an emotionally expressive writing exercise that was employed as a pre and post-treatment measure to assess the effect of the group therapy intervention. Participants were asked to write for 15 minutes about their life "both the good and the bad" and the resulting text was analysed using the PCAD software. Scores on selected "Anxiety", "Depression" and "Hope" subscales measured the effects of the intervention on the personal construct states of "Threat to Existence", "Dislocation", and "Hope" (respectively). Table 7 shows example clauses from the study for each Gottschalk-Gleser scale, and demonstrates the Gottschalk-Gleser scales mapping neatly onto another conceptual framework (Personal Construct Theory) to measure emotional meaning. In comparison to the wait-list control condition, the writing of group therapy participants showed differential decreases in "Threat" and "Dislocation" and a differential increase in "Hope", both at the end of treatment and at three month follow-up.

Several clinical studies using the Gottschalk-Gleser Scales were excluded from this review due to being based on speech data; however the remit of these studies is worth noting here in brief. Lebovits and Holland (1983) reviewed the wide and ambitious use of the scales with medically ill patients. A notable study examined the emotional impact of mastectomy on women (Gottschalk & Hoigaard-Martin, 1986b). Numerous other clinical applications described by the authors include assessment of the following: the relative severity of many mental health conditions; the cognitive effects of substance abuse; the emotional status of medically ill patients; and process or outcome in psychotherapy research (see Gottschalk & Bechtel, 2002 for a summary of applications).

Table 7.

Example PCAD clauses from expressive writing analyses evaluating personal construct therapy for breast cancer survivors (adapted from Lane & Viney, 2005).

Two studies identified by the search applied PCAD to expressive writing, but did not meet criteria for the review. One study (excluded because it was unpublished) involved the analysis of diaries written by patients with eating disorders as a means of assessing the illness over the course of treatment (Gottschalk & Bechtel, 2005). The study by Owen et al. (2005, see Table 4, LIWC), which used

LIWC to measure emotion, also used the PCAD "Health Concerns" scale to analyse internet postings as an outcome measure of quality of life and wellbeing. However, in that study use of PCAD was limited to scales relating to health concerns, and emotional content was analysed by LIWC alone.

Limitations of the Gottschalk-Gleser Content Analysis Scales/ PCAD

Due to the rare use of the Gottschalk-Gleser Content Analysis Scales in expressive writing, it is difficult to comment in detail on its limitations in this context. The extensive validation studies suggest that, consistent with their eclectic theoretical roots, the scales have correlates across the full range of established psychological and biological indices of emotions. Despite this, it still seems improbable at face value that PCAD may automatically, and with reasonable sensitivity and specificity, identify precise nuances of emotional meaning. It is interesting to note that the authors are almost as vocal in acknowledging the limitations of the output as they are in articulating its potential. They note that while suggestions made by the computer program may be revealing and useful in formulating clinical decisions, "some of the suggestions can be readily discarded" (Gottschalk & Bechtel, 2005, p. 216). Further research comparing the performance of the scales against other methods of emotional content analysis such as LIWC would be valuable.

Thematic Coding Approaches to Emotional Content Analysis

Two studies identified by the search used different types of thematic coding to analyse the emotional content of expressive writing in a clinical context. Both were studies of writing produced in the Pennebaker paradigm among physical health populations.

Theoretical Aspects and Analytic Features of the Thematic Coding Approach

Based on the studies identified in this review, the methodological category of Thematic Coding does not represent a systematic tool, such as LIWC or PCAD. Nor does it refer to the similarly-named inductive qualitative method Thematic Analysis (Braun & Clarke, 2006). The thematic coding approaches applied here offer a simple means of coding text for the presence or absence of certain emotional characteristics in the data, according to pre-defined content categories. The basic technique of rating text units for emotional valence is in essence the same as that adopted by LIWC and PCAD, both of which could strictly be described as a computerised form of thematic coding.

The differences between the two studies reviewed in this section (Creswell et al., 2007; Solano et al, 2007) illustrate the versatility of a thematic coding approach to identifying emotional content. The Creswell et al. analyses were quantitative, (i.e. percentages of coded words and phrases per text) whereas the Solano et al. data were qualitative. Each study assessed emotional content within a different theoretical framework and the respective analyses were conducted using different degrees of structure and psychometric precision.

Psychometric Aspects of the Thematic Coding Studies

In terms of psychometric properties, the Creswell et al. (2007) and Solano et al. (2007) studies differed considerably. In the Creswell et al. study, the procedures for ensuring consistency and objectivity of coding standards were thorough: a coding manual was used to train coders in standardised coding strategies; the coding for each separate category was carried out by different coders, in order to avoid contamination among coding categories; coders were blind to condition and hypotheses and checks were made on inter-rater reliability, which found over 90% agreement between

coders. In contrast, the thematic coding procedure in the Solano et al. study was a preliminary analysis carried out by the non-blind senior researcher, performed in order to provide post-hoc explanations for results in the main analyses; as such the findings of the analysis were liable to be biased towards finding a "fit" in the data for the other findings.

Studies which Applied Thematic Coding

The Creswell et al. study (2007) used a thematic coding system to re-analyse data from the expressive writing study by Stanton et al. (2002) (see section on Self-report Essay Evaluation Rating Scales). The emotional themes coded by Creswell et al. related closely to complex emotional processes, rather than affective states. The coding categories were based on those used by Bower et al. (1998) and linked to literature on the role of self-affirmation as a buffer to stress that may offer health protective effects for at-risk populations such as in breast cancer. The written data were coded for themes of: "self-affirmation" (defined as "a positive reflection of a valued self domain"); "cognitive processing" (the process of actively thinking about the positive aspects of one's cancer experience); and "discovery of meaning" (a major shift in values, priorities or perspective in response to getting cancer). In comparing the three writing conditions, both expressive writing conditions were found to elicit significantly more self affirmation statements than the control writing. Only the benefit finding condition elicited significantly more cognitive processing and discovery of meaning writing than the control. Across groups, writing high in self-affirmation was associated with fewer physical symptoms at follow up, and self-affirmation was also found to be the key mediating variable for the effect of expressive writing on physical symptom reduction.

The study by Solano et al. (2007) analysed written content in order to differentiate the writing of urology patients who were high or low surgical risk. An informal post-hoc "clinical analysis" was used to identify the themes and attitudes which might offer tentative explanations as to why low risk patients benefited from the intervention while high risk patients had worse outcomes. The coding framework assessed the quality of emotional expression, and the modalities of emotional expression and regulation. The analysis was described as a "clinical assessment", rather than a systematic content analysis. They found that high risk participants in the intervention frequently denied or disavowed feelings, or expressed negative feelings about their hospital experience. In contrast, low risk participants expressed fewer complaints and their writing was characterised by optimism and trust of medical staff. The authors interpret the findings as evidence that complaining behaviour and negative emotion may be a sign of the denial, or repression of difficult thoughts relating to an impending operation. The study concludes that level of pre-operative risk can be used as a proxy measure for likely distress, and may be more reliable than self-report distress, which is subject to bias via denial or defensiveness.

The Solano et al. (2007) findings echo the cautionary conclusions of a thematic coding study by Honos-Webb, Harrick, Stiles, and Park (2000), which was excluded from the present review due to not meeting the review criterion of a clinical population. However, it is worthy of brief note due to the clinical implications of its findings. The study used the Assimilation of Problematic Experiences scale (APES; Stiles et al., 1990) to rate scripts in the Pennebaker paradigm. The APES is a psychotherapy-oriented assessment tool, which judges the stage at which an individual is in relation to a problem; from a baseline of "warded off", through seven stages of increasing insight, to the maximum level of assimilation at "mastery".

Participants whose writing was coded to have achieved greatest levels of change and highest levels of assimilation over the course of the intervention, were also those who had the poorest health outcomes (greater numbers of health centre visits). This interesting and cautionary result links to the Solano et al. findings, by suggesting that emotional writing initiates a process of emotional expression and processing that may have negative consequences where subsequent therapeutic support for the integration of those changes is not provided.

A longitudinal study, conducted among nuns, was excluded on grounds of being among a non-clinical population. It is noted briefly here due to its interesting findings contributing to a larger Alzheimer's study. Danner, Snowdon and Friesen (2001) thematically coded written autobiographical transcripts in which 180 novice nuns had sketched their lives so far at the point of entering one of three U.S. convents between 1931 and 1943. Human coders identified all words or phrases in each transcript which directly reflected an emotional experience, classifying them as positive, negative or neutral. The profiles of early emotional expression were compared to data on subsequent mortality rates in each convent. A strong positive association was found between levels of positive emotion expressed in the early-life autobiography, and longevity.

Limitations of Thematic Coding

The studies described here highlight the number of different ways in which themes of emotional content can be read from written data. A number of limitations arise for the methodology as it has been applied here. The application of bespoke coding categories may create difficulty in cross-comparing findings particularly in terms of the different levels of specificity around emotional content. It would be unclear, for example, whether findings from Creswell et al. (2007) and Danner et al.

(2001) regarding positive emotional processes could be meta-analysed together. A second limitation may lie in the different levels of quality control in how codings are applied, as shown in the contrasts between the Creswell et al. and Solano et al. (2007) studies, which in the latter case limits the reliability of their findings. Solano et al. note that following this preliminary analysis, the data would benefit from reanalysis by a quantitative method such as LIWC.

Self-report Essay Evaluation Rating Scales

Six studies used a self-report rating scale as the primary measure to evaluate the emotional aspects of expressive writing texts. All of these were Pennebaker paradigm-type writing interventions in clinical populations. Self-report scales are generally applied as a manipulation check on writing condition. A number of studies reviewed in the LIWC category used such a manipulation check to verify fidelity to writing instructions. However, this section of the review is limited to those studies where the self-report rating scale was the primary measure of emotional content.

Theoretical Aspects and Analytic Features of Self-report Rating Scales

In contrast to the other methods in this review, participants' self-report ratings represent a simpler and more subjective approach to assessing the emotional characteristics of expressive writing samples. The self-report scales generally used in expressive writing studies are variations on the Essay Evaluation Measure developed by Greenberg and Stone (1992), which comprises Likert-type ratings of the degree to which the completed essay was: personal, emotionally revealing, meaningful and increased understanding. Essay evaluation ratings are generally used as a manipulation check on adherence to writing conditions. This approach to assessing the emotional content differs vastly from linguistic analytic approaches, as it entirely bypasses the written data itself, cutting straight to participants' contemporaneous

appraisals of content. No formal psychometric data was found on the self-report manipulation checks. However, some studies supplement the manipulation check with other assessments of group adherence, such as LIWC scores. Norman, Lumley, Dooley and Diamond (2004) combined the self-report manipulation check with a blind-rater assessment of group condition.

Studies which apply Self-report Rating Scales

Table 4 details six studies in which self-report scales were used to measure the emotional dimensions of writing. In the study among women with breast cancer by Stanton et al. (2002) (the writing from which was also analysed by Creswell et al., 2007; and Low et al., 2006), two expressive writing conditions were compared to a non-expressive factual control condition. Stanton et al. performed manipulation check analyses on the self-report essay ratings which showed that writing in both expressive conditions was non-significantly more personal and significantly more revealing of emotions and enhancing of understanding than writing by the factual control group.

In contrast, where content ratings of experimental and control writings are statistically indistinguishable, the validity of further analyses of outcome may be questionable. Where this occurred in a study of writing by lower-leg amputee patients, data from the two conditions was pooled (Gallagher & MacLachlan, 2002). In this study, the essay ratings highlighted an important clinical effect. It was found that the more highly essay content was rated as emotionally expressive, the less satisfied participants subsequently were with the aesthetic aspects of their prosthetics. In response to this reverse-cathartic effect, the authors suggested the contraindication of the emotional disclosure intervention for that population.

In another study where the experimental manipulation proved unsuccessful, a very simple four-point scale was used to compare standard written disclosure, an "enhanced meaning" writing task and a control task among rheumatoid arthritis patients (Broderick, Stone, Smyth & Kaell, 2004). Self-report ratings of writing were measured in terms of: stressfulness, extent of expressed emotion and level of upset. Based on equivalence in both experimental groups' ratings, the authors reflect that it is difficult to confirm that a different therapeutic experience was had under the two conditions.

Limitations of Self-report Rating Scales

Although crude, self-report scales trade objectivity for high face validity by tapping directly into the very personal realm of emotional meaningfulness. However, an obvious limitation of this approach is vulnerability to bias, as Gottschalk and Bechtel (2002) argue: "with self-report measures, though it is true that the self-rating comes directly from the individual being evaluated, the assumption is that self-raters are all, indeed, in good and equivalent contact with themselves and are not likely to be falsifying, consciously or unconsciously, their self-evaluations" (p. 37). For example, a participant's wish to emphasise their adherence to emotional or neutral writing instructions might bias their ratings on way or the other.

Discussion

Summary

This review identified 25 studies in which different forms of expressive writing by clinical populations were analysed for emotional content by four different methods of analysis. The methods varied in their theoretical complexity from simple self-report ratings to nuanced inferences based on psychological theory. The degree of psychometric rigour differed between the measures, with dozens of validation

studies for some methods, while others reported no formal validation at all. The level at which methods analysed texts also varied: from the individual word level, through measurement of the content in clauses and phrases, to global ratings of content. Emotional content analyses were used to explore texts in various ways: descriptive analyses were used to show group differences, either as a manipulation check or as an outcome measure on clinically relevant content; correlational analyses were conducted to shed light on the relationship between patterns of emotional content and physical, psychological or psychosocial outcomes, either over the course of several writing sessions or overall. The findings of these latter analyses were inconsistent, with regard to the beneficial effect of levels of positive or negative words.

Implications for the Measurement of Emotional Content of Written Emotion

The studies in this review illustrate the diversity of approaches to the emotional content analysis of writing in the clinical field. Yet this diversity presents problems: the heterogeneous nature of the studies makes the cross-comparison and summary of their findings difficult. The most progress in summarising findings on emotional content in language has been made by LIWC studies. However, the shared prominence of the Pennebaker paradigm and the LIWC method has also skewed the evidence on the emotional content of writing towards word-level analysis. Given the breadth and depth of theory available to this field, from both psychology and linguistics, it is curious that a tool based on no more sophisticated a concept of "emotion" than can be gained from the average dictionary has come to dominate the analysis of emotional phenomena in natural language. In contrast, more theoretically complex methods such as PCAD or APES have not been widely applied. This limitation is significant, given the use of expressive writing among clinical

populations, and the emergence of findings that link emotional expression to poorer outcomes (Batten et al., 2002). In order to shed further light on such findings, a theoretically-grounded analysis of written emotional content would be highly pertinent.

Most of the content analysis methods in this review seem relatively disconnected from formal psychological theory; only PCAD overtly acknowledges its (predominantly psychoanalytic) theoretical roots. LIWC, thematic codings and self-report measures could roughly be categorised as applying basic conceptions of emotion that fall into either the "dimensional" (positive-negative) or "specific-affect" (e.g. sadness, anger, anxiety) categories outlined by Gray and Watson (2007). It is noteworthy that few of these studies applied more than one method of content analysis, and none directly compared different methods. In measuring a phenomenon as complex as emotional expression, for which multiple levels of analysis are available, this absence of triangulation is striking.

Implications for Future Research

A greater role for methodological triangulation in future research would be valuable for a number of reasons. Firstly, exploring expressive writing from a range of perspectives could deepen understanding of the process and effect of written emotional expression. For example, the current review featured three studies which used different methods to content-analyse written data taken from a single trial (Creswell et al., 2007; Low et al., 2006; Stanton et al., 2002). Each study explored different aspects of the emotional content in order to examine the effects of expressive writing. It would be fruitful for further research to approach emotional content from different theoretical angles, and systematically bring together the findings. Secondly, triangulation is needed in order to develop further evidence on

the psychological validity of these methods, particularly regarding their use as a clinical tool. There is also much scope for the greater integration of psychological theory into emotional content analysis. This could contribute to the development of models of change relating to writing and emotional expression (see Kerner & Fitzpatrick, 2007, for a review). Alternatively, further research could build on the work of Stroebe, Schut and Stroebe (2006), whose attachment-based model suggests what the differential effects of expressive writing may be across attachment styles.

Remarkably little is suggested in the clinical literature reviewed here about what may differentiate these samples of written emotional expression from spoken equivalents. Further exploration of the validity of PCAD in written and spoken samples would be useful, in order to indicate the extent of characteristic differences between written and spoken text. Also useful would be to compare content analyses of expressive writing with transcript data from a spoken word adaptation of the Pennebaker paradigm, such as that used in a study by Graves et al. (2005). Triangulation with measures of non-verbal expression of affect would be useful in terms of noting what aspects of emotional expression are lost in only considering verbal data (see Liess et al., 2008). Further research could also examine the effect that modality of writing may have on emotional content. For example, a study among students by Brewin and Lennard (1999) compared the effects of a typed versus handwritten disclosure, and found greater levels of self-rated disclosure and negative affect in the handwriting condition. Comparisons of content analyses of emotional content of writing produced by hand or by typing would be valuable.

Limitations of this review

The primary limitations of this review arise from the fact that the study of emotion in language straddles several fields of literature. Although both broad and

specific search terms were applied, conceptual differences between different fields meant that generic emotion or analysis-related search terms were not always successful in identifying key papers, and several were only found by hand searches. Furthermore, the identification of content analyses was hampered by the "hidden" nature of many content analyses, which were often secondary to the primary (e.g. outcome-related) analyses of a study. The lack of inductive qualitative methods for analysing content in the review was also notable. Their absence may have been a function of the search strategy concentrating on data type, rather than on type of analysis.

Other limitations of this review relate to the exclusions applied. Firstly, the restriction of the review to English language analyses limited the generalisability of the findings, due to issues of cultural specificity. Secondly, the focus on clinical samples in this review may have resulted in the exclusion of any methods of analysis which have only been applied in non-clinical studies. From a clinical psychological viewpoint it seemed most likely that the methods of emotional content analysis with clinical utility would be located in studies among clinical populations. However, it may be that there are more similarities than differences between the emotional content of writing by clinical populations and that of non clinical populations (such as trauma writing by student samples). Therefore, this review may not represent the full range of methods of written emotional content analysis. Finally, limiting the review to written data may have excluded spoken word research findings that apply both to written and spoken data alike.

Conclusions

The study of emotional expression in language is a complex, multidisciplinary field. However, neither theories of language nor emotion have much been applied to

the measurement of written emotional content for clinical purposes. The methods of emotional content analysis which have been applied to clinical writing vary in a number of ways, chiefly in terms of conceptual and technological complexity. Analysis of writing within the Pennebaker paradigm has tended to measure emotional content by using an automated word counting approach; alternative methods such as automated ratings of psychoanalytic meaning have been less commonly used. Where levels of emotional content have been analysed in relation to expressive writing outcome, findings have been inconsistent; further research is needed, in which a greater role for methodological triangulation would be valuable. Triangulation may develop understanding of the emotional processes in expressive writing from a range of theoretical perspectives.

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Part 2: Empirical Paper

An exploratory study of the psychological content of writing produced by women recovering from surgery for gynaecological cancers.

Abstract

This exploratory study analyses the psychological content of writing produced by women recovering from surgery for gynaecological cancers. Following Pennebaker's expressive writing paradigm (Pennebaker & Beall, 1986), 20 women were randomised to write for at least three, daily 20 minute sessions on either emotionally expressive or emotionally neutral topics. The emotional and cancer-related content of writing scripts was measured using two types of computerised content analysis: Pennebaker's word count method (LIWC; Pennebaker, Booth & Francis, 2007); and the psychoanalytically-informed Gottschalk-Gleser content analysis scales (PCAD; Gottschalk & Bechtel, 2000). Self-report ratings of content were also analysed. Expressive writing scripts scored more highly than neutral writing scripts on most dimensions of emotional expression and cancer-related content. The two computerised measures were highly correlated, both with each other and with self-reports. The findings suggest that the experimental manipulation was effective and that expressive writing may enable gynaecological cancer patients to articulate important psychological aspects of their experience.

An exploratory study of the psychological content of writing produced by women recovering from surgery for gynaecological cancers.

Introduction

The Clinical Context of Gynaecological Cancer

Gynaecological cancers such as ovarian, uterine and cervical malignancies account for 10 percent of new cancer cases in British women (McPherson & Waller, 1997). Although the prognosis for women with gynaecological cancer is generally good, it is estimated that in the months following a diagnosis of gynaecological cancer, as many as 47 to 70 percent of women experience psychological symptoms equivalent to moderate or severe depression or anxiety (Evans et al., 1986; Cain et al., 1983). Major gynaecological cancer surgery requiring a hospital stay may increase vulnerability to psychological difficulties: inpatient cancer care in general can increase the frequency of distress compared to outpatient care (Reuter, Raugust, Marschner & Härter, 2007); and in gynaecological cancer, undergoing surgery is a risk factor for post-treatment psychosocial maladjustment (Chan et al., 2001). While the psychological problems experienced in this population are similar to those seen in breast cancer or other chronic diseases, there is evidence to suggest that the diagnosis and treatment of gynaecological cancers "may impose an extraordinarily stressful burden on a woman" (Andersen, 1984, p. 115).

Psychosocial Aspects of Gynaecological Cancer

A number of distressing aspects of women's experiences of gynaecological cancer have been described, such as: depression, anxiety, fear of dying, fatigue, pain, bladder and genital problems, sexual dysfunction, and loss of reproductive organs (Miller, Pittman & Strong, 2003; Steginga & Dunn, 1997). Many women of reproductive age experience disappointment at losing reproductive capacity, and

where sexual problems are encountered following gynaecological cancer surgery, these have been found to be associated with anxiety (Corney, Everett, Howells & Crowther, 1992). The need for psychosocial support in this population has been stressed. Particular needs and concerns that may require psychosocial support include the stress of changing roles and relationships, distress regarding the genetic association of the disease, and uncertainty about the future (Beesley et al., 2008; Ferrell, Smith, Ervin, Itano & Mecancon, 2003).

There is clearly a rationale for providing access to effective psychosocial support interventions for gynaecological cancer; their importance has been recognised by policymakers as a means of helping to reduce pain and distress, and improve survival (NHS Executive, 1999). A core component of many psychosocial and psychological interventions will be to facilitate the patient's expression and exploration of difficult emotions (Watson, 1991). In terms of the expression of positive emotions, there is a considerable literature emphasising the importance of hope among this and other cancer populations. Hope may be used as a cognitive manoeuvre to manage stress (Salander, Bergenheim & Henricksson, 1996), and as a way of finding meaning in the cancer experience (Reb, 2007).

The Expressive Writing Paradigm

The expression of emotions concerning troubling or distressing experiences via a series of brief, daily writing sessions was first described by Pennebaker and Beall (1986), and has come to be known as the "Pennebaker paradigm" or "expressive writing" intervention. Originally trialled among student populations, studies of expressive writing have more recently been conducted among clinical populations, including cancer patients (de Moor et al., 2002; Rosenburg et al., 2002; Solano et al., 2003; Stanton et al., 2002; Zakowski, Ramati, Morton, Johnson & Flanigan, 2004).

Typically, participants complete a short course of daily writing sessions in which they are assigned to write either about difficult or traumatic experiences, or about a non-emotive, "neutral" topic as part of a control group. Health-related gains have repeatedly been observed among expressive writing participants, in terms of fewer physical symptoms, better sleep quality, or fewer medical visits compared to controls. Improvements in immune system functioning have also been objectively measured. In terms of psychological outcomes, however, there is much less evidence of benefit. As yet, no study has been undertaken looking at the effect of expressive writing during the post-operative period among women with gynaecological cancers.

Analysing Content In Expressive Writing

Extensive investigations have sought to shed light on the means by which expressive writing "works", in terms of the emotional or cognitive processes which underlie its effects. While the consensus view is that no one mechanism is responsible (Pennebaker, 2004), evidence has been found to support a number of proposed models, including: the confrontation of inhibited emotions, exposure, cognitive adaptation, narrative formation, and emotional self-regulation (Baikie & Wilhelm, 2005; Lepore, Greenberg, Bruno & Smyth, 2002). Most of these theories have drawn on analyses of language use, which Pennebaker describes as a proxy measure for psychological processes that may "bypass the usual concerns of self-reports" (Pennebaker & Stone, 2003, p. 299). Due to the dominance of the work of Pennebaker and colleagues in the expressive writing field, the vast majority of studies of language use in expressive writing have used Pennebaker's word-counting software. The software was developed in answer to the question: "if we merely counted the ways people use emotion words in natural text, could we begin to

capture the underlying emotional processes that occur during writing?" (Pennebaker & Chung 2007, p. 275).

Word Count Analysis of the Psychological Content of Language

Linguistic Inquiry and Word Count (LIWC; Pennebaker, Booth & Francis, 2007), the computer program developed by Pennebaker and colleagues, measures the percentages of words occurring in around 80 different content categories, such as categories of words implying emotional or cognitive processes. The LIWC method has been employed where cancer-related writing was the subject, both in the Pennebaker paradigm (Lacetti, 2007; Low, Stanton & Danoff-Burg, 2006), in other variations of expressive writing interventions (Morgan, Graves, Poggi & Cheson, 2008; Owen et al., 2006; Smith, Anderson-Hanley, Langrock & Compas, 2005), and in the analysis of postings to breast cancer support websites (Alpers et al., 2005; Lieberman & Goldstein, 2006; Owen et al., 2005). The findings of word analyses in these studies vary, in terms of what words are associated with which physical, psychological and psychosocial outcomes. Owen et al. (2006) note that a limitation of word-count analysis is that it cannot discriminate between the different contexts in which words are used. Lepore et al. (2002) also reflect on this limitation and note that in order to achieve sensitive assessments of changes in cognitive representations, more qualitative approaches may be needed (p. 113).

Context-Sensitive Analysis of the Psychological Content of Language

Nearly 20 years before the first Pennebaker paradigm study, the Gottschalk-Gleser Content Analysis Scales were developed as a means of measuring the psychological content of language, by rating meaning within the context of the grammatical clause (Gottschalk & Gleser, 1969). To date, the Gottschalk-Gleser scales have not been applied to Pennebaker paradigm research. The Gottschalk-

Gleser scales interpret meaning within a text according to psychoanalytically informed principles, by identifying not only words in isolation but by considering relationships and attitudes reported by the subject. For example, a clause would be scored for "death anxiety" if it makes "references to death, dying, threat of death, or anxiety about death" (Gottschalk & Bechtel, 2002). The score would be weighted depending on object relations-influenced distinctions as to whether the death reference applied to the speaker, to animate others, to the destruction of inanimate objects or whether the reference was a denial of death anxiety. The Gottschalk-Gleser scales were originally developed to aid psychiatric diagnosis by identifying potentially pathological patterns of meaning in verbal samples, and have been validated extensively (Gottschalk, 1974; Gottschalk, 1979; Gottschalk, 1995; Gottschalk & Bechtel, 1989; Gottschalk & Bechtel, 1995; Gottschalk & Gleser, 1969; Gottschalk, Hausmann & Brown, 1975; Gottschalk & Hoigaard-Martin, 1986a; Gottschalk, Winget & Gleser, 1969).

In terms of their application in physical health populations, the Gottschalk-Gleser scales have been used to describe interviews with medical patients (Lebovits & Holland, 1983). They were also used to explore the emotional impact of breast cancer surgery on women (Gottschalk & Hoigaard-Martin, 1986b) and found higher levels of clinically significant emotional distress among mastectomy patients, in comparison to biopsy and cholecystectomy control groups. Lane and Viney (2005) used the Gottschalk-Gleser scales as an outcome measure in order to evaluate group therapy for women with breast cancer, by measuring the levels of anxiety, depression, and hope expressed in a pre and post-treatment writing task. To date, no studies have analysed the psychological content of writing in the Pennebaker paradigm using the

Gottschalk-Gleser scales. Neither have Gottschalk-Gleser analyses been directly compared to LIWC analyses.

Aims of the Present Study

This study explored the psychological content of writing scripts produced by women who participated in an expressive writing intervention on a hospital ward after surgery for gynaecological cancer. The purpose of the study was to extend understanding of the psychological content of expressive writing beyond the limitations of the word count approach, by applying an additional, context-sensitive method of content analysis. Therefore, writing scripts were computer analysed using both the Pennebaker word count tool and the context-sensitive Gottschalk-Gleser Scales. Global self-report assessments of writing content were also collected. Combined, these three measurements provided multi-dimensional profiles of the emotional and cancer-related content of the writing scripts. The study aimed to analyse differences between "expressive" and "neutral" writing conditions along key emotional dimensions, and on cancer-related content. The correspondence between the measures on the emotional dimensions was also explored. Initially, an additional aim of the study was to look at the relationship between a context-sensitive appraisal of writing content and the physical and psychological outcomes of expressive writing. Such data could contribute to understanding of the mechanisms of change in expressive writing. However, due to small recruitment numbers, there was insufficient statistical power for this aspect of the analysis.

Method

Overview and Design

This study was part of a larger, pilot investigation using a randomised design to compare an expressive writing intervention with a neutral writing control, among

women recovering from surgery for gynaecological cancer. The neutral writing condition was employed in order to control for expectancy and attention effects, and no benefit from this condition was expected. Two studies in the larger project examined the writing intervention in relation to physical (Delmar-Morgan, 2008) and psychological (Saunders, 2008) aspects of recovery. The current study consisted of exploratory analyses of key psychological dimensions of the women's writing, in terms of emotional and cancer-related content.

Setting

Enrolment and intervention took place on the on the gynaecological oncology ward of a major London teaching hospital. Ethical consent was obtained from the local Research and Ethics Committee (see Appendix 2).

Participants

Eligibility Criteria

Women were eligible to take part in the study if they were booked to have major surgery for diagnosed or suspected gynaecological cancers (e.g. ovarian, cervical, endometrial or vulval). Eligible procedures were major laparoscopic or open surgical procedures which were predicted to require an inpatient stay of at least 7 days in total. This length of stay would allow sufficient time for participants to undertake the writing intervention after surgery. Exclusion criteria were: (1) a serious physical illness co-morbid with cancer, such as diabetes, which could affect wound healing; (2) a severe mental health difficulty that contraindicated the intervention or risked confounding psychological outcome measures; (3) a learning disability or sensory impairment that could undermine the principle of informed consent or prevent the completion of written tasks required by the study; (4) the participant being less than 18 years of age; (5) not being able to write fluently in

English. This latter criterion was necessary due to the written content analyses being conducted in English.

A few months into the study, recruitment difficulties arose, in part due to a decrease in numbers on surgery lists. In response, the decision was taken to broaden the eligibility criteria. This enabled the inclusion of a range of gynaecological cancers, whereas initially it had been expected that only ovarian cancer patients would be recruited. It was also decided at that point to relax those exclusion criteria which did not affect the patient's ability to complete the writing intervention itself, such as that regarding diabetes.

Recruitment Procedure

Approximately one week before surgery, all women were given a brief leaflet about the study (see Appendix 3) by a clinical nurse specialist at a routine outpatient "pre-assessment" interview. On the day before surgery, women were admitted to the ward. A researcher consulted with a senior ward nurse to identify eligible patients, who were then invited to discuss taking part in the study and provided with a detailed information sheet (see Appendix 4). The study focus was set out as investigating different types of writing and other factors that may influence recovery from surgery. The writing tasks were conceptualised as a "Hospital Diary" and the two writing conditions were described. The randomisation process was also detailed. In order to avoid biasing participant expectations, hypotheses about relative benefits of the writing conditions were not given. Participants were made aware of their right to withdraw from the study at any time without giving reasons, with the assurance that such a decision would not affect their care. Willing participants were then asked to sign a consent form (see Appendix 5), directly after which they completed baseline

measures of physical, psychological and demographic characteristics (see Delmar-Morgan, 2008; Saunders, 2008).

Sample Size

Due to the exploratory nature of the written content analyses, a priori statistical power estimates were guided by the recovery-related analyses of group differences in the larger study. Previous studies of expressive writing in cancer found medium to large effects of writing on measures of mood and sleep (de Moor et al., 2002). With power set at .80, the required sample size in order to detect large effects was calculated to be 26 per group (Cohen, 1992).

Participant Flow

Figure 1 shows the flow of participants through the study over approximately 40 weeks of recruitment between June 2007 and April 2008. Of 112 eligible women, 39 (35%) consented to take part and completed the baseline measures before surgery. The main reasons patients gave for not taking part were that they were not interested (N= 45), or that they felt that it would be "too much" for them (N= 19). Nine women specifically stated that they were not interested in the writing component.

Of the 39 who completed the baseline measures, seven went home before they could be randomised and six decided not to take part. Three of the 26 women who were randomised did not start writing: one was no longer interested in writing, one did not feel up to it, and one actively declined the emotional writing task. Twenty-three women started writing in either condition, of whom 20 completed at least three writing sessions. Three participants requested to discontinue writing after the first writing session: in two cases this was due to their not feeling well enough and in the third case the participant disliked the neutral writing task. The data of one completer

Figure 1. *Participant flow through the study (after Moher, Schultz & Altman, 2001).*

in the expressive writing condition was excluded from the written content analyses due to the illegibility of significant portions of her writing scripts, as judged by two researchers. Therefore, 19 participants in the study completed three or four writing sessions of legible quality.

Participant Characteristics

The two experimental groups had similar profiles on baseline demographic and clinical characteristics, as shown in Table 1.

Table 1.

Participant characteristics

	Expressive Writing N= 11	**Neutral Writing N=8**
Age in years		
Mean (SD)	48.3 (14.2)	50.1 (14.3)
Range	19 to 70	24 to 64
Highest Educational Qualification[a]		
Up to A-level	6 (55%)	3 (43%)
A-level or above	5 (45%)	4 (57%)
Ethnicity		
White	8 (73%)	8 (100%)
Other ethnicity	3 (27%)	0
Marital Status[a]		
Married/Partner	5 (45%)	5 (71.4%)
Single	4 (36%)	1 (14.3%)
Separated/Divorced	0	1 (14.3%)
Widowed	2 (18%)	0
Gynaecological Cancer Diagnosis		
Ovarian	4 (36.3%)	6 (75%)
Endometrial	1 (9.1%)	1 (12.5%)
Vulval	2 (18.2%)	0
Cervical	1 (9.1%)	0
Benign	1 (9.1%)	0
Other cancer	2 (18.2%)	1 (12.5%)
Type of surgery[b]		
Non-laparoscopic	5 (75%)	6 (62.5%)
Laparascopic	3 (25%)	2 (37.5%)

Notes: [a] Expressive N=11, Neutral N=7 (data missing for one participant)
[b] Expressive N=8, Neutral N=8 (in three cases medical notes were unclear).

Intervention Procedures

Writing Intervention

From the second or third day after surgery participants were invited to be randomised to either an "expressive" writing condition or a "neutral" writing condition. Details of the writing instructions can be found at Appendix 6. Writing instructions were closely based on those used in a previous study among cancer patients (Stanton et al., 2002) with adaptations made to the neutral writing instructions for use in the hospital ward setting.

In brief, women in the expressive writing condition were asked to write for 20 minutes about their deepest thoughts and feelings regarding their experience of cancer and surgery. Women in the neutral writing condition were asked to write for the same amount of time, giving a factual, non-emotional account of daily activities on the ward. Participants in both conditions were approached to repeat the writing task for a maximum of four, ideally consecutive, days. Where consecutive days were not possible, the participant completed as close as possible to four sessions during the remainder of her stay. If participants were well enough to leave before the fourth session, a minimum of three sessions was deemed to be a completed intervention.

In order to increase the privacy afforded to patients as they wrote on the ward, the researcher offered to draw the curtains around the bed and displayed a sign requesting that the patient not be disturbed for the 20 minute period. Where possible, the researcher remained close by and picked up the scripts afterwards. However, in some cases participants requested that they be allowed to postpone the task until later in the day; so the writing materials were left with the patient, to be collected by the researcher the next day. To encourage adherence to the protocol, these participants

were asked to note the start and finish times of the writing, in order that they limited their writing to 20 minutes.

Manipulation Check

In order to verify adherence to writing instructions, directly after each session participants were asked to rate their writing on levels of emotional and personal content (see section on "Measures", below). In those cases where a rating was inappropriate for the allocated condition, the researcher gave corrective advice to the participant for the next session.

Ethical Considerations in Expressive Writing

There is evidence that expressive writing can give rise to short term emotional distress, during or after the task (Pennebaker, 1997; Pennebaker & Beall, 1986). On collecting a completed writing script, the researcher checked how the participant had found the task. In response to emotional distress, the researcher offered to talk with the participant for a few minutes. Where the participant indicated a need for longer term emotional support, the researcher liaised with the clinical team.

In order to check that there were no clinical contraindications for the writing intervention, each point of ward contact with a participant was preceded by consultation with a member of nursing staff and checking of recent entries in the participant's ward medical notes. Verbal consent was sought from participants each time they were approached to complete a writing task or other measures. Where participants expressed ambivalence about writing, they were offered the chance to defer writing to the following day. If participants indicated reluctance to continue in the study, they were reminded of the option of withdrawing from the study altogether.

Confidentiality of Writing Scripts

In order to assure participants that their writing would be kept securely with anonymity maintained, a number of measures were taken. Writing scripts were labelled with a code number and were securely stored away from the hospital, for subsequent typed transcription and analysis. Participants were informed that ward staff would not have access to their writing scripts and that neither would they be read by the researcher during their stay on the ward. This was in part to minimise the extent to which the researchers were felt to be the "audience" for the writing; an additional aim was to discourage communication of clinically important information, such as a request for help. Participants not wishing to hand in their writing samples could still participate in the study; however, this did not arise. Two participants requested photocopies of their writing scripts.

Randomisation Procedures Including Allocation Concealment and Blinding

Enrolment to the study prior to surgery was performed by each of the three members of the study team, and the same researchers rotated the task of allocating participants to groups after surgery. A random allocation sequence was generated by a member of the research team who had no contact with the participants.

Each of the three researchers was given a set of sequentially numbered, opaque, sealed envelopes containing instructions for the assigned writing condition. In order to ensure equal numbers of participants in each condition, writing instructions were sequenced using randomly permuted blocks of four. The contents of the envelope were concealed from the study researchers until the point at which the participant was ready to start the first writing session, whereupon the envelope was opened in front of the participant. This ensured that allocation was concealed until the intervention commenced.

After allocation, the researchers administering the intervention and collecting self-report measures were not blind to group assignment. As a rule, efforts were made to conceal group assignment from medical staff on the ward. In particular, surgeons and nurses providing assessment of physical outcomes were made aware of a patient's participation in the study, but were not informed of group assignment. At the discretion of the researchers, a small number of exceptions to this rule were made for ethical reasons, for example where it was felt that nursing staff should be made aware of emotional distress experienced by participants in the expressive condition.

Procedures for Follow-up and Debriefing

On completion of the final follow-up questionnaires, participants were offered the opportunity to ask questions about the study. At the end of the study, a letter was sent to participants, thanking them for their participation, outlining a summary of the findings and explaining the purpose of the two writing conditions.

Measures

Self-Report Ratings of Global Emotional and Personal Writing Content

Data from the manipulation check provided a contemporaneous self-report measure of global writing content. Two seven-point Likert scales were used, on which participants rated the degree of emotion revealed and the extent to which the writing was of a personal nature. This was the same as the manipulation check used by Pennebaker & Beall (1986).

Computer Analyses of the Psychological Content of Participants' Writing

Legible scripts submitted by participants were typed and the resulting text was prepared for computer analysis. Spelling was standardised in order to aid linguistic recognition by the software. For the same reason, a small number of grammatical corrections were made, typically where long sentences featured multiple clauses that

ran together and required re-punctuation in order to be recognised by the software. Such changes aimed to preserve the meaning of the sentence.

The computer programs, LIWC and PCAD were used to analyse the psychological content of transcribed scripts. The large number of variables generated by both of the programs inflated the risk of Type I error in the statistical analyses. With this in mind, a limited number of variables were selected on the basis of pertinence to the emotional and psychosocial experience of women with gynaecological cancer (Beesley et al., 2008; Corney, 1992; Ferrell et al., 2003; Miller, Pittman & Strong, 2003; Reb, 2007; Steginga & Dunn, 1997).

LIWC: Levels of word usage relating to emotional and cancer-related content. "Linguistic Inquiry and Word Count" (LIWC; Pennebaker, Booth & Francis, 2007) was used to analyse the psychological content of writing at the word-level. The software calculates the percentages of words that occur under 80 hierarchically organised content categories. LIWC emotional content categories comprise a global "Affective Processes" category, to which "Positive Emotion" and "Negative Emotion" words contribute. Negative Emotion is further subcategorised into: "Anxiety", "Anger" and "Sadness". All of these LIWC emotional categories were included in the analysis. Selected LIWC categories that seemed relevant to the experience of cancer were also analysed. Here, the global categories were: "Social Processes" (with subcategories: "Family", "Friends", "Human"); "Biological Processes" (with subcategories "Body" and "Health"); "Sexual"; "Religion"; and "Death".

PCAD: Levels of emotional and cancer-related content rated on the Gottschalk-Gleser Scales. Individual grammatical clauses were rated on the psychoanalytically-informed Gottschalk-Gleser content analysis scales (Gottschalk &

Bechtel, 2002) using the Psychiatric Content Analysis and Diagnosis software (PCAD Version 3.0.4 beta; GB software, 2007). PCAD generates continuous Gottschalk-Gleser Scale scores for a given text sample and also calculates deviations from the Gottschalk-Gleser norms. As with LIWC, the PCAD output is generally organised hierarchically, into "total scale" scores and contributory "subscale" scores. Where possible, the higher order scales were selected in order to limit the number of statistical analyses, to again minimise risk of Type I error. Scales were also selected on the basis of comparability with related LIWC categories. The PCAD scales included in the analysis were: "Anxiety", "Hostility" (subcategorised into hostility directed "inwards" and hostility directed "outwards"), "Depression", and "Hope". Selected cancer-related PCAD scales and subscales were: "Death Anxiety" and "Mutilation Anxiety" (subscales of the "Anxiety" scale); "Somatic Concerns" (a subscale of the "Depression" scale); "Health" and "Sickness" (subscales of the "Health/Sickness" scale) and the total scale score of the "Human Relations" scale. Summary descriptions of these scales are included at Appendices 7 to 12.

Results

Overview of Analyses

Emotional expression was central to the experimental manipulation; therefore the primary analyses focus on emotional content categories as measured by LIWC, PCAD and the global self-report scale. Additional analyses of cancer-related themes are presented separately. The small sample size (N=19) lacked sufficient statistical power to avoid Type II errors; the risk of Type I error was inflated by the inclusion of more than 30 variables. The following analyses are therefore tentative. Visual inspection suggested that the distribution of the emotional variables approximated normality; this was confirmed by non-significant Kolmogorov-Smirnov tests. A

number of the cancer-related variables did not have normal distributions; where this occurred the appropriate non-parametric tests were used.

Quantity of Writing

The majority of participants in each condition wrote for three sessions (N=6 (54.5%), N=6 (62.5%) for expressive and neutral writing, respectively); the remainder wrote for the maximum four sessions. For all participants (N=19), the mean number of words per session was 328.7 (SD 147.0) with a range of 57 to 724. There was a trend for the expressive writing scripts to contain more words per session than neutral scripts (expressive writing mean = 372.3 (SD 169.4), neutral writing mean = 268.8 (SD 86.7), $t(17) = -1.58$, $p = .133$).

In the following analyses of group differences and correlations, the content scores were based on participants' writing from all three or four sessions. Text transcribed from writing sessions one to four was collated into a single overall script file for each participant, and was analysed using both LIWC and PCAD software. Self-report ratings were averaged over the three or four sessions.

Emotional Content

Comparisons of Expressive and Neutral Writing

Table 2 compares the emotion-related content of writing produced under the two experimental conditions, as measured by LIWC, PCAD and self-report. Normative means derived from published analyses of similar types of data are provided for guidance purposes. Chiefly due to the normative data originating from a range of different populations (clinical and non-clinical), the relationships between the present data and norms were not explored statistically. The LIWC norms were based on data collected across 29 studies comparing expressive writing with a control writing

Table 2.

Comparisons of emotional content in expressive and neutral writing.

Content category	Expressive (N = 11)		Neutral (N = 8)		Experimental group differences		
	Mean (SD)	Norm (M)	Mean (SD)	Norm (M)	*t(17)*	*p*	Effect size *r*
LIWC (percentage of total words)							
Affective Processes	7.18 (1.62)	6.02	4.49 (2.45)	2.57	-2.90	.010	.57
Positive Emotion	4.36 (1.32)	3.28	2.68 (1.64)	1.83	-2.47	.024	.51
Negative Emotion	2.82 (1.00)	2.67	1.78 (1.03)	0.71	-2.21	.041	.47
Anxiety	0.81 (0.47)	0.68	0.57 (0.49)	0.21	-1.08	.294	.25
Anger	0.57 (0.46)	0.66	0.15 (0.17)	0.14	-2.45	.025	.60
Sadness	0.66 (0.45)	0.63	0.32 (0.35)	0.14	-1.76	.096	.39
PCAD (scaled scores)							
Anxiety	2.51 (0.38)	1.48	1.82 (0.27)	n/a	-4.45	<.001	.73
Hostility Outwards	1.10 (0.11)	0.97	1.04 (0.06)	n/a	-1.22	.240	.28
Hostility Inwards	1.07 (0.15)	0.60	0.77 (0.16)	n/a	-4.19	.001	.71
Depression	7.43 (0.83)	5.39	6.00 (0.65)	n/a	-4.03	.001	.70
Hope	0.76 (0.52)	0.74	0.74 (0.35)	n/a	-.068	.947	.02
Self-Report Measures							
Revealed Emotion	5.77 (1.01)	5.10	2.49 (1.14)	3.36	-6.64	<.001	.85
Personal Content	6.00 (0.88)	5.23	3.13 (1.40)	4.06	-5.51	<.001	.80

condition, among populations with varied demographic and health profiles (Pennebaker, Chung, Ireland, Gonzales & Booth, 2007). PCAD norms (GB Software, no date) were based on extensive studies of spoken verbal data describing "personal interesting or dramatic personal life experiences" (Gottschalk & Bechtel, 2002). The original normative studies for the Gottschalk-Gleser scales were

conducted among non-psychiatric populations that included both medically healthy and ill participants (Gottschalk & Gleser, 1969, p.69). Comparison data for the self-report measures were average scores taken from two studies of expressive writing among cancer patients which used the same manipulation check as the present study and similar non-emotive control conditions (Stanton et al., 2002; Zakowski et al., 2004).

Overall, emotional content was higher in expressive writing scripts than neutral scripts, across all three methods of measurement. For both expressive and neutral writing, scores of emotional content tended to be slightly higher than the LIWC and PCAD norms. The self-report ratings of neutral writing in this study were slightly lower than the self-report norms for neutral writing.

Global emotional content. Expressive writing scripts had higher proportions of affect-related words than neutral scripts, as measured by the "Affective Processes" category on LIWC, and higher self-report ratings of emotional and personal content. Differences on both measures showed large effect sizes, ranging from $r = .57$ to $r = .85$.

Positive emotional content. Percentages of words in the LIWC "Positive Emotion" category were higher in expressive writing than neutral writing. In contrast, on the PCAD "Hope" scale, mean scores were roughly equivalent between the writing groups.

Negative emotional content. Percentages of words in the LIWC "Negative Emotion" category were higher in expressive writing than neutral writing, and expressive writing was also higher on LIWC "Sadness" and PCAD "Depression" dimensions. On measures of anxiety, the findings of the two computer content analyses differed: PCAD "Anxiety" was higher for expressive writing (with a large

effect size), whereas LIWC "Anxiety" showed no difference between the two groups. Of the three variables measuring angry affect, LIWC "Anger" was higher in expressive writing, as was PCAD "Hostility Inwards" (both having large effect sizes). However, there was no group difference on PCAD "Hostility Outwards".

Correspondence of Methods of Emotional Content Analysis

The correspondence between the three measures of emotional content was explored further via correlational analyses. Data from both groups were analysed together (N=19) and all analyses were two-tailed.

Measures of global emotional content. The two indices of global emotional content, LIWC "Affective Processes" and the self-report measure of the degree of emotion revealed, were highly correlated ($r = .72, p < .001$).

Measures of positive emotional content. Table 3 shows the correlations between the LIWC and PCAD measures of positive emotional content and the global self-report measure of revealed emotion.

Table 3.

Correlations of measures of positive emotional content.

Measure	LIWC Positive Emotion *r* (*p*)	PCAD Hope *r* (*p*)
PCAD Hope	.44 (.063)	-
Self-Report Revealed Emotion	.70** (.001)	-.033 (.894)

Notes: N=19 in all correlations; all analyses were 2-tailed.
** Correlation is significant at the 0.01 level.

A non-significant trend was found for an association between LIWC "Positive Emotion" and PCAD "Hope". LIWC "Positive Emotion" correlated with self-report

revealed emotion but there was no relationship between PCAD "Hope" and self-report revealed emotion.

Measures of negative emotional content. In order to explore the degree of conceptual overlap between the various dimensions of negative emotional content that LIWC and PCAD attempt to capture, a full set of correlations was performed, and is shown in Table 4.

Table 4.

Correlations of measures of negative emotional content.

Measure	PCAD Anxiety	PCAD Depression	PCAD Hostility Outwards	PCAD Hostility Inwards	Self Report Revealed Emotion
	r (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)	*r* (*p*)
LIWC Negative Emotion	.81** (.001)	.82** (.001)	.28 (.246)	.61** (.005)	.54* (.018)
LIWC Anxiety	.57** (.011)	.46* (.046)	-.10 (.689)	.41 (.082)	.28 (.242)
LIWC Sadness	.49* (.032)	.65** (.003)	.10 (.700)	.68** (.001)	.63** (.004)
LIWC Anger	.65** (.003)	.73** (.001)	.55* (.015)	.42 (.071)	.49* (.034)
Self-Report Revealed Emotion	.62** (.005)	.74** (.001)	.29 (.228)	.69** (.001)	-

Notes: N=19 in all correlations; all analyses were 2-tailed.
** Correlation is significant at the 0.01 level.
* Correlation is significant at the 0.05 level.

All LIWC indices of negative emotional content (including "Anxiety", "Sadness" and "Anger") showed moderate to large correlations with PCAD "Anxiety" and PCAD "Depression" (*r*'s range from .46 to .82). LIWC "Anger" was moderately correlated with "PCAD "Hostility Directed Outwards", but there was only a non-significant trend for a relationship between LIWC "Anger" and PCAD

"Hostility Directed Inwards"; the latter showed a stronger association with LIWC "Negative Emotion" and LIWC "Sadness".

The global self-report revealed emotion measure was significantly correlated with LIWC and PCAD measures of negative emotion (*r*'s range from .49 to.74), with the exception of LIWC "Anxiety" and PCAD "Hostility Directed Outwards".

Cancer-Related Content

Comparisons of Expressive and Neutral Writing

Table 5 compares the cancer-related content of writing produced under the two experimental conditions, as measured by LIWC and PCAD. As before, normative means derived from published analyses of similar types of data are provided for guidance. Fewer differences were found between expressive and neutral writing scripts in cancer-related content. Expressive writing was higher than neutral writing on LIWC "Sexual", "Death" and "Religion" content, as well as PCAD "Death Anxiety" and "Mutilation Anxiety" (with large effect sizes, ranging from $r = .50$ to $r = .70$). Expressive writing was higher than neutral writing on the LIWC "family" dimension, a result which represented a large effect size.

Measures of health and sickness-related content presented a mixed picture. On the PCAD "Health" and "Sickness" subscales, expressive writing was higher than neutral writing. However, on LIWC biological process words, comprising "Body" and "Health" subcategories, there were no differences between expressive and neutral scripts.

Table 5.

Comparisons of cancer-related content in expressive and neutral writing.

Content category	Expressive (N = 11)		Neutral (N = 8)		Experimental group differences		
	Mdn (IQR)	Norms (mean)	Mdn (IQR)	Norms (mean)	*U*	*p* (2-tailed)	Effect size *r*
LIWC (percentage of total words)							
Biological processes	4.19 (1.29)	1.95	4.80 (2.23)	2.97	29.0	.238	-.28
Body	0.88 (0.75)	0.51	1.17 (1.01)	1.05	37.0	.600	-.13
Health	2.58 (0.81)	0.93	2.62 (1.42)	0.49	39.0	.701	-.09
Sexual	0.40 (0.37)	0.34	0.05 (0.14)	0.05	15.0	.013	-.56
Death	0.21 (0.22)	0.18	0.00 (0.00)	0.03	9.0	.001	-.70
Religion	0.17 (0.31)	0.17	0.00 (0.00)	0.17	14.5	.010	-.58
Social processes	7.61 (2.6)	9.09	7.58 (2.11)	5.55	39.0	.717	-.09
Family	0.56 (0.8)	0.99	0.22 (0.44)	0.33	16.0	.020	-.53
Friends	0.35 (0.34)	0.50	0.14 (0.32)	0.42	22.0	.072	-.42
Human	0.52 (0.66)	0.84	0.79 (0.56)	0.38	32.0	.340	-.23
PCAD (scaled scores)							
Somatic Concerns	0.80 (0.24)	0.46	0.72 (0.22)	n/a	31.5	.319	-.24
Health	2.46 (1.22)	0.94	1.38 (1.41)	n/a	3.0	.000	-.78
Sickness	3.11 (1.32)	0.46	1.59 (1.08)	n/a	6.0	.001	-.72
Death Anxiety	0.82 (0.33)	0.18	0.53 (0.27)	n/a	17.5	.027	-.50
Mutilation Anxiety	1.09 (0.29)	0.28	0.94 (0.20)	n/a	14.5	.013	-.56
Human Relations	0.77 (1.59)	1.40	0.12 (0.70)	n/a	30.0	.272	-.27

Notes: Mdn = Median, IQR = Interquartile range.

Again, due the normative data being derived from studies with a range of different populations, the relationship to norms was not explored statistically. In comparison to norms, expressive writing tended to be higher on the cancer-related variables that concerned the self or personal matters (e.g. LIWC "Biological

Processes", PCAD "Somatic Concerns", plus sexual and death-related variables) and lower on social-themed content (e.g. LIWC "Social Processes", PCAD "Human Relations").

PCAD Content in the Clinical Range

Comparisons of Expressive and Neutral Writing

The writing groups were compared in terms of the numbers of participants whose writing was significantly elevated on PCAD variables. The PCAD software compares the scores of input texts with normative scoring profiles based on non-psychiatric populations. It outputs standard deviations from normative means as a tentative aid to identifying psychiatrically relevant content in the analysed text (Gottschalk & Bechtel, 2002). The thresholds described here therefore indicate scores that are clinically noteworthy, rather than diagnostically significant. On PCAD scales relating to psychologically distressing phenomena, scores within one standard deviation of the relevant normative mean are considered to be within the "normal" range. Above this, scores within less than two standard deviations are "slightly high", those between two and three standard deviations are "moderately high", and any above three standard deviations are described as "very high". On positive psychological phenomena, such as expressions of "Hope" and "Human Relations", PCAD reports clinical significance in terms of deviations below the mean, i.e. slightly, moderately, or very low. Table 6 shows the frequency of participants scoring across the clinical range on emotional and cancer-related PCAD scales.

Table 6.

Frequency of participants scoring within the clinical range on PCAD scales.

Scale	Expressive Writing (N= 11)				Neutral Writing (N=8)			
	Norm N (%)	Mild N (%)	Mod. N (%)	High N (%)	Norm N (%)	Mild N (%)	Mod. N (%)	High N (%)
Total Anxiety	2 (19)	8 (73)	1 (9)	0	8 (100)	0	0	0
Hostility Outwards	11 (100)	0	0	0	8 (100)	0	0	0
Hostility Inward	2 (18)	8 (73)	1 (9)	0	7 (87.5)	1 (12.5)	0	0
Total Depression	3 (27)	7 (64)	1 (9)	0	7 (87.5)	1 (12.5)	0	0
Hope[a]	11 (100)	0	0	0	8 (100)	0	0	0
Somatic Concerns	2 (18)	0	7 (64)	2 (18)	3 (38)	0	5 (63)	0
Health	2 (18)	6 (55)	3 (27)	0	7 (87.5)	1 (12.5)	0	0
Sickness	0	0	0	11 (100)	1 (12.5)	1 (12.5)	1 (12.5)	5 (63)
Death Anxiety	2 (18)	0	8 (73)	1 (9)	4 (50)	0	4 (50)	0
Mutilation Anxiety	0	0	11 (100)	0	2 (25)	0	6 (75)	0
Human Relations[a]	8 (73)	3 (27)	0	0	3 (38)	5 (63)	0	0

Notes: Norm = normal, mild = mildly elevated, mod. = moderately elevated, high = highly elevated.

[a] Low scores indicate distress, e.g. mildly low.

Clinical profile of expressive writing based on PCAD scores. Nearly three quarters of scripts in the expressive condition indicated mild levels of "Anxiety" in comparison to PCAD norms. Two thirds of expressive writing participants' scores on the "Depression" scale were clustered within the mildly elevated range. The software rated all of the expressive writing samples to have normal levels of "Hope" and "Hostility Directed Outwards", whereas "Hostility Directed Inwards" was at the mildly elevated level on almost three quarters of scripts.

Where cancer-related variables were analysed for divergence from the PCAD norms, elevated levels of content were observed on the majority of participants' scores. All expressive writing participants were in the highly elevated range on sickness-related content. On "Somatic Concerns", the writing of over three quarters of participants were in the moderately or highly elevated range. At least moderately elevated levels of "Death Anxiety" and "Mutilation Anxiety" scales were observed in over 80 percent of expressive writing scripts. On health-related content, roughly half were in the mild range, and just over a quarter were moderate elevated. A more normal level of content was found on the "Human Relations" scale, with only a quarter of samples falling below the norm, at the mildly low level.

Clinical profile of neutral writing based on PCAD scores. On all emotional content variables, the majority of neutral writing scripts were within the normal range. Although most scripts scored normal levels on the "Health" scale, nearly two thirds registered highly elevated levels on the "Sickness" scale; 50 percent showed moderately elevated levels of "Death Anxiety", and 75 percent showed moderately elevated "Mutilation Anxiety". Finally, almost two thirds of neutral writing scripts were deemed by PCAD to be mildly low in human relations-related content.

Case Examples of Psychological Content Analyses

In order to contextualise the content ratings, two sample writing scripts were examined in detail in relation to the LIWC, PCAD and self-report ratings. The writing of one participant from each condition was selected on the basis of good adherence to the experimental conditions as rated across the LIWC, PCAD and self-report assessments of emotional content (i.e. high revealed emotion and personal content for the expressive condition, and the converse for the neutral condition). To preserve anonymity, identifiable information was removed from the scripts and the authors were re-named "Participant A" (expressive writing), and "Participant B" (neutral writing). Table 7 shows the writing produced in the first session by Participants A and B. Excerpts from across the four-session scripts for Participants A and B are included at Appendix 13, and 14, respectively. The two participants' content scores over the four writing sessions are shown in Table 8 (emotional content) and Table 9 (cancer-related content).

Case Study Profile of Expressive Writing

Participant A's first writing session scored within the PCAD clinically elevated range on "Anxiety", "Depression", "Health" and "Sickness". Normal levels were observed across the other scales. In comparison to Participant A's four-session average, this first session contained slightly higher levels of PCAD "Anxiety" and LIWC "Anxiety"; similar or slightly lower levels were seen on other LIWC and PCAD dimensions.

Table 7.

Example expressive and neutral writing scripts.

Expressive Writing Session One, by Participant A

I have never really thought that I would be a victim of cancer if so a brain tumour but not this and not now. It seems so unfair having just got over a terrible year caring for my partner [*name*] watching him die of prostate cancer and being no longer able to communicate properly with him between January and July when he died. Surely I had been dealt a bad enough hand. I think of him today because ironically I should have been on a Marie Curie vigil for him today which I said I would take part in a month ago. How come I am here? Where is the fairness in life – no where. The last few months I felt so well physically and in my mind, I was beginning to get my life together.

It has all happened so fast that I have hardly had time to think I dreaded the operation but felt that alien, my ovaries etc. had to get out. Now it is done and I feel very scared but I know I will recover. I do want to go back to normal life. I don't want to retire because of this because I love my job and although I could leave I would feel pushed out by this disease. I want to fight that but I don't know how the chemotherapy will be. I just trust the disease has not gone further. If this is the result I will cope.

At the back of my mind I am so conscious that without modern medicine my time would be up. It is so frightening to think of what has been going on inside my body with me being so unaware. Without the tumour pushing on my bowel nothing would have been found out – thank god it did. Now the operation is over what I find most difficult to accept at first is the stoma bag. It should be reversible but if it isn't I feel it will change my life. I must learn to be patient, take each step day to day.

What I most appreciated are my darling children and good friends. I feel carried by them and keep optimistic. I am aware of how really terrible this kind of experience must be to face all alone. It is painful, fearful and can easily take over your life, but I am determined that it doesn't. I want to face it as a hurdle like others in life – unwanted but not insurmountable. I don't want my will to sap – keep strong I say to myself face it bit by bit not all at once.

Expressive Neutral Session One, by Participant B

The ward is very busy at different times. Mornings very busy, night nurses having to handover to day nurses. Providing all medications, ensuring patients have everything they need. Different people coming and going. Some doctors, some not. This can be before breakfast which arrives at 8:30am, after which nurses assist patients with their personal hygiene, making beds etc. Doctors come to see patients. Then lunchtime. Other people come to see you such as people to take your blood, pharmacists, physiotherapists, radiologists to go for x-rays and also your visitors.

After lunch, medication time for some. Rest time. Later on in the afternoon the tea trolley will come around. After which there would be more medication if needed. Then teatime.

Table 8.

Emotional content analysis scores over four sessions: Participants A and B.

	Participant A (Expressive)					Participant B (Neutral)				
	Session					Session				
Content category	**1**	**2**	**3**	**4**	**M**	**1**	**2**	**3**	**4**	**M**
LIWC (% total words)										
Affective Processes	6.11	7.85	7.40	9.42	7.68	0.83	4.46	3.85	5.22	3.56
Positive Emotion	3.39	5.23	4.34	5.56	4.64	0.00	3.57	3.08	3.48	2.51
Negative Emotion	2.71	2.82	3.06	4.11	3.15	0.00	0.89	0.77	1.74	0.84
Anxiety	0.90	0.00	0.26	1.21	0.57	0.00	0.89	0.77	0.87	0.63
Anger	0.45	1.41	0.77	0.97	0.92	0.00	0.00	0.00	0.00	0.00
Sadness	0.23	0.40	1.02	0.72	0.57	0.00	0.00	0.00	0.00	0.00
PCAD (scaled scores)										
Anxiety	3.32	2.31	2.08	2.63	2.62	1.30	2.08	2.29	1.62	1.80
Hostility Outwards	1.25	1.34	1.13	1.09	1.22	0.95	0.96	1.07	1.09	0.98
Hostility Inwards	0.90	1.06	1.07	1.17	1.03	0.84	0.85	0.83	0.85	0.67
Depression	8.98	8.25	6.94	8.19	8.01	5.14	6.60	7.35	6.86	5.59
Hope	0.53	1.46	0.58	-0.52	0.56	0.81	1.85	1.34	1.82	1.44
Self-Report Measures[a]										
Revealed Emotion	5.00	6.00	7.00	6.00	6.00	1.00	-	2.00	4.00	2.33
Personal Content	6.00	6.00	7.00	7.00	6.50	2.00	-	2.00	3.00	2.33

Notes: M= Mean scores for this participant over the four sessions.

[a] Manipulation Check data was missing for Participant B, on the second writing session.

Table 9.

Cancer-related content analysis scores over four sessions: Participants A and B.

	Participant A (Expressive)					Participant B (Neutral)				
	Session					Session				
Content category	**1**	**2**	**3**	**4**	**M**	**1**	**2**	**3**	**4**	**M**
LIWC (% total words)										
Social processes	3.39	3.42	4.34	6.04	4.24	9.09	5.36	6.15	8.70	7.32
Family	0.00	0.00	0.00	0.48	0.11	0.00	0.00	0.00	0.00	0.00
Friends	0.45	0.20	0.26	0.97	0.46	0.00	0.00	0.00	0.00	0.00
Human	0.45	0.60	0.51	0.48	0.52	2.48	0.89	0.77	0.87	1.26
Biological processes	5.66	4.23	2.81	5.56	4.58	11.57	14.29	11.54	12.17	12.34
Body	2.04	1.41	1.28	1.69	1.60	0.83	1.79	1.54	0.87	1.26
Health	3.39	2.62	1.53	2.66	2.58	7.44	5.36	3.08	7.83	5.86
Sexual	0.68	0.20	0.00	0.72	0.40	0.00	0.00	0.00	0.00	0.00
Religion	0.23	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00
Death	0.45	0.60	0.26	0.00	0.34	0.00	0.00	0.00	0.00	0.00
PCAD (scaled scores)										
Death anxiety	1.09	1.21	1.03	0.48	0.97	0.75	1.54	0.73	0.77	0.83
Mutilation anxiety	1.38	0.94	0.59	1.20	1.07	0.60	1.10	1.31	0.90	0.96
Somatic concerns	0.91	0.88	0.81	0.79	0.80	0.82	0.84	0.81	0.84	0.58
Health	3.61	2.00	2.57	1.69	2.46	0.82	0.89	1.54	0.88	1.05
Sickness	2.48	2.00	2.06	4.83	2.81	0.00	0.89	0.00	1.75	0.63
Human relations	0.56	0.30	2.06	0.36	0.77	0.00	0.00	0.00	0.00	0.00

Notes: M= Mean scores for this participant over the four sessions.

Case Study Profile of Neutral Writing

In the first session, Participants B's neutral writing scored within the normal range on all PCAD scales. This continued to be the case for the following three sessions with the exception of moderately elevated scores on "Death Anxiety" and Mutilation Anxiety" scales, which were largely due to references to hospital life (e.g. nurses' activities around blood collection and references to "oncology"). LIWC results for Session One for this participant showed minimal use of emotional words, which corresponded with the self-report ratings. Over the four sessions, Participant B's writing did not register any angry or sad content on LIWC, nor any PCAD "Human Relations" content. Levels of "Positive Emotion" words were generally higher than "Negative Emotion" words.

Detailed Analysis of PCAD Ratings

In order to examine the way in which the PCAD software rated written content, PCAD ratings for Participant A's first session were explored in detail. Table 10 gives summary scale descriptions of the PCAD (Gottschalk-Gleser) scales (adapted from Gottschalk & Bechtel, 2002), illustrated with example clauses from Participant A's Session One script. Generally, the Gottschalk-Gleser scale scores are graded according to a psychoanalytically-informed judgement about the subject's proximity to the anxiety or other emotional content. For example, ratings for death anxiety are graded, based on whether the form of anxiety or threat is to the self (three points), animate others (two points), inanimate others (one point), or whether the reference is one of denial of anxiety (one point).

Table 10.

Example clause-ratings on the PCAD scales for expressive writing Session One, by Participant A.

Scale/subscale name (clinical elevation of scores for this session is also given)
Description of the relevant section of the scale (after Gottschalk & Bechtel, 2002)
"example clauses quoted in italics" (PCAD keywords given in parentheses (with PCAD rating codes as appropriate))

Hope Scale (scores were within the normal range)

References to self or others getting or receiving help, advice, support, sustenance, confidence, esteem from others or from self:

"I will cope" (cope)
"thank god" (thank)
"I just trust" (trust)
"I will recover" (recover)
"I must learn to be patient" (patient)
"I feel carried by them and keep optimistic" (carried)
"a terrible year caring for my partner" (partner) (caring)

References to feelings of optimism about the present or future, for others or for self:

"it will change my life" (life)
"good friends" (good)
"I want to face it as a hurdle like others in life" (life)
"keep strong" (strong)
"where is the fairness in life nowhere" (life)

References to being or wanting to be or seeking to be the recipient of good fortune, good luck, God's favour or blessing, for others or for self:

"I do want to go back to normal life" (normal)

References to not being or not wanting to be or not seeking to be the recipient of good fortune, good luck, God's favour or blessing:

"he died" (died)
"surely I had been dealt a bad enough hand" (bad)

References to self or others not getting or receiving help, advice, support, sustenance, confidence, esteem from others or from self:

"no longer able to communicate properly with him " (communicate)
"I dreaded the operation" (operation)
"would be a victim of cancer" (victim, cancer)
"terrible this kind of experience must be to face all alone" (alone)
"it is painful fearful and can easily take over your life" (painful, fearful)

References to feelings of hopelessness, losing hope, despair, lack of confidence, lack of ambition, lack of interest; feelings of pessimism, discouragement for others or for self:

"him die of prostate cancer" (die)
"a terrible year caring for my partner [name] watching" (terrible)
"no longer able to communicate properly with him" (able)
"I want to face it as a hurdle ... unwanted but not insurmountable" (unwanted)
"terrible this kind of experience must be to face all alone" (terrible)

Scale/subscale name (clinical elevation of scores for this session is also given)
Description of the relevant section of the scale (after Gottschalk & Bechtel, 2002)
"example clauses quoted in italics" (PCAD keywords given in parentheses (with PCAD rating codes as appropriate))

Hostility Directed Outwards Scale (scores were within the normal range)

Self robbing or abandoning other individuals, causing suffering or anguish to others, or threatening to do so:
"I would take part in a month ago" (take)

Self adversely criticizing, depreciating, blaming, expressing anger, dislike of other human beings:
"a terrible year caring for my partner [name]" (terrible)

Others (human) killing, fighting, injuring other individuals or threatening to do so:
"him die of prostate cancer" (die)

Others (human, domestic animals) injured, robbed, dead, abandoned or threatened with such from any source including subhuman and inanimate objects, situations (storms, floods, etc.):
"he died" (died)
"it is painful fearful and can easily take over your life" (take)

Denial of anger, dislike, hatred, cruelty, and intent to harm:
"bit by bit not all at once" (bit)

Hostility Directed Inwards Scale (scores were within the normal range)

Self adversely criticizing, depreciating self; references to regretting, being sorry or ashamed for what one says or does; references to self mistaken or in error:
"but I do not know how" (do not know how)

Human Relations Scale (scores were within the normal range)

References to giving to, supporting, helping, or protecting others in which the giving etc. is inferential or the object is unspecified:
"I will recover" (recover) ; *"I will cope"* (cope)

References to warm, loving, congenial human relations or human relations in which a desire to be closer is expressed. The reference should be specific rather than inferred: (a) involving self or self and others; (b) involving others:
"I just trust" (trust (a)) ; *"because I love my job"* (love (a))
"I must learn to be patient" (learn (a))
"terrible this kind of experience must be to face all alone" (kind (b))

Distancing: reference in which people are alienated, drawn apart, kept at a distance from one another: (a) focus on self; (b) focus on others:
"I want to face it as a hurdle like others in life" (hurdle (a))
"and although I could leave" (leave (a))
"him die of prostate cancer" (die (b))
"I would feel pushed out by this disease" (disease (b))

References to lack of humans or sub-humans in the environment. The references must contain evidence of lack of interest in or need for human or subhuman objects:
"terrible this kind of experience must be to face all alone" (alone)

Scale/subscale name (clinical elevation of scores for this session is also given)
Description of the relevant section of the scale (after Gottschalk & Bechtel, 2002)
"example clauses quoted in italics" (PCAD keywords given in parentheses (with PCAD rating codes as appropriate))

Anxiety Scale with subscales (total scale scores were within the moderately elevated range)

Death anxiety - references to death, dying, threat of death, or anxiety about death experienced by or occurring to: (a) self; (b) animate others; (c) inanimate objects; or (d) denial:

"him die of prostate cancer" (die (b))
"he died" (died (b))

Mutilation (castration) anxiety - references to injury, tissue or physical damage, or anxiety about injury or threat of such experienced by or occurring to: (a) self; (b) animate others; (c) inanimate objects destroyed; or (d) denial:

"would be a victim of cancer" (cancer (c))
"him die of prostate cancer" (cancer (c))
"I dreaded the operation" (operation (c))
"I would feel pushed out by this disease" (disease (c))
"I want to fight that" (fight (c))
"the disease has not gone further" (disease (c))
"now the operation is over" (operation (c))
"it is painful fearful and can easily take over your life" (painful (c))
"it bit by bit not all at once" (bit (d))

Separation anxiety - references to desertion, abandonment, ostracism, loss of support, falling, loss of love or love object, or threat of such experienced by or occurring to: (a) self; (b) animate others; (c) inanimate objects; or (d) denial:

"I do not want my will to sap" (do not want (a))
"it is painful fearful and can easily take over your life" (take (b))
"take each step day to" (take (b))
"I would take part in a month ago" (take (b))
"I do not want to retire because of this" (do not want (c))
"and although I could leave" (leave (c))
"terrible this kind of experience must be to face all alone" (alone (c))
"the disease has not gone further" (gone (d))

Shame anxiety - references to ridicule, inadequacy, shame, embarrassment, humiliation, overexposure of deficiencies or private details, or threat of such experienced by: (a) self; (b) animate others; or (d) denial:

"but I do not know how" (do not know (a))

Diffuse or non-specific anxiety - references by word or phrase to anxiety and/or fear without distinguishing type or source of anxiety: : (a) self; (b) animate others; or (d) denial:

"It is so frightening to think of what has been going on inside my body with me being so unaware" (frightening (a))
"I dreaded the operation" (dreaded (a)); *"and I feel very scared"* (scared (a))
"it is painful fearful and can easily take over your life" (fearful (b))
"a terrible year caring for my partner [name] watching" (terrible (b))

Scale/subscale name (clinical elevation of scores for this session is also given)
Description of the relevant section of the scale (after Gottschalk & Bechtel, 2002)
"example clauses quoted in italics" (PCAD keywords given in parentheses (with PCAD rating codes as appropriate))

Depression Scale with subscales (total scale scores were within the moderately elevated range)

References to not being or not wanting to be or not seeking to be the recipient of good fortune, good luck, God's favour or blessing:
"it seems so unfair" (unfair)

Depression subscale: Somatic Concerns (scores were in the moderately elevated range)

General somatic symptoms, including heaviness in limbs, back, or head, backaches, headaches, muscle aches, loss of energy, fatigability, and loss of weight:
"I would feel pushed out by this disease" (disease)

Depression subscale: Death and mutilation depression (scores were highly elevated)

Death depression. References to death, dying, threat of death, or anxiety about death experienced by or occurring to: (a) self; (b) animate others; (c) inanimate objects; or (d) denial:
"would be a victim of cancer" (victim (a))

Mutilation depression. References to injury, tissue or physical damage, or anxiety about injury or threat of such experienced by or occurring to: (a) self; (b) animate others; (c) inanimate object destroyed; or (d) denial:
"would be a victim of cancer" (cancer (a))

Health Scale (scores were within the moderately elevated range)

References to feelings of well-being, health, being symptom-free (mental or physical) as experienced by others.
"I do want to go back to normal life" (normal); *"because I love my job"* (love)
"a terrible year caring for my partner [name] watching" (partner)

References to feelings of well-being, health, being symptom-free (mental or physical) as experienced by self.
"I will cope" (cope); *"I will recover"* (recover); *"good friends"* (good)
"most difficult to accept at first is the stoma bag" (accept)
"I feel carried by them and keep optimistic" (optimistic); *"keep strong"* (strong)

Sickness Scale (scores were within the highly elevated range)

References to feelings of poor health, having symptoms, pain, suffering (mental or physical) as experienced by others:
"and in my mind I was beginning to get my life together" (together)

References to feelings of poor health, having symptoms, pain, suffering (mental or physical) as experienced by self:
"would be a victim of cancer" (victim, cancer)
"him die of prostate cancer" (die, cancer)
"no longer able to communicate properly with him" (able)
"I would feel pushed out by this disease" (disease)
"the chemotherapy will be" (chemotherapy)

A careful examination of PCAD rated clauses for the first session script for Participant A, suggested that the software was generally appropriate in delineating key clauses and allocating ratings to them on one or more scales. The "Hope" scale was effective in distinguishing between positive and negative content; however, a considerable degree of overlap was apparent within the different "Hope" sub-scales. Overlap was also evident between the higher order scales, for example "Hope" coincided with "Human Relations" and "Health" scales, in terms of capturing the same content and inferring similar meaning. On the "Anxiety" scale, the software drew psychoanalytic distinctions between different anxious or distressed content, allocating clauses to the respective subscales in an interpretive way. Although the allocation of clauses to the "Anxiety" subscales generally had good face validity, several errors were noted in the selection of subject-object relationships, particularly the identification of objects as inanimate where animate would be more appropriate. Within the Session One script, the incidence of "Depression" scale-rated clauses was relatively low, although those "Depression" clauses which were rated scored highly in clinical terms, due to the strong death and mutilation-related meanings inferred.

Across the scales, a number of clause-rating errors were evident. For example, the software inappropriately identified a subject-object relationship on "Hostility Directed Outwards" where "a terrible year caring for my partner" was rated to express critical or angry affect towards another human being, rather than frustration with a situation. The same clause was rated out of context on the "Hope" scale, whereby a positive emphasis was inferred from the references to "caring" and "partner". Other errors were seen where the software evidenced poor specificity in processing certain words. For example, the word "take" within the clause "[the vigil] I would take part in" was rated to imply robbing or abandoning on the "Hostility

Directed Outwards" scale, as well as registering loss of an animate other on the "Separation Anxiety" scale. Similarly, use of the word "bit" was ambiguously rated to imply mutilation anxiety in the phrase "bit by bit, not all at once". The software also demonstrated poor sensitivity, in terms of key phrases in the script that did not score at all on emotional or cancer-related PCAD dimensions. These omissions included: "not this and not now"; "I have hardly had time to think"; "my ovaries etc. had to get out"; "without modern medicine my time would be up"; and "my darling children". The software also lacked sensitivity in picking up clauses in which emotional distress was expressed in the form of questions, for example: "how come I am here?"; "where is the fairness in life – nowhere".

Discussion

Summary of Findings

In this study, computerised content analytic and self-report measures were used to explore the emotional and cancer-related content of writing produced by women recovering from gynaecological cancer surgery. Pennebaker's expressive writing paradigm was compared with a neutral writing control; the scripts were content analysed by LIWC and PCAD programs and the results compared with self-report ratings. On each of the three measures, expressive writing was significantly higher than neutral writing on almost all emotional content dimensions. A high level of correspondence was observed between the three measures of emotional content. Fewer differences between the two writing groups were observed on levels of cancer-related content compared to emotion-related content. Expressive writing was higher than neutral writing on levels of family, death, religion and sexual-related themes; and on some illness-related categories. PCAD was found to provide reasonably appropriate ratings of the psychological meaning of individual clauses, and produced

norm-referenced scores which contributed to clinical profiles of psychological content.

Comparisons between Expressive Writing and Neutral Writing Content

The findings that higher levels of emotional content, both positive and negative, were measured in expressive writing compared to neutral writing suggest that the experimental manipulation was successful. The findings regarding cancer-related content suggest that women in the expressive writing condition used the exercise to write about themes that are closely related to what is known about the distressing aspects of gynaecological cancer, such as anxieties about sickness, death and sexuality (Booth, Beaver, Kitchener, O'Neill & Farrell, 2003; Steginga & Dunn, 1997). Higher levels of content relating to family and religion also reflect some of the identified psychosocial needs of this population (Miller et al., 2003). The clinical profiles based on norm-referenced PCAD scores indicated a high frequency of mild to moderately elevated levels of emotional and sickness-related content in the expressive condition. This suggested that a greater degree of distress and worry was being articulated in the expressive writing than in the neutral writing, which had a more normal profile.

Consistency of Measurement Between the Methods of Emotional Content Analysis

PCAD and LIWC measurements were found to correlate on most emotional dimensions: global, positive and negative. This may imply that similar vocabulary was being captured by the two measures, although this is hard to judge because the output of the LIWC program does not specify the words selected for each category score. The two computer measures were also highly correlated with the self-report of global revealed emotion. This suggests two things: firstly, that the computer measures have good validity in recognising emotional content as judged by the

writer. Secondly, it suggests that the manipulation check ratings were a reflection of what participants had written, rather than the product of compliance-related bias. In view of this reduced likelihood of compliance-related bias, it is worth reviewing the fact that the neutral writing self-report manipulation check means for this study were lower than the normative comparison means on both revealed emotion and personal content dimensions (norms derived from Stanton et al., 2002; and Zakowski et al., 2004). This finding may suggest that in the present study, adherence to the experimental protocol was higher than in these previous expressive writing studies.

The patterns of correlation suggested a high degree of overlap in the content picked up by the various LIWC and PCAD negative emotional dimensions. A relationship was found between anxious and depressive content variables: LIWC "Anxiety" and PCAD "Depression" were correlated, as were PCAD "Anxiety" and LIWC "Sadness". Measures of sadness and anger were also related: a highly significant relationship was observed between PCAD "Depression" and LIWC "Anger" that echoed a highly significant relationship between LIWC "Sadness" and PCAD "Hostility Inwards". From the user point of view, the overlap suggests poor specificity. However, explaining the overlap is complicated, again because the LIWC output does not report the specific words in a text that contribute to individual category scores. Therefore, the overlap could be because the same content (e.g. key words) is repeatedly counted across multiple LIWC or PCAD negative emotion categories, or alternatively it could be due to theoretical differences between LIWC and PCAD conceptions of sadness, anger, or anxiety. Namely, the PCAD "Depression" scale (see Appendix 8) incorporates selected subscales of the "Hostility" scales, which is likely to influence an overlap in depressed and angry content.

The robustness of the negative PCAD dimensions was variable on the basis of the case study analyses. When examined in close detail, the "Anxiety" scale output seemed to present valid and relatively robust ratings of content. However, ratings on the "Hostility" scales were less precise and coherent, which might explain the discrepancy between the "Hostility Directed Outwards" and "Hostility Directed Inwards" scoring patterns, whereby significant group differences were only observed on the latter subscale. It was difficult to judge the performance of the "Depression" scale due to the small number of clauses that scored content on it. Measurement of positive emotion was reasonably appropriately captured on the PCAD "Hope" scale. The lack of correlation between PCAD "Hope" and LIWC "Positive Emotion" scores may have been due to the PCAD "Hope" scale capturing hope as well as hopelessness, in contrast to the unipolar LIWC "Hope" dimension.

Observations on the Different Methods of Analysis

LIWC has been widely used in studies analysing the emotional content of expressive writing (Pennebaker & Chung, 2007). Although the LIWC program has strengths in terms of operational speed, simplicity in presentation of output, and good face validity; the limitations of the LIWC approach in terms of disregarding the contextual aspects of meaning have been recognised (Lepore et al., 2002; Owen et al., 2006). In this study, the PCAD analyses were conducted in order to supplement LIWC scores with a context-sensitive analysis of emotional content. Given the high correspondence between LIWC and PCAD scores, it was not evident at the quantitative level whether anything was "added" by the PCAD analysis. However, when the individually-rated clauses were examined, the PCAD output was found to offer a complex analysis of content which captured nuances and interpreted meaning within context. In comparison to LIWC, PCAD is operationally the more

complicated and time-consuming tool to use (e.g. manual delineation of grammatical clauses is an optional part of the procedure, and the output is lengthy and dense, providing both quantitative and qualitative results). In terms of the quality of PCAD output, a small but conspicuous number of omissions and errors were observed, including inappropriate inferences of meaning. Overall, however, the qualitative output of PCAD (such as that presented in the case study of Participant A's writing) highlighted aspects of meaning expressed in the writing that were not apparent in either the raw PCAD or LIWC scores. Although this study focussed on emotional content rather than psychological processes, the findings of the detailed PCAD analysis offer tentative evidence that a broadly psychoanalytic reading of expressive writing content is viable using PCAD.

In assessing what would be the method of choice for analysing the psychological content of expressive writing, the nature of the proposed analysis is the key determining factor. For speed of processing and compatibility with a large body of previous studies, LIWC and standard self-report manipulation check rating scales have a clear advantage. If grounding in established psychological theory is a requirement, PCAD would be a more appropriate tool, and would provide an effective and relatively time-efficient means of analysing a large body of text within a consistent theoretical framework. If a high level of sensitivity to the individualised nuances of emotional expression or psychological phenomena were required, an alternative approach would be to apply a qualitative, inductive method such as Thematic Analysis (Braun & Clarke, 2006). This kind of human-rated method would potentially reduce the liability of automated ratings to miss content. It would, however, be potentially difficult for such idiographic, qualitative data to be meta-

analysed with data from the current, LIWC-dominated literature in order to contribute to the evidence on mediating variables in expressive writing.

The Application of Expressive Writing in Gynaecological Cancer

In general, the higher levels of emotional and cancer-related content in the expressive writing condition suggest that the intervention was successful in eliciting expression of the kinds of thoughts and feelings that have been shown to be a source of worry or distress in gynaecological cancer (Beesley et al., 2008; Chan et al., 2001; Miller et al., 2003; Steginga & Dunn, 1997). Based on the original, "inhibition" model of expressive writing (Pennebaker & Beall, 1986), this expression of emotions could serve a therapeutic purpose. However, although a number of women in the expressive condition informally reported finding the intervention helpful, it is not possible to systematically evaluate whether or not it was therapeutic, due to the small sample size. Furthermore, the private elicitation of emotional expression by itself is arguably insufficient as a psychologically therapeutic intervention in a gynaecological cancer population, given clinical recommendations for support of a psychosocial nature (NHS Executive, 1999). Additional evidence of the limitations of emotionally expressive writing as a standalone intervention was highlighted in a paper by Honos-Webb, Harrick, Stiles and Park (2000). In this study, the Assimilation of Problematic Experiences model was applied to expressive writing scripts in order to rate the degree to which the intervention allowed participants to develop their awareness of problems, thereby increasing the degree of problem "assimilation". Honos-Webb et al. express caution that, at the end of the brief intervention, the participant may be left midway through a process of change, and at risk of psychological harm in the absence of support to complete and bring closure to the assimilation process. In order to minimise the potential for harm and maximise the psychologically

therapeutic effect of expressive writing in this population, writing combined with supportive social feedback and post-intervention follow up may be more appropriate. Due to the controlled conditions of the writing experiment in this study, substantial clinically-responsive feedback and follow-up were not part of the procedure.

Limitations of this Study

Several limitations of this study relate to aspects of the design. The small sample size of this exploratory study increased the risk of Type II error; given this risk, it is notable that the analyses found a number of large effect sizes. The high number of variables that were included from the two computer measures increased the risk of Type I error, therefore the findings are tentative. One weakness in the analyses relates to the lack of directly comparable normative data. For example, specific norms for gender, education, age, illness status and inpatient setting were not available. Additionally, the PCAD norms that were given for guidance were based on data from speech samples, which may limit the extent to which they can be directly referenced against the writing sample data. In the spirit of encouraging free writing, the writing instructions stated that grammar and handwriting were unimportant. However, this advice may have impaired the quality of the written data, firstly given the need to transcribe (which led to the subsequent exclusion of one participant on grounds of illegibility); and secondly given the likelihood that PCAD missed numerous clauses due to the use of non-standard grammar, which the program may have found difficult to recognise and process. Most liable to be missed were long sentences due to non-standard punctuation and abbreviated sentences in "note" format, which may have lacked subject, verb, or object.

A number of limitations to this study relate specifically to the hospital setting. Firstly, the inherent insecurity of the busy ward may have inhibited participants'

willingness to disclose in their writing. Secondly, the neutral writing condition instructed participants to produce detailed descriptions of hospital life; as a result, several "neutral" writing scripts featured observations of emotive incidents relating to human distress. A control condition that did not draw on this difficult and emotionally taxing environment may have produced even greater distinctions between the levels of emotional and cancer-related content in each group. Finally, a possible weaknesses related to likely variations in the degree of social feedback that the participants received from the researchers. This was not monitored and may have varied, for example in response to the need to keep participants engaged in the process.

Further Research

There are a number of potential avenues for further research that arise from this study. Firstly, the content scores could be compared to physical and psychological outcomes, as was originally planned for this study. Secondly, a closer analysis of the writing in comparison to norms could be performed, either to develop the clinical psychological profile of the gynaecological cancer population; or as a measure of outcome. Thirdly, a number of process-related investigations could be conducted: for example, variations in content scores over the course of the intervention could be compared to outcomes. Alternatively, a range of LIWC or PCAD dimensions not used in this study could be investigated, such as the LIWC categories that analyse references to time (e.g. present, past, or future orientation). These could be used to look at patients' psychological wellbeing in relation to their sense of time and place in the context of chronic illness. There is also scope to explore, in greater detail the process or content of expressive writing within a psychodynamic model of understanding. Finally, the computerised content analyses used in this study could be

compared to an in-depth, qualitative content analysis of the psychological aspects of expressive writing (e.g. using Thematic Analysis: Braun & Clarke, 2006). This would provide an additional perspective from which to assess the relative merits of different approaches to content analysis.

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Part 3: Critical Appraisal

Critical appraisal of an exploratory study of the psychological content of writing produced by women recovering from surgery for gynaecological cancers.

Introduction

At the heart of this thesis was the goal of capturing the meaning of what women wrote when presented with the opportunity to freely explore their emotions following the potentially distressing experience of gynaecological cancer surgery. The literature review aimed to investigate what methods were available for the analysis of emotion in this kind of writing. The empirical study sought to analyse the emotional and cancer-related content of the women's writing, using a range of measures in order to capture greater levels of contextual meaning than previous studies in this area. The aim of this critical appraisal is to reflect on the different stages of the study from the perspective of "meaning". I will explore a selection of meaning-related issues, which to a large extent framed the conceptual and practical decisions taken. For example, in analysing what women wrote, what aspects of psychological meaning were most relevant for this population? Which of the psychological models of understanding had tools that could be applied in order to systematically measure written meaning? To what extent did the resulting analyses retain the meaningfulness of the women's words as they lay on the page? Additionally, I will consider what the intervention *meant* to women. What motivated them to take part? What kept them engaged in the task?; and what did they gain (or lose) from participating?

Conceptualisation

The primary aim of this project was to extend the expressive writing intervention to a new population: women undergoing gynaecological surgery. The design was geared towards measuring psychological and physical health outcomes following the expressive writing intervention. Secondary to these analyses, the collection of a large amount of written data presented the opportunity to investigate

the following areas: what women were writing, whether or not they adhered to writing conditions, what use they made of the intervention, and the inferences and interpretations that could be made about the psychological and emotional processes involved in expressive writing. In planning the content analytic component of the writing, an obvious choice of method was "Linguistic Inquiry and Word Count" (LIWC: Pennebaker, Booth, & Francis, 2007) the word-counting programme that is the most widely applied content analysis method in expressive writing studies. However, our approach to measuring the content of what women wrote aimed to be broad; the word counting approach seemed too restrictive because meaning beyond individual words would be lost. An additional measurement tool was sought, one which would provide a more nuanced analysis and bring forward different levels of meaning from the texts.

Reflections on the Literature Review

The literature review of emotional content analysis methods was undertaken in order to identify other methodological options for the content analysis. This was a complicated search, which hinted at large bodies of literature located across a range of disciplines, chiefly: linguistics, psychology, and computer programming. This made it difficult to grasp the state of the art of content analysis methodology, because each discipline used slightly different concepts of language, emotion and methodological complexity. As noted in the literature review, the low level of theoretical integration between these disciplines meant that few papers met the main criteria of applying a method of content analysis to text produced by an instructed emotional or personal writing task, among a clinical population. This meant that some interesting and potentially relevant literature was excluded, most often because it dealt with non-clinical samples or spoken-word data.

There was a dilemma over whether or not to review the exclusion criteria in order to include a broader range of methods. In the end, the decision was made to maintain the scope to include only clinical writing. This was in part a consideration of scale, but was also informed by a key assumption of the thesis: that there is something specific and different that occurs in the expressive writing process. For example, when analysing the emotional content of different forms of verbal data (e.g. diaries, text messages, web postings) a key consideration is the environment in which the text is produced, and the intended audience for the writing. The degree to which emotion is expressed or inhibited is likely to be influenced by these factors. One aim of the Pennebaker paradigm is to offer a protected space for emotion to be processed and expressed in a way that limits the inhibitory expectation of an "audience". With this in mind, some studies destroy participants' scripts immediately after they are written. In the ward setting, it was felt that written (rather than spoken word) disclosure was the most appropriate method to maintain the private aspect of the intervention. Another assumption of the thesis was that emotional expression assessed in a clinical context has a meaning that is distinct from emotional expression among non-clinical populations. The clinical context will influence the methodology used to assess the emotion and is likely to increase the relevance of the data for use in psychological interventions or research. Clinical studies were therefore assumed to be those most likely to have applied psychologically validated methods of analysis, which was seen to be the case in the process of screening out non-clinical studies.

Content analysis

The literature review revealed a lack of interdisciplinary theoretical integration among the methods of content analysis, and the PCAD measure (PCAD; GB

software, 2003; Gottschalk & Bechtel, 2002) was exceptional in that it applied psychoanalytic theory, via a linguistic structure (the grammatical clause) for clinical purposes. The PCAD analysis was selected for this study in order to provide a context-sensitive measure of content as a supplement to the LIWC analysis. The addition of PCAD allowed us to look at the difference that a context-sensitive analysis made, in terms of whether anything was added to our understanding of the women's writing by looking beyond the word-count approach. Furthermore, the PCAD analyses were exploratory; they were run as a test of the software's ability to screen text for psychologically meaningful content.

In using computerised content analysis tools to capture the emotional and cancer-related content of the writing scripts, the challenge was to keep the patient's experience in the centre of the frame and maintain the meaningfulness of the text as they had written it. The word-count analyses, although rapid and reliable, condensed the emotional content into crude units; the way in which the analysis developed was largely a response to the need to counter this process. Arguably, the addition of a qualitative analysis (e.g. grounded theory analysis) would have been the most direct way to capture the content of the text in a way that allowed meaning to filter through. However, time limitations restricted our analysis of the scripts to the computer analytic methodology. In order to assess the performance of PCAD, maximal use was made of its qualitative output, such as the individual clause ratings which in many ways resemble a psychoanalytic theory-driven thematic analysis performed by hand. The finding that the qualitative PCAD ratings were for the most part appropriately coded was encouraging evidence in support of the validity of the PCAD scale scores.

When analysing small samples of expressive writing, the automated methods would arguably add little to the impressions a clinician may glean from simply reading scripts. However, there may be advantages to applying automated content analyses in clinical work. For example, if a large amount of writing needed to be processed, both LIWC and PCAD analyses would allow for this to be done at speed. Additionally, where changes in writing content needed to be charted over time, LIWC or PCAD could provide a reliable means of measurement.

Recruitment

The study was affected by difficulties in both recruitment and retention. Of the 112 women who were approached to participate, 39 consented and completed the baseline, and 20 completed the writing intervention. From the outset, a number of measures aimed to encourage participation among women coming to the ward for surgery. Several measures tapped into the meaningfulness of the writing task when presenting it to potential participants. The day of arrival on the ward was a particularly busy time. Patients were seen by a number of nurses and doctors, requesting paperwork or blood samples, and a number of research teams also approached patients. In the midst of this, researchers for the present project sought to explain the aims of the project to patients, obtain informed consent, and ask them to complete a lengthy baseline questionnaire within a limited timeframe. It was important to be able to communicate quickly and clearly what participation would mean, before moving onto the more detailed information about the study. The randomised nature of the study complicated this, insofar as it was not possible to specify in advance the type of writing that would be undertaken, nor detail the relative benefits. It was misleading to even name the project as an "expressive writing" study, because half of those participating would be completing a neutral

writing task. The study was therefore branded a "Hospital Diary". This title aimed to communicate both the written, daily, and brief nature of the task. In addition it broadly covered both writing conditions by alluding to a "diary", which could equally evoke a record of daily comings and goings, or something more personal. While this branding served to facilitate the task of communicating to women what the study was about, on reflection it may in some cases have been off-putting. For example, it may be fair to assume that many people do **not** write in a daily diary, and to non-diary writers it immediately sounded like something that was "not for them".

The reasons given by women as to why they did not want to take part were not often elaborated beyond their saying that they were "not interested in writing", "not interested [at all]", or that it all sounded like "too much". Clearly, for many women the stay in hospital was a worrying and onerous prospect and the addition of the writing task may have felt like something additionally burdensome. In order to avoid this, future studies may benefit from structuring the timing of recruitment to avoid coinciding with ward arrival when the patients may feel overwhelmed by the volume of traffic and requests.

A number of patients who had consented and completed the baseline were subsequently unable to participate. Seven women were unable to commence writing because they were discharged from the hospital before the intervention could take place. In the light of this, consideration was also given to the possibility that the intervention could be taken home by patients. Six other women did not write because they had either changed their mind or, due to their experiencing significant pain, discomfort, worry, or fatigue, they preferred to withdraw from the study. Where writing seemed to be physically difficult, an adaptation to the protocol was considered in terms of a spoken word intervention where participants could speak

into a tape recorder for the standard 20 minute Pennebaker paradigm "dose". This would open up participation to those who did not like writing or those whose learning or performance difficulties had excluded them. Both of these options were also suggested by participants in their feedback, and would be valuably explored in future research. It was felt, however, that either of these adaptations could potentially be uncontaining for participants. Therefore the study focus remained on a ward-based writing intervention, which (from the point of view of the content analyses) preserved the homogeneity of the written dataset.

A clinically meaningful intervention?

The clinical context for the writing intervention was highly influential in the design of experimental procedures and the analysis. The stressful nature of gynaecological cancer is significant (Andersen, 1984), and the considerable psychosocial needs of this population have been extensively explored in the literature (e.g. Steginga & Dunn, 1997), and highlighted in policy (NHS Executive, 1999). In view of the vulnerability in this population, procedures were set up throughout the recruitment and intervention phases that would promote the careful consideration of the participant's ongoing physical and psychological fitness to participate, and would allow the ethical management of participant harm in terms of emotional distress aroused by the task. Linked to these considerations, the analysis of content became framed in clinically relevant terms. Initially, the analysis had planned to consider only emotional content. However, it was clear from early examples of the completed scripts that the women's writing also presented an opportunity to explore what the experience of cancer diagnosis, treatment and, in particular, surgery meant to them. To move the content analysis closer to these aspects of meaning, LIWC and PCAD content categories were selected to highlight clinically relevant meaning in the text.

Therefore, in addition to emotional categories such as anxiety, sadness and anger and hope, "cancer-related" themes including death, friends, family, sexuality and religion were added to the analysis.

Expressive writing literature is increasingly focussed on clinical populations and exploring what psychological mechanisms and moderators may be at work and what these may suggest about potential benefit and harm. Studies have made interesting links to theories on attachment (Stroebe, Schut, & Stroebe, 2006), and the Assimilation of Problematic Experiences Scale (APES; Honos-Webb, Harrick, Stiles, & Park, 2000) to posit reasons why disclosure in a time-limited intervention may be unsuitable for some. It would be valuable to apply these theories in future research, for example as a model to use in screening for vulnerable or unsuitable participants.

Participants' experiences of the intervention

When considering the benefits of expressive writing, in many ways the scripts speak for themselves. It was striking to note the extent to which participants used the expressive writing task to process their difficult experiences. Expressive writing participants often surveyed their hospital day through an emotional and personal lens, in some cases filling several pages with gusto. Neutral participants' diaries were similarly a response to the hospital situation, but as per the instructions were restricted in terms of personal content. However, given the proximity to human issues and human distress, even the neutral scripts contained sections and phrases that were emotionally meaningful. For example, one participant in the neutral condition wrote:

"The hospital ward is very clean and bright and during the morning to night, light and dark come and go. The traffic rushing by, people busy, and yet here the steady planned day has a serenity on the ward. People seem safe although there are

some patients who are confused and unaware where they are. For these people this must seem a terrifying place to be. A sad moment to reflect this was once a fit, young girl who now is a confused and frightened old lady".

This excerpt touches on emotional issues in a way that is arguably not detached and neutral as required by the writing instructions. However, given that the events occurring around patients are likely to be more emotive than the daily routine outside the ward, perhaps a neutral writing task that took the patient's mind away from the hospital entirely would be more appropriate for controlled studies in future. What this and other excerpts tells us is that women in the neutral condition sometimes found the writing task emotionally meaningful without overtly expressing emotion.

Participants' comments at follow-up shed some light on what they had gained from the experience. Many expressive writing participants viewed the writing very positively, and several reflected that *"putting your feelings and thoughts on paper"* was surprisingly helpful. One participant felt that the exercise had *"strengthened her spirit"*; another said that it had been therapeutic to write down *"the things you can't say"*. One woman reflecting that she had *"found it very therapeutic. While writing, all these thoughts came from nowhere. I would definitely recommend others to try it"*. Several participants commented that it was upsetting, but ultimately felt beneficial. Similar sentiments were expressed in a few of the actual writing scripts, at the point where participants were signing off from the intervention. Some neutral writing participants reported that they had found it useful too: *"it was something concrete to focus on that was not related to my health"*, although others expressed frustration at not being able to choose what they wrote, and said that they would have preferred to have had the space to *"open up"*.

Conducting the study on a hospital ward presented a number of difficulties, largely those arising from the distractions and demands of the illness and its treatment. This frustrated the process of both recruitment and intervention, and often tasks needed to be postponed until a medical procedure had been completed. However, in spite of these multiple complications, there were aspects of the inpatient routine which worked well with expressive writing. Where women were left to complete the writing overnight, more than one participant noted to the researcher the next day that they had completed the exercise in the early hours of the morning, when the ward was relatively quiet and they "could think". In comparison, a spoken intervention would have been harder to do in this way, and the quiet space to think and open up that the Pennebaker paradigm provided seemed in some cases to have been very valuable for patients. Based on the qualitative feedback from study, the expressive writing paradigm could be applied as a viable clinical psychosocial intervention after surgery, particularly in those cases where the writing task appeals to the patient and is felt by them to be potentially useful. Further research into the outcomes of expressive writing post-surgery is needed in order to assess the extent to which benefits may be seen among those patients who are reluctant to write; in this study such individuals tended to decline participation and therefore did not contribute to the post-intervention feedback.

The small sample size did not allow for any systematic exploration of ethnic or cultural differences in participants' responses to intervention. However, it was noteworthy that the two women who withdrew from the study strongly stating a reluctance to undertake an **expressive** writing task were both women of a non-Western ethnic group (Japanese, and Southern Asian). It is possible that either the

focus of expressive writing on the self, or the emphasis on emotional expression may have culturally been at odds with non-Western cultural beliefs.

Summary

This study was in part an exploration of the potential of written language to provide clinically relevant information about an individual's emotional experience, and in part a test of the capability of computerised methods to screen for clinically relevant emotional data. The writing that was produced by patients was personally, emotionally, and clinically revealing in very individual ways; the key challenge was to retain as much as possible of that meaning in the content analysis. Triangulation between LIWC, PCAD and the self-report methods allowed an exploratory, multi-level analysis of communicated meaning that to a large extent was representative of the content in the raw data. It may be a fruitful in future research to use these or other tools to reflect back clinically important observations to participants about their emotional states. In doing so, the expressive writing intervention may be developed further as a containing and therapeutic psychosocial intervention.

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Appendices

Appendix 1: Outline of Contributions to the Joint Study.

Outline of Contributions to the Joint Study

The study was conducted by three trainee clinical psychologists, under the supervision of a clinical psychologist in the Sub-Department of Clinical Health Psychology, UCL and a clinical psychologist in the UCLH Gynaecological Cancer Centre. The burden involved in planning and implementing the recruitment, intervention and follow-up phases of the study was shared equally between the three study researchers, with supervisor support.

During the majority of the recruitment period, the current author was responsible for consultation with ward staff regarding potential participants on surgery lists, while the other two researchers approached participants and completed baseline questionnaires. Administration of writing tasks, participant debriefing and follow up was conducted by the three researchers on a rotating basis. Analysis of the emotional content was performed by the current author. Analyses of the psychological outcomes and physical outcomes were performed by the two other trainee clinical psychologists.

Appendix 2: Confirmation of Ethical Approval.

NHS

Camden & Islington Community Local Research Ethics Committee

02 May 2007

Dr Nancy Pistrang
Senior Lecturer in Clinical Psychology

Dear Dr Pistrang

Full title of study: **Expressive writing and recovery from surgery for ovarian and endometrial cancer: A hospital diary study**

REC reference number: **07/Q0511/17**

The REC gave a favourable ethical opinion to this study on 26 March 2007.

Further notification has been received from local site assessor following site-specific assessment. On behalf of the Committee, I am pleased to confirm the extension of the favourable opinion to the new site. I attach an updated version of the site approval form, listing all sites with a favourable ethical opinion to conduct the research.

R&D approval

The Chief Investigator or sponsor should inform the local Principal Investigator at each site of the favourable opinion by sending a copy of this letter and the attached form. The research should not commence at any NHS site until approval from the R&D office for the relevant NHS care organisation has been confirmed.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

07/Q0511/17	Please quote this number on all correspondence

Yours sincerely

Committee Co-ordir

Email:

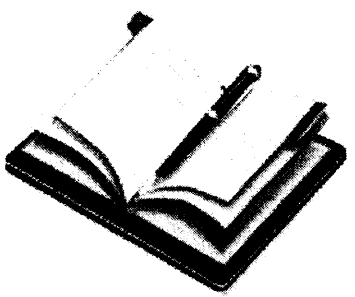
Enclosure: *Site approval form*

Copy to: *Sponsor and Research Governance contact:*

Appendix 3: Information Leaflet Given to Women at Pre-Assessment.

Hospital Diary Project

Finding out how writing may help women recover after surgery

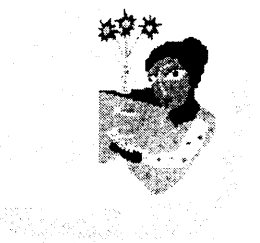


Would you like to take part?

The UCLH Gynaecological Cancer Centre

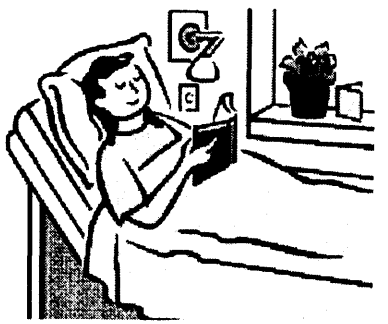
Diary Writing can have surprising effects!

Studies have shown that a simple daily writing task can be helpful for patients with conditions such as breast cancer, asthma and rheumatoid arthritis.



We are trying to find out whether writing a diary can help women after surgery for gynaecological cancer.

We invite you to try the writing task during your hospital stay.



Q: What will I have to do?

After your operation, when you are feeling ready, we'll visit you to complete a 20 minute writing task, rather like a diary. We'll only need you to write once a day, for 3 or 4 days and we'll try to make taking part as simple and stress-free as possible for you.

Frequently Asked Questions

What if I am no good at writing?

Spelling, grammar and handwriting are not important here. The most important part of the task is that you are given the private time to write.

Will my writing be kept anonymous?

Yes. Your name will not be on the writing. All project papers will be stored under lock and key away from the hospital.

What if I decide it's not for me?

If you try the writing and don't want to continue, that's fine. What we have found is that once women begin the writing task, they are happy to complete it.

Would you like to find out more?

Please speak to either:

- Lois of the project team on

- Your Clinical Nurse Specialist

- Acting Deputy Sister,

The project is coordinated by (UCH) and (UCL).

REC Reference number : 08/Q0511/17

North London Gynaecological Cancer Network

UCL Elizabeth Garrett Anderson Institute for Women's Health

UCL

Appendix 4: Information Sheet Given to Potential Participants at Enrolment.

University College London Hospitals NHS
NHS Foundation Trust

UCLH Gynaecological Cancer Centre

Version: 2
Date: 07.11.07
REC reference number: 07/Q0511/17

Hospital Diary Study

Patient Information Sheet

We are inviting you to take part in a research study looking at whether writing a daily diary while in hospital can help with recovery after surgery. Before you decide whether to take part it is important for you to understand why the research is being done and what it will involve.

Part 1 of this information sheet tells you the purpose of this study and what you will have to do if you take part. **Part 2** gives you more detailed information about the conduct of the study.

Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Part 1 of the information sheet

What is the purpose of the study?

Research has found that a daily writing task – similar to keeping a diary – may be helpful for people with medical conditions such as breast cancer, asthma and rheumatoid arthritis. However, little is known about whether writing might be useful just after surgery. This study aims to find out whether and how keeping a brief diary for 4 days might benefit women who are recovering from surgery for gynaecological cancer.

Why have I been chosen?

We are inviting all women undergoing major surgery at UCLH for gynaecological cancer to participate. Approximately 60 women will be taking part in the study.

Do I have to take part?

It is up to you to decide. If you do decide to take part you will be asked to sign a consent form and you will be given this information sheet and the signed consent form to keep. If you decide to take part you are still free to withdraw at any time and without giving a reason either to the researchers or other staff. A decision not to take part or a decision to withdraw will not affect the standard of care you receive.

What will I have to do?

If you agree to take part, you will be asked to write for 20 minutes on four days while you are in hospital, starting on the third day after surgery. To find out about whether writing is helpful, we will be comparing two different ways of keeping a diary. You will be asked to either:

(1) write about your feelings and thoughts about your surgery and illness

or

(2) write about daily activities on the ward.

Which type of diary you are asked to keep will be decided by chance (randomly). You will have an equal chance of doing either one.

To make sure that your diary is anonymous, it will be identified by a code number only and it will be put in a sealed envelope each day. It will then be transcribed into electronic form, with any identifying information removed, and the hand-written sheets will be destroyed.

We will also ask you to complete some questionnaires on the day before surgery (when you are on the hospital ward) and then one week and six weeks after finishing the diary (when you are at home). These questionnaires ask about a range of things, including how you are sleeping, the amount of pain you are in, your mood, and your feelings about yourself and others. They should take about 40 minutes to complete. In addition, on each day you do the diary, we will ask you to complete some brief questionnaires, taking about 5 minutes. A member of the research team will also look in your medical records so that we can obtain some details of your medical care.

Expenses

There will be no expenses involved in taking part. We will provide you with pre-paid envelopes for sending us the questionnaires that you complete at home.

What are the possible disadvantages or risks of taking part?

Sometimes people feel upset or distressed immediately after writing in a diary, especially if they are writing about personal thoughts and feelings. Previous studies have found that such distress does not last long – it usually goes away within an hour or so after writing. Should you feel at all upset after any of the writing sessions, a member of the project team will be available to talk to you and will make sure that you are given support if it is needed. You will also be free to stop participating in the study if you wish to.

What are the possible benefits of taking part?

We hope that you will find participating in this study interesting, but we cannot promise that you will benefit directly from it. The findings of the study should be of benefit to future patients. By learning about the ways in which keeping a diary might be helpful, we hope to improve the treatment of women recovering from surgery for gynaecological cancer.

What happens when the research study stops?

At the end of your participation in the study (6 weeks after keeping the diary), we will give you more information about it if you are interested. We will also send you a summary of our findings when the study is completed.

What if there is a problem?

Any complaint about the way you have been dealt with during the study or any possible harm you might suffer will be addressed. The detailed information on this is given in Part 2.

Will my taking part in the study be kept confidential?

Yes. We will follow ethical and legal practice and all information about you will be handled in confidence. The details are included in Part 2.

This completes Part 1 of the information sheet. If the information in Part 1 has interested you and you are considering taking part, please read the additional information in Part 2 before making any decision.

Part 2 of the information sheet

What will happen if I don't want to carry on with the study?

You are free to withdraw from the study at any time without giving any reason. If you withdraw from the study, we will use the data collected up to your withdrawal, unless you ask us to destroy it. If you decide not to carry on with keeping the 4-day diary, we will ask if you would still be willing to complete the questionnaires.

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions (see contact details below). If you remain unhappy and wish to complain formally, you can do this through the NHS Complaints Procedure. Details can be obtained from the hospital.

If you are harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone's negligence, then you may have grounds for a legal action but you may have to pay for it. Regardless of this, if you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of the study, the normal National Health Service complaints mechanisms should be available to you.

Will my taking part in this study be kept confidential?

All information which is collected about you during the course of the research will be kept confidential. A code number, rather than your name, will be used to label all data, so that you cannot be identified. Transcriptions of the anonymous diaries will be made, with any identifying information removed, and then the hand-written scripts will be destroyed. Dr Nancy Pistrang will be responsible for the safety and security of all data, which will be stored at UCL. Only the research team will have access to the data. Participants have the right to check the accuracy of data held about them and correct any errors.

Your consultant at UCLH will be informed that you are taking part in the study, and a copy of the signed consent form will be put in your medical notes. The specific information you provide will not be passed on to the consultant without your permission. The only exception to this would be if any information gives us cause for concern about your health or safety or that of others.

What will happen to the results of the study?

The project is due to be completed in October 2008, after which we can send you a written summary of the results. We intend to publish the results of the study in doctoral theses and in a scientific or medical journal. You will not be identified in any report or publication.

Who is organising and funding the research?

This study is a collaboration between researchers at University College London and clinicians at University College London Hospitals NHS Trust. It is being conducted as part of the doctoral research of three post-graduate students in clinical psychology at UCL, with a small amount of funding from UCL.

Who has reviewed the study?

All research in the NHS is reviewed by a Research Ethics Committee (an independent group of people) before it can proceed. This study has been reviewed and given favourable opinion by the Camden and Islington Community Local Research Ethics Committee.

Further information and contact details

Please do not hesitate to contact one of the project team members for further information or if you have any questions about the study.

Dr Nancy Pistrang
Senior Lecturer in Clinical
Psychology

Lois Thomas
Trainee Clinical Psychologist
07806 768962
ucjtlrt@ucl.ac.uk

Thank you for taking the time to read this information sheet. Please keep it for future reference.

Appendix 5: Informed Consent Form.

University College London Hospitals NHS
NHS Foundation Trust

UCLH Gynaecological Cancer Centre

Version: 1
Date: 23.02.07
REC reference number: 07/Q0511/17
Patient Identification Number for this study:

CONSENT FORM

Title of Project: Hospital Diary Study

Name of Principal Investigator: Dr Nancy Pistrang

		Please initial box
1.	I confirm that I have read and understand the information sheet dated.....(version.....) for the above study and have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2.	I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected.	☐
3.	I agree to my hospital consultant being informed of my participation in the study.	☐
4.	I understand that the daily diary that I write will be analysed by computer in an anonymous form, together with writing from other patients. I give permission for quotations from my writing to be used in reports or scientific publications, with all names and other identifying information removed.	☐
5.	I agree to take part in the above study.	☐

Name of Patient	Date	Signature
Name of Person taking consent	Date	Signature

When completed: 1 for patient, 1 for researcher site file, 1 to be kept in medical notes.

Appendix 6: Writing Instructions as given to participants in each condition.

Writing Instructions as given to participants in each condition

Instructions for Expressive Writing Condition:

What we would like you to write about for these four sessions are your deepest thoughts and feelings about your surgery or illness. You might think about all the various feelings and changes that you have experienced before being diagnosed, after diagnosis, before surgery and now. Whatever you choose to write, we want you to really let go and explore your very deepest emotions and thoughts. Ideally, we would like you to focus on feelings, thoughts or changes that you have not discussed in great detail with others. You might also tie these thoughts and feelings to other parts of your life i.e. your childhood, people you love, who you are, who you want to be etc. Again, the most important part is that you really focus on your deepest emotions and thoughts. The only rule we have is that you write continuously for the entire time. If you run out of things to say, just repeat what you have already written. Don't worry about grammar, spelling, sentence structure or crossing things out. Just write.

Instructions for Neutral Writing Condition.

What we would like you to write during these four sessions is a factual account of life on the ward during the last 24 hours. For instance, you may choose to describe the daily routine or timetables of activities, the different people on the ward and what they have been doing, the hospital food, the physical surroundings etc. The most important part is that you describe what is happening as a 'detached observer', rather than write about your own personal thoughts and feelings. The only rule we have is that you write continuously for the entire time. If you run out of things to say, just repeat what you have already written. Don't worry about grammar, spelling, sentence structure, or crossing things out. Just write.

Appendix 7: Gottschalk-Gleser Anxiety Scale.

Gottschalk-Gleser Anxiety Scale

(Description with weightings adapted from the PCAD 2000 manual (Gottschalk & Bechtel, 2002).

1. Death anxiety -- references to death, dying, threat of death, or anxiety about death experienced by or occurring to:
a. self (3).
b. animate others (2).
c. inanimate objects (1).
d. denial of death anxiety (1).

2. Mutilation (castration) anxiety -- references to injury, tissue or physical damage, or anxiety about injury or threat of such experienced by or occurring to:
a. self (3).
b. animate others (2).
c. inanimate objects destroyed (1).
d. denial (1).

3. Separation anxiety -- references to desertion, abandonment, ostracism, loss of support, falling, loss of love or love object, or threat of such experienced by or occurring to:
a. self (3).
b. animate others (2).
c. inanimate objects (1).
d. denial (1).

4. Guilt anxiety -- references to adverse criticism, abuse, condemnation, moral disapproval, guilt, or threat of such experienced by:
a. self (3).
b. animate others (2).
d. denial (1).

5. Shame anxiety -- references to ridicule, inadequacy, shame, embarrassment, humiliation, overexposure of deficiencies or private details, or threat of such experienced by:
a. self (3).
b. animate others (2).
d. denial (1).

6. Diffuse or nonspecific anxiety -- references by word or phrase to anxiety and/or fear without distinguishing type or source of anxiety:
a. self (3).
b. animate others (2).
d. denial (1).

Appendix 8: Gottschalk-Gleser Depression Scale.

Gottschalk-Gleser Depression Scale

(Description with weightings adapted from the PCAD 2000 manual (Gottschalk & Bechtel, 2002).

Appendix 9: Gottschalk-Gleser Hostility Scale.

Gottschalk-Gleser Hostility Scales: Hostility Directed Outward (Overt and Covert) and Hostility Directed Inwards.

(Description with weightings adapted from the PCAD 2000 manual (Gottschalk & Bechtel, 2002).

Appendix 10: Gottschalk-Gleser Hope Scale.

Gottschalk-Gleser Hope Scale

(Description with weightings adapted from the PCAD 2000 manual (Gottschalk & Bechtel, 2002).

Appendix 11: Gottschalk-Gleser Health/Sickness Scale.

Gottschalk-Gleser Health/Sickness Scale

(Description with weightings adapted from the PCAD 2000 manual (Gottschalk & Bechtel, 2002).

Appendix 12: Gottschalk-Gleser Human Relations Scale.

Gottschalk-Gleser Human Relations Scale

Description with weightings adapted from the PCAD 2000 manual (Gottschalk & Bechtel, 2002).

Appendix 13: Excerpts from Expressive Writing Scripts by Participant A.

Excerpts from Expressive Writing Scripts by Participant A.

Session 1. I have never really thought that I would be a victim of cancer [...] It seems so unfair having just got over a terrible year [...] Surely I had been dealt a bad enough hand. [...] How come I am here? Where is the fairness in life – no where. [...] It has all happened so fast that I have hardly had time to think [...] Now it is done and I feel very scared but I know I will recover. I do want to go back to normal life. [...] I want to fight that but I don't know how the chemotherapy will be. I just trust the disease has not gone further. If this is the result I will cope. [...] It is so frightening to think of what has been going on inside my body with me being so unaware. [...] What I most appreciated are my darling children and good friends. I feel carried by them and keep optimistic. [...] It is painful, fearful and can easily take over your life, but I am determined that it doesn't. I want to face it as a hurdle like others in life – unwanted but not insurmountable. [...]

Session 2: Today it is beginning to sink in how mammoth this operation has been. [...] I talked to the young doctor who has seen me through all this [...] He said look at this like a marathon not a sprint and I think that is good advice. [...] What I find most difficult to accept is the stoma. I find it quiet disgusting and shocking [...] I am surprised I do not feel bitter about all of this but what use is bitterness? Life is unfair. I see it more as a test I have to go though and hope that I come out the other end as a more compassionate person. [...] There is so much of interest in the world outside. I do not want to wallow in self pity looking at my own navel [...]. What I am sure about is modern medicine in all it's breadth of forms, is fantastic when it is possible to be patched up and set back on track. [...]

Session 3: I am on a rollercoaster of feelings. This morning I felt buoyed up by the surgeon's remarks [...] Now later in the day [...] It is sinking in more and more how much I have to overcome. It will really test me and my optimism. [...] I have really started a nightmare with much more still to face. [...] I suppose inside me is rising some sense of anger – why me? But everyone must ask this, think the same thoughts and there is no answer [...] I have been so struck by how good my friends are to me, the cards and visits, their sincerity. [...]

Session 4: Yesterday I felt very upset and weak after completing my writing but pulled though when one of my best friends turned up and took me out of it all. I cannot believe I have so many true, deep friends and the sense of love they pervade [...] It is something I do not take for granted. [...] I feel realism is creeping in more and more. I had underestimated this operation and all that follows [...] It does not help hiding the truth. Today I feel tired having so much to face. Somewhere I will find strength, I must be patient. [...] I have met a neighbour here going through similar experiences[...] We have decided to exchange telephone numbers as it may well be very useful and supportive. I am encouraged by others I know who have gone through this and similar and come out the other end.

Appendix 14: Excerpts from Neutral Writing Scripts by Participant B.

Excerpts from Neutral Writing Scripts by Participant B.

Session 1. The ward is very busy at different times. Mornings very busy, night nurses having to handover to day nurses. Providing all medications, ensuring patients have everything they need. [...] This can be before breakfast which arrives at 8:30am, after which nurses assist patients with their personal hygiene, making beds etc. [...]. Then lunchtime. Other people come to see you such as people to take your blood, pharmacists, physiotherapists, radiologists to go for x-rays and also your visitors. After lunch, medication time for some. Rest time. Later on in the afternoon the tea trolley will come around. After which there would be more medication if needed. Then teatime.

Session 2: 6am onwards. Very quiet this morning not the usual hustle and bustle as usual. Nurse due to come around to do blood pressure, temperature etc then medication time. [...] Breakfast arrives, cereal and toast, tea or coffee. [...] Getting a bit more busy. Nurses now rushed off their feet, how things change in a matter of 2 hours. [...]Lunch time now [...]. More medication. Visitors popping in and out. [...]

Session 3: Yesterday evening not feeling well at all. Not interested in what is happening around me. Very quiet during night, no buzzers going off. Quieter evening. [...]. Nurses completing their rounds of observations – blood pressure, temperature oxygen level. Breakfast trolley, usual food. Tea trolley[...] Medication time mid-morning which everyone looks forward to: painkillers. On ward doctor doing rounds. Nurse came round to take off dressings, do drips, make beds. Cleaner in and out of bays, completing their tasks here all day, very good. Haematology doing their rounds collecting blood. Man came round to give out lunch and supper cards to complete for tomorrow meals. Everybody chatting to each other on the wards.

Session 4: Monday morning, very busy again. Senior nurses on ward again very early. Nurses taking observations, giving medication. Consultants making their ward rounds, very early as well. [...] Man comes to change everybody's water jug. Cleaner comes around to do her fantastic job. Haematology arrive, great: do not need my blood today. Nurses come to give medication and to do observations. After, they have to change all beds. Physiotherapist arrives to assist with exercises[...] Everybody has naps after lunch. Nurse comes to do observations again, and more medication. Oncology nurse also visits. Nearly teatime.
