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Written Prayers in a Pediatric Hospital: Linguistic Analysis

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Previous research suggests that written prayers have linguistic characteristics similar to written emotional self-disclosures, and may also confer their health benefits. This study's aim was to test that hypothesis in a clinical setting; a secondary aim was analysis of prayer content. Written prayers in a pediatric hospital chapel were collected ($N = 800$). Linguistic analysis provided the percentages of word types previously associated with health benefits. Prayers written in this clinical setting do not share linguistic characteristics of written emotional disclosures. These petitionary/intercessory prayers have a significant amount of positive emotion words; more words of causality than insight; and are frequently specific about desired outcomes. The prayer language suggests that the writers expect some result from the Deity or other readers of the prayer book. Prayers written in pediatric and adult settings differ in some respects. Clinical implications and future directions are discussed.

Keywords: prayer, disclosure, linguistics, emotional expression, pediatrics

People believe prayer helps them cope with stressful experiences (Levine, 2008). In fact, Harrison and colleagues reported that persons in 42-79% of published studies have used religious beliefs to cope with an illness (Harrison, Koenig, Hays, Eme-Akwari, & Pargament, 2001), and only 10% of Americans reported that they never pray (Levine, 2008). There have been numerous studies examining the relationship between health outcomes and the use of prayer; two excellent reviews of the literature relate religious coping and psychological outcomes (Ano & Vasconcelles, 2005) and to relate prayer with the ability to tolerate stressful events (Levin, 2008).

Early studies of how prayer helps people cope examined mostly distal, observable aspects of prayer, such as frequency and typology of prayer, although in practice, clear distinctions between types of prayer are academic rather than practical (Poloma & Pendleton, 1989; Stern, Canda, & Doershuk, 1992). However, distal aspects of prayer is a limited approach and does not allow the proximal aspect of prayer to be examined—the actual content of prayer. One means of overcoming that difficulty is to study written prayers, which a number of authors have done in either a congregational setting (Ap Sion, 2008) or in a health care setting (Cadge & Daglian, 2008; Grossoehme, 1996; O'Reilly, 1994). Tanya Ap Sion presented the results of studying 1,067 written prayers from a rural Anglican parish in England (Ap Sion, 2008). She concluded that health concerns constituted a significant portion of the prayers, and that prayers tended to be oriented more toward others than one's self. Prayers for health and well-being tended to have objectives

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that were made explicit in the prayer. She further concluded that as a place in which members of the region could come and write prayers, the church had an important role in community life above and beyond its ritual or public services. The content of written prayers in hospitals have been studied as a means of establishing community (even if not in person, but through reading others' prayers) among people also experiencing stress and suffering (O'Reilly, 1994), and the characteristics of prayers written in a pediatric hospital chapel (Grossoehme, 1996). In that study ($N = 63$ prayers), Grossoehme found that the language suggested that writers imagined a God who was accessible to them, interested in their concerns and was expected to be responsive to them. He noted a lack of specificity in the prayers, suggestive of the belief that God did not need to be informed of the person's condition, but already knew it. The majority of prayers in that study concerned healing. Another recent study of written prayer by Cadge and Daglian (2008) in which they presented the results of a study of 6 years of written prayers from the hospital chapel at Johns Hopkins Medical Center. They found that prayers were written primarily to thank God, make requests of God (or both). Prayers in this study were written in language that allowed for a variety of interpretations concerning the prayer's outcome. Overall, the language in the prayers revealed a God who could be imagined as accessible to people, benevolently inclined toward them and supportive (Cadge & Daglian, 2008), similar to Grossoehme's study noted above.

There is a theory that prayer is a means by which people create a coherent narrative of their experience (cite) and the creation of this narrative is associated with improved health outcomes (Pennebaker, 1993). Research on written emotional disclosure shows associations with physical and mental health benefits (Pennebaker, 1999; Pennebaker, Kiecolt-Glaser, & Glaser, 1988; Pennebaker, Mayne, & Francis, 1997). Pennebaker (1999) proposed that four linguistic characteristics of emotional disclosure were associated with such health benefits. These are words denoting positive emotions (e.g., happy, glad, joy); negative emotions (e.g., angry, sad, wrong); words employed in causal statements (e.g., because, infer, thus); and expressions of insight (e.g., realize, understand). The important of these four categories was theorized by Pennebaker as follows (Pennebaker et al., 1997). The construction of a narrative about an experience forces the experience to be structured, the process of which promotes understanding and integration of an event and decreases the level of emotionality. This process of constructing a narrative is though to have two important components. First is the process of constructing a coherent, understandable narrative. Two dimensions of a written narrative text were expected to quantify the creation of a coherent narrative, self-reflective (insightful) thinking and causal thinking. The second component is that identification and naming of one's emotions, which are thought lower the level of arousal associated with the event and to assist in the integration of one's emotional responses into their constructed narrative of the event. With this rationale, VandeCreek and colleagues speculated that written prayers may function in a similar manner to written emotional disclosures of traumatic events (Pennebaker et al., 1997; VandeCreek, Janus, Pennebaker, & Binau, 2002). They performed linguistic analysis of three types of texts (prayers, letters to God, and written emotional disclosures) written by graduate theology students regarding the most difficult experience in the writer's life. The purpose was to explore whether writing prayers for help with difficult personal experiences (a definition of petitionary prayer) functioned as emotional disclosures to God. Findings suggested that the written prayers were both linguistically similar to, and different from, written emotional disclosures. Specifically, the rates of causal expressions and negative emotions in written prayers were similar to rates in written emotional disclosures, while insightful expressions and positive emotions occurred more frequently in written prayers. VandeCreek and colleagues accepted the data as suggesting that writers of prayers and emotional disclosures share certain linguistic features and that writers of prayers may also share in the personal benefits associated with written emotional disclosures. However, the participants in that study were graduate students in three denominational seminaries. They can therefore be assumed to have a more sophisticated theological language than an average person. They also wrote under controlled conditions, and were recalling a significant and difficult event from which they were well-separated in time.

These aspects VandeCreek and colleagues' study leaves open the question of any similarity between prayers written in the midst of stressful conditions compared with prayers about past events, and whether prayers written under laboratory conditions are similar linguistically to those written under actual conditions.

One means of overcoming those two limitations is to study prayers written in open notebooks hospital chapels, where they are a common feature. Such notebooks may be an underappreciated means of expressing one's self and accruing whatever benefits stem from self-expression (in addition to any benefits from Divine response to one's prayers). The specific aim of this study was to test the hypothesis that spontaneously written prayers contained in an open-format notebook in a pediatric hospital chapel will share the linguistic properties associated with written emotional disclosures.

Method

Setting

Application to the hospital's Institutional Review Board (IRB) was made and the IRB determined this study did not require IRB oversight (because of the public nature of the prayer book in the hospital chapel). The setting for this study was a 478-bed Midwestern United States pediatric medical center with a primary service area of 5 counties, although it draws patients from across the United States and more than 80 other nations. It is a religiously pluralistic environment, although patients and families from the immediate service area tend to be Christians, especially Roman Catholic, Baptist, and nondenominational Christians. The medical center has two adjacent chapels located off the main hospital corridor: an interfaith chapel and a Christian chapel, "The Chapel of the Holy Child." The prayer book is located on a small table at the entrance to the Christian chapel, thus likely precluding the likelihood that prayers would be written except by Christians, despite the presence of numerous persons of other faiths in the Hospital. The book lies open, and each page has a heading, "Prayer and remarks." No guidance is given on what can be written in the prayer book. Those who chose to write in the book essentially self-define what "prayer" is to them. Space is available to write the patient's name and room number by each prayer if the writer chooses to do so. Although potentially identifying data was separated from the prayers as described below, the wording of the prayers indicates that the majority (81%) were written by parents of patients, 10% by grandparents, 4% by employees, 3% by patients, and 3% by other family members or was indeterminate.

Procedure

The staff chaplain responsible for the periodic removal of pages of prayers from the open notebook in the hospital chapel provided 6 months of pages to the first author. Each prayer was sequentially numbered with an alphanumeric identifier and transcribed into text files. Even a cursory review of the prayers showed that some individuals wrote only a single prayer over the 6-month time span while others had written multiple prayers. It seemed plausible that there would be very different circumstances between writers who authored one prayer or multiple prayers and that those circumstances might affect their relationship with (and hence, words to) God. Multiple prayers, for example, imply a longer length of stay and a chronic disease (e.g., leukemia), compared with a single prayer, which implied a short length of stay and an acute condition (e.g., asthma or appendicitis). The prayers were separated into two groups by the first author: those prayers that were single occurrences (one person who wrote one prayer in this body of texts; hereafter referred to as "Singles") and those prayers that were part of a series of multiple prayers by a single author (hereafter referred to as "Multiples"). This was based on continual comparison of the person named in the prayers (which occurred in all but a few cases) and changes in handwriting from one writer to the next. A MANOVA test was performed to see if the linguistic characteristics of these two groups were significantly different to warrant further analysis separately if all prayers were sufficiently similar to be analyzed as a single group.

Analysis

The reading level on which the prayers were written was determined by using the Fry Readability Graph (Discoveryschool.com, 1995). Because of the brevity of individual prayers,

several randomly chosen sets of sequential prayers were grouped together to reach the 100-word groupings within which to count syllables and number of sentences.

Linguistic analysis of the texts was performed using Linguistic Inquiry and Word Count (LIWC) 2007 software (Pennebaker, Francis, & Booth, 2008). LIWC provides a standardized, computer-based method for examining narratives. LIWC has a dictionary of over 2,200 words and word stems, and distinguishes 72 linguistic characteristics (past tense, verb, positive emotions, social, health), with each word or word stem having one or more of those characteristics assigned to it. For each recognized word in the target text, the score for that characteristic is increased by one in the LIWC program. The program reports the percentage of the total words in the prayer represented by each linguistic characteristic. The resulting data are percentages of the total words in a text that are incremented in various categories. The psychometric properties of LIWC are established (Pennebaker & King, 1999), (Pennebaker et al., 1997). Because of the number of unrecognized words in the LIWC 2007 standard dictionary (primarily medical words, such as "pulmonary" or "ventilator"), the authors customized the LIWC dictionary to code unrecognized medical words by reaching consensus on their linguistic characteristics to be assigned to each word. Permission to analyze data from VandeCreek et al. (2002) was obtained (personal communication, October 10, 2008). Statistical analyses consisted of two phases, which included exploratory data analysis and testing differences in the current cohort (Multiples and Singles) and the emotional disclosures (referred to as Disclosures) written by the cohort studied in VandeCreek et al. (2002). Results were considered statistically significant at $\alpha = .01$. All statistical analyses were implemented in SAS 9.1.3 (SAS Institute, Cary, NC).

The distribution of word percentages for each group and the four linguistic characteristics was not normally distributed. We used a nonparametric approach designed for unbalanced multivariate data in a one-way layout to compare each of Multiples and Singles to Disclosures (Munzel & Brunner, 2000). This test is based on differences between distributions for each comparison, where the differences are described by relative effects. The analysis can be explained as follows: First, we ranked all of our word percentage data. Next, we generated ANOVA-Type *F*-statistics (ATF) for group, characteristic, and the interaction of group and characteristic using the MIXED procedure (Brunner, Dimhof, & Langer, 2002). For each collection of group and characteristic ranked data, a relative effect estimate was calculated to gauge the tendency of the distribution to have values above or below the other distributions. We also calculated least square (LS) means and standard errors of the ranked data, medians, and a 99% confidence interval (CI) for each group and characteristic relative effect. We concluded that two distributions were significantly different from each other if their corresponding CIs did not overlap.

Results

Description of Prayers

The sample consisted of a total of 800 prayers that had been written over a 6-month time span; 509 of which were Single prayers (defined as a prayer written by one person one time in the sample), and 291 prayers that were written by 57 individuals (called Multiples, defined as two or more prayers written by a single writer in the sample). Within the Multiples group, the number of prayers written by any individual ranged from 2 to 22, with the mean number of prayers written being 4 ($SD = 4.5$). The mean number of words per prayer was 220 ($SD = 262$) and the mean number of words per sentence was 10 (SD 2.6). The reading level was relatively low, with Multiple prayers being written on a 3rd grade level (8- to 9-year-old level), and the Single prayers being somewhat lower at a 1st grade or 6-year old reading level.

There was a significant group by linguistic characteristic interaction (ATF: 135.96, num *df*: 4.61, den *df*: 262, $p < .0001$). Based on relative effect estimates and 99% CIs, a similar degree of causality was present in Multiples, Singles, and Disclosures; however, Multiples' prayers had a significantly higher percentage of causal words than Singles' prayers (Respective group medians: 1.92 and 0%). Both Multiples and Singles tended to express significantly less insight (Respective group medians: 0.89 and 0%)

and negative emotion (1.69 and 0%) than the Disclosure group (Respective characteristic medians: 2.93 and 3.24%). However, texts from Multiples and Singles had significantly more positive emotion than found in written disclosures (12.50 and 11.76 vs. 1.85%). Combining Multiples and Singles word percentages and comparing them to Disclosures yielded similar conclusions (Table 1).

Certain linguistics characteristics of these texts provide a means of describing their contents. The prayers contained a relatively high percentage of "social" words (22%; $N = 6635/30157$) (e.g., family, friends, communication) and were more frequently oriented to the present (14%; $N = 4222$ of the total words) compared to the past (0.8%; $N = 241$) or the future (1.6%; $N = 482$). Religious words accounted for 7.4% ($N = 673$) of the words used in the prayers, and the words related to death was almost zero (0.1%; $N = 30$). It should be noted, however, that there were occasional (<10 occurrences) of euphemisms for death (e.g., ". . . don't take him . . ." or, ". . . as she passes to you") that the LIWC 2007 software would not recognize. The prayers in the present study used more words of causation (e.g., because, effect, hence) rather than insight (e.g., think, know, consider).

Discussion

The findings from this study are that written prayers in a pediatric hospital chapel prayer book do not share the linguistic characteristics of written emotional disclosures. This is true whether an individual writes only one prayer or whether they write a series of prayers over an extended time span. This latter finding was the opposite of the study's hypothesis, which posited that a series of prayers written over time would share the linguistic characteristics of a written emotional disclosure as suggested by the work of VandeCreek and colleagues. We have evidence that written prayers contain emotional content, just as Pennebaker's model suggests that writing allows persons to access and express their emotions. However, it appears that written prayers and written emotional disclosures are qualitatively different writing genres, contrary to the suggestive conclusions of VandeCreek and colleagues. Applying this model to the genre of written prayers may not be suitable.

However, this study contributes to understanding of the content and framing of prayers by persons experiencing the hospitalization of their child. Given the relative paucity of data about the content of prayer, our findings shed light on this topic. The writers' concept of the

Table 1
Median, Mean Rank, and Estimated Relative Effects for Percentage (%) of Total Words in Each Linguistic Characteristic

Cohort	Linguistic category	Median word % (min, max)	LS-mean ranks (*SE*)	Estimated relative effect (99% CI)
Multiples ($N = 57$)	Causality[†]	1.92 (0, 13.95)	1157.42 (47.89)	0.4919 (0.4401, 0.5439)
	Insight[*]	0.89 (0, 4.17)	919.34 (43.21)	0.3907 (0.3430, 0.4407)
	Negative Emotion[*]	1.69 (0, 6.98)	1049.25 (46.82)	0.4459 (0.3956, 0.4974)
	Positive Emotion[*]	12.50 (3.12, 19.44)	2018.56 (25.05)	0.8580 (0.8286, 0.8827)
Singles ($N = 509$)	Causality[†]	0 (0, 20)	952.70 (24.78)	0.4049 (0.3846, 0.4257)
	Insight[*]	0 (0, 13.89)	789.21 (21.48)	0.3353 (0.3142, 0.3577)
	Negative Emotion[*]	0 (0, 20)	961.74 (23.76)	0.4087 (0.3888, 0.4291)
	Positive Emotion[*]	11.76 (0, 42.11)	1942.60 (18.41)	0.8257 (0.8080, 0.8400)
Combined ($N = 800$)	Causality	0 (0, 20)	973.32 (22.93)	0.4136 (0.3957, 0.4319)
	Insight[*]	0 (0, 13.89)	802.32 (19.86)	0.3409 (0.3214, 0.3615)
	Negative Emotion[*]	0.50 (0, 20)	970.55 (21.90)	0.4124 (0.3948, 0.4305)
	Positive Emotion[*]	11.88 (0, 42.11)	1950.25 (16.77)	0.8290 (0.8131, 0.8413)
Disclosures ($N = 22$)	Causality	1.08 (0.35, 2.13)	1038.91 (11.50)	0.4415 (0.4145, 0.4689)
	Insight	2.93 (2.23, 4.83)	1374.16 (27.07)	0.5840 (0.5498, 0.6175)
	Negative Emotion	3.24 (1.40, 5.13)	1368.05 (40.07)	0.5814 (0.5348, 0.6266)
	Positive Emotion	1.85 (0.98, 3.73)	1170.95 (28.66)	0.4976 (0.4604, 0.5349)

[†] Multiples and Singles significantly different at $\alpha = 0.01$. [*] Significantly different from Disclosures at $\alpha = 0.01$.

Deity (accessible, listening, familiar, and intervening) is similar to that of Cadge and Daglian (2008). Although the writers in the present study were primarily experiencing the hospitalization of a child (presumably a spiritually and emotional stressful experience) the prayers expressed a great deal of thanksgiving. In that respect, they share similarities with what VandeCreek and colleagues reported, that the prayers written in their study had a higher percentage of positive emotion words than written emotional disclosures. It is possible that the writers in the present study were trying to appear positive before the Deity; or that they were avoiding expressions of anger, sadness, or whatever might be construed by the Deity as a lack of faith. This could reflect their unwillingness to express anything that might offend the Deity; therefore, change the child's outcome for the worse (also noted by Cadge & Daglian, 2008). It could also reflect following their faith tradition's precepts to trust the Deity in all things, and or their ability to experience multiple emotions simultaneously. What image the writers hold of the Deity (e.g., the Deity is not to be angered or questioned), and how that image affects the way they operationalize their beliefs (e.g., stay strong and positive; don't demonstrate a lack of faith) are important issues for clinicians to assess on an individual basis.

The relative balance between words of causation and insight suggest that causing the situation to change is a higher priority in the midst of an event than understanding it. The subjects in VandeCreek et al.'s (2002) study, writing prayers about a past event, had different results. Taken together the balance between these two linguistic characteristics suggests that the content of prayers change over time from the immediate moment (in which causal words come to the fore), to praying about an event in one's in past (in which words of insight increase). This has implications for clinicians, for whom sensitivity to people's concerns and interests is important to guide their conversations and interventions. One should also be cautious about intervening in such a way that people are prematurely brought out of their concern for the immediate present toward insight or other emotions (e.g., anger) or implications of the event before those persons are emotionally or spiritually ready to make that transition.

There are several limitations to this study. The linguistic analysis software only provides figures for the frequency of word use. It does permit some comparisons of our written prayers with other examples of writing, but it neglects the issue of context. Although there is a relatively large sample of prayers in this study, the fact they come from a single site makes the study liable to regional religious and cultural influences, and limits the ability to generalize the findings. Individual author characteristics and information were not included in analysis data, for the sake of confidentiality. In addition, the open notebook format itself may exert at least two effects: it may influence what is subsequently written and prayed about if the writer reads previous entries; and the public nature of the notebook is such that although one may write a prayer anonymously, whatever is written is obviously available to be read by anyone entering the Chapel.

However, certain conclusions can still be drawn. People expressed substantially more positive emotions than negative, and tended to be focused on the present situation. Most of the prayers were of intercession or petition, and thanksgiving. Their prayers suggest belief in a Deity who either wants to know or needs to be told explicitly what is happening in people's lives. This study demonstrated that extemporaneous prayers written in a pediatric hospital prayer book do not generally share the linguistic characteristics associated with written emotional disclosures. Therefore, it is not clear that such prayers would share in the health benefits associated with disclosures (though they may offer different benefits that the writers may experience as religious benefits). However, the open prayer notebook format is frequently used by persons as a means of petitioning or expressing thanksgiving to the Deity, who is conceptualized as being interested in the current situation of the writer. With regard to health and health care settings, understanding written prayer offers guidance to practitioners about the most effective ways in which to interact with persons experiencing difficult life events such as the hospitalization of a loved one. Practitioners may also recommend writing one's prayers to some people as a potentially helpful tool for them during these events. Future research directions include understanding the role and purpose served by writing in such a prayer book, and further exploration of differences because of the

situation of adult versus pediatric settings. Further work, possibly including cognitive interviewing of people who have written in open hospital prayer books, is needed to elucidate exactly what role open prayer books play in the hospital experience and how they can best be utilized to facilitate helping families cope during such a difficult time in their lives.

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