32 Symptoms, Secrets, Writing, and Words

James W. Pennebaker

I was born and reared in Midland, Texas, a small West Texas town fueled by new oil fields, optimism, ambition, alcohol, and greed. My parents, a lawyer and a *bon vivant* who were newly married, had moved there from New Orleans and Boston to take advantage of the oil boom – just like other new Midlanders. Most people we knew were temporary, coming and going once they made their fortune or were transferred by their oil companies, but my parents had come to stay. Mine was a Tom Sawyer-like childhood of adventures and social and scientific experiments and fire-setting, often bordering on delinquency.

I started college at the University of Arizona with the vague ambition of becoming a lawyer. I began as a music major but soon switched to math. Then philosophy and, after that, sociology. Oh, and anthropology. My most valuable course was meteorology (ask me about isobars and the Coriolis Effect). After two years I transferred to Florida Presbyterian College (now called Eckerd College), a hippie college at the time, with my girlfriend, Ruth.

It was in the move from Arizona to Florida that my professional life came into focus. At a stopover in Austin, I found a used copy of Krech, Crutchfield, and Livson's *Introductory Psychology*. It opened a new world. The chapter on social psychology – especially the works of Milgram, Darley and Latané, and Schachter – bowled me over. It was a discipline that celebrated a broad perspective, social dynamics, and biological processes, while keeping an eye toward addressing real-world problems, all with a sense of fun and panache.

At Eckerd, I was introduced to research by Ted Dembroski, a social psychologist, and James MacDougall, a physiological psychologist. I briefly became a True Believer in behaviorism and loved taunting my philosophy friends about the nature of meaning which was nothing more than positive reinforcement. Things were so simple. I performed brain surgery on rats and mice and was forever changed by watching a rat press a bar that stimulated its pleasure center until it collapsed.

In 1972, I applied to several graduate social programs emphasizing my interests in physiological, learning, and social psychology. None were seeking someone so unfocused. The following year, I applied again and was more successful. I still remember the letter from Elliot Aronson accepting me into the UT Austin graduate

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program. Within a week, Ruth – now my wife – was accepted into UT's law school and we soon headed for Austin.

In 1973, social psychology was in flux. Motivation and drive theories were out, cold cognitive models were the rage. Freud was heresy, Lewin was a distant memory, and even dissonance was slipping from the journals. The orange attribution book by Jones et al. (1972) served as our generation's Little Red Book. This theoretical pivot was a bit of a problem for someone like me who was truly interested in physiology, learning, social behaviors, and emotions.

My path diverged from the mainstream early on. The day I arrived at UT, I met with Elliot who told me that he had accepted a job at UC Santa Cruz and wouldn't be taking students with him. A senior graduate student, David Krantz, urged me to talk with David Glass who was starting to study Type A personality, heart disease, physiology, and stress. Glass was the new chair of the psychology department who had been recruited from NYU the year before. In almost no time, he had collected a group of graduate students who were remarkable: Krantz, Karen Matthews, Charles (Chuck) Carver, Mel Snyder, Audrey Burnam, Rick Gibbons, among others. The group was beginning to study heart disease, a significant real-world problem, by focusing on personality processes, emotion, and interpersonal conflict. Unlike most labs, we had a phenomenon in search of a theory, not the other way around. None of us knew at the time but Glass had brought together some of the founding members of health psychology.

After working on Type A for almost two years, Glass announced he was leaving Texas for another job. For me, this was an opportunity to begin setting up my own research team to study the psychology of physical symptom reporting – a topic of personal relevance since I had grown up with a mother who was obsessed with her own symptoms. Rather than work with another faculty member, my strategy was to simply talk with people across all areas to get their input on the projects I was doing. Three people were particularly important mentors. Devendra Singh, a physiological psychologist, educated me about the limbic system and brain mechanisms associated with behavioral inhibition. Arnold Buss, the father of David Buss, was a powerful influence in my thinking about personality, evolution, and science in general. Bob Wicklund, a traditionally trained social psychologist, pushed me to be more theoretically focused and to think about the nature of attentional focus and the self.

One other person of great importance was Dan Wegner. Dan had just started a new job at Trinity University in San Antonio. On a visit to Austin, we met and immediately became fast friends. His ideas and demeanor were both quirky and innovative. Over the next four decades we educated and entertained each other as we developed our overlapping ideas of thought suppression, expressive writing, and much more.

The Early Years: The Psychology of Physical Symptoms

My first job was at the University of Virginia in 1977. Seven years earlier, the courts had forced UVA to admit women undergraduates. Rather than reduce the number of

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men, the school essentially doubled its enrollment over the next few years. In so doing, they also doubled the size of the faculty. The psychology department quickly hired a large number of eminent and, oftentimes, sketchy senior faculty, many of whom did not fit in at other universities. Although there was often great turmoil in the department, I felt free to pursue my interests surrounding physical symptoms and their links to physiological and social processes.

The symptom research soon took off. The central question was why and when do people report everyday physical symptoms such as racing heart, shortness of breath, headache, sensations associated with hunger, etc. On what internal physiological signals do people rely in making their judgments? People's perceptions of heart rate, hand temperature, hand sweatiness, blood glucose levels, and muscle tension were poorly correlated with their presumed physiological referents. Darren Newtson, my closest colleague in the early years, spent hundreds of hours talking with me about J. J. Gibson's perceptual approach, which fit nicely with what I was finding with symptoms: that is, our perception of physical symptoms was based on a host of cues – physiological and situational and whatever other information was available to us.

The symptom research was going well. My students (including Andy Skelton and Linda Gonder-Frederick) and I were publishing broadly. I began to write a book, *The Psychology of Physical Symptoms*, that came out in 1982. Just before it went to press, I realized I needed a chapter on the personality and psychological profiles of people who tended to report the most physical symptoms. With the help of a visiting faculty member, Billy Barrios, and two undergraduates, Cobie Hendler Whitten and Pam Grace, I devised an all-encompassing questionnaire that asked people about their childhoods, eating, sleeping, and dating patterns, and other topics. As we were brainstorming about possible questions, one student suggested, "Prior to the age of 17, did you have a traumatic sexual experience (e.g., rape, molestation)?"

And, like that (snap finger here), my career changed. The survey went out to 800 undergraduates. The 15 percent who endorsed the sexual trauma question were far more likely to report physical symptoms of all kinds and to have visited the university health center. Over the next three years, other surveys were completed by thousands of people of all ages and the effects were even more compelling. Both women and men who had had early traumatic sexual experiences were far more likely to have been hospitalized the previous year and to have been diagnosed with virtually every illness we asked about (e.g., cancer, high blood pressure, ulcers). Later studies found that it wasn't a sexual trauma per se that caused health problems but, rather, having any kind of major upheaval that people kept secret.

A Brief Personal Intermission

In 1982, things were coming together nicely. My wife Ruth had switched careers from being a lawyer to a journalist, writing for the local paper along with op-ed articles for

the *New York Times*, *Washington Post*, and other outlets. We had a very active social life, especially with our good friends Tim Wilson and Dede Smith. In February, we had our first child, Teal, who was glorious, delightful, and oftentimes demanding. Although I was coming up for tenure in the fall, I felt secure that I'd fare well. Yes, there were some ugly rumors about data fabrication by a senior psychology faculty member that were being suppressed, but I assumed it wouldn't be a problem for me. I was mistaken. In the fall, I learned that I did not have the full support of the department and that I'd likely be turned down for tenure. Ironically, I had recently been contacted by Robert Folger at Southern Methodist University about a possible job. Three months later, I accepted a position at SMU back in my home state of Texas and Ruth landed a position with the *Dallas Morning News*.

Major life upheavals visit most of us. For an academic, being turned down for tenure is crushing and humiliating. For the first few months, I was filled with anger and bitterness, something I'd never seen in myself. With the help of Ruth, our daughter, and the move to Dallas, I was able to move on. The experience certainly taught me more about traumas and secrets than I ever expected. (Next time your life falls apart, take notes. There are some great research ideas scattered in the wreckage.)

Back to the Research Story: Expressive Writing

The secret trauma findings spurred me to talk with clinical psychologists, professional polygraphers, and trauma survivors about their experiences. Major life traumas together with overwhelming secrets appeared to undermine mental and physical health in profound ways. If holding in major secrets was such a risk factor, what would happen if we brought people in the lab and had them talk or write about their secrets?

The first SMU graduate student I met, Sandy Beall, said she wanted to do her Master's thesis on something related to health. We talked about getting students to write about major life experiences that they had kept secret. Over the next few weeks, a study emerged wherein we would randomly assign students to write about either traumatic experiences (in one of three ways) or superficial topics for four consecutive days. We got their permission to track their student health center records in the months before and after their writing.

The study worked. People who were asked to write about their thoughts and feelings about having a traumatic experience evidenced significant drops in student health center visits in the months after writing compared to controls who wrote about superficial topics. In retrospect, our findings were the result of remarkably good luck as much as anything – small sample size, borderline statistical effects, etc. Today's culture would never have accepted the paper, which we published in 1986.

Several other, more defensible studies followed from my and other labs. Most, but not all, replicated the basic patterns. The central question all of us were asking is why

did writing improve physical health? Standing back now and looking at the thousands (!) of writing studies, there is a growing consensus that there are multiple overlapping processes at work, including:

- Acknowledging that the event happened.
- Translating the experience into language, including the labeling of emotions.
- Working to understand and organize the experience, perhaps constructing a story to explain it.
- Experiencing cognitive changes that help to reduce rumination, improve sleep, improve working memory, and reduce stress.
- Enjoying beneficial social changes after writing, including talking to friends about the upheaval and also greater social engagement in general.

As we and others ran more and more writing studies, we found that after writing, people went to the doctor less and had more efficient immune activity. Among students, expressive writing was associated with higher grades. Among engineers who had been laid off from their jobs, writing was linked to getting jobs more quickly compared to controls. I was occasionally stopped by students who had been in a writing study several months earlier who told me that writing had changed their lives and profusely thanked me for letting them be in my study. That had never happened before.

I've frequently asked myself why the expressive writing research caught on. In the early 1980s, concepts such as self-help, self-awareness, and self-reflection started to peak in the cultural vernacular (see https://books.google.com/ngrams/). Since its inception, psychology, and especially social psychology, had studiously avoided anything that smacked of Freud, therapy, or deep emotional processing. Expressive writing quietly entered the field at a perfect time. The method was simple and easily replicable. There was no grand theory behind it so it served as a projective test for most theoretical approaches. Above all, it brought about objective health and behavioral outcomes that were lacking in traditional paradigms.

The writing studies also changed the ways I thought about research. Most of my earlier symptom research involved self-reports. I rarely found that expressive writing affected long-term self-reports, including self-reports of exercise, drinking, smoking, talking with others, etc. It was as if people's self-views were fixed but their objective behaviors and health had changed.

Another important lesson concerned the value of theory. In the two years leading up to the first writing study, I had been developing a rather elegant theory about behavioral inhibition. The idea was that people who had had a trauma and who had kept it secret were constantly inhibiting their urges to disclose to others. The psychic work of inhibition served as a long-term, low-level stressor that exacerbated health problems. Nice, huh? The problem is that I never could find any evidence for inhibitory mechanisms at work. (Theories are quite important in guiding research questions. But theories are ultimately cheap. It's the data that is often the foundation of the story.)

Between 1986 and 1990, a number of important things happened. My wife and I had a son, Nick. I published a popular book, *Opening Up: The Healing Power of Expressing Emotion*. In 1989, Lee Ross invited me to spend part of the year at Stanford. It was a heady time.

Through all of this, I had been conducting study after study trying to identify what active mechanisms were driving the expressive writing results. Perhaps some important clues were embedded in the expressive writing samples I had collected. I enlisted many of the clinical graduate students to read and evaluate multiple writing samples. But the task was too difficult and produced ambiguous findings.

If I could just find some fast and efficient ways to analyze hundreds of expressive writing samples, my life would be perfect.

The Power of Words and Computerized Text Analysis

In the same semester I took meteorology, I also enrolled in a course on Fortran, one of the first popular computer programs. My brief background in programming gave me a sense of how a computer program might be able to analyze text. I initially called experts in cognitive science in a search for a text analysis desktop computer program. My first contact was Art Graesser who gave me names of people around the country in computer science. No luck. (Years later, I discovered that Phil Stone and his colleagues at Harvard had built a mainframe computer program twenty-five years earlier, called General Inquirer, which was largely unknown in the mainstream of psychology.)

I decided to build a text analysis program myself. Fortunately, I had a relatively new graduate student, Martha Francis, who had majored in computer science as an undergraduate. Together, over the next two to three years, we put together a program that eventually became known as Linguistic Inquiry and Word Count, or LIWC (pronounced "Luke"). The first edition of LIWC was released in 1992. The sixth edition just recently came out (Pennebaker et al., 2022).

Other than my Fortran course, I had no training in programming and no background in linguistics. My real interest was in identifying objective markers of the ways people think, feel, pay attention, and connect with others. It made sense that the words people used in everyday life would likely reflect their psychological processes.

The first LIWC studies focused on the ways people wrote in several previously published expressive writing studies. Intuitively, people who used more emotion words (such as *hurt, angry, happy*) and cognitive language (with words like *think, understand, because*) would likely benefit more than people who used these types of words at lower levels. The early studies were moderately successful. Profiles of successful expressive writing (i.e., writing samples of people who subsequently evidenced improvements in physical health) include higher use of positive emotion words, a moderate use of negative emotion words, and, most powerfully, an increasing use of cognitive words over the course of the writing exercises.

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Another Personal Interlude

Between 1995 and 1997, our lives changed considerably. Ruth was diagnosed with an aggressive breast cancer when our children were 13 and 9. She underwent surgery, chemotherapy, and radiation for months. It was an upheaval that was unexpected, horrible, destabilizing, and oddly centering. I watched how Ruth's diagnosis shifted her social network. Many old friends quietly disappeared because they were so terrified by the prospect of the disease, while another set of acquaintances magically appeared because they wanted to provide support. The specter of death touched every part of our lives. Fortunately, Ruth responded well to treatment and, within a year, was reconstructing her life by writing more novels and essays.

It was about this time that my old friend Bill Swann asked me to consider moving back to Austin to join the psychology department at the University of Texas. It was a difficult choice. I loved SMU and the department was young and scrappy. In the fourteen years I'd been there, we hired a remarkable group of colleagues including David Watson, Lee Anna Clark, and the amazing Laura King. But even though Ruth and I had built strong ties in Dallas, we both had strong memories of Austin from our graduate school days. The department was exceptionally strong and there were friends to talk with in philosophy (Bob Solomon), communications (Rod Hart), linguistics (David Beaver), English (Betty Sue Flowers), computer science (Joydeep Ghosh), and other departments. Bill and UT made us an offer we couldn't refuse.

The World of Words

The move to Austin served as a transition from expressive writing research to language. Words didn't work the ways I originally thought they did. By analyzing all kinds of texts (e.g., emails, books, poetry, survey responses), I discovered that most of the social psychological information in language was apparent in *how* people expressed themselves rather than in *what* they were expressing. It was perplexing that there were large differences in personality, sex, age, and status in the linguistic styles but not the linguistic content.

It was George Miller's book *The Science of Words* that tied it together for me. He summarized centuries of work on people with different language deficits following brain damage. When their Broca's area in the left frontal lobe was damaged, people could often talk haltingly using nouns and regular verbs even though they appeared to have lost their social connections with others. Others with damage to Wernicke's area in their left temporal lobe spoke fluidly, even warmly to others, but only had access to function words such as pronouns, preposition, auxiliary verbs, and articles. They simply could not access nouns and regular verbs. This distinction between linguistic style and content was apparent in function versus content words.

The ability to use function words requires advanced social skills. The sentence, "I gave her the book," is surprisingly complex. Most anyone knows what "gave" and

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"book" mean. But who is "I" and "she"? If it's "the" book, it means that the speaker knows that the reader knows which book is being referred to. By analyzing people's everyday language, their function words reveal how they are paying attention to and understanding others in their social worlds, their sense of a shared identity, their interests in people and concrete objects, etc.

The power of LIWC, I finally realized, was in its ability to track social and psychological processes though people's use of function words (and, to a lesser extent, certain emotion, cognitive, and other content categories). With this knowledge, my students and I were able to begin mapping the boundaries of text analysis. Indeed, it has been my students who have helped lead the way over the last two decades.

Some examples of my former students' accomplishments include Matthias Mehl who has developed increasingly sophisticated devices to capture what people are saying as they go about their daily lives which can help foreshadow impending depression, health changes, eating behavior, and personality shifts. Richard Slatcher has found that language use in close relationships can predict breakups and the physical health of family members. Nairán Ramírez-Esparza has been a leader in tracking the language of bilingual English-Spanish speakers to understand how their personalities change as function of their language. Cindy Chung invented a new way to pull out the underlying themes of text and changed the ways our lab thought about language. These and other early findings helped spur me to summarize them in my 2011 book, *The Secret Life of Pronouns*.

My lab and I have now moved into the world of big data – a direction that has tremendous value for social psychologists. One of my central collaborators, Rada Mihalcea, is a computer science professor at the University of Michigan. She helped open my eyes about ways to think about tracking the language of hundreds of thousands of people over time, culture, and context. My former graduate student Ryan Boyd was the first person I met who represents a new generation of computational social scientists with a solid background in computer science methods with social psychology grounding. His language toolkit has helped us to identify the underlying structure of tens of thousands of stories and even identify genuine versus forged plays associated with authors such as Shakespeare and Aphra Behn.

Sarah Seraj and Kate Blackburn harnessed much of this knowledge to demonstrate the social, cognitive, and emotional shifts of thousands of people on Reddit who have undergone a major relationship breakup – from one year before to one year after the breakup. Kayla Jordan has tracked the language of US presidents and other world leaders over the last two centuries showing that the growth of mass media and democratization have changed the language styles of the people we elect. Another former student, Ashwini Ashokkumar, has identified the ways people become socially committed to groups, cults, and, during COVID, to their friends and families. Although the linguistic signals for powerful social connections and conflict are weak, big data approaches can aggregate across the noise of people's everyday lives revealing clear social processes unfolding over time.

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Much to my surprise, the LIWC research is beginning to have a significant impact across several disciplines including business, medicine, computer and data science, communication, and psychology. As I stand back, I feel so grateful to so many people who shaped my thinking. My students – both graduate and undergraduate – were the muscle and brain power behind most of the ideas and methods. Some others whom I've not mentioned include Jenna Baddeley, Jason Ferrell, Molly Ireland, Youngsuk Kim, Kate Niederhoffer, Robin O'Heeron, Jason Rentfrow, Yitai Seih, Miti Shah, Lori Stone, Sanaz Talaifar, Mohini Tellakat, and Yla Tausczik. My colleagues, especially Bill Swann, Sam Gosling, Laura King, and Keith Petrie have been invaluable over the years. And, of course, Ruth and our children have been a part of all of this research – as critics, collaborators, and even participants.

What Does the Future Hold for Social Psychology?

Who knows? I got into social psychology because it was fun and offered the possibility of discovering new and exciting things that had the potential to change the world in a good way. I have been incredibly lucky. I've stumbled on some interesting findings that have occasionally yielded big payoffs.

As a discipline, social psychology is still trying to define itself. To me, it should be an endeavor where scientists are studying social behavior. It should be cross-disciplinary with researchers who study children, dogs, birds, and amoeba (at least sociable amoeba). We should embrace whatever methods help us to answer our questions. Our approaches should be deductive, inductive, and a mix of both. We should respect occasional case studies as well as population studies and laboratory experiments.

Of central importance is that we keep our eyes on the world around us. How can we help change the world? Think about the biggest challenges that people around the world are facing: social polarization, prejudice, disease, rampant fear and suspicion, the prospect for societal and/or financial collapse, global warming, paralyzed bureaucracies unable to function, and much more. These are all social psychological problems. Any solutions will require cross-disciplinary collaboration. Embedded in all of these collaborations should be experts in social and personality processes. Governments need us, businesses need us, and certainly educational institutions need us.

So, no. I don't know what the future holds for social psychology. If it acknowledges these issues and problems, the field will thrive. And we will all have fun figuring it all out.

Suggested Reading

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