

Computerized Content Analysis of Some Adolescent Writings of Napoleon Bonaparte: A Test of the Validity of the Method

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The aim of this study was to test the validity of a computer software program previously demonstrated to be capable of making DSM-IV neuropsychiatric diagnoses from the content analysis of speech or verbal texts. In this report, the computer program was applied to three personal writings of Napoleon Bonaparte when he was 12 to 16 years of age. The accuracy of the neuropsychiatric evaluations derived from the computerized content analysis of these writings of Napoleon was independently corroborated by two biographers who have described pertinent details concerning his life situations, moods, and other emotional reactions during this adolescent period of his life. The relevance of this type of computer technology to psychohistorical research and clinical psychiatry is suggested.

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In this age of high technology in which computers are beginning to mirror humans and our extraordinary thinking capacity, we have come to believe it is time to try to see what the modern computer and new software can understand with regard to the meanings of the writings of historical personages. We aimed to test this possibility after an initial successful attempt (Gottschalk and Gottschalk, 1999) to perform a neuropsychiatric evaluation of the Unabomber, Theodore Kaczynski, from his writings. Using the written text of his 35,000-word Manifesto and selected short personal notes he wrote while living in his Montana cabin, we content-analyzed these writings by means of computerized content analyses software.

The computer software has been in the process of development for many years (Bechtel, 1997; Gottschalk, 1995, 1996, 1999, 2000; Gottschalk and Bechtel, 1993, 1995, 2000; Gottschalk et al., 1975, 1983, 2000). It was designed to take the place of human scorers using the Content Analysis Scales based on Gottschalk-Gleser content analysis methodology (Gottschalk, 1976, 1979, 1995; Gottschalk and Gleser, 1969). These Content Analysis Scales are applied to the smallest unit of verbal communications, the grammatical clause, and the software reports who does what to whom, or who feels in one way or another.

The scales are capable of providing to the user valid scores, which are automatically compared to norms

for children and adults, on such neuropsychobiological dimensions as anxiety (and six subscales), hostility outward, hostility inward, ambivalent hostility, social alienation-personal disorganization (a measure of the relative severity of schizophrenic syndrome), cognitive impairment, depression (and six subscales), hope, human relations, health-sickness, dependency, and dependency frustration.

The computer analysis of Kaczynski's diaries and Manifesto correlated very highly with the totally independent conclusions of the psychiatrist for the prosecution in the Unabomber's case (Gottschalk and Gottschalk, 1999). Moreover, a reading of the recent book *The Age of Spiritual Machines: When Computers Exceed Human Intelligence* by Ray Kurzweil (1999), the developer of voice-recognition software, has also served as an encouraging stimulus for this venture. In his book, Kurzweil provides convincing evidence that, in consideration of the rapid development of smaller and faster computer chips and other essential computer hardware as well as the effective creation of new software, in 20 years the computer will exceed the breadth and depth of the human brain, not only in the functional areas of human cognition, but also in the capacity to understand human emotions.

From an excellent collection of autobiographical excerpts written by famous historical figures (Kiell, 1964), we selected three excerpts written by Napoleon Bonaparte when he was between the ages of 12 and 16 years to learn what our computer software program would be able to tell us from these writings about his neuropsychiatric status during that time in his life.

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Methods

The three selections from Kiell's book (1964) written by the adolescent Napoleon Bonaparte are presented. Although these represent translations into English from the original versions, we think that they are reasonably faithful and accurate. How well the computerized content analysis of these writings reflects what his biographers have written could help serve as an independent test of the accuracy and relevance of these written documents.

Autobiographic Excerpt 1

Name: Napoleon Bonaparte
 Life dates: August 15, 1769 to May 5, 1821
 Age: 12 years
 Sex: Male
 Race: Caucasian
 Education: 6th grade
 Date: April 5, 1781

"My Father,

If you, or my protectors, cannot give me the means of making a better appearance in this school, let me come home immediately. I am tired of living like a beggar and of having my insolent schoolmates, who having nothing but wealth to recommend them, make sport of my poverty. Not one of them is my equal, for not one of them can understand the lofty ideals which fill and inflame my heart.

What, sir! Shall your son be the butt of the sarcasms of these rich and impertinent young fellows who dare to make fun of the privations I endure! No, my Father, no—if nothing can be done to improve my circumstances, take me out of Brienne.

Let me learn a trade, if necessary; place me with my equals and I promise you I shall soon be their superior.

By this offer you may judge how desperate I am. Let me repeat, I would rather be the first among the workmen in a factory than the laughing-stock of the best school in the world. Do not imagine that what I write is prompted by a desire to indulge in expensive amusements; they do not attract me; but I must be in a position to show my comrades that I too can afford them.

Your respectful and obedient son,
 Napoleone."

Autobiographic Excerpt 2

Name: Napoleon Bonaparte
 Life dates: August 15, 1769 to May 5, 1821
 Age: 16 years
 Sex: Male
 Race: Caucasian
 Education: Finished high school
 Date: 1785

"In the middle of May 1779 I entered the Military School of Brienne, and was happy. All kinds of thoughts began to run through my head. I found the need to learn, to acquire knowledge, to make progress. I devoured books. Soon I was the only subject of conversation. I became an object of wonder and envy; I had confidence in my power, and enjoyed my superiority.

As I still spoke French badly, and found it hard to accustom myself to a completely different mode of living, I generally kept away from my companions at first, and preferred to occupy myself with my books. Extraordinarily sensitive as I was, I suffered infinitely from the ridicule of my schoolmates, who used to jeer at me as a foreigner. My pride and sense of honor would tolerate no insult to my country or to the beloved national hero, Paoli. Once I had been guilty of some slight offense, whereupon a particularly severe master snorted out: 'On your knees, Mr. Bonaparte, you will take your dinner kneeling.' Greatly excited, I answered: 'I will, if necessary, take my dinner standing, but not on my knees, for in our family we only kneel to God.' And as this brutal teacher still insisted on his demand, I uttered a cry of rage, and fell to the floor insensible.

In Brienne it was only in the exact sciences that I took an interest. Everyone used to say: 'That is a boy whose talent is all for geometry.' I lived apart from my comrades and had chosen a small corner of the courtyard/to which I would retire in order to give myself up to my daydreams, for I have always been fond of indulging in visions. When my companions tried to take this retreat from me I defended it with all my might. Already I had the feeling that my will was stronger than that of the others, and that whatever I fancied must belong to me. I was liked in the school; it takes time to be appreciated, and that I had not got. But even when there was nothing to do there always remained the indefinite feeling that I was losing nothing through the indifference of others."

Autobiographical Excerpt 3

Name: Napoleon Bonaparte
 Life dates: August 15, 1769 to May 5, 1821
 Age: 16 years
 Sex: Male
 Race: Caucasian
 Education: Finished high school
 Date: 1786

“As I was poor, I gave myself up completely to my duties and my books. My relatives, my country, and my veneration for Paoli and Rousseau were my only passion. Far from home and those I loved a repugnance to life often overcame me so that I thought of suicide. At this time—it was the beginning of May 1786—I wrote the following words: Always alone in the midst of people, I return home in order to give myself up with unspeakable melancholy to my dreams. How do I regard life today? I give way to thoughts of death. I stand at the dawn of life and may hope to live long. For six or seven years now I have been absent from my country. What pleasure shall I feel when, in four months’ time, I see my countrymen and my relatives again? Can I conclude from this tender recollection of my youthful enjoyment that my happiness will be complete? What madness then drives me to wish to kill myself? Why am I really in the world? As I must die some time it would perhaps be better if I killed myself! If I had already sixty years behind me I would respect the prejudices of my contemporaries and wait patiently for nature to complete her work. But, as I am beginning to feel the seriousness of life, and nothing any longer gives me pleasure, why should I suffer the days from which I can promise myself no further good? What a gap there is between mankind and nature! How cowardly, base, and crawling men are! What tragedy awaits me in my country? My fellow-countrymen are loaded with chains and have to bear, trembling, the weight of the oppressor’s hand! Gone are the brave Corsicans whom a hero once inspired with his virtues, those enemies of tyrants, luxury, and base courtiers. Proud, and filled with the noble feeling of his worth, the Corsican led a happy life when he devoted the day to public affairs. Then he spent the night in the tender arms of a loved spouse. Good sense and enthusiasm caused all the cares of the day to be forgotten. Love and nature created divine nights. But they also have vanished like the dreams of those happy days! You Frenchmen! It

is not enough that you have robbed us of what we loved most, you have even destroyed our manners and customs! The present condition of my country and the impossibility of altering it are a further reason for leaving a world in which I am compelled by duty to love people I should naturally hate. What attitude shall I adopt, how shall I speak/when I arrive in my country? When his country no longer exists a good citizen should die. If one man could save my countrymen by sacrificing his life, I would at once rise and thrust the avenging sword into the breast of the tyrant in order to revenge my country and its injured rights.

Life has become a burden to me, for I no longer enjoy any pleasure, and everything causes me pain. It is a burden to me because the people with whom I live, and probably always shall live, have manners and customs which are as different from mine as the light of the moon from that of the sun. I cannot, therefore, live as I should wish to, and thence arises an aversion to everything.”

Analysis

Each of these three writings was typed onto a computer diskette in Microsoft Word. Our computerized content analysis program, PCAD 2000 (Gottschalk and Bechtel, 2000) using LISP artificial intelligence software, is able to identify and recognize grammatical clauses. In addition, the writer’s name, age, race, sex, approximate date of writing the text, and educational level were inserted at the beginning of the text. The norms for each Content Analysis Scale scored are influenced for some scales by educational level, age, and sex and the software program adjusts for these factors. The texts on the diskettes are then converted to ASCII or TEXT, which the computer software understands.

Each diskette was then run on PCAD 2000 for all the computerized content analysis scales. The software notes when the score obtained on each scale is one, two, or three standard deviations above the norms. This information is made available to the user, either at the end of the summary of scores for each scale or, if requested, on a spreadsheet showing summaries of the content analysis scores on all the scales scored.

The norms on these scales were derived from 5-minute speech samples obtained from over many years from hundreds of normal, medically, and psychiatrically healthy white and black adults (ages 18–80 years) and children (ages 4–17 years)

(Gottschalk, 1976, 1995; Gottschalk and Gleser, 1969). These norms were corroborated and not found to be significantly different on large numbers of similarly obtained 5-minute verbal samples from German, Chilean, and Australian adults (Gottschalk and Lolas, 1989). They were elicited from adults by purposely ambiguous instructions to the speaker to talk about any interesting or dramatic personal life experiences. Children younger than 8 years of age who did not seem to be able to follow the instructions used with adults were optionally elicited by further instructions to talk about any radio, television, movie, or storybook. We realized that these norms were obtained in the form of brief speech samples from healthy individuals in response to standardized purposely ambiguous instructions so that the subject matter elicited would be spontaneous and primarily in response to a general query (*e.g.*, how are you feeling?). The autobiographical texts computer-analyzed herein were obtained under circumstances in which the text was also written spontaneously, and expressed how the subject was feeling at the time. We think that comparing the magnitudes of the scores obtained from the written excerpts from Napoleon to our norms for these scores provides adequate criteria for the significance of the magnitudes of the deviations of the content analysis scores from our norms. Furthermore, previous studies (Gottschalk, 1979, 1995; Gottschalk and Gleser, 1969) have shown there are no significant differences in scores derived from spoken and written verbal samples obtained from the same subject.

Hopefully, a not-too-technical explanation concerning how the computerized content analysis software works by using artificial intelligence software known as LISP may be useful here. The computer software operates on a PC-class computer under Microsoft Windows. The software system relies on a very large dictionary (>300,000 words) containing part-of-speech information and a large collection of (mostly American) English idiomatic and slang expressions. Some of the words and all of the idioms are identified as possible indicators of semantic content pertinent to one or more the Content Analysis Scales. Syntactic information about the words in the input, such as part of speech and number (*i.e.*, singular or plural), is extracted from the dictionary and used by a software parser, which outputs an analysis of the structure of each input clause. When a word or phrase from the dictionary is noted as a possible marker of an item from a Content Analysis Scale, it is added to a listing of scoring candidates. This list of candidates is then examined by a set of scale-dependent procedures that consider the clause structure

as well as the clause structure and the score-marking to decide the validity of the scoring of each candidate. Candidate scores approved by the process are emitted as content analysis scores applicable to the input clause.

The dictionary is predefined for any specific content analysis scoring sessions, but can be changed or added to through the use of a set of interactive dictionary-manipulation tools.

The software system generates four distinct classes of output, the last three of which are optional. The most basic output is an interlinear listing of each grammatical clause and the scores assigned to it. This is printed out as clause per line, with each clause followed by a line of scores (one or more per scale, but more lines may be used if the clause or score-tokens are lengthy).

The second class of outputs is a scoring summary for each scale being used. The summary gives tallies of the number of occurrences of the various scores/codes and a word count of the total verbal sample. And it derives a single number from the score/codes that is used to characterize the verbal sample on each scale. The summaries indicate to what extent the verbal sample scores deviate from the norms that have already been obtained for each scale, in terms of standard deviations.

The third class of outputs is an analysis or interpretation, in textual forms, of the scale scores. It is directed to the clinician making diagnostic use of the scoring output, and it suggests areas for further examination and areas in which significant deviation from the norms have been found.

The fourth class of outputs includes possible neuropsychiatric diagnoses that the user might consider in evaluation of the subject. The diagnoses suggested for consideration are taken from the DSM-IV American Psychiatric Association, 1994).

Results

Computerized Content Analyses of the Autobiographical Excerpts

This computerized assessment procedure is designed to provide the user with useful neuropsychiatric information concerning patients with and without mental disorders who are being evaluated. It is also important to realize that mentally ill individuals often behave in ways that are indistinguishable from people who are mentally well. People who enjoy good mental health are able to express their fear, anger, and sadness appropriately. Hence, the assessment of emotions from verbal or textual samples may reveal an individual's reactions to recent dis-

tressing current events. What distinguishes mental health from mental disorders is not merely the intensity of emotional reactions, but also the timeliness and appropriateness of these emotions as well as the defenses and coping mechanisms the person has available. These are matters about which the clinician has to make the major judgments.

These evaluations from verbal samples are capable of detecting early signs of minor and major mental disorders as well as signs of early cognitive impairment and cerebral organic malfunctioning.

The diagnostic classifications, which conform to DSM-IV criteria and are offered here for the consideration of the clinician, do not include all the conditions that may be legitimate areas of treatment or research efforts. Also, the clinician should be reminded that the diagnostic classifications suggested here are based solely on the content analysis of single verbal samples produced by an individual, and all the specialized clinical training and skills of the clinician should be included in order to corroborate which suggestions are most relevant and valid.

The reliability of this neuropsychiatric assessment, with regard to giving a description of the typical traitlike characteristics of an individual, is more stable if at least three speech samples are used. Scoring is not very reliable on verbal samples of less than 80 words.

The First Autobiographical Excerpt

The content analysis scales from this first autobiographical excerpt were all mildly elevated ($p < .05$) for hostility inward and moderately elevated for social alienation-personal disorganization, cognitive impairment, and depression.

Axis I. Adjustment disorder with depressed mood (309.00), dysthymia (depressive neurosis) (300.40), depressive disorder not otherwise specified (311.00); major depression, mild, single episode (296.21), recurrent (296.31); and bipolar disorder, mild, depressed or mixed (296.51, 296.61).

Axis II. Personality disorder not otherwise specified (301.90).

The Second Autobiographical Excerpt

The content analysis scores for guilt anxiety, sickness, and health-sickness were highly elevated ($p < .005$) and were mildly elevated for diffuse anxiety, hostility inward, and health ($p < .05$).

With respect to a neuropsychiatric diagnosis, the DSM-IV diagnostic classifications, based on only the

second autobiographical excerpt, to consider are as follows:

Axis I. Adjustment disorder with depressed mood (309.00), dysthymia (depressive neurosis) (300.40), depressive disorder not otherwise specified (311.00); major depression, mild, single episode (296.21), recurrent (296.31); and bipolar disorder, mild, depressed or mixed (296.51, 296.61).

Axis II. Personality disorder not otherwise specified (301.90).

The Third Autobiographical Excerpt. With regards to the third autobiographical excerpt from Napoleon, the content analysis scores were mildly elevated ($p < .05$) for death anxiety and highly elevated ($p < .005$) for sickness and health-sickness.

All psychological dimensions examined, except for death anxiety and the dimensions of sickness and health-sickness, were within normal ranges. This individual showed significant evidence of being preoccupied with death and sickness.

Discussion

Let us first acknowledge the encouraging collection of contributions assembled by de Mause (1975) in psychohistory and those of Roberts (1997) featuring computerized text analysis in the social sciences. Such works also motivated us to use our computerized methodology for the text analysis of some autobiographical material from a historical leader. We selected a collection of three adolescent writings of Napoleon. After computer-analyzing the content of these autobiographical data, we compared the portraits generated by our computer program with the observations pertaining to Napoleon made by his biographers.

One theme stemming from Napoleon's adolescent conflicts, which rings through the life of this historical figure, was opposition to adults, including his parents, his contemporaries, and the established governmental authority of his time. Yet his family had, to some, aristocratic origin and elevated social status, and when he could do so he used these entitlements.

Let us examine two biographies of Napoleon (Ludwig, 1926; Seward, 1935) and compare what we learn from them to what has emerged from the computer analyses of excerpts from Napoleon's own autobiographical writings.

The computerized content analysis program detected from his writings that Napoleon felt depressed, isolated, self-critical, and alienated from his

parents and contemporaries between the ages of 12 and 16 years. The neuropsychiatric DSM-IV classification of some kind of depressive syndrome is suggested from the computerized content analyses of the written excerpts 1 and 2. And from written excerpt 3, the program observed that he had preoccupations with death, anxiety, and serious sickness. The biographers both observed that Napoleon was a lonely youngster at age 12, and that he felt alienated from his French fellow students. The biographers indicate that at the age of 16 years, Napoleon became a sublieutenant, for which rank he qualified at the Paris Cadets' School, where he spent his time, as he had at Brienne, poring over books. He was an adolescent of Spartan tastes, and he found the expenditures of the young French nobility quite distasteful. He avoided getting into debt, for he knew how poor his parents were. When his father died, his affection for his family intensified, and he began to save money in order to help his mother.

After his examination as a military officer, which he passed with fair credit, his superiors wrote of him (Ludwig, 1926, p. 8): "Reserved and diligent, he prefers study to any kind of conversation, and nourishes his mind upon good authors. He is taciturn, with a love for solitude; is moody, overbearing, and extremely egotistical. Though he speaks little, his answers are decisive and to the point, and he excels in argument. Much self-love, and overweening ambition."

Napoleon's aims, formulated as he walked many miles at the age of 16 to join his regiment at Valence (Ludwig, 1926, p. 9), were "to despise and make use of his fellow-creatures, most of whom he felt were empty-headed and pretentious; to extricate himself from the clutches of poverty; to learn much in order that he might rule others, and to make himself master of Corsica."

Napoleon was aware of his parents' financial problems. He wrote to his father (Seward, 1935, p. 11): "If you or my patrons can't let me have sufficient funds to keep up a more respectable appearance at this college, then please write and ask for me to be sent home and as quickly as possible. I am tired of looking like a beggar and being jeered at by impertinent schoolboys whose one claim to be my superior is a rich background." Rather than endure such mockery, he wrote his parents that he would prefer to be apprenticed to a trade, and to abandon any pretensions to nobility. His father was away, and his mother sent him a draft for 300 francs and warned him that if he ever wrote such a letter to his parents again, they would have nothing more to do with him. Despite his economic worries, his father continued to ensure that his children were educated as nobles.

He planted mulberry groves in the mistaken belief that he would be subsidized by the Crown, and he sued the Jesuits for the return of a legacy, although their order had been suppressed a decade earlier. Somehow, he was able to obtain a bursary to enable Napoleon to go to Brienne.

Napoleon tried drafting a novel on Corsica and, also, some short stories. All these writings were animated by hatred of France, but none was ever finished. Meanwhile, he was learning his trade, spurred on by poverty, passion, and sentiment. He studied ordnance and munitions of war. He imagined and mapped out battle plans. He drew up specifications of all the localities in the island where he would place batteries, locate cannons, dig trenches, and station troops. On a furlough to Corsica he wrote in his diary (Seward, 1935, p. 13): "Always alone, though in the midst of men, I go back home that I may give myself up to my lonely dreams and to the waves of my melancholy. Whither, now, do my lonely thoughts end? Towards death. Yet I stand on the threshold of life, and may reasonably expect to draw breath for many, many years. For the last six or seven years I have been far away from my country. How great the joy—to see my own people once more! What demon, then, is it that tempts me to self-destruction? Since misfortune dogs my footsteps, and nothing give me pleasure, why should I go on bearing a life in which, for me, everything goes awry?"

Conclusions

The similarities between the independent biographical observations (Ludwig, 1926; Seward, 1935) concerning Napoleon during his adolescence and Napoleon's own autobiographical excerpts during his adolescence do provide convincing evidence that the suggestions made by our computer content analysis program are valuable for psychohistorical purposes. The usefulness of this computer content analysis software for clinical neuropsychiatry assessment has been previously demonstrated (Gottschalk, 1995; Gottschalk and Bechtel, 2000), and the current report demonstrates and supports its application to verbal texts. We hope that the application of computer technology reported herein can serve as a catalyst toward refinements and, perhaps, add rigor in the field of psychohistory and text and speech content analysis in clinical neuropsychiatry.

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