

AN ABSTRACT OF THE DISSERTATION OF

Margaret A. O'Hara for the degree of Doctor of Philosophy in Counseling presented on April 17, 2019.

Title: Discursive and Psychological Processes in Project MATCH Treatment Manuals and 12-Step Program Literature

Abstract approved:

Cass Dykeman

Addiction is a word that represents a condition that, at best, causes minor disruptions to one's life and, at worst, is lethal. The current definition was developed by 80 neuroscientists. It references substance use and other behaviors and includes food and sex. Addictions do not seem to be lessening but rather are increasing in terms of substances, behaviors, and lives affected. The United States opiate epidemic was fueled in part by false claims in over 600 research journal articles that pain medications were non-addictive. Language matters.

In the 1930s, decades before researchers drew attention to the psychological importance of emotional tone and pronoun use, editors of the original Alcoholics Anonymous literature drew the same conclusions which informed their writing. Over 400 groups have received permission to adapt this literature for their use. Many represent behavioral addictions, which in theory, were recognized in the last diagnostic manual revision, though its authors included only gambling due to insufficient evidence to date for sex addiction, exercise addiction, and shopping addiction to name a few. In addition to a lack of research, there is a 15- to 20-year lag-time in making clinical use of research. The slow recognition of behavioral addictions by health professionals is filled in part by 12-step programs. Hence, research on 12-step programs is warranted.

This dissertation covers the first of the 12 steps which addresses powerlessness and unmanageability. The concept of impaired control has been identified in each of the addictions studied. There has been an evolution of definitions of addiction from “failure of will” concepts to a “language of self-control” – the loss of which is seen as a diagnostic criterion.

Rehabilitative treatment is through talk therapy. Addiction treatment manuals are often used to guide treatment; however, their language is unstudied. Leading researchers at some of the most prestigious universities in the United States and advocates for recovery are joining forces with a call to change the language of addiction. It is vital that the current language be disrupted because it induces negative implicit cognitive biases that evoke punitive attitudes and stigmatizing judgments. Globally, addictions are within the top four most stigmatized social problems. Stigma is a major barrier to treatment.

For the first manuscript, three research questions were used to examine twelve-step facilitation, cognitive behavioral therapy, and motivational enhancement therapy manuals from Project MATCH. The second manuscript used the same questions to examine the first step of Alcoholics Anonymous, Debtors Anonymous, Gamblers Anonymous, Narcotics Anonymous, Overeaters Anonymous, and Sex and Love Addicts Anonymous. The research questions were: Do differences in the level of broad psycholinguistic processes exist among the texts? Do differences in specific linguistic categories exist among the texts? Do differences in specific psychological and physical processes exist among the texts?

Using a synchronic corpus linguistic design, all texts were analyzed using LIWC2015. The log-likelihood ratio test was used to examine if differences in variables exist between the texts, with *post hoc* analysis to further examine differences. Bayesian information criterion was used to measure effect size, with effects ranging from weak to very strong.

Results demonstrate that in each study, statistically significant differences exist in the broad psycholinguistic, specific linguistic, and psychological and physical process words used in the texts. For both manuscripts, differences in analytic, authentic, emotional tone, first-person singular pronouns, third-person plural pronouns, male, and biological processes words showed significance. Manuscript One also showed difference for first-person plural pronouns and third-person singular pronouns. This manuscript is the first study to compare the linguistic components of addiction treatment manuals. Manuscript Two also showed difference for second-person pronouns and negative emotion words. This second manuscript is the first study to compare linguistic components of different 12-step programs. Findings of this dissertation may have relevance to addiction treatment providers, writers of treatment manuals and of 12-step literature, researchers, and individuals with addiction issues.

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Discursive and Psychological Processes in Project MATCH Treatment Manuals
and 12-Step Program Literature

by

Margaret A. O'Hara

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I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

Margaret A. O'Hara, Author

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CONTRIBUTION OF AUTHORS

Dr. Cass Dykeman assisted with methodology and research design, in addition to refining the narrative of this manuscript. Evelyn Stamey provided assistance with statistical analysis.

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DEDICATION

This dissertation is dedicated to members of recovery, clinical and research communities who are engaged in efforts to overcome or help others overcome substance use and behavioral addictions.

Chapter 1: A General Introduction

Overview

Research, clinical, and recovery communities agree that addiction is a chronic, progressive, fatal disease characterized by impaired control. The official definition of addiction, developed by 80 neuroscientists, references substance use and “other behaviors” and includes the words “food” and “sex” (American Society of Addiction Medicine, 2011, para. 3). Research and clinical communities use manuals to guide treatment. Community self-help programs have texts for their approaches. Given the wide span of problematic behaviors and attendant consequences, an understanding of all aspects of these conditions, including language, matters.

Study Rationale

A large body of research exists on substance use disorders as addictions. A major study included twelve-step facilitation among other more studied approaches (Project MATCH Research Group [PMRG], 1998). Twelve-step programs provide community support for those struggling with substance use and other behaviors considered addictions. Though lay persons use the terms *food addiction*, *sex addiction*, and *shopping addiction*, and the afflicted are seen by clinicians, there is a dearth of research on behaviors as addictions. When the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed., [DSM-5]) was revised, there was not sufficient evidence to include subcategories such as “sex addiction,” “exercise addiction,” or “shopping addiction” (American Psychological Association [APA], 2013, p. 481). A growing body of research on gambling led to *DSM-5* inclusion of this disorder as a behavioral addiction. A newly identified addiction, gaming disorder, is recognized by the World Health Organization (2018) and is a *DSM-5* condition for further study. There is limited research on behavioral addictions to guide treatment professionals. Additionally, time gaps in research are estimated at 17 years (Morris, Wooding, & Grant, 2011). The slow recognition of behavioral addictions is filled in

part by 12-step groups. Therefore, an analysis of the discursive and psychological processes of treatment manuals and 12-step literature will extend current knowledge and fill a gap in the existing literature.

Organization Plan for Chapter 1

This section contains an overview of scientific knowledge on the topics of this study. It is followed by descriptions of each manuscript, and then a glossary of specialized terms. Next, the thematic links between the first manuscript (Chapter 2) and the second manuscript (Chapter 3) are provided. Chapter 1 concludes with a guide for the organization of the dissertation followed by Chapter 1 references.

To provide a context for the present study, a review of the literature is provided. Ten topic areas emerged from this review. These are: (a) what is manualized treatment?; (b) a description of manualized addiction research prior to Project MATCH; (c) a description of Project MATCH and its significance; (d) a description of 12-step facilitation; (e) a description of motivation enhancement therapy; (f) a description of cognitive behavioral therapy; (g) descriptions of the 12-step programs studied; (h) a description of the first step; (i) historical accounts of the editorial process in the original manuscript of AA, known as the *Big Book*; and (j) addiction studies using the Linguistic Inquiry and Word Count (LIWC). Once addressed, the research questions of the study are described.

Manualized Treatment

Manualized treatment refers to psychotherapy that follows a standardized structure, including practices that have been supported by well-controlled research studies with randomly assigned participants. The techniques are provided in written form in a treatment manual. As a dissemination tool of evidence-based therapies, they have been credited with improving clinical

practice while also criticized for imposing impersonal treatment that is not practical or reflective of real-world issues (Godley, White, Diamond, Passetti, & Titus, 2001).

Researchers have provided information that increases the knowledge base about manualized treatment. In one such study, researchers evaluated clinicians' experiences. Godley et al. (2001) studied interviews of 19 clinicians who used manualized treatment for cannabis misuse. Almost all participants reported positive experiences and reported the treatment manuals as helpful guides to focus treatment and to support creativity and flexibility with useful structure and ease of use. The researchers also identified challenges including the management of behavior problems and the need to adapt approaches based on differing levels of complexity. Clinicians in the study by Godley et al. (2001) discussed supervision's important role in implementation, whereas Barlow et al. (2011) believed the provision of ancillary materials may be used to approximate supervision processes in manualized treatment.

Clinicians stay updated on best practices through professional literature. LeCroy (2008) differentiated research articles from treatment manuals by pointing out that authors of articles report on treatment effects, whereas manual writers describe in greater depth how to deliver treatment. Accordingly, the likelihood that practitioners will be able to deliver effective, well-conceptualized therapies to clients with varied presenting problems is increased (LeCroy, 2008). Singer and Greeno (2013) also reiterated that treatment manuals may be effective in disseminating evidence-based therapies provided they are written with the clinician rather than the researcher in mind. In their research, based in a community mental health agency, Singer and Greeno (2013) documented the first author's experience with implementing manualized treatment. The researchers made recommendations based on the challenges identified.

Manualized Addiction Research Prior to Project MATCH

Treatment manuals are relatively new in the counseling field. They have been a studied component of psychotherapy research since only the 1960s (Duncan, Nicol, & Ager, 2004). The first identified treatment manual was Paul's (1966) dissertation, which was based on the procedural elements of systematic desensitization provided by Wolpe (1958). Treatment manuals marked the advent of manualized treatment, though addiction treatment lagged behind. The Minnesota Model was the traditional American approach that dominated addiction treatment (Cook, 1988) in spite of a lack of research to support its effectiveness. This was the context of the addiction field prior to Project MATCH ([Matching Alcohol Treatment to Client Heterogeneity]; PMRG, 1997, 1998).

Project MATCH

Project MATCH was a large, multisite clinical trial, which, as the title suggests, sought to find ways to match individuals with treatment that best suited them (PMRG, 1997, 1998). The National Institute on Alcohol Abuse and Alcoholism funded this federal effort. One aim was to determine client attributes (e.g., readiness to change) that would reliably predict how well clients would do with different treatment approaches. Twenty-one attributes were studied. The 806 clients in five outpatient facilities were randomly assigned to either 12-step facilitation ([TSF]; Nowinski, Baker, & Carroll, 1992) or to one of two theoretically-driven, highly-studied therapies: motivational enhancement therapy ([MET], Miller, Zweben, DiClemente, & Rychtarik, 1992) or cognitive behavioral therapy ([CBT], Kadden et al., 1992). Through interviews, researchers also assessed clients' relevant attributes. The most powerful predictors of total abstinence that emerged were self-efficacy and client readiness to change (PMRG, 1997, 1998).

The PMRG (1997, 1998) found few differences in outcomes among the three treatment approaches. However, the results garnered respect for TSF, the least-studied approach, and indirectly for Alcoholics Anonymous (AA) as the main goal of TSF is to help clients work the 12 steps. Results showed that clients attended more 12-step meetings when they participated in TSF, and these clients had similar reductions in drinking compared to clients in the other two treatments with higher levels of overall abstinence (PMRG, 1997, 1998; Tonigan, Connors, & Miller, 2003). With TSF, statistical significance was achieved when total abstinence was the desired outcome. A three-year follow-up study that was part of Project MATCH was conducted through the Center for Alcohol and Addiction Studies at Brown University in Providence, Rhode Island (Longabaugh, Wirtz, Zweben, & Stout, 1998). Results showed 50% higher abstinence rates in the prior 90 days for the TSF group when compared with CBT. The researchers concluded that for those whose networks support continued drinking, TSF may be the treatment of choice and that regardless of therapeutic approach, Alcoholics Anonymous (AA) should be considered. The results of Project MATCH were surprising and significant. Prior to Project MATCH, research on AA and professionally-led treatments that support AA, such as TSF, were not considered to be methodologically sound.

Twelve-Step Facilitation

There exist a number of interventions that facilitate engagement in AA and the 12-step recovery process. Common features include education and discussion about 12-step groups, the nature of meetings and what one can expect, and systemic encouragement to participate (Kelly et al., 2016). The 12-step facilitative intervention used in Project MATCH was twelve-step facilitation therapy (Nowinski et al., 1992). It is a manually-guided intervention based on the emotional, cognitive, behavioral, and spiritual principles of AA. The aim is to facilitate early

recovery through guidance with the beginning steps. The first content session covers the disease concept, surrender process, and acceptance of total abstinence. Developed for individual counseling for those with alcohol use disorders, it has been adapted for use in groups (Brown, Seraganian, Tremblay, & Annis, 2002a, 2002b) and to address other substances (Baker, 1998; Carroll et al., 2000).

Motivation Enhancement Therapy

Motivation enhancement therapy is a manualized treatment developed for use in research (PMRG, 1997, 1998). MET combined adaptations of an intervention called the Drinker's Checkup ([DCU]; Miller & Sovereign, 1989; Miller, Sovereign, & Krege, 1988) and motivational interviewing ([MI]; Miller & Rollnick, 1991, 2002). Sensitive to lower impairment levels, the DCU was an in-depth assessment of alcohol use and related problems. An increase in help-seeking behaviors was the expected outcome; however, DCU intervention in and of itself triggered motivation for self-change. Motivational interviewing is a brief, client-centered intervention that is evidence-based with tested validity and reliability (Madson & Campbell, 2006). Developed to address alcohol addiction, MI has shown beneficial effects across a wide range of problems. Developed as a tool to address and resolve ambivalence in the change process, MI may be used in concert with other counseling approaches. Motivational interviewing has shown effectiveness when conducted by a broad range of clinicians and with diverse populations.

Cognitive Behavioral Therapy

Cognitive behavioral therapy, also referred to as *cognitive therapy*, was developed in the 1960s by Aaron T. Beck (2005). Beck posited that the way situations are perceived affects the way one feels about them. This therapeutic approach is used to assist individuals in identifying

underlying thinking patterns, challenging distortions, and replacing them with healthier thoughts. For example, when cravings to use alcohol are present, clients learn to respond in ways other than drinking, such as noticing how one rationalizes drinking, challenging those thoughts, and replacing them with thoughts that support relapse prevention. The CBT intervention in Project MATCH followed a treatment manual developed by Kadden et al. (1992).

Twelve-Step Programs Studied

Literature from six 12-step programs were examined. The programs were AA, Narcotics Anonymous (NA), Gamblers Anonymous (GA), Overeaters Anonymous (OA), Debtors Anonymous (DA), and Sex and Love Addicts Anonymous (SLAA). They are community organizations founded in the United States that subscribe to a set of principles known as the 12 steps and 12 traditions. The principles vary by program with the basic structure preserved.

The original program is AA. It is the largest community-based program for alcohol-related problems (Greenfield & Tonigan, 2013). It was founded in 1935 by Bill Wilson, a New York stockbroker, and Bob Smith, an Ohio physician (AA, n.d.-b). Both struggled with alcoholism and prior to meeting had been to Oxford Groups, comprised of mostly non-alcoholics who used spiritual principles for daily living. Wilson attained sobriety through these principles and with the help of a friend, as well as subscribed to the disease concept of alcoholism. Smith was not able to stop drinking until he met Wilson. Their meeting had an immediate effect and is considered the spark that began AA, and thus, one alcoholic helping another became the basis of the program (AA, n.d.-b). The 2018 estimate is two million members in 180 countries (AA, n.d.-a). “The only requirement for membership is a desire to stop drinking” (AA, 1981, p. 139). Members identify themselves as *alcoholic*.

Two 12-step programs examined in this study address substance use. The second is NA, which is not limited to narcotics in its scope, but rather includes all drugs, including alcohol. Historical information is from the NA website (n.d.-a). Founded in California by Jimmy Kinnon in 1953, NA is the second largest 12-step group behind AA. As of 2016, there were 67,000 weekly meetings in 139 countries. “The only requirement for membership is a desire to stop using” (NA, 1993, p. 144). Members identify themselves as *addict*.

The third program examined was GA, the first 12-step program to address a behavioral addiction. Historical information is from the GA website (n.d.). GA began in 1957 with a chance meeting between two men with an obsession to gamble. They concluded that character changes through use of spiritual principles used by those recovering from other addictions would prevent relapse. The first group met in California. “The only requirement for membership is a desire to stop gambling” (GA, n.d., p. vii). Members identify themselves as *gambler*.

The fourth 12-step program examined was OA. This program addresses eating issues, including anorexia and bulimia. Historical information is from the OA website (n.d.). The OA program began in 1960 when Rozanne, Jo S., and Bernice S. met in California. Today, there are 60,000 members in 75 countries, with 6,500 groups meeting weekly. “The only requirement for membership is a desire to stop eating compulsively” (OA, 2018, p. 107). Members identify themselves as *compulsive overeater, anorexic, or bulimic*.

The fifth 12-step program examined was DA. This program addresses financial issues across a wide spectrum, including those who are miserly and those who spend compulsively whether they are or are not in debt. Historical information is from the DA website (n.d.). The DA program began in 1976 when John H., an AA member, met with another debtor in a church in New York. Their success in applying 12 steps to overspending and what they refer to as

*debt*ing caught on. Today, there are more than 500 registered meetings in 15 countries worldwide. “The only requirement for membership is a desire to stop incurring unsecured debt” (DA, 2016, p. 74). Members identify themselves as *debtor, compulsive spender, underearner, or vague about money*.

The sixth 12-step program examined was SLAA. This program addresses a wide range of sex and love issues, including those with sexual anorexia. The program began in 1976 in Massachusetts (Augustine Fellowship, 1986). While not listed on the SLAA website, anecdotal estimates were provided by the webmaster. The number of registered groups is estimated at 920, not including the many unregistered groups, with an estimated 25,000 members meeting in 60 countries (B., personal communication, October 30, 2018).¹ “The only requirement for membership is a desire to stop living out a pattern of sex and love addiction” (Augustine Fellowship, 2018, para. 12). Members identify themselves as *sex and love addicts*.

Step One

The surrender process, including acknowledging lack of personal control, forms the basis of recovery in 12-step programs. Step one, the surrender step, is characterized by the admission of powerlessness and unmanageability. It is weakness, not strength, that undergirds 12-step recovery. Alcoholics Anonymous members admit powerlessness over alcohol. Alcoholism is viewed as an incurable disease that can be arrested but not eliminated (Humphreys et al., 2004). It is believed that alcoholics have an allergy, meaning their bodies simply cannot tolerate alcohol (Franken, 2014). Willpower is considered to be of no use, regardless of the consequences; it is considered a progressive illness that combines a mental obsession with drinking and a physical sensitivity to alcohol (AA, 1952). The need to “hit bottom” is emphasized (AA, 1981). Bateson

¹ Last name not provided due to the anonymity of the program.

(1972) theorized that the reason AA worked was because members' acknowledging powerlessness over alcohol experienced "a change in epistemology, a change in how to know about personality-in-the-world" that included acceptance of distinctly different assumptions (p. 313).

These concepts evolved with input from the medical community, which heretofore, had little success in treating alcoholics. The physician Benjamin Rush was the first to describe the disease concept as a compulsion that was chronic, progressive, and led to a loss of control (Levine, 1978). At the time, the problem was considered a moral issue. A chain of events beginning in the 1930s is credited with AA's formation. In 1931, Rowland, a struggling alcoholic, having exhausted recovery options in the United States, sought care in Switzerland from Dr. Carl Jung. Following a period of sobriety, Rowland relapsed, and Jung candidly expressed hopelessness regarding treatment. Jung spoke of rare conversions of a spiritual nature and recommended involvement in religious groups. In a letter to Wilson years later, Jung (1963) wrote about the "protective wall of human community" (para. 5). Rowland returned to the United States and joined the Oxford Groups, also attended by a childhood friend of Wilson's named Ebby, who, in Wilson's estimation, was a hopeless alcoholic. Ebby paid a visit to Wilson, who listened intently as his friend spoke of his spiritual transformation and resulting sobriety. This friend, Jung, and Dr. William Silkworth were instrumental in the development of AA.

Clinicians continued seeking answers. Silkworth (1937, 1941) is credited with the first medical writing on alcoholism as an illness. He treated Wilson at Towns Hospital in 1933. Wilson learned of the nature of the illness, which was a mental obsession and compulsion to drink, with an allergy of the body that leads to insanity or death. In his work with others,

Silkworth advised Wilson not to preach and to present the hard, medical facts first (Wilson, 1957). Decades later, brain imagery research confirmed the hard, medical fact that dysfunctional brain circuitry disrupts self-control (Volkow, 2018). A similar disruption is seen in brain scans of those with obesity, suggesting the need for further research to provide empirical support for why overeaters benefit from a program formed for alcoholics (Volkow & Baler, 2015; Volkow & O'Brien, 2007).

Attention to the surrender process and its significance in recovery has been ongoing. Another doctor who treated Wilson was Harry Tiebout, who coupled his psychiatric knowledge with philosophies of AA (Levin, 1977). He presented an alcoholic client with a prepublication copy of *Alcoholics Anonymous*. She became sober and he was the first psychiatrist to refer clients to AA. He believed alcoholism began as a symptom and progressed to a disease (Lobdell, 2004). Tiebout's articles (1944, 1946, 1951) introduced AA to medical and scientific communities. He emphasized the concept of "surrender," which is characterized by a willingness to accept powerlessness and the need for help from a greater power (Tiebout, 1944). Humphreys et al. (2004) identified difficulty surrendering and accepting powerlessness as factors that may present barriers to 12-step effectiveness. Laudet and White (2005) found that motivational factors, including ambivalence, posed greater barriers than difficulties with powerlessness and the surrender process. Spiritual surrender and its phenomenological link to transcending difficulties has been shown with other populations (Cole & Pargament, 1999; Mattis, 2002).

The work of William James, the great American philosopher, is also considered of importance to AA's development. James's (1902) book the *Varieties of Religious Experience* was popular with the Oxford Groups. Reading the myriad versions of spiritual experiences

provided validation for a transformational experience Wilson had at the hospital. The concepts conveyed were incorporated into the *Big Book* (Wilson, 2001) and the 12 steps (AA, 1981).

Anecdotal testimony about the effectiveness of AA, rather than scientific support, had been responsible for its growth, though there has been an increase in research that supports AA and 12-step programs (e.g., Humphreys & Moos, 2001; Longabaugh et al., 1998; Walitzer, Dermen, & Barrick, 2009; Zemore & Kaskutas, 2009). In relation to the first step, Fiorentine and Hillhouse (2000a) concluded that people use a combination of 12-step and outpatient treatment as integrated activities and speculated that 12-step philosophy accurately depicts the nature of addiction, including powerlessness over alcohol and other drugs (Fiorentine & Hillhouse, 2000a). Fiorentine and Hillhouse (2000b) also determined that abstinence is more likely in individuals who accept powerlessness over alcohol and drugs.

Admission of powerlessness is the first step toward liberation from alcohol. The surrender process is also the first step toward liberation in programs modeled after AA. The literature examined in this study was not the first 12-step literature to cover the concept of powerlessness.

Editorial Process in the *Big Book*, the Original Manuscript of AA

Historical accounts of the editorial process in the original manuscript of AA, *Alcoholics Anonymous*, also known as the *Big Book*, will add context to the study (Wilson, 2001). In 1937, with 35-40 sober members, Wilson and Smith decided it was time for a book (Anonymous, 2010). It was word-of-mouth up until that point and the message varied.

In 1939, the original manuscript of the *Big Book* was ready for review. Four-hundred copies were sent to the 100 AA members, friends and family of members, as well as medical and religious representatives. The original manuscript with handwritten changes reveals the

discussions and debates that the feedback stimulated before the first printing six weeks later (Anonymous, 2010). Decades later, reviewers analyzed these edits and found consistent themes, including shifts to descriptive language from prescriptive language, pronoun changes, efforts to minimize potentially offensive language, less emphasis on religion and more emphasis on the personal and universal regarding spirituality, ensuring consistency and efforts to engender cooperation and respect from a variety of professional disciplines (Anonymous, 2010). The *Big Book* is one of the best-selling books of all time. In 2010, the 30 millionth copy was presented to the American Medical Association for its long recognition of alcoholism as a disease (AA, 2012).

Step one concepts are mentioned throughout the *Big Book* and are directly covered in the opening chapters. The obvious step one edit is the addition of the famous “We” in front of “admitted we were powerless over alcohol and that our lives were unmanageable” (Anonymous, 2010, p. 3). Oftentimes, members refer to AA as a *we-program*, signifying the importance of the community approach.

The foreword to the first edition opens with, “We, of Alcoholics Anonymous, are more than one hundred men and women who have recovered from a seemingly hopeless state of mind and body” (Wilson, 2001, p. xiii). The second sentence states the purpose and changed from showing alcoholics how “they can recover” to how “we have recovered” (Wilson, 2001, p. xiii). There were significantly more edits to first-person plural from singular and plural second- and third-person pronouns than any other edits, setting the voice of the text in first-person plural. The steps are introduced with “Here are the steps we took” (Wilson, 2001, p. 59) with White (1998) pointing out that “we” was most exclusively male and Caucasian (Maxwell, 1982)—hence, a reminder of the sociocultural era in which these publications were released. Though

ethnicity variables are not included in the analysis software of this study, gender variables were examined. Research has shown that women may have concerns regarding “powerlessness” (Kaskutas, 1994; Krentzman, Brower, Cranford, Bradley, & Robinson, 2012). These concerns are understandable given the relationship between context, language, and behavior. For example, in misogynist cultures women experience marginalization, and as such their perceptions regarding opportunities, such as career opportunities may be limiting. Using a feminist perspective, Richardson (2012) provides in-depth historical background of the evolving discourse and language of work and how vocational and career theories were contextual based on the needs of the male-dominant society.

Addiction Studies Using LIWC

A review of the growing body of literature that features LIWC as a methodology instrument used to examine addiction produced a representative sample of articles for research conducted in the United States and abroad (Pennebaker, Booth, Boyd, & Francis, 2015). The LIWC methodology has been utilized to study relapse prevention. Kornfield, Toma, Shah, Moon, and Gustafson (2018) examined whether language use in online discussions may be predictive of relapse and found predictive linguistic cues, such as use of swear words. Journals focused specifically on addictions have included research that utilized LIWC to study addiction. A *Journal of Studies on Alcohol and Drugs* article by Hancock, Talley, Bohanek, Iserman, and Ireland (2018) found that women with ambiguous sexual orientation self-concept showed an increased risk for alcohol use disorder when there was a language style that was aversively focused on self.

The Psychology of Addictive Behavior, a journal of the American Psychological Association, published a language analysis study on validity and clinical utility of mindfulness in

relapse prevention (Collins et al., 2009). The LIWC program utilizes a built-in dictionary and user-created dictionaries. An expert panel generated two mindfulness-language (ML) dictionaries. Comparisons were made between the ML in a mindfulness-based treatment manual and the *Big Book* (Wilson, 2001). Results provided support for mindfulness language as a valid measure for relapse prevention. The journal *Substance Abuse* also published a linguistic analysis study by Liehr et al. (2010) on mindfulness and relapse prevention. Though significant differences were not found, the authors noted that the intervention group used fewer negative emotion words for all data points. Moreover, over time, both groups studied saw a decrease in anxiety and negative emotion word-use and an increase in positive emotion word-use. This finding adds knowledge to the literature base on negative and positive emotions in the recovery process (Folkman, 2008; Kelly, 2017; Keyes, 2007; McHugh, Kaufman, Frost, Fitzmaurice, & Weiss, 2013; Serafini, Malin-Mayor, Nich, Hunkele, & Carroll, 2016; Vaillant, 2008; Zemore, 2017).

Couple-based interventions in alcohol use disorders is another area of study that utilizes LIWC. The University of Washington and the University of New Mexico are known for research on addictions. Hallgren and McCrady (2015), who are researchers at these schools, examined treatment outcomes using within-session language analysis. Their results support communal coping practices. Interestingly, the next volume of the same journal entitled *Family Process* included an article by researchers at other United States universities that provided further evidence of the significance of communal coping through the examination of pronoun usage of individuals with problematic alcohol use (Rentscher, Soriano, Rohrbaugh, Shoham, & Mehl, 2017).

Additional articles relative to the topic of research studied in this paper were located. Ding, Bickel, and Pan (2017) studied social media, using data from the myPersonality project (Kosinski, Matz, Gosling, Popov, & Stillwell, 2015). They found a negative correlation between drug use with first-person plural pronouns and positive emotion words and were surprised to find that for alcohol use, there was a negative correlation with negative emotions. Finally, Lord, Sheng, Imel, Baer, and Atkins (2015) used LIWC methodology (Pennebaker, Booth et al., 2015) to study language used in MI (Miller & Rollnick, 1991, 2002) and found implications for training MI practitioners.

Organizations outside the U.S. also use LIWC (Pennebaker, Booth et al., 2015) to study addiction. Stephenson, Laszlo, Ehmann, Lefever, and Lefever (1997) examined diaries for correlations of therapy outcomes for patients in 12-step residential treatment in the UK. They found a statistical significance between language indicative of *insight* and *inhibition* and treatment outcome. Bliuc, Best, Iqbal, and Upton (2017) also used LIWC to study a recovery initiative in the United Kingdom that sought to foster increased recovery capital through participation in an online recovery community. The linguistic analysis resulted in positive correlations with *achievement* and *group identity* language content and engagement, which facilitated increased recovery capital.

The studies referenced are representative of the subset of addiction-related research using LIWC, with variables and interventions identified. Additionally, on a broader level the effectiveness of corpus linguistics for intervention purposes has been shown. Baikie and Wilhelm (2005) outlined the use of expressive writing as a therapeutic intervention for trauma survivors as an advance in psychiatric treatment, published in the journal *Advances in Psychiatric Treatment*. Another study on expressive writing addressed the social effects of

expressive writing in romantic relationships and found increased relationship stability for participants who wrote about their relationship compared to those who wrote about daily activities (Slatcher & Pennebaker, 2006).

Description of Manuscript 1

Manuscript Rationale

The language of addiction matters because rehabilitative treatment is through talk therapy. Outdated terminology does not reflect what scientists know about addictions. Hence, there is a “growing movement in the scientific and advocacy community to reframe the language of addiction” (Gordon, 2016, p. 3). Kelly joins others who have called for examining language use in this area (Dossett, 2017; Kelly, 2017; Kurtz, 2017; McCrady, 1994). Though addiction treatment manuals are often used to guide treatment, their language is largely unstudied. Only one study was located on the language in a mindfulness treatment manual for substance use treatment outcome (Collins et al., 2009). The present study of addiction treatment manuals from a large clinical trial analyzes rhetorical and psychological processes, including emotion words (PMRG, 1997, 1998). A prior study using Project MATCH data found that there were worse outcomes for clients with comorbid depression whose therapists focused too much on negative emotions (Karno & Longabaugh, 2003). Other researchers (e.g., Kelly, 2017; Zemore, 2017) question the potential role of positive emotions in the addiction recovery process and have called for further exploration, though, to date, “no one has looked into quantifying this” (J. Kelly, personal communication, November 12, 2018). By studying emotion word-use and other variables, this analysis of addiction treatment manuals will fill a knowledge gap. It may add further support to the movement to reframe the language of addiction to better serve those who are afflicted.

Current practice includes language that reflects a lack of cultural competence and professionalism and perpetuates stigma. Professionals have been implored to “stop talking dirty” as terminology in use induces negative implicit cognitive biases that evoke punitive attitudes and stigmatizing judgments (Kelly, Wakeman, & Saitz, 2015, p. 9). For example, drug screen test results are often referred to as *dirty*, a pejorative term compared to other typical medical test results described as positive or negative. Another example is reference to those with substance use disorders as *drug abusers*. The word *abusers* is a loaded term, akin to child abusers. A randomized study of more than 500 doctoral-level addiction and mental health clinicians concluded that clinicians exposed to the term *substance abuser* in a vignette were significantly more likely to assign punitive judgement rather than treatment (Kelly & Westerhoff, 2010). When a similar research design was used with the general population, the likelihood of judging the individual presented as a substance abuser as deserving of punishment was further increased, compared to those described as *having* a substance use disorder (Kelly, Dow, & Westerhoff, 2010). Such terminology is not used for other disorders; “having an eating disorder” is used rather than *food abusers* (Kelly et al., 2015). Additionally, “person-first” language has been supported in mental health practice (i.e., instead of “schizophrenic,” “an individual with schizophrenia” is recommended). It is vital that the current language in practice be disrupted. In a fourteen-country World Health Organization study, drug and alcohol addiction have been identified as the first and fourth most stigmatized social problems (Room, Rehm, Trotter, Paglia, & Ustun, 2001). The National Institutes of Health (2015) report that 10% of adults in the United States meet substance use criteria at some point in their lives, and that 75% report that no form of treatment is received. Stigma is a major barrier. Language matters.

Target Journal for Publication

The target journal for publication selected for the first manuscript was the *Journal of Studies on Alcohol and Drugs*. According to the journal's website, it is the oldest substance-related journal published in the United States. Based at the Center of Alcohol Studies at Rutgers, The State University of New Jersey multidisciplinary journal publishes research on all aspects of use, including problem use of alcohol, illicit substances, inhalants, tobacco, and the misuse of prescription medication. The impact factor is 2.616. The abstract for Manuscript One follows the format for authors provided by the journal. An article that appeared in the *Journal of Studies on Alcohol and Drugs* that is related to the topic of the manuscript is "Binge Drinking Episodes in Young Adults: How Should we Measure Them in a Research Setting?" (Piano, Mazzuco, Kang, & Phillips, 2017). The authors reviewed electronic databases for current binge drinking definitions, questionnaires, and biomarkers that are used for binge drinking assessment of young adults. They found that open-ended questions that assess frequency, intensity, and duration of daily versus weekend consumption patterns in conjunction with direct alcohol biomarkers are useful in identifying binge drinkers in the young adult population.

Statement of Research Questions

The purpose of the study was to analyze language used in addiction treatment manuals to fill a gap and increase the knowledge base that exists about language use that supports the recovery process. Variables including pronoun use, emotional tone, clout, authenticity, analytical thinking, and psychological and physical process words were explored in hopes of expanding the knowledge base for substance use and behavioral addictions. Three research questions were designed to guide this study. The first research question was: Do differences in the level of broad psycholinguistic processes exist among the Project MATCH treatment manuals? The broad psycholinguistic process categories were analytic, clout, authentic, and

tone. The second research question was: Do differences in specific linguistic categories exist among Project MATCH treatment manuals? The linguistics process categories were first-person singular pronouns, third-person singular pronouns, second-person pronouns, first-person plural pronouns, third-person plural pronouns, and impersonal pronouns. The third research question was: Do differences in specific psychological and physical processes exist among Project MATCH treatment manuals? The psychological and physical process categories were positive emotion, negative emotion, female reference, male reference, and biological processes.

Description of Methodology

This study employed a synchronic corpus linguistic design (Weisser, 2016). The corpora were drawn from the treatment manuals used in Project MATCH (PMRG, 1997, 1998). Project MATCH was a large, multisite clinical trial which, as the title suggests, sought to find ways to match individuals with treatment that best suited them (PMRG, 1997, 1998). One aim of Project MATCH was to determine client attributes (e.g., readiness to change) that would reliably predict how well clients would do with different treatment approaches. The 806 clients in five outpatient facilities were randomly assigned to either twelve-step facilitation (TSF) or one of two theoretically driven, highly studied, therapies: cognitive behavioral therapy (CBT) and motivational enhancement therapy (MET). In this study the TSF, CBT, and MET manuals were examined. The unit of analysis was individual words (Gabrielatos, 2018).

Description of Data Analysis

To answer the research questions, the log-likelihood ratio test (LL) was used to examine if words of a given linguistic category are proportionately distributed across the three manuals ($df = 2$) (Brezina, 2018). If the discrepancy between observed and expected proportions were statistically significant, then we rejected the null hypothesis of proportional distribution and

concluded that at least one corpus comprises a disproportionate share of words within a given linguistic category. In the event of a significant finding, three additional *post hoc* LL tests were conducted to determine which corpora contain disproportionate word shares. The *post hoc* testing procedure was identical to the overall log-likelihood ratio test, except word frequencies were regrouped to focus on specific corpora.

To control the probability of falsely rejecting at least one null hypothesis in a family of m hypotheses with an overall significance level of $\alpha = 0.05$, the Bonferroni correction was applied such that each hypothesis was tested at an adjusted significance level of $\alpha_{\alpha} = \alpha/m$. There were three linguistic families under consideration—(1) Broad Psycholinguistic Process, (2) Linguistic Process, and (3) Psychological-Physical Process—which were associated with four, six, and five linguistic categories, respectively. Hence, the adjusted significance level for the first round of hypothesis tests were $\alpha_a = 0.05/4 = 0.0125$, $\alpha_a = 0.05/6 = 0.0083$, and $\alpha_a = 0.05/5 = 0.01$, respectively. We also applied the Bonferroni correction to the family of *post hoc* tests, where m was determined after the first round of testing was complete.

Bayesian information criterion (BIC) was used to measure effect size. Positive BIC values measure the strength of evidence against the null hypothesis; negative BIC values measure the strength of evidence in favor of the null hypothesis. The following descriptors for the absolute value of BIC were used: not worth more than a bare mention (0-2), positive evidence (2-6), strong evidence (6-10), and very strong evidence (>10) (Wilson, 2013). All analyses were conducted using R.

The segmented corpus was analyzed using the LIWC2015 software program. The first four linguistic categories (i.e., analytic, clout, authentic, tone) were summary variables. The reported rates were standardized scores that are converted to a percentile ranging from 0 to 100

(Voogt, 2017). The reported rate for the remaining variables was the percentage of all words counted (Pennebaker, Boyd, Jordan, & Blackburn, 2015). For each corpus, data were derived from LIWC2015 summary tables that gave word use percentages across a variety of linguistic categories. The 15 linguistic categories we examined are grouped under three major families:

(1) Broad Psycholinguistic Process

- Analytical Thinking (analytic)
- Clout (clout)
- Authentic (authentic)
- Emotional Tone (tone)

(2) Linguistic Process

- 1st Person Singular Pronouns (i)
- 3rd Person Singular Pronouns (shehe)
- 2nd Person Pronouns (you)
- 1st Person Plural Pronouns (we)
- 3rd Person Plural Pronouns (they)
- Impersonal Pronouns (ipron)

(3) Psychological-Physical Process

- Female Reference (female)
- Male Reference (male)
- Positive Emotion (posemo)
- Negative Emotion (negemo)
- Biological Processes (bio)

Data Summary

Overall word counts. All corpora have differing word counts. The pooled word count, the individual word counts of each corpus, and the word frequency distribution across corpora are considered. For example, there was a total of 80,180 words across three corpora. Of these, 31,726 are members of the TSF corpus. Thus, the TSF corpus contains $31,726/80,180 = 40\%$ of all words in the dataset. The word frequency distribution summarizes the relative size of each corpus. The MET corpus is small relative to the other corpora as it contains only 28% of the total word share.

Word counts by category. The LIWC2015 output gives word percentages within each linguistic category. For the purposes of our analysis, it was necessary that we convert these percentages into raw word counts. For example, 0.15% out of 31,726 in the TSF corpus were “we” words. Thus, we can infer that $31,726 \times 0.15\% = 48$ words in the TSF corpus are first-person plural words. Almost the same percentage of words in the MET corpus are “we” words (0.15%), but since the MET corpus contains fewer words than the TSF corpus, the number of “we” words in the MET corpus is also smaller ($22,531 \times 0.15\% = 34$). Overall, there are $48 + 34 + 29 = 111$ “we” words, which comprise roughly 0.14% of the pooled word count. While frequency counts are required for performing the log-likelihood ratio test, the percentages that LIWC2015 provides were useful for describing patterns in the data.

Description of Manuscript 2

Manuscript Rationale

With addiction, the path to recovery is complex, due in part to stigma and conflicting information. Additionally, a recognized disconnect between the recovery community and the clinical and research community provides further complication (Best, 2017; Vederhus, Laudet, Kristensen, & Clausen, 2010). Calls for connection ensued, according to directors of addiction

research centers at the University of Pennsylvania and UCLA (Toft, 2000), following the Institute of Medicine's call for rigorous research on AA (1990). Research supporting 12-step efficacy emerged (Humphreys, 2003; Kaskutas, 2009; Litt, Kadden, Kabela-Cormier, & Petry, 2009; Owen et al., 2003; Project MATCH Research Group [PMRG], 1998).

Two Harvard Medical School professors explained that “the addiction research field has moved beyond asking *whether* AA and 12-step treatment works, to investigating *how* and *why* they work” (Kelly & Beresin, 2014, para. 18). Using criteria for determining effects in research (Hill, 1965), a causal pathway is supported by a preponderance of evidence that shows that AA attendance leads to abstinence (Krentzman et al., 2010). Increased abstinence is associated with participation in AA (Moos & Moos, 2006). Mechanisms of behavior change, and the effects of AA have been identified (Kelly, 2017). Researchers such as Kelly (2017) and Zemore (2017) suggest work on other “drivers of abstinence” in AA including neglected psychosocial factors such as positive emotions (Folkman, 2008; McHugh, Kaufman, Frost, Fitzmaurice, & Weiss, 2013; Serafini, Malin-Mayor, Nich, Hunkele, & Carroll, 2016; Vaillant, 2008), a variable in this study.

Researchers have established a link between language and behavior. Examples include the aforementioned randomized studies in which clinicians in the first study, and members of the public in the second study, were more likely to assign punitive judgement rather than treatment when exposed to vignettes of individuals using the term *substance abuser* versus *having* a substance use disorder (Kelly & Westerhoff, 2010; Kelly, Dow, & Westerhoff, 2010). Language influenced perception and behavior. The term *abuser* is viewed as a pejorative term, akin to child abusers according to Kelly and others who have called for an examination and reframing of the language of addiction (Dossett, 2017; Gordon, 2016; Kelly, 2017; Kurtz, 2017; McCrady, 2017).

Kelly, Wakeman, and Saitz (2015) explain that the language in use induces negative implicit cognitive biases that evoke punitive attitudes and stigmatizing judgments. Rather than stimulating help-seeking behaviors, the current language induces stigma, a barrier to treatment.

In addition to the language/behavior link when others refer to specific populations, there is a language/behavior link within populations. To illustrate this concept we will consider clout, a variable in this study. Clout may be portrayed through writing. It refers to confidence, status, and leadership. A destructive side of clout has been studied (Drouin, Boyd, & Greidanus Romaneli, 2018; Drouin, Egan, Yergens, & Hernandez, 2018). Increased understanding may aid those studying gaming disorder given that “clout” may be a driving force in the dark side of gaming, as evidenced by a report that a gamer's online clout went up after a prank 911 call on an opposing gamer led cops to draw fire and kill his opponent (Koerner, 2018). Links between language and behavior have been examined for relapse prevention. For example, Kornfield et al. (2018) researched whether language use in online discussions may be predictive of relapse and found predictive linguistic cues, such as use of swear words. Researchers have also conducted statistical discourse analysis of online sexual offenders' chats with minors to detect language/behavior links between those motivated by fantasy versus those seeking in-person contact and identified relevance of self-disclosure and emotion words (Chiu, Seigfried-Spellar, & Ringenberg, 2018).

The AA program is a model for 12-step programs where, for example, overeaters and gamblers find relief. Over 400 groups have received permission from AA to adapt the *Big Book* and 12 steps (Anonymous, 2010). Research reported in the *American Medical Association Journal of Ethics* (Mendola & Gibson, 2016) describe 12-step programs as useful for a wide range of addictions. Recovery and research communities agree that addiction is a chronic,

progressive, fatal disease characterized by impaired control (Goldstein & Volkow, 2011; Kalivas & Volkow, 2005). The American Society of Addiction Medicine (ASAM) references substance use and “other behaviors” and includes the words “food” and “sex” in the official definition of addiction developed by 80 neuroscientists (ASAM, 2011, para 3). Raikhel (2015, p. 387) states that definitions evolve that translate prior ‘failure of will’ concepts to a ‘language of self-control’ – “the loss of which is seen as a core diagnostic criterion (Baler & Volkow, 2006; Weinberg, 2013).”

Impaired control is characteristic of substance and behavioral addictions (Dackis & O’Brien, 2005; Fraser, Moore, & Keane, 2014; Grant, Potenza, Weinstein, & Gorelick, 2010). The American Psychiatric Association (APA) includes impaired control as a criterion for Gambling Disorder, the only behavioral addiction in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; [DSM-5]; APA, 2013). When revised, there was not sufficient evidence to include subcategories such as “sex addiction,” “exercise addiction,” or “shopping addiction” (APA, 2013, p. 481), though lay persons use these terms, and the afflicted are seen by clinicians. Time lags in research are estimated at 17 years (Slote Morris, Wooding, & Grant, 2011). The slow recognition of behavioral addictions is filled in part by 12-step programs. A new disorder arrived on the scene. In 2018, the World Health Organization (2018) recognized gaming disorder. Not yet seen as a disorder by APA, internet gaming disorder is in the Conditions for Further Study section of the *DSM-5* (APA, 2013) with lack of control as a criterion. With much unknown about behavioral addictions, research and recovery communities agree that control is impaired. Due to outdated addiction terminology, members of the scientific community are advocating for a change to language that more closely reflects current knowledge

(Gordon, 2016). Hence, a study of the rhetorical and psychological processes of the first of the 12 steps, which addresses lack of control, is warranted.

Target Journal for Publication

The target journal for publication selected for the second manuscript was *Addictive Behaviors*, an international peer-reviewed journal publishing research on addictive behaviors and disorders since 1975. The journal publishes articles on substance-related addictions, as well as behavioral addictions involving gambling and technology. The impact factor for the journal is 2.686. An article that appeared in *Addictive Behaviors* related to the topic of the manuscript is “Effects of Self-Reflection on Engagement in a 12-Step Addiction Treatment Programme: A Linguistic Analysis of Diary Entries” (Stephenson & Zygouris, 2007). This study found that treatment engagement was enhanced by reviewing journal entries that were written at a prior time in the course of 12-step-based treatment.

Statement of Research Questions

The purpose of the study is to analyze language used in 12-step program literature to fill a gap and increase knowledge about language use that supports the recovery process. Variables including pronoun use, emotional tone, clout, authenticity, analytical thinking, as well as psychological and physical process words were explored in hopes of expanding the knowledge base for substance use and behavioral addictions. Three research questions were designed to guide this study. The first research question was: Do differences in the level of broad psycholinguistic processes exist among the 12-step program literature? The broad psycholinguistic process categories were analytic, clout, authentic, and tone. The second research question was: Do differences in specific linguistic categories exist among the 12-step program literature? The linguistics process categories were first-person singular pronouns, third-

person singular pronouns, second-person pronouns, first-person plural pronouns, third-person plural pronouns, and impersonal pronouns. The third research question was: Do differences in specific psychological and physical processes exist among the 12-step program literature? The psychological and physical process categories were positive emotion, negative emotion, female reference, male reference, and biological processes.

Description of Methodology

This study employed a synchronic corpus linguistic design (Weisser, 2016). Literature from six 12-step programs were examined in this study. The corpora were drawn from the primary text for the following self-help groups: Alcoholics Anonymous (AA), Narcotics Anonymous (NA), Gamblers Anonymous (GA), Overeaters Anonymous (OA), Debtors Anonymous (DA), and Sex and Love Addicts Anonymous (SLAA). The unit of analysis was individual words (Gabrielatos, 2018).

Description of Data Analysis

To answer the research questions, the log-likelihood ratio test (LL) was used to examine if words of a given linguistic category are proportionally distributed across the six tests ($df = 5$) (Brezina, 2018). If the discrepancy between observed and expected proportions were statistically significant, then we rejected the null hypothesis of proportional distribution and concluded that at least one corpus comprises a disproportionate share of words within a given linguistic category. In the event of a significant finding, six additional *post hoc* LL tests were conducted to determine which corpora contain disproportionate word shares. The *post hoc* testing procedure was identical to the overall log-likelihood ratio test, except word frequencies were regrouped to focus on specific corpora.

To control the probability of falsely rejecting at least one null hypothesis in a family of m hypotheses with an overall significance level of $\alpha = 0.05$, the Bonferroni correction was applied such that each hypothesis was tested at an adjusted significance level of $\alpha_\alpha = \alpha/m$. There were three linguistic families under consideration—(1) Broad Psycholinguistic Process, (2) Linguistic Process, and (3) Psychological-Physical Process—which were associated with four, six, and five linguistic categories, respectively. Hence, the adjusted significance level for the first round of hypothesis tests were respectively. We also applied the Bonferroni correction to the family of *post hoc* tests, where m was determined after the first round of testing was complete.

The BIC was used to measure effect size. Positive BIC values measure the strength of evidence against the null hypothesis; negative BIC values measure the strength of evidence in favor of the null hypothesis. The following descriptors for the absolute value of BIC were used: not worth more than a bare mention (0-2), positive evidence (2-6), strong evidence (6-10), and very strong evidence (>10) (Wilson, 2013). All analyses were conducted using R.

The segmented corpus was analyzed using the LIWC2015 software program. The first four linguistic categories (i.e., analytic, clout, authentic, tone) were summary variables. The reported rates were standardized scores that were converted to a percentile ranging from 0 to 100 (Voogt, 2017). The reported rate for the remaining variables was the percentage of all words counted (Pennebaker, Boyd et al., 2015). For each corpus, data were derived from LIWC2015 summary tables that gave word use percentages across a variety of linguistic categories. The 15 linguistic categories we examined are grouped under two major families:

(4) Linguistic Process

- first-person singular pronouns (i)
- third-person singular pronouns (shehe)

- second-person pronouns (you)
- first-person plural pronouns (we)
- third-person plural pronouns (they)
- impersonal pronouns (ipron)

(5) Psychological-Physical Process

- female reference (female)
- male reference (male)
- positive emotion (posemo)
- negative emotion (negemo)
- biological processes (bio)

Data Summary

Overall word counts. All corpora have differing word counts. The pooled word count, the individual word counts of each corpus, and the word frequency distribution across corpora were considered. For example, there were a total of 10,130 words across six corpora. Of these, 1,022 are members of the AA corpus. Thus, the AA corpus contains $1022/10130 = 10\%$ of all words in the dataset. The word frequency distribution summarizes the relative size of each corpus. The GA corpus is small relative to the other corpora, as it contains only 3% of the total word share.

Word counts by category. The LIWC2015 output gave word percentages within each linguistic category. For the purposes of our analysis, it was necessary that we convert these percentages into raw word counts. For example, 7.83% out of 1022 words in the AA corpus are “ipron” words. Thus, we can infer that $1022 \times 7.83\% = 80$ words in the AA corpus are ipron words. Roughly the same percentage of words in the GA corpus are ipron (7.77%), but since the

GA corpus contains far fewer words than the AA corpus, the number of ipron words in the GA corpus is also smaller ($296 \times 7.77\% = 23$). Overall, there are $80 + 136 + 23 + 147 + 80 + 130 = 596$ ipron words, which comprise roughly 5.88% of the pooled word count. While frequency counts are required for performing the log-likelihood ratio test, the percentages that LIWC2015 provides are useful for describing patterns in the data.

Specialized Glossary

This study includes terms that may be unfamiliar to readers. The terms are defined here:

Alcoholics Anonymous (AA): Alcoholics Anonymous is a 12-step program for people who have problems related to alcohol use.

Alcohol Use Disorder (AUD): “Alcohol Use Disorder is a chronic relapsing brain disease characterized by compulsive alcohol use, loss of control over alcohol intake, and a negative emotional state when not using” (National Institute of Alcohol Abuse and Alcoholism, 2017, para. 1). According to the *DSM-5*, a diagnosis of AUD is assigned if any two of 11 criteria in a 12-month period is met (APA, 2013).

Bayesian Statistics: “In contrast to frequentist statistics, Bayesian statistics focuses on the probability of hypotheses in the light of observed data, rather than on the probability of observed (and more extreme) data in the light of hypotheses” (Wilson, 2013, p. 5).

Bayesian Information Criterion (BIC): “Bayes factor is a measure of the amount of evidence provided by a test against the null hypotheses” (Wilson, 2013, p. 5).

Corpus/Corpora: “A collection of text, now usually in machine-readable form and compiled to be representative of a particular kind of language and provided with some kind of annotation” (“Corpus linguistics,” 1998).

Corpus Linguistics: “Depending on the author, may mean either (a) any approach to language that uses corpus data and methods, or (b) an approach to linguistics that uses corpus methods but does not subscribe to principles of the so-called *corpus-driven* approach” (McEnery & Hardie, 2012, p. 241).

Debtors Anonymous (DA): Debtors Anonymous is a 12-step program for people who have problems related to debt.

Gamblers Anonymous (GA): Gamblers Anonymous is a 12-step program for people who have problems related to gambling.

Linguistic Inquiry and Word Count (LIWC):

LIWC is a transparent text analysis program that counts words in psychologically meaningful categories, with LIWC2015 being the latest version. Empirical results using LIWC demonstrate its ability to detect meaning in a wide variety of experimental settings, including to show attentional focus, emotionality, social relationships, thinking styles, and individual differences (Tausczik & Pennebaker, 2010, p. 24).

Log Likelihood (LL) Test: “A significance test similar to the chi-square test, but generally considered more reliable, especially when working with small values” (McEnery & Hardie, 2012, p. 246).

Narcotics Anonymous (NA): Narcotics Anonymous is a 12-step program for people who have problems related to substance use.

Overeaters Anonymous (OA): Overeaters Anonymous is a 12-step program for people who have problems related to compulsive eating.

Project MATCH: Project MATCH (Matching Alcohol Treatment to Client Heterogeneity) was a large, multisite clinical trial which, as the title suggests, sought to find ways to match individuals with treatment that best suited them (PMRG, 1997, 1998).

Sex and Love Addicts Anonymous (SLAA): Sex and Love Addicts Anonymous is a 12-step program for people who have problems related to sex and love addiction.

Thematic Links Between Phases of the Research

The studies contained in these manuscripts are thematically linked. Both studies use LIWC2015 (Pennebaker, Booth et al., 2015) to explore the rhetorical and psychological processes in professional and self-help literature for substance misuse and behavioral addictions.

Dissertation Organization

This dissertation is divided into four chapters. Chapter 1 provides a general introduction that includes an overview of the major research on the topics of discursive and psychological processes in Project MATCH treatment manuals and six 12-step programs. Chapter 2 is an original manuscript that examines whether differences exist among Project MATCH treatment manuals. Chapter 3 is a separate original manuscript that investigates difference among 12-step literature on step one. Chapter 4 will provide a general conclusion, including the common conclusions that link the manuscripts thematically. Summaries of the findings, the limitations section, discussion section, and recommendations will be included. Additionally, an agenda for future research will be articulated.

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Chapter 2: A Research Manuscript

A Corpus Linguistic Study of Addiction Professional Treatment Manuals

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Abstract

Objective: Research indicates that the language used in addiction matters; therefore, the purpose of this study was to investigate whether differences in discursive and psychological processes exist in treatment manuals used for addiction treatment. **Method:** Using a synchronic corpus linguistic design, twelve-step facilitation, cognitive behavioral therapy, and motivation enhancement therapy manuals from Project MATCH were analyzed using LIWC2015. The log-likelihood ratio test was used to examine if difference in variables exist between the three manuals, with *post hoc* analysis to further examine differences. Bayesian information criterion was used to measure effect size, which ranged from weak to very strong. **Results:** Statistically significant differences exist in analytical thinking, authentic, emotional tone, first-person singular pronouns, second-person pronouns, third-person plural pronouns, negative emotion, male, and biological process words. **Conclusions:** Differences exist in psycholinguistic, linguistic, psychological, and physical processes between TSF, MET, and CBT. The greatest differences across all variables were between TSF and MET. Physical and mental aspects are addressed in TSF, whereas MET focuses on mental aspects. Knowledge of these and other differences support treatment matching for improved client outcomes. Findings of this study may have relevance to clinicians who provide addiction treatment, manual writers, addiction researchers, and clients with addiction issues. Further study of *I* words, which correlate with truth-telling, versus *we* words which support community, is suggested.

Keywords: addiction, alcohol use disorder, corpus linguistics, LIWC, treatment manuals

A Corpus Linguistic Study of Addiction Professional Treatment Textual Materials

*My drug dealer was a doctor, doctor
 Had the plug from Big Pharma, Pharma
 He said that he would heal me, heal me
 But he only gave me problems, problems
 My drug dealer was a doctor, doctor
 Had the plug from Big Pharma, Pharma
 I think he trying to kill me, kill me
 He tried to kill me for a dollar, dollar
 (Macklemore, 2016)*

Language is powerful—often lethal. In 1980, a one-paragraph letter published in the *New England Journal of Medicine* (Porter & Jick, 1980) was instrumental in fueling the American opiate epidemic. It falsely claimed a low risk of addiction when opiates were prescribed for chronic pain. The publication had no supporting evidence, yet it was referenced in over 600 citations (Leung, Macdonald, Stanbrook, Dhalla, & Juurlink, 2017). Money talks. However, in 2007, OxyContin manufacturers pled guilty to criminal charges that they misled the medical community, regulators, and the public (Meier, 2007). Overdoses related to prescription opioids accounted for over 200,000 deaths in the United States from 1999 to 2016, with five times higher rates in 2016 compared to 1999 (Seth, Rudd, Noonan, & Haegerich, 2018). According to the Center for Disease Control, 36% of the 47,600 opioid overdose deaths in 2017 were related to prescription opioids (Scholl, Seth, Kariisa, Wilson, & Baldwin, 2019). There is no bringing back the sons, daughters, sisters, brothers, mothers, fathers, and friends who were misinformed and crossed the line to fatal addiction. Their lives are lost. There are many who still suffer. How can those who struggle with substance use disorders restore their faith in the research and medical community? What can we learn from the tragic fallacy that was promulgated? Language matters.

The language of addiction matters because rehabilitative treatment is through talk therapy. Outdated terminology does not reflect what is known by scientists about addiction. Hence, there is a “growing movement in the scientific and advocacy community to reframe the language of addiction” (Gordon, 2016, p. 3). Kelly joins others who have called for an examination of the language used in this area (e.g., Dossett, 2017; Kelly, 2017; Kurtz, 2017; McCrady, 1994). Though addiction treatment manuals are often used to guide treatment, their language is unstudied. One study on the language in a mindfulness treatment manual for substance-use treatment was located (Collins et al., 2009). The present study of addiction treatment manuals from a large clinical trial (Project MATCH Research Group [PMRG], 1997, 1998) contains analysis of rhetorical and psychological processes, including emotion words. Researchers of a prior study used Project MATCH data and found that there were worse outcomes for clients with comorbid depression whose therapists focused too much on negative emotions (Karno & Longabaugh, 2003). Other researchers (e.g., Kelly, 2017; Zemore, 2017) questioned the potential role of positive emotions in the addiction recovery process and have called for further exploration, though, to date, “no one has looked into quantifying this” (J. Kelly, personal communication, November 12, 2018). By studying emotion word-use and other variables, this analysis of addiction treatment manuals will fill a knowledge gap. It may add support to the movement to reframe the language of addiction to better serve those who are afflicted.

To provide context for the study, a review of the literature was conducted. Five topics that emerged are addressed. These are: (a) What is manualized treatment? (b) a description of manualized addiction research prior to Project MATCH, (c) a description of Project MATCH and its significance, (d) a description of twelve-step facilitation (TSF), cognitive behavioral

therapy (CBT) and motivational enhancement therapy (MET), and (e) representative studies using Linguistic Inquiry and Word Count (LIWC) in addiction research. Once these areas are addressed, the research questions are described.

Manualized treatment refers to psychotherapy that follows a standardized structure, including practices that have been supported by well-controlled research with random assignment. Clinicians stay updated on best practices through professional literature. Whereas journal articles include treatment effects reports, manuals describe in greater depth how to deliver treatment (LeCroy, 2008). Accordingly, the likelihood that practitioners will be able to deliver effective therapies to patients is increased (LeCroy, 2008). Singer and Greeno (2013) stressed that manuals should be written with clinician rather than researcher in mind. As a dissemination tool of evidence-based therapies, treatment manuals have been credited with improving clinical practice while also criticized for imposing impersonal treatment that is not practical or reflective of real-world issues (Godley, White, Diamond, Passetti, & Titus, 2001). Godley et al. (2001) studied 19 clinicians who used manualized treatment for problem use of cannabis. Almost all reported positive experiences and identified ease of use, structure, and focus as reasons why.

Treatment manuals are relatively new in the counseling field. They have been studied in psychotherapy research only since the 1960s (Duncan, Nicol, & Ager, 2004). The first identified treatment manual was Paul's (1966) dissertation based on the procedural elements of systematic desensitization provided by Wolpe (1958). Treatment manuals marked the advent of manualized treatment, though addiction treatment lagged. The Minnesota Model (Cook, 1988) was the traditional American approach that dominated addiction treatment in spite of a lack of research to support its effectiveness.

Project MATCH (Matching Alcohol Treatment to Client Heterogeneity) was a large, multisite clinical trial that sought to find ways to match individuals with treatment that best suited them (PMRG, 1997, 1998). The 806 clients in five outpatient facilities were randomly assigned to either TSF or one of two theoretically-driven, highly-studied therapies: CBT and MET. The researchers found few differences in outcomes between the three treatment approaches; however, results garnered respect for TSF, the least-studied approach, and indirectly for Alcoholics Anonymous (AA) as the main goal of TSF is to help clients work the 12 steps. Results showed that clients achieved higher levels of overall abstinence and attended more 12-step meetings when they participated in TSF. At one-year post-treatment, more than double the number of participants remained abstinent, and at the three-year mark approximately one-third more were abstinent (Tonigan, Connors, & Miller, 2003).

A three-year follow-up study was conducted (Longabaugh, Wirtz, Zweben, & Stout, 1998). Results showed 50% higher abstinence rates in the prior 90 days for the TSF group when compared with CBT. The researchers concluded that, for those whose networks supported drinking, TSF may be the treatment of choice and that regardless of the therapeutic approach AA should be considered. The results of Project MATCH (PMRG, 1997, 1998) were surprising and significant. Prior to Project MATCH, research on AA and professionally led treatments that support AA, such as TSF, were not considered to be methodologically sound.

There exist a number of interventions that facilitate engagement in AA and the 12-step recovery process. Common features include education and discussion about 12-step groups, the nature of meetings and what one can expect, and systemic encouragement to participate (Kelly et al., 2016). The 12-step facilitative intervention used in Project MATCH (PMRG, 1997, 1998) was TSF (Nowinski, Baker, & Carroll, 1992). It is a manually-guided intervention based on the

emotional, behavioral, cognitive, and spiritual principles of AA. The aim is to facilitate early recovery through guidance with the beginning steps. The first session covers the disease concept, surrender process, and acceptance of total abstinence. Developed for individual counseling for those with alcohol use disorder (AUD), it has been adapted for use in groups (Brown, Seraganian, Tremblay, & Annis, 2002a, 2002b) and to address other substances (Baker, 1998; Carroll et al., 2000).

Motivation enhancement therapy (Miller, Zweben, DiClemente, & Rychtarik, 1992) is a manualized treatment developed for use in research (PMRG, 1997, 1998). MET combined adaptations of an intervention called the “Drinker’s Checkup” ([DCU]; Miller & Sovereign, 1989; Miller, Sovereign, & Krege, 1988) and motivational interviewing ([MI]; Miller & Rollnick, 1991, 2002). The DCU was an in-depth assessment of alcohol use and related problems. Increased help-seeking was the expected outcome; however, DCU intervention in and of itself triggered motivation for change. Motivational interviewing is a brief, client-centered intervention and is evidence-based with tested validity and reliability (Madson & Campbell, 2006). Developed to address AUD, MI has shown beneficial effects across a wide range of problems. Motivational interviewing may be used with other counseling approaches as it was developed as a tool to address and resolve ambivalence in the change process. Motivational interviewing has shown effectiveness when conducted by a broad range of clinicians and with diverse populations.

Cognitive behavior therapy, also referred to as cognitive therapy, was developed in the 1960s by Aaron T. Beck (2005). The theory behind is that the way situations are perceived affects the way one feels about them. This therapeutic approach is used to assist individuals with identifying underlying thinking patterns, challenging distortions, and replacing them with

healthier thoughts which result in changed behaviors. For example, when cravings are present, clients learn to respond in ways other than drinking, such as noticing how one rationalizes drinking, challenging those thoughts, and replacing them with thoughts that support relapse prevention. Information is conveyed in a lecture format in order to teach skills. The CBT intervention in Project MATCH (PMRG, 1997, 1998) followed a treatment manual developed by Kadden et al. (1992).

A review of the growing body of literature that features LIWC (Pennebaker, Boyd, Jordan, & Blackburn, 2015) as a methodology instrument used to examine addiction produced a representative sample of articles. A *Journal of Studies on Alcohol and Drugs* article by Hancock, Talley, Bohanek, Iserman, and Ireland (2018) covered women's ambiguity of sexual orientation, with results showing increased AUD risk when language was aversively focused on self. *The Psychology of Addictive Behavior* published a language analysis study (Collins, et al., 2009) that compared a mindfulness-based treatment manual to the *Big Book*, the original text of AA (Wilson, 2001). Support for clinical use of mindfulness language to prevent relapse was found. The journal *Substance Abuse* also published a linguistic analysis study by Liehr et al. (2010) on mindfulness and relapse prevention. Though significant differences were not found, the authors noted that the intervention group used less negative emotion words for all data points. Also, both groups studied saw a decrease in anxiety and negative emotion words and an increase in positive emotion words. This finding adds knowledge to the literature base on negative and positive emotions in the recovery process (e.g., Folkman, 2008; Kelly, 2017; Keyes, 2007; McHugh, Kaufman, Frost, Fitzmaurice, & Weiss, 2013; Serafini, Malin-Mayor, Nich, Hunkele, & Carroll, 2016; Vaillant, 2008; Zemore, 2017). Ding, Bickel, and Pan (2017) studied social media, using data from myPersonality project (Kosinski, Matz, Gosling, Popov, & Stillwell,

2015). They found a negative correlation for drug use with first-person plural pronouns and positive emotion words and were surprised to find that for alcohol use there was a negative correlation with negative emotions. Finally, an article by Lord, Sheng, Imel, Baer, and Atkins (2015) that used LIWC methodology (Pennebaker et al., 2015) to study language used in MI (Miller & Rollnick, 1991, 2002) found implications for training MI practitioners.

Given the aforementioned gaps and needs, three research questions were developed to guide the present study on the Project MATCH (PMRG, 1997, 1998) treatment manuals. The first research question was: Do differences in the level of broad psycholinguistic processes exist among the Project MATCH treatment manuals? The second research question was: Do differences in specific linguistic categories exist among Project MATCH treatment manuals? The third research question was: Do differences in specific psychological and physical processes exist among Project MATCH treatment manuals?

Method

Design

This study employed a synchronic corpus linguistic design (Weisser, 2016). The corpora were drawn from the treatment manuals used in Project MATCH (PMRG, 1997, 1998). The treatment manuals studied were TSF, CBT, and MET. The unit of analysis was individual words (Gabrielatos, 2018). The variables were broad psycholinguistic, linguistic, psychological, and physical processes.

Corpora

Register and source. The register was addiction treatment manuals. The source was the three Project MATCH manuals (PMRG, 1997, 1998). Each manual formed a corpus of the corpora. All manuals were publicly available full-text.

Construction. The file for each corpus was reviewed closely and cleaned according to LIWC2015 manual (Pennebaker et al., 2015) instructions. Charts were removed as LIWC2015 does not recognize them. Spelling errors were corrected and hyphens that appeared in the document but not in the original text were removed. Cover pages, acknowledgements, list of contributors, recommended readings, references, and appendices were removed. The forward, preface, contents, and introduction sections were included for all three manuals. Additionally, in TSF, the overview, caveats, and critical conditions section, as well as the section that explains the treatment manual was included. In MET, sections on clinical considerations, practical strategies, structuring the MET session, and dealing with special populations were included. In CBT, the overview, core session, and elective session sections were included.

Measures

Overview. The first four variables listed are summary variables, scaled from 0 to 100. Higher scores indicate higher degrees of variables. Each is a population-normed, composite variable combining several LIWC2015 categories that reflect empirically-based constructs. The specific algorithms are proprietary and therefore are not publicly available. The remaining variables were reported as a percentage of total words. Pennebaker, Boyd, et al. (2015) reported acceptable validity and reliability for all of the measures below.

Analytic. Analytic is a variable that measures logical, formal, and hierarchal thinking patterns (Pennebaker, Chung, Frazee, Lavergne, & Beaver, 2014). High scores reflect this pattern, whereas lower scores suggest an informal, narrative, personal, here-and-now style (Pennebaker, Booth, Boyd, & Francis, 2015).

Clout. Clout is a variable that measures language indicative of social dominance and leadership (Drouin, Boyd, Hancock, & James, 2017). When one is in a position of authority,

conveys high expertise, and communicates with confidence, a specific, consistent linguistic pattern of several LIWC2015 variables, including pronoun use, is seen. (Kacewicz, Pennebaker, Davis, Jeon, & Graesser, 2014). High scores reflect this pattern, whereas lower scores reflect an anxious, humble, or tentative style (Pennebaker, Booth et al., 2015).

Authentic. Authentic is a scale that combines scores on a number of variables. Higher scores are indicative of honest (versus deceptive) communication and reflect more authentic and open language (Pennebaker, Booth et al., 2015). It is based on research that identified how word patterns differ when subjects told the truth compared to when they were lying (Newman, Pennebaker, Berry, & Richards, 2003; Pennebaker, 2011). When being dishonest, people tend to reference themselves less often, use more negative emotions words, and use simpler language (Newman et al., 2003).

Tone. Tone combines the positive emotion and negative emotion variables in one summary variable (Cohn, Mehl, & Pennebaker, 2004). A linguistic style that is emotionally positive would have higher scores, whereas lower scores reflect sadness, anxiety, or hostility (Pennebaker, Booth et al., 2015).

First-person singular pronoun. First-person singular pronouns are used in place of a noun when there is personal reference to the speaker or writer. Examples include *I* and *mine*.

Third-person singular pronoun. Third-person singular pronouns are used in place of a noun when there is reference to a person, animal, or thing other than the speaker or writer and reader or listener. Examples include *she* and *him*.

Second-person pronoun. Second-person pronouns are singular or plural and are used in place of a noun to address the reader or listener. Examples include *you* and *your*.

First-person plural pronoun. First-person pronouns are used in place of a noun when speaking or writing to a group that includes the speaker or writer. Examples include *we* and *us*.

Third-person plural pronoun. Third-person pronouns are used in place of noun when there is reference to people, animals, or things other than the speaker or writer and reader or listener. Examples include *they* and *their*.

Impersonal pronoun. Impersonal pronouns do not refer to a particular person, animal, or thing. Examples include *it* and *those*.

Positive emotion. Positive emotions are defined as intense and pleasurable mental experiences (Cabanac, 2002) and short-lived “multicomponent response tendencies” (Fredrickson, 2001, p. 218). Examples include *love* and *nice*.

Negative emotion. Negative emotions are usually unpleasant emotions that are evoked in individuals to express negative feelings towards an event or person. Examples include *hurt*, *ugly*, and *nasty*.

Female reference. Female references include nouns and pronouns. Examples include *her* and *mom*.

Male reference. Male references include nouns and pronouns. Examples include *his* and *boy*.

Biological process. Biological process words refer to the life processes of living organisms. Examples include *eat* and *pain*.

Apparatus

The text analysis software used to analyze the data for this study was the Linguistic Inquiry and Word Count 2015 (LIWC2015) program (Pennebaker, Booth et al., 2015). Text files were analyzed yielding scores for approximately 90 output variables. Each data record begins

with the file name, word count, and four summary language variables (i.e., analytic, clout, authentic, and tone). Next, a general descriptor variable—words per sentence—is listed. These six variables were not reported as percentages. The remaining variables were all calculated as a percentage of the total words in the file. These included two additional general descriptor variables (i.e., percentage of words containing greater than six letters and percentage of words captured by the dictionary), 21 standard linguistic categories (e.g., percentage of articles, pronouns, and auxiliary verbs), 41 word categories for psychological constructs (e.g., cognition and affect), six personal concern variables (e.g., home, work, and leisure activities), five paralinguistic categories (e.g., fillers and non-fluencies), and 12 punctuation variables (e.g., commas and periods).

Data Analysis

To answer the research questions, the log-likelihood ratio test (LL) was used to examine if differences exist between the three manuals (Brezina, 2018). When an LL result was significant, *post hoc* analyses were conducted to examine difference between specific corpora. The *post hoc* testing procedure is identical to the overall log-likelihood ratio test, except word frequencies are regrouped to focus on specific corpora. If a category variable was found to be significant, three additional *post hoc* LL tests were conducted. To control the probability of falsely rejecting at least one null hypothesis in a family of m hypotheses with an overall significance level of $\alpha = 0.05$, the Bonferroni correction was applied such that each hypothesis was tested at an adjusted significance level of $\alpha_{\alpha} = \alpha/m$. The Bayesian information criterion (BIC) was used to measure effect size. Positive BIC values measure the strength of evidence against the null hypothesis; negative BIC values measure the strength of evidence in favor of the null hypothesis. The following descriptors for the absolute value of BIC were used: not worth

more than a bare mention (0-2), positive evidence (2-6), strong evidence (6-10), and very strong evidence (>10) (Wilson, 2013). All analyses were conducted using R.

Results

Research Question 1 (Broad Psycholinguistic Processes)

Differences in four broad psycholinguistic processes among the manuals were examined ($df=2$, $\alpha=0.05/4=0.0125$, $cv=8.76$). See Table 1.1 at the end of this chapter for results of significance testing for these elements. *Post hoc* testing for broad psycholinguistic processes ($df=1$, $\alpha=0.05/12=0.0042$, $cv=8.21$) was conducted. See Table 1.2 at the end of this chapter for results of *post hoc* testing.

Research Question 2 (Linguistic Processes)

Difference in six linguistic processes among the manuals were examined ($df=2$, $\alpha=0.05/6=0.0083$, $cv=9.57$). See Table 1.1 for results of significance testing for these elements. *Post hoc* testing for linguistic processes ($df=1$, $\alpha=0.05/15=0.0033$, $cv=8.62$) was conducted. See Table 1.2 for results of *post hoc* testing.

Research Question 3 (Psychological and Physical Processes)

Differences in five psychological/physical processes among the manuals were examined ($df=2$, $\alpha=0.05/5=0.01$, $cv=9.21$). See Table 1.1 for results of significance testing for these elements. *Post hoc* testing for psychological/physical processes ($df=1$, $\alpha=0.05/9=0.0056$, $cv=7.69$) was conducted. See Table 1.2 for results of *post hoc* testing.

Discussion

This study sought to explore word usage of treatment manuals for AUD and used manuals from Project MATCH (PMRG, 1997, 1998). Using the broad psycholinguistic categories of analytic, clout, authentic, and tone words, the first research question examined

whether differences exist in the Project MATCH treatment manuals. Using the linguistic process categories of first-person singular pronoun, third-person singular pronoun, second-person pronoun, first-person plural pronoun, third-person plural pronoun, and impersonal pronouns, the second research question examined whether differences exist among Project MATCH treatment manuals. Using the psychological process categories of positive emotion and negative emotion and physical process categories of female, male, and biological processes, the third research question examined whether differences exist in Project MATCH treatment manuals.

The first research question was related to the broad psycholinguistic categories. For analytic scores, TSF had higher standard scores, and MET had lower scores than expected. There are two probable reasons for the obtained results for analytic scores. One possible reason is that the language in MET is informal, whereas TSF language is more formal. An alternative explanation is that TSF, as a step-by-step approach (Nowinski et al., 1992), receives higher standard scores for being logical and hierarchal (Pennebaker et al., 2014), whereas MET does not attempt to provide such step-by-step guidance (Miller et al., 1992). Between the former and the latter explanations, the latter is most likely because TSF has a logical progression with its step-by-step approach.

For authentic, TSF was lower, and MET and CBT were higher than expected. There are three probable reasons for the obtained results for authentic. One possible reason may be that this LIWC2015 variable is a standard score derived from deception research of individuals (Newman et al., 2003; Pennebaker, 2011) and may not apply to texts such as treatment manuals. Another explanation for the obtained results may be due to the fact that the LIWC2015 composite variable of authentic was derived from research indicating that *I* words are associated with truth-telling, which is an indication that one is speaking from the heart (Jordan &

Pennebaker, 2017). TSF is based on AA, which prefers *we* words over *I* words as a means to convey a sense of community, not because of dishonesty. A third explanation may be that TSF reflects less openness in public discourse, as was characteristic of the era in which AA was founded (Klein, 2018). TSF is closely aligned with AA, which was written in the 1930s when public discourse was less open than today, a trend described in a Pennebaker interview (Sutton, 2017). Bulkeley and Graves (2018) point out that in LIWC2015, the more a writer filters what is being said for their audience, the lower the authentic score and vice versa. Between the three explanations, the third is most likely because TSF has its basis in AA, whose literature was written long before the other manuals, during an era of less openness and more filtering.

For tone, TSF and CBT had lower scores and MET had higher scores than expected. There are two plausible reasons for these results. One possible reason is that MET is a therapy that leans positive in terms of emotion as MET is based on motivational psychology (Miller et al., 1992). An alternative explanation is that TSF and CBT are deficit-model therapies that focus on denial (Kadden et al., 1992; Nowinski et al., 1992). Between the former and the latter explanations, the latter is most likely because TSF and CBT address denial, and typically treatment is initiated by some presenting problem; hence, low scores for tone words were not unexpected.

The second research question was related to the linguistic categories of pronoun usage. For first-person singular pronouns, use was lower in TSF and higher in MET and CBT. One possible reason is that the individual perspective is not considered in TSF, whereas it is valued in MET and CBT. An alternative explanation is that TSF is highly aligned with AA, which as far back as the 1930s, stressed the community approach and use of *we* instead of *I* (Anonymous, 2010), whereas this approach has not been stressed in MET or CBT. Between the former and the

latter explanations, the latter is most likely because the individual perspective is supported and safeguarded in TSF and AA with emphasis placed on supporting newcomers and helping them form their own conceptualizations, including personal experiences of spirituality and surrender (Alcoholics Anonymous, 1981; Wilson, 2001). Additionally, the intentional change to *we* language is well-documented in AA history (Anonymous, 2010).

Similarly, there is a decreased rate of second-person pronouns in TSF and an increased use in MET. One possible reason is that in TSF there is less distinction between a TSF trainer, therapist, and client, hence, less use of *you* pronouns with a greater emphasis on *we*, whereas in MET there is a hierarchy with greater distinction between MET trainers, therapists, and clients. MET is a more research-based and clinically based approach (Kelly, 2017), which may be inherently more hierarchal, whereas TSF evolved from more egalitarian 12-step community groups (Nowinski et al., 1992). An alternative explanation for the decreased rate of second-person pronouns is that in TSF, therapists are opposed to prescribing behavior (Nowinski et al., 1992), similar to AA, which again, as far back as the 1930s, stressed the need to avoid telling people what to do (Alcoholics Anonymous, 1981; Anonymous, 2010; Wilson, 2001), whereas MET is a directive approach in which therapists are encouraged to give advice (Miller et al., 1992). Between the former and the latter explanations, the latter is most likely because giving advice entails more use of second-person pronouns.

There is an increased use of third-person plural pronouns in TSF and a decreased use in MET. One possible reason is that third-person pronouns are being used to differentiate and sometimes create distance between *us* (i.e., healthy clinicians) and *them* (i.e., sick clients). A second explanation may be that the writers of TSF were aware of the health benefits of perspective switching, which refers to pronoun use variation (Campbell & Pennebaker, 2003;

Jin, 2005; Seih, Lin, Huang, Peng, and Huang, 2008), and specifically, the self-distancing that the third-person perspective allows (Kross, Ayduk, & Mischel, 2005). A third explanation is that, although supportive of AA, TSF is not AA; therefore, use of third-person plural pronouns in the TSF manual may be used when referring to AA, its members, its practices, and its principles. The third is the most likely explanation due to a lack of research to support the first two explanations. Many practitioners who are drawn to TSF are themselves “wounded healers” (White, 2011) and have empathy for what their clients experience. Their background might preclude them from stressing such a differentiation. Furthermore, research on perspective switching came after Project MATCH (PMRG, 1997, 1998).

The third research question was related to psychological/physical categories. The only difference found with emotion words was that there were fewer than expected negative emotion words in MET. One possible reason is that in MET the expression of negative emotions is denied. An alternative explanation is that compared to TSF and CBT, in MET there is less emphasis on negative emotions and consequences and more emphasis on the change process. Between the former and the latter explanations, the latter is most likely because MET seeks to enhance motivation and focus on the change process (Miller et al., 1992). Miller and Sanchez (1994) developed a framework within MET known as FRAMES (Feedback, Responsibility, Advice, Menu of options, Empathy, Self-efficacy) that includes elements of brief interventions that induce change, including support for self-efficacy and optimism (Miller et al., 1992).

For male words, use was lower in CBT and higher in TSF. One possible reason might be that CBT is a more feminine approach, and TSF is a more masculine approach. An alternative explanation is that CBT was developed for more universal use with many clients without regard to sex or gender; whereas TSF had its basis in AA with AA literature written decades ago and

representative of the higher prevalence of men coming forward for help at that time (Maxwell, 1982; White, 1998). Between the former and the latter explanations, the latter is most likely because there is no research to support the former, whereas the fact that AA literature reflects the high prevalence rate of males with AUD seeking help at the time of publication has been referenced (Maxwell, 1982; White, 1998). Additionally, because AA was founded by men, the effectiveness of TSF for men was predicted to be higher than for women in Project MATCH (PMRG, 1997, 1998)

The biological process words were higher in TSF and lower in MET. One possible reason is that TSF is more descriptive of life processes compared to MET. An alternative explanation is that TSF is based on AA, which not only stresses mental, but also physical aspects of AUD (Alcoholics Anonymous, 1981; Anonymous, 2010; Nowinski et al., 1992; Wilson, 2001), whereas MET focuses only on mental aspects. Between the former and the latter explanations, the latter is most likely because physical manifestations of AUD receive more focus in TSF and AA than in MET.

Although results of this study advanced knowledge of the language of addiction, there were limitations. One is that the treatment manuals were written by different authors. Results of the analysis could be related to their different writing styles rather than differences in the treatment modalities. A future study might inform one writer, who is unaffiliated with any of the approaches, about the workings of each model so that the different writing styles would not confound results. A second limitation is that the LIWC2015 scores for analytic, clout, authentic, and tone do not reflect actual usage, but instead rely on a nontransparent LIWC2015 algorithm derived from large comparison samples. Outcome scores for analytic, clout, authentic, and tone show where each standard score fell on a normal curve based on prior research. The non-

transparency of the algorithm is a limitation for the researcher as it creates an element of uncertainty. In terms of external validity, the results from this study were specific to the texts analyzed and therefore they are not generalizable.

The literature presented has shown that the language of addiction matters. There are several implications of the current study for counseling practitioners. First, the high analytic results add to the steadily increasing evidence base for TSF, which, prior to a call for research (Institute of Medicine, 1990), was frowned upon for not having scientific support. Clinicians who provide or refer clients to TSF treatment have one more study that supports its efficacy. Additionally, the analytic results may mean that compared to MET, TSF may provide more benefit to a client who needs step-by-step guidance. Second, the higher MET results and lower TSF results for second-person pronouns, may inform clinicians that MET is a directive approach while TSF is non-directive. Knowledge of this difference may be beneficial in matching clients to treatments that resonate with them. The higher TSF results and lower MET results for biological process words, may inform clinicians that TSF takes a mind, body, spirit approach; whereas MET is based in motivation psychology with little emphasis on physical or spiritual aspects of addiction. This differentiation may prove helpful for client matching. Finally, where CBT had the least variation across variables, the results for TSF and MET indicate stark differences for many categories: analytic, authentic, tone, first-person singular, second-person, third-person plural, and biological process words. Hence, if a client does not respond well to one of these approaches, it may be beneficial to switch to the other treatment approach. Broader implications include TSF and AA consideration of how the overuse of male language impacts females as well as other gendered individuals. This study would add to the research on gender differences in AA (Kelly, 2013).

Several implications for researchers were drawn from this study. First, this research is the first study to examine linguistic components of addiction treatment manuals. Findings may have relevance to clinicians who provide treatment for SUDs, writers of manuals, researchers who examine and develop treatment approaches, and clients with SUDs. Research demonstrates that differences exist in the broad psycholinguistic, specific linguistic, and psychological and physical process words used in the treatment manuals studied. Future research may help differentiate when texts with different authentic scores vary due to filtering and the degree of openness of the era in which they were written versus deception and dishonesty. It may be interesting to examine use of *I* words, which correlate with truth-telling, versus use of *we* words, which support community, when authors have a choice in whether to communicate from the first-person singular or first-person plural perspective. TSF and CBT had less tone, whereas MET had higher tone and less negative emotions. Given the aforementioned interest in the role of positive and negative emotions in addiction treatment, further research is warranted.

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Table 1.1

Results for Broad Psycholinguistic, Linguistic, Psychological, and Physical Processes

Category	Process	TSF %	MET %	CBT %	<i>LL</i>	<i>BIC</i>
Analytic	Broad	90.12	84.46	88.93	50.95**	Very Strong
Clout	Broad	70.34	72.05	69.83	9.12**	Very Strong
Authentic	Broad	16.17	25.99	24.21	741.86**	Very Strong
Tone	Broad	27.61	35.05	26.35	350.33**	Very Strong
1 st person sing.	Linguistic	0.20	0.90	0.87	171.02**	Very Strong
3 rd person sing.	Linguistic	0.24	0.20	0.12	11.67**	Very Strong
2 nd person	Linguistic	0.89	2.48	1.79	217.74**	Very Strong
3 rd person pl.	Linguistic	1.46	0.54	1.18	114.46**	Very Strong
Negemo	Psychological	2.38	1.98	2.46	14.21**	Strong
Male	Physical	0.27	0.14	0.07	36.71**	Very Strong
Bio	Physical	4.29	2.75	3.18	99.68**	Very Strong

* $p < 0.05$, ** $p < 0.01$

Table 1.2

Post Hoc Results for Broad Psycholinguistic, Linguistic, Psychological, and Physical Processes

Category	Corpus	<i>LL</i>	<i>BIC</i>
Analytic	TSF	23.18**	11.89
Analytic	MET	48.69**	37.4
Clout	MET	8.59**	-2.7
Authentic	TSF	726.62**	715.33
Authentic	MET	278.91**	267.62
Authentic	CBT	125.37**	114.08
Tone	TSF	51.14**	39.85
Tone	MET	341.94**	330.65
Tone	CBT	115.42**	104.13
1 st person sing.	TSF	170.9**	159.61
1 st person sing.	MET	38.94**	27.65
1 st person sing.	CBT	38.91**	27.62
3 rd person sing.	CBT	10.71**	-0.58
2 nd person	TSF	190.64**	179.35
2 nd person	MET	128.79**	117.49
3 rd person pl.	TSF	56.16**	44.87
3 rd person pl.	MET	106**	94.71
Negemo	MET	13.83**	2.54
Male	TSF	30.93**	19.64
Male	CBT	25.86**	14.56
Bio	TSF	92.17**	80.88
Bio	MET	52.68**	41.39
Bio	CBT	11.29**	0

* $p < 0.05$, ** $p < 0.01$

Chapter 3: A Research Manuscript

A Corpus Linguistic Study of 12-Step Program Literature

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Abstract

Research indicates that the language used in addiction matters; therefore, the purpose of this study was to examine whether differences in discursive and psychological processes exist in 12-step texts used for substance and behavioral addictions. Using a synchronic corpus linguistic design, writings on the first step of Alcoholics Anonymous, Debtors Anonymous, Gamblers Anonymous, Narcotics Anonymous, Overeaters Anonymous, and Sex and Love Addicts Anonymous were analyzed using LIWC2015. The log-likelihood ratio test was used to examine if differences exist between the six texts, with *post hoc* analysis to further examine differences. Bayesian information criterion was used to measure effect size, which ranged from weak to very strong. Statistically significant differences exist in analytic, authentic, emotional tone, first-person singular pronouns, first-person plural pronouns, third-person singular pronouns, third-person plural pronouns, male, and biological process words. Results demonstrate that differences exist in the broad psycholinguistic, specific linguistic, and psychological and physical process words used in the texts. This research is the first study to compare linguistic components of different 12-step programs, which often fill a gap created by lags in research. Findings may have relevance to writers of 12-step literature, clinicians who provide treatment, and researchers who study substance use and behavioral addictions, and individuals with these issues.

Keynotes: 12-step, addiction, behavioral addictions, corpus linguistics, LIWC

A Corpus Linguistic Study of 12-Step Program Literature

“A difference between mental illness and mental wellness is the ‘i’ and the ‘we.’
 “The opposite of addiction is not sobriety. The opposite of addiction is connection” (TED, 2015).

“Together we could do what we could never do alone.”

“We had to hang together or die separately.”

Community-journalist Sam Quinones (2015), the sole expert witness at a 2018 Senate hearing on the United States opiate epidemic, refers to it as the antidote. Alcoholics Anonymous (AA) knew the importance of community and modified language in its first publication to reflect this. Fifty years before Pennebaker Conglomerates (n.d.) shared their groundbreaking research on pronoun use, a New Jersey psychiatrist provided editorial advice on pronouns to AA founders. He strongly suggested changing use of the second-person pronoun *you* to the third-person pronoun, *we* to reflect community. Dr. J. W. Howard also recommended eliminating the word *must* and authoritarian tone. To remove all forms of coercion, he suggested changing from a *you must* to a *we ought* approach. “You may think you could find an easier, softer way. We doubt if you can” was changed to “We thought we could find an easier softer way. But we could not” (AA Cleveland, n.d., para. 1).

With addiction, the way out is rarely easy or soft and is often unclear due to conflicting information and stigma. There had been a disconnect between the research and clinical community and the recovery community (Best, 2017; Vederhus, Laudet, Kristensen, & Clausen, 2010). There were calls for connection according to addiction research directors at UCLA and University of Pennsylvania (Toft, 2000), following calls for rigorous research on AA by the Institute of Medicine (1990). Studies supporting 12-step efficacy ensued (Humphreys, 2003; Kaskutas, 2009; Litt, Kadden, Kabela-Cormier, & Petry, 2009; Owen et al., 2003; Project MATCH Research Group [PMRG], 1998).

Two Harvard Medical School professors explained that “the addiction research field has moved beyond asking *whether* AA and 12-step treatment works, to investigating *how* and *why* they work” (Kelly & Beresin, 2014, para. 18). Using criteria for determining effects in research (Hill, 1965), a causal pathway is supported by a preponderance of evidence that shows that AA attendance leads to abstinence (Krentzman et al., 2010). Increased abstinence is associated with participation in AA (Moos & Moos, 2006). Mechanisms of behavior change and the effects of AA have been identified (Kelly, 2017). Researchers such as Kelly (2017) and Zemore (2017) suggest work on other “drivers of abstinence” in AA including neglected psychosocial factors such as positive emotions (Folkman, 2008; McHugh, Kaufman, Frost, Fitzmaurice, & Weiss, 2013; Serafini, Malin-Mayor, Nich, Hunkele, & Carroll, 2016; Vaillant, 2008), a variable in this study.

Another variable studied was clout, which refers to leadership, confidence, and status portrayed through writing. Yet there is a destructive side of clout (Drouin, Boyd, & Greidanus Romaneli, 2018; Drouin, Egan, Yergens, & Hernandez, 2018). Increased understanding may aid those studying gaming disorder given that “clout” may be a driving force in the dark side of gaming, as evidenced by a report that a gamer's online clout went up after a prank 911 call on an opposing gamer led cops to draw fire and kill his opponent (Koerner, 2018).

The AA program is a model for 12-step programs where, for example, gamblers and debtors find relief. Over 400 groups have received permission from AA to adapt the *Big Book* and 12 steps (Anonymous, 2010). Research reported in the *American Medical Association Journal of Ethics* (Mendola & Gibson, 2016) describe 12-step programs as useful for a wide range of addictions. Research and recovery communities agree that addiction is a chronic, progressive, fatal disease characterized by impaired control (Goldstein & Volkow, 2011; Kalivas

& Volkow, 2005). The American Society of Addiction Medicine (ASAM) references substance use and “other behaviors” and includes the words “food” and “sex” in the official definition of addiction developed by 80 neuroscientists (ASAM, 2011, para. 3). Raikhel (2015, p. 387) states that definitions evolve that translate prior ‘failure of will’ concepts to a ‘language of self-control’— “the loss of which is seen as a core diagnostic criterion” (Baler & Volkow, 2006; Weinberg, 2013).

Impaired control is characteristic of substance and behavioral addictions (Dackis & O’Brien, 2005; Fraser, Moore, & Keane, 2014; Grant, Potenza, Weinstein, & Gorelick, 2010). The American Psychiatric Association (APA) includes impaired control as a criterion for Gambling Disorder, the only behavioral addiction in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; [DSM-5]; APA, 2013). When revised, there was not sufficient evidence to include subcategories such as “sex addiction,” “exercise addiction,” or “shopping addiction” (APA, 2013, p. 481), though lay persons use these terms, and the afflicted are seen by clinicians. Time lags in research are estimated at 17 years (Slote Morris, Wooding, & Grant, 2011). The slow recognition of behavioral addictions is filled in part by 12-step groups. A new disorder arrived on the scene. In 2018, the World Health Organization (2018) recognized gaming disorder. Not yet seen as a disorder by APA, internet gaming disorder is in the Conditions for Further Study section of the *DSM-5* (APA, 2013) with lack of control as a criterion. With much unknown about behavioral addictions, research and recovery communities agree that control is impaired.

Furthermore, there is a “growing movement in the scientific and advocacy community to reframe the language of addiction” as outdated terminology does not reflect what scientists know about addiction (Gordon, 2016, p. 3). Kelly joins others who have called for examining

language use and suggest that investigation may reveal that treatment professionals and AA support the same underlying change processes (Dossett, 2017; Kelly, 2017; Kurtz, 2017).

Hence, a study of the rhetorical and psychological processes of the first of the 12 Steps, wherein addressing lack of control is warranted.

To give context for the present study, a review of the literature is provided. Topic areas emerged from this review. These are: (a) descriptions of the 12-step programs studied; (b) a description of the first step; (c) historical accounts of the editorial process in the original manuscript of AA (Wilson, 2001), known as the *Big Book*; and (d) addiction studies using LIWC. Once addressed, the research questions of the study are described.

Literature from six 12-step programs were examined. The programs were AA, Narcotics Anonymous (NA), Gamblers Anonymous (GA), Overeaters Anonymous (OA), Debtors Anonymous (DA), and Sex and Love Addicts Anonymous (SLAA). They are community organizations founded in the U.S. that subscribe to a set of principles known as the 12 steps and 12 traditions. The principles vary by program with the basic structure preserved.

The original program is AA. It is the largest community-based program for alcohol-related problems (Greenfield & Tonigan, 2013). It was founded in 1935 by Bill Wilson, a New York stockbroker and Bob Smith, an Ohio physician (AA, n.d.-b). Both struggled with alcoholism and prior to meeting had been to Oxford Groups, comprised of mostly non-alcoholics who used spiritual principles for daily living. Smith was not able to stop drinking until he met Wilson. Their meeting had an immediate effect and is considered the spark that began AA (AA, n.d.-b). One alcoholic helping another is the basis of the program. The 2018 estimate is 2 million members in 180 countries (AA, n.d.-a). “The only requirement for membership is a desire to stop drinking” (AA, 1981, p. 139).

The surrender process, including acknowledging lack of personal control, forms the basis of recovery in 12-step programs. Step One, termed the surrender step, states, “We admitted we were powerless over alcohol and that our lives were unmanageable” (AA, 1981, p. 21). It is weakness, not strength that undergirds 12-step recovery. Alcoholism is viewed as an incurable disease that can be arrested but not eliminated (Humphreys et al., 2004). Alcoholics are believed to have an allergy, meaning their bodies simply cannot tolerate alcohol (Franken, 2014). Willpower is considered to be of no use, regardless of the consequences; it is considered a progressive illness that combines a mental obsession with drinking and a physical sensitivity to alcohol (AA, 1952). The need to hit bottom is emphasized (AA, 1981). Bateson (1972) theorized that the reason AA worked was that members acknowledging powerlessness over alcohol experienced “a change in epistemology, a change in how to know about personality-in-the-world” that included acceptance of distinctly different assumptions (p. 313).

Anecdotal testimony about the effectiveness of AA had been responsible for its growth, though there has been an increase in research that supports AA and 12-step programs (Humphreys, & Moos, 2001; Longabaugh, Wirtz, Zweben, & Stout, 1998; Walitzer, Dermen, & Barrick, 2009; Zemore & Kaskutas, 2009). In relation to the first step, Fiorentine and Hillhouse (2000a) concluded that people use a combination of 12-step and outpatient treatment as integrated activities and speculated that 12-step philosophy is an accurate depiction of the nature of addiction, including powerlessness over substances (Fiorentine & Hillhouse, 2000a). Fiorentine and Hillhouse (2000b) also determined that abstinence is more likely in individuals who accept powerlessness over alcohol and drugs.

Admission of powerlessness is the first step toward liberation from alcohol. The surrender process is also the first step toward liberation in programs modeled after AA.

Narcotics Anonymous members admit powerlessness “over our addiction”; GA members admit powerlessness “over gambling”; OA members admit powerlessness “over food”; DA members admit powerlessness “over debt”; and SLAA members admit powerlessness “over sex and love addiction.” The literature examined in this study was not the first 12-step literature to cover the concept of powerlessness.

Historical accounts of the editorial process in the original manuscript of AA, *Alcoholics Anonymous* (Wilson, 2001), known as the *Big Book*, will add context to the study. In 1937, with 40 sober members, Wilson and Smith decided it was time for a book (Anonymous, 2010). It was word-of-mouth up until that point, and the message varied. In 1939, the manuscript was ready for review. Four hundred copies were sent to the 100 AA members, friends, family, and medical and religious representatives. The original manuscript with handwritten changes reveals the discussions and debates that the feedback stimulated before the first printing six weeks later (Anonymous, 2010). Decades later, reviewers analyzing these edits found consistent themes, including shifts to descriptive language from prescriptive language, pronoun changes, efforts to minimize potentially offensive language, less emphasis on religion and more emphasis on the personal and universal regarding spirituality, ensuring consistency and efforts to engender cooperation and respect from a variety of professional disciplines (Anonymous, 2010).

The obvious Step One edit is the addition of the famous “we” in front of “admitted we were powerless over alcohol and that our lives were unmanageable” (Anonymous, 2010, p. 3). Oftentimes members refer to AA as a “we-program” signifying the importance of the community approach. The book’s purpose changed from showing alcoholics how “they can recover” to how “we have recovered” (Anonymous, 2010). There were significantly more edits to first-person plural from singular and plural second- and third-person pronouns than any other edits, setting

the voice of the text in first-person plural. The steps are introduced with “Here are the steps we took,” (Wilson, 2001, p. 59) with White (1998) pointing out that *we* was most exclusively male and Caucasian (Maxwell, 1982)—hence, a reminder of the sociocultural era in which these publications were released. Though ethnicity variables are not included in the analysis software of this study, gender variables are examined. Research has shown that women may have concerns regarding the word “powerlessness” (Kaskutas, 1994; Krentzman, Brower, Cranford, Bradley, & Robinson, 2012).

There is a growing body of research on LIWC (Pennebaker, Boyd, Jordan, & Blackburn, 2015) as a methodology instrument used to study addiction. A literature review produced a representative sample, including articles in journals that focus specifically on addictions. *The Psychology of Addictive Behavior*, a journal of the American Psychological Association published a language analysis study (Collins et al., 2009) on the validity and clinical utility of mindfulness in relapse prevention. An expert panel generated two mindfulness-language (ML) dictionaries and compared ML in a mindfulness-based treatment manual to the *Big Book* (Wilson, 2001). Results supported ML for relapse prevention. Kornfield, Toma, Shah, Moon, and Gustafson (2018) examined whether language use in online discussions may predict relapse and found linguistic cues such as use of swear words.

Domestic and international LIWC studies exist in non-addiction journals. Couple-based interventions in alcohol use disorders is an area of study that utilizes LIWC. The University of Washington and the University of New Mexico are known for research on addictions. Researchers at these schools, Hallgren and McCrady (2015), examined treatment outcomes using within-session language analysis. Their results support communal coping practices. Interestingly, the next volume of the same journal, included an article (Rentscher, Soriano,

Rohrbaugh, Shoham, & Mehl, 2017) by researchers at other United States universities who provided further evidence of the significance of communal coping through studying pronoun usage of individuals with problematic alcohol use. In the United Kingdom, Stephenson, Laszlo, Lefever, and Lefever (1997) examined diaries for correlations of therapy outcomes in 12-step residential treatment and Bliuc, Best, Iqbal, and Upton (2017) used LIWC to study a recovery initiative that sought to foster increased recovery capital through participation in an online recovery community.

The purpose of the study is to analyze the language used in 12-step literature to fill a gap and increase knowledge about language use that supports recovery for substance and behavioral addictions. Given the aforementioned literature review, three questions guided the study. The first research question was: Do differences in the level of broad psycholinguistic processes exist among the 12-step program literature? The second research question was: Do differences in specific linguistic categories exist among the 12-step program literature? The third research question was: Do differences in specific psychological and physical processes exist among the 12-step program literature?

Method

Design

This study employed a synchronic corpus linguistic design (Weisser, 2016). The corpora were drawn from the primary text for the following 12-step programs: AA, NA, GA, OA, DA, and SLAA. The selection of AA was because it is the original program; NA because it is among the most well-known 12-step programs (NIDA, 2013). In addition to programs that address substance use, a representative sample of programs that address behavioral addictions was sought. The GA program and text was selected because it addresses gambling, the only

medically recognized behavioral addiction based on its inclusion in the *DSM-5* (APA, 2013); OA because it is the most longstanding anonymous program that addresses food; DA because the researchers have concerns about how debt affects mental health (Lubin, 2011) and the lack of resources; and SLAA because it seems to be the most longstanding anonymous program that addresses sex (i.e., there is vagueness around the founding years of the other anonymous programs that address sex). The unit of analysis was individual words (Gabrielatos, 2018).

Corpus

Source texts. To construct the corpus, the researchers reviewed literature from 12-step programs to locate texts for comparison. Alcoholics Anonymous serves as the basis for the other programs so it was reviewed first. Opinions about which is the main text vary. *Alcoholics Anonymous* (Wilson, 2001), the *Big Book*, is the original book. It contains a description of the 12-step process followed by personal stories. The *Twelve Steps and Twelve Traditions* (AA, 1981), referred to as the *Step Book* was published 14 years later. The literature of the other 12-step programs more closely resembled the *Step Book*, therefore it was decided that it was more appropriate. The first step was examined.

Corpora construction. The section on the first step from each book was scanned and saved as a text file. The files were reviewed and cleaned according to LIWC2015 manual (Pennebaker et al., 2015) instructions. Spelling errors were corrected and hyphens that appeared but were not in the original texts were removed. The six documents were combined into one document with ‘#’ placed between each according to segmentation instructions in the LIWC2015 manual (Pennebaker et al., 2015).

Measures

Overview. The first four variables listed are summary variables, scaled from 0 to 100. Higher scores indicate higher degrees of variables. Each is a population-normed, composite variable, combining several LIWC2015 categories that reflect empirically-based constructs. The specific algorithms are proprietary, and therefore are not publicly available. The remaining variables are reported as a percentage of total words. Pennebaker, Boyd et al. (2015) reported acceptable validity and reliability for all of the measures below.

Analytic. Analytic is a scale that measures formal, logical, and hierarchal thinking (Pennebaker, Chung, Frazee, Lavergne, & Beaver, 2014). High scores reflect this pattern, whereas personal, informal, narrative thinking would yield low scores (Pennebaker, Booth, Boyd, & Francis, 2015).

Clout. Clout is a variable that measures language indicative of social dominance and leadership (Drouin, Boyd, Hancock, & James, 2017). When one communicates with confidence and conveys high expertise, such as those in positions of authority, there is a specific, consistent linguistic pattern that incorporates several LIWC2015 categories (Kacewicz, Pennebaker, Davis, Jeon, & Graesser, 2014). High scores reflect this pattern, whereas lower scores reveal a more tentative, anxious style (Pennebaker, Booth et al., 2015).

Authentic. Authentic is a scale that combines scores on a number of variables. Higher scores are indicative of honest (versus deceptive) communication. It is based on research that identified how word patterns differ when subjects were lying from when they told the truth (Newman, Pennebaker, Berry, & Richards, 2003; Pennebaker, 2011). When being dishonest people tend to use simpler language, more negative emotion words, and reference themselves less often (Newman et al., 2003). Possible scores on this scale range from 0 to 100 with higher scores reflecting more authentic and open language (Pennebaker, Booth et al., 2015).

Tone. Tone takes the negative emotion variable and the positive emotion variable and combines them into one summary variable (Cohn, Mehl, & Pennebaker, 2004). A linguistic style that is emotionally positive would have high scores, whereas sad, anxious, or hostile tones would yield lower scores (Pennebaker, Booth et al., 2015).

First-person singular pronoun. First-person singular pronouns are used in place of a noun when there is personal reference to the speaker or writer. Examples include *I*, *me*, and *mine*.

Third-person singular pronoun. Third-person singular pronouns are used in place of a noun when there is reference to a person, animal, or thing other than the speaker or writer and reader or listener. Examples include *she*, *her*, and *him*.

Second-person pronoun. Second-person pronouns are singular or plural and are used in place of a noun to address the reader or listener. Examples include *you* and *your*.

First-person plural pronoun. First-person pronouns are used in place of a noun when speaking or writing to a group that includes the speaker or writer. Examples include *we*, *us*, and *our*.

Third-person plural pronoun. Third-person pronouns are used in place of noun when there is reference to people, animals, or things other than the speaker or writer and reader or listener. Examples include *they* and *their*.

Impersonal pronoun. Impersonal pronouns do not refer to a particular person, animal, or thing. Examples include *it* and *those*.

Positive emotion. Positive emotions are defined as short-lived “multicomponent response tendencies” (Fredrickson, 2001, p. 218) or as pleasurable mental experiences (Cabanac, 2002). Examples include *love* and *nice*.

Negative emotion. Negative emotions are typically unpleasant emotions that are evoked in individuals to express a negative feeling towards a person or event. Examples include *hurt* and *nasty*.

Female reference. Female references include nouns and pronouns. Examples include *mom* and *her*.

Male reference. Male references include nouns and pronouns. Examples include *boy* and *his*.

Biological process. Biological process words refer to the life processes of living organisms. Examples include *eat*, *sex*, and *pain*.

Apparatus

The text analysis software used to analyze the data for this study was the Linguistic Inquiry and Word Count 2015 (LIWC2015) program (Pennebaker, Booth et al., 2015). Text files were analyzed yielding scores for approximately 90 output variables. Each data record begins with the file name, word count, and four summary language variables (e.g., analytic, clout, authentic, and tone). Next, a general descriptor variable, words per sentence, is listed. These six variables are not reported as percentages. The remaining variables are calculated as a percentage of total words. These include two additional general descriptor variables (i.e., percentage of words with more than six letters and of words in the dictionary), 21 standard linguistic categories (e.g., percentage of pronouns), 41 word categories for psychological constructs (e.g., affect and cognition), six personal concern variables (e.g., leisure activities), five paralinguistic categories (e.g., non-fluencies), and 12 punctuation variables (ex., commas).

Data Analysis

To answer the research questions, the log-likelihood ratio test (LL) was used to examine if differences exist between the six texts (Brezina, 2018). When an LL result was significant, *post hoc* analyses were conducted to examine difference between specific corpora. The *post hoc* testing procedure is identical to the overall log-likelihood ratio test, except word frequencies are regrouped to focus on specific corpora. If a category variable is found to be significant, six additional *post hoc* LL tests were conducted. To control the probability of falsely rejecting at least one null hypothesis in a family of m hypotheses with an overall significance level of $\alpha = 0.05$, the Bonferroni correction was applied such that each hypothesis was tested at an adjusted significance level of $\alpha_{\alpha} = \alpha/m$. The Bayesian information criterion (BIC) was used to measure effect size. Positive BIC values measure the strength of evidence against the null hypothesis; negative BIC values measure the strength of evidence in favor of the null hypothesis. The following descriptors for the absolute value of BIC were used: not worth more than a bare mention (0-2), positive evidence (2-6), strong evidence (6-10), and very strong evidence (>10) (Wilson, 2013). All analyses were conducted using R.

Results

Research Question 1 (Broad Psycholinguistic Processes)

Differences in four broad psycholinguistic processes among the texts were examined ($df=5$, $\alpha=0.05/4=0.0125$, $cv=14.54$). See Table 2.1 at the end of this chapter for results of significance testing for these elements. *Post hoc* testing for broad psycholinguistic processes ($df=1$, $\alpha=0.05/18=0.0028$, $cv=8.95$) was conducted. See Table 2.2 at the end of this chapter for results of *post hoc* testing.

Research Question 2 (Linguistic Processes)

Difference in six linguistic processes among the texts were examined ($df=5$, $\alpha=0.05/6=0.0083$, $cv=15.53$). See Table 2.1 for results of significance testing for these elements. *Post hoc* testing for linguistic processes ($df=1$, $\alpha=0.05/24=0.0021$, $cv=9.47$) was conducted. See Table 2.2 for results of *post hoc* testing.

Research Question 3 (Psychological and Physical Processes)

Differences in five psychological/physical processes among the texts were examined ($df=5$, $\alpha=0.05/5=0.01$, $cv=15.09$). See Table 2.1 for results of significance testing for these elements. *Post hoc* testing for psychological/physical processes ($df=1$, $\alpha=0.05/12=0.0042$, $cv=8.21$) was conducted. See Table 2.2 for results of *post hoc* testing.

Discussion

This study sought to explore word usage of self-help texts using the text for Step One in AA, DA, GA, NA, OA, and SLAA. Using the broad psycholinguistic categories of analytic, clout, authentic, and tone words, the first research question examined whether differences exist in the 12-step program literature. Using the linguistic process categories of first-person singular pronoun, third-person singular pronoun, second-person pronoun, first-person plural pronoun, third-person plural pronoun, and impersonal pronouns, the second research question examined whether differences exist in the 12-step program literature. Using the psychological process categories of positive emotion and negative emotion and physical process categories of female, male, and biological process processes, the third research question examined whether differences exist in 12-step program literature.

For analytic words, standard scores were lower than expected in GA and OA and higher than expected in SLAA. One possible reason for this finding is that GA and OA language is informal, whereas SLAA language is formal. An alternative explanation is related to the word

count of each text, with lengthier texts affording more in-depth coverage of what Step One involves. Between the former and the latter, the latter is more likely as GA and OA are among the shorter texts, and SLAA is among the longer texts.

For authentic words, standard scores were lower than expected in AA, GA and OA, and higher than expected in DA and SLAA. One possible reason for the obtained results may have to do with stigma and shame, which may be higher for individuals with alcohol, gambling, or food addiction. In LIWC2015, the more a writer filters what they are writing, the lower the authentic score and vice versa (Bulkeley & Graves, 2018). Stigma and shame may affect the degree of openness. A second explanation may be related to how LIWC2015's authentic composite score was derived. This research showed that *I* words were among those associated with truth-telling, as it indicates one is speaking from the heart (Jordan & Pennebaker, 2017). The AA program, which served as a model to other anonymous programs, preferred *we* words over *I* words as a means to convey a sense of community (Anonymous, 2010), not to avoid the truth. A third possible reason may be that because the LIWC2015 authentic variable is a composite score based on deception studies of individuals (Newman, Pennebaker, Berry, & Richards, 2003; Pennebaker, 2011), it may not apply to self-help texts. Between the possible explanations, the third is more likely as research does not support the first explanation, and the second does not explain the variation of the results found.

For tone words, standard scores were lower than expected in AA and GA and higher than expected in SLAA. One possible reason for the obtained results is related to changes in language use over time. The AA and GA texts were written decades before SLAA. An alternative explanation is that the tone of the AA text slanted negative due to Wilson's depression at the time he authored the text (AA, 1984). GA modeled its text after AA literature, as did SLAA;

however, it was decades later when critiques of the book were promulgated (AA, 1984). It is possible SLAA writers referenced these critiques when writing their own literature. Between the former and the latter, the latter is more likely as Wilson's depression is well-documented.

For first-person singular pronouns, scores were lower than expected in SLAA and higher than expected in DA. One possible reason for the obtained results may have to do with research showing increased use of first-person singular pronouns with depression (Rude, Gortner, & Pennebaker, 2004). Individuals in debt may be more depressed than individuals with sex and love addiction. An alternative explanation is the increased use of first-person singular pronouns in SLAA's first step may be for the purpose of helping members confront denial and identify with the thought patterns of others prior to recovery. Between the former and the latter, the latter is more likely as most of the first-person singular plural references in the step are in a paragraph with quotes such as, "If *I* could only get the tax authorities (or *my* spouse/partner or *my* boss or these creditors) off *my* back, *I'd* be fine" (DA, 2016, p. 4).

For third-person singular pronouns, scores were more than expected in AA. One possible reason for this finding is related to psychological correlates of word use categories. Tausczik and Pennebaker (2010) attributed social interests and social support with the third-person singular linguistic category. An alternative explanation is that the obtained results are due to high rates of male third-person singular pronouns (he, him, his), which may be related to the higher prevalence of men identified with problematic alcohol use at the time the AA literature was written (Maxwell, 1982; White, 1998). Between the former and the latter explanations, the latter is most likely because at the time that AA literature was published there were higher prevalence rates of males with AUD seeking help (Maxwell, 1982; White, 1998). An example in

the text is, “*he* would return to us convinced. *He* had hit bottom as truly as any of us” (AA, 1981, p. 23).

For first-person plural pronouns, scores were lower than expected in AA, and more than expected in NA. One possible reason for the obtained results may be related to the psychological correlate of social connection (Tausczik & Pennebaker, 2010), specifically that it is greater in NA than in AA. An alternative explanation relates to the evidence that shows a decrease in first-person plural pronouns with depression (Rude, Gortner, & Pennebaker, 2004). Bill Wilson was depressed for several years leading up to the writing of the AA text that is the subject of this study, which, according to AA history, is in contrast to the joy he felt upon writing the *Big Book* (AA, 1984). Between the former and the latter, the latter is more likely. In an AA publication, *Pass It On: Bill Wilson and the AA Message* (1984), Wilson is quoted as saying, “I’ve had a dreadful hex about further writing. Figure I had been so beat up by the events of these last years that I could never bring anything more off that would be worthwhile” (p. 355).

For third-person plural pronouns, scores were higher than expected in AA. One possible reason for the obtained results concerns out-group awareness (Tausczik & Pennebaker, 2010). An example from the text is, “Many less desperate alcoholics tried AA, but did not succeed because *they* could not make the admission of hopelessness” (AA, 1981, p. 23). An alternative explanation is that the authors were aware of the health benefits of varying pronoun use, referred to as perspective switching (Jin, 2005; Campbell & Pennebaker, 2003; Seih, Lin, Huang, Peng, & Huang, 2008), specifically in relation to the third-person perspective (Kross, Ayduk, & Mischel, 2005). Between the former and the latter, the latter is more likely because even though the research on the perspective switching came decades after the text was written, editors of AA writings were astute to the power of pronoun usage (Anonymous, 2010). Furthermore, the quote

above is the only out-group reference in the text. An example of perspective switching is, “Alcoholics who still had *their* health, *their* families, *their* jobs, and even two cars in the garage, began to recognize *their* alcoholism” (AA, 1981, p. 23).

For male words, usage was more than expected in AA. One possible reason for this obtained result is that an approach that may be considered masculine is more effective to address AUD. An alternative explanation is related to the fact that AA literature was written decades ago and, as previously stated, was representative of the higher prevalence of men coming forward for help at that time (Maxwell, 1982; White, 1998). Between the former and the latter, the latter is more likely as noted in the aforementioned explanation.

For biological process words, scores were lower than expected in DA and higher than expected in OA and SLAA. One possible reason for this result is related to the era that each program was founded. Of the six anonymous programs studied, the three most recently formed showed difference. An alternative explanation is related to the nature of the addiction each text represented. The behaviors that lead one to DA are financial in nature, whereas the behaviors that lead one to OA and SLAA are physical in nature. A review of the texts shows that between the former and the latter, the latter is more likely as evidenced by quotes from each text. “The certain *pain* of continuing our *sex* and love addiction brought us to the admission of Step 1” (Augustine Fellowship, 1986, p. 72). “We hid from our *pain* by *eating* compulsively” (OA, 2018, p. 6).

Although results of this study advanced knowledge of the language of addiction, there were limitations. One limitation is that the LIWC2015 scores for analytic, clout, authentic, and tone do not reflect actual usage, but instead rely on a nontransparent LIWC2015 algorithm derived from large comparison samples. The outcome scores for these categories show where

each standard score fell on a normal curve based on prior research. The non-transparency of the algorithm is a limitation for the researcher as it creates an element of uncertainty. In terms of external validity, results from this study were specific to the texts analyzed and therefore are not generalizable.

The literature presented has shown that the language of addiction matters. Clinical and research implications were drawn from this study. This research is the first study to compare linguistic components of different 12-step programs. Findings may have relevance to writers of 12-step literature, clinicians who provide treatment, researchers who study substance use and behavioral addictions, and individuals with these issues. Research demonstrates that differences exist in the broad psycholinguistic, specific linguistic, and psychological and physical process words used in the texts studied. From a global perspective, it is interesting that AA has the most difference compared to the other texts. The opposite would be expected. For six variables, scores were either more or less than expected. This result is surprising. Perhaps the other 12-step programs that depend on AA literature are not modeling their texts as closely as expected.

The implications for specific variables were expected and unexpected. It makes sense that there would be more biological process words in OA and SLAA versus DA due to the former being more physical in nature and the latter being financial. The fact that first-person singular words would be greater in DA and NA, which may represent more isolative behaviors, than SLAA, which may involve others, also makes sense. Furthermore, it is well-known that AA literature is male-based. Research has shown that AA is effective for women in different ways from men (Kelly, 2013). Additional recognition of how male-dominated the AA literature is may support a call for changes to better represent AA membership. A surprising finding was that AA had fewer than expected first-person plural pronouns, given how much attention was

devoted to use of *we* words in AA's original manuscript, *The Big Book*. In fact, differences in three different types of pronoun use were found in AA. The aforementioned influence of Wilson's depression on his writing or skill in pronoun use for perspective switching may be reasons. Further research may shed light on these results. It is difficult to make inferences based on the broad psycholinguistic process studied due to the limitation referenced above. It may be interesting to examine use of *I* words, which correlate with truth-telling, versus use of *we* words, which support community, when authors have a choice in whether to communicate from the first-person singular or first-person plural perspective. Finally, across all the corpora, clout was very high with scores over 92 on a percentile rank scale. This result was not discussed as there was no statistical difference per the nature of the research questions of this study. However, the reasons for such high clout levels may represent an important area for future research.

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Table 2.1

Results for Broad Psycholinguistic, Linguistic, Psychological, and Physical Processes

Category	Process	AA%	DA%	GA%	NA%	OA%	SLAA%	LL	BIC
Analytic	Broad	58.43	57.05	34.67	60.02	46.42	74.27	163.34**	Very Strong
Authentic	Broad	10.00	43.05	11.68	33.32	26.03	38.40	380.53**	Very Strong
Tone	Broad	18.55	21.33	4.83	24.69	20.89	34.28	181.45**	Very Strong
1 st person sing.	Linguistic	0.00	0.87	0.00	0.2	0.00	0.00	45.09**	Weak
3 rd person sing.	Linguistic	1.47	0.00	0.00	0.07	0.00	0.18	53.02**	Strong
1 st person pl.	Linguistic	4.89	10	9.12	13.41	12.8	8.75	75.3**	Very Strong
3 rd person pl.	Linguistic	1.37	0.34	0.34	0.34	0.19	0.45	16.93**	Very Strong
Male	Physical	1.57	0.00	0.00	0.07	0.00	0.13	57.76**	Very Strong
Bio	Physical	3.72	1.93	1.35	4.94	7.17	6.56	87.94**	Very Strong

* $p < 0.05$, ** $p < 0.01$

Table 2.2

Post Hoc Results for Broad Psycholinguistic, Linguistic, Psychological, and Physical Processes

Category	Corpus	<i>LL</i>	<i>BIC</i>
Analytic	GA	37.23**	28
Analytic	OA	57.27**	48.05
Analytic	SLAA	99.04**	89.81
Authentic	AA	233.71**	224.49
Authentic	DA	86.17**	76.95
Authentic	GA	52.99**	43.76
Authentic	OA	23.98**	14.75
Authentic	SLAA	31.55**	22.33
Tone	AA	16.91**	7.68
Tone	DA	10**	0.77
Tone	GA	70.63**	61.41
Tone	OA	9.41**	0.19
Tone	SLAA	107.56**	98.33
1 st -person sing.	DA	33.23**	24.01
1 st -person sing.	SLAA	11.94**	2.72
3 rd -person sing.	AA	44.85**	35.62
3 rd -person sing.	DA	9.65**	0.43
1 st -person pl.	AA	11.94**	2.72
1 st -person pl.	NA	29.38**	20.16
1 st -person pl.	SLAA	9.75**	0.53
3 rd -person pl.	AA	14.98**	5.75
Male	AA	51.67**	42.45
Male	DA	9.61**	0.38
Bio	DA	54.69**	45.47
Bio	GA	10.5**	1.28
Bio	OA	19.31**	10.09
Bio	SLAA	17.23**	8.01

* $p < 0.05$, ** $p < 0.01$

Chapter 4: A General Conclusion

Overview

Addiction is a chronic, progressive, fatal disease characterized by impaired control (Goldstein & Volkow, 2011; Kalivas & Volkow, 2005) and includes substance use and other behaviors (American Society of Addiction Medicine, 2011). There has been a call for research on the language of addiction (Dossett, 2017; Kelly, 2017; Kurtz, 2017; McCrady, 1994). Research and clinical communities use treatment manuals to guide treatment; therefore, Manuscript 1 was an analysis of the discursive and psychological processes of treatment manuals used in a major study of alcohol use disorder, Project MATCH (Project MATCH Research Group [PMRG], 1997, 1998). Manuals for TSF (Nowinski et al., 1992), MET (Miller et al., 1992) and CBT (Kadden et al., 1992) were analyzed using the LIWC2015 program.

The LIWC2015 program was also used for Manuscript 2, which studied self-help texts from 12-step programs. Laypeople use the terms food addiction, sex addiction, and shopping addiction, and the afflicted are seen by clinicians though there was insufficient evidence for inclusion of behavioral addictions other than gambling in the last revision of the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; APA, 2013). With time gaps in research estimated at 17 years (Morris et al., 2011), the slow recognition of behavioral addictions is filled in part by 12-step groups. Given the wide span of problematic behaviors and attendant consequences associated with addictions, an understanding of all aspects of these conditions, including language, matters. Therefore, analysis of the discursive and psychological processes of treatment manuals and 12-step literature was conducted to extend current knowledge and fill a gap in the existing literature.

This chapter will review the findings of both studies and compare the commonalities between the two manuscripts. This chapter covers the following five sections: (a) a summary of

Manuscript 1, (b) a summary of Manuscript 2, (c) a presentation and discussion of the thematic linkage between the two manuscripts, (d) a discussion on the contribution of this dissertation to the knowledge base, and (e) implications of this dissertation for the research agenda.

Summary of Manuscript 1

Manuscript 1 explored the language used in addiction treatment manuals to fill a gap and increase the knowledge base that already exists about language use that supports the recovery process. Pronoun use, emotional tone, clarity, authenticity, analytical thinking, gender, and psychological and biological process words were explored in hopes of expanding the knowledge base for substance use and behavioral addictions. Three research questions were designed to guide this study. The first research question was: Do differences in the level of broad psycholinguistic processes exist among the Project MATCH treatment manuals? The broad psycholinguistic process categories were analytic, clarity, authentic, and tone. The second research question was: Do differences in specific linguistic categories exist among Project MATCH treatment manuals? The linguistics process categories were first-person singular pronouns, third-person singular pronouns, second-person pronouns, first-person plural pronouns, third-person plural pronouns, and impersonal pronouns. The third research question was: Do differences in specific psychological and physical processes exist among Project MATCH treatment manuals? The psychological and physical process categories were positive emotion, negative emotion, female reference, male reference, and biological processes.

The first research question was related to the broad psycholinguistic categories. For analytic scores, TSF had higher standard scores, and MET had lower scores than expected. An explanation posited was that TSF, as a step-by-step approach (Nowinski et al., 1992), received higher standard scores for being logical and hierarchical (Pennebaker et al., 2014), whereas MET

does not attempt to provide a step-by-step approach (Miller et al., 1992). Future research may help differentiate when texts with different authentic scores vary due to filtering and the degree of openness of the era in which they were written versus deception and dishonesty. It may be interesting to examine use of *I* words, which correlate with truth-telling, versus use of *we* words, which support community, when authors have a choice in whether to communicate from the first-person singular or first-person plural perspective.

For authentic, TSF was lower and MET and CBT were higher than expected. Three reasons that seemed equally plausible were explored. The first questioned whether the LIWC2015 summary variable, which is a composite score based on deception studies of individuals (Newman et al., 2003; Pennebaker, 2011) is applicable to texts such as treatment manuals. The second also related to prior research from which the authentic variable was derived. This prior research indicates that *I* words are among those associated with truth-telling as they indicate one is speaking from the heart (Jordan & Pennebaker, 2017). TSF is based on AA, in which the use of *we* words over *I* words is purposeful—that is, to convey a sense of community—and may be unrelated to the separate construct of authenticity. This third possibility was posited due to the current evidence base. TSF reflects less openness in public discourse as was characteristic in the era in which AA was founded (Klein, 2018). TSF is closely aligned with AA, which was written in the 1930s when public discourse was less open than today, a trend described in a Pennebaker interview (Sutton, 2017). Bulkeley and Graves (2018) pointed out that in LIWC2015, the more a writer filters what is being said for their audience, the lower the authentic score and vice versa.

For tone, TSF and CBT had lower scores, and MET had higher scores than expected. The conclusion reached was that the results reflected the fact that TSF and CBT are deficit-

model therapies that focus on denial (Kadden, et al., 1992; Nowinski et al., 1992), whereas MET does not. TSF and CBT address denial, and typically treatment is initiated by some presenting problem; hence, low scores for tone words was not unexpected.

The second research question was related to the linguistic categories of pronoun usage. For first-person singular pronouns, use was lower in TSF and higher in MET and CBT. The explanation that seemed most plausible is related to the fact that TSF is highly aligned with AA, which as far back as the 1930s stressed the community approach and use of *we* instead of *I* (Anonymous, 2010), whereas this approach has not been stressed in MET or CBT. The intentional change to *we* language is well-documented in AA history (Anonymous, 2010).

For second-person pronouns, there was decreased use in TSF and increased use in MET. Two plausible reasons for this result emerged. One possible reason is that in TSF there is less distinction between a TSF trainer, therapist, and client, hence less use of *you* pronouns with a greater emphasis on *we*, whereas in MET there is a hierarchy with greater distinction between MET trainers, therapists, and clients. MET is a more research-based and clinically-based approach (Kelly, 2017), which may be inherently more hierarchal, whereas TSF evolved from more egalitarian 12-step community groups (Nowinski et al., 1992). The second explanation was that in TSF therapists are opposed to prescribing behavior (Nowinski et al., 1992), similar to AA, which again, as far back as the 1930s, stressed the need to avoid telling people what to do (Alcoholics Anonymous, 1981; Anonymous, 2010; Wilson, 2001), whereas MET is a directive approach in which therapists are encouraged to give advice (Miller et al., 1992). Between the former and the latter explanations, the latter is most likely because giving advice entails more use of second-person pronouns.

There is an increased use of third-person plural pronouns in TSF and a decreased use in MET. One reason posited was that third-person pronouns were being used to differentiate and sometimes create distance between *us* (i.e., healthy clinicians) and *them* (i.e., sick clients). A second explanation may be that the writers of TSF were aware of the health benefits of varying pronoun use, referred to as “perspective switching” (Campbell & Pennebaker, 2003; Jin, 2005; Seih, Lin, Huang, Peng, and Huang, 2008), and specifically, the self-distancing that the third-person perspective allows (Kross, Ayduk, & Mischel, 2005). A third explanation is that although supportive of AA, TSF is not AA; therefore, use of third-person plural pronouns in the TSF manual may be used when referring to AA, its members, its practices, and its principles. The third is the most likely explanation due to a lack of research to support the first two explanations. Many practitioners who are drawn to TSF are themselves “wounded healers” (White, 2011) and have empathy for what their clients experience. Their background might preclude them from stressing such differentiation. Furthermore, research on perspective switching came after Project MATCH (PMRG, 1997, 1998).

The third research question was related to psychological/physical categories. The only difference found with emotion words was that there were less than expected negative emotion words in MET. One possible reason is that in MET the expression of negative emotions is denied. An alternative explanation is that compared to TSF and CBT, in MET there is less emphasis on negative emotions and consequences and more emphasis on the change process. Between the former and the latter explanations, the latter is most likely because MET seeks to enhance motivation and focuses on the change process (Miller et al., 1992). Miller and Sanchez (1994) developed a framework within MET known as the FRAMES (Feedback, Responsibility, Advice, Menu of options, Empathy, Self-efficacy) model that includes elements of brief

interventions that induce change, including “facilitation of client self-efficacy or optimism” (Miller et al., 1992, p. 2).

For male words, use was lower in CBT and higher in TSF. One possible reason might be that CBT is a more feminine approach and TSF is a more masculine approach. An alternative explanation is that CBT was developed for more universal use with many clients without regard to sex or gender, whereas TSF had its basis in AA with AA literature written decades ago and representative of the higher prevalence of men coming forward for help at that time (Maxwell, 1982; White, 1998). Between the former and the latter explanations, the latter is most likely because there is no research to support the former, whereas the fact that AA literature reflects the high prevalence rates of males with AUD seeking help at the time of publication has been referenced (Maxwell, 1982; White, 1998). Additionally, because AA was founded by men, effectiveness of TSF for men was predicted to be higher than for women in Project MATCH (PMRG, 1997, 1998)

The biological process words were higher in TSF and lower in MET. One possible reason is that TSF is more descriptive of life processes compared to MET. An alternative explanation is that TSF is based on AA which not only stresses the mental but also the physical aspects of AUD (Alcoholics Anonymous, 1981; Anonymous, 2010; Nowinski et al., 1992; Wilson, 2001) whereas, MET focuses only on mental aspects. Between the former and the latter explanations, the latter is most likely because physical manifestations of AUD receive more focus in TSF and AA than in MET.

Although results of this study advanced knowledge of the language of addiction, there were limitations. One is that the treatment manuals were written by different authors. Results of analysis could be related to their different writing styles rather than differences in the treatment

modalities. A future study might inform one writer, who is unaffiliated with any of the approaches, about the workings of each model so that the different writing styles would not confound results. A second limitation is that the LIWC2015 scores for analytic, clout, authentic, and tone do not reflect actual usage but instead rely on a nontransparent LIWC2015 algorithm derived from large comparison samples. The outcome scores for analytic, clout, authentic, and tone show where each standard score fell on a normal curve based on prior research. The non-transparency of the algorithm is a limitation for the researcher as it creates an element of uncertainty. In terms of external validity, results from this study were specific to the texts analyzed and therefore are not generalizable.

The literature presented has shown that the language of addiction matters. There are several implications of the current study for counseling practitioners. First, the high analytic results add to the steadily increasing evidence base for TSF, which, prior to a call for research (Institute of Medicine, 1990), was not considered credible by many in the research community. Clinicians who provide or refer clients to TSF treatment have one more study that supports its efficacy. Additionally, the analytic results may mean that compared to MET, TSF may provide more benefit to a client who needs step-by-step guidance. Second, the higher MET results and lower TSF results for second-person pronouns, may inform clinicians that MET is a directive approach, whereas TSF is non-directive. Knowledge of this difference may be beneficial in matching clients to treatments that resonate with them. The higher TSF results and lower MET results for biological process words may inform clinicians that TSF takes a mind, body, spirit approach, whereas MET is based in motivation psychology, with little emphasis on physical or spiritual aspects of addiction. This differentiation may prove helpful for client matching. Finally, whereas CBT had the least variation across variables, the results for TSF and MET

indicate stark differences for many categories: analytic, authentic, tone, first-person singular, second-person, third-person plural, and biological process words. Hence, if a client does not respond well to one of these approaches, it may be beneficial to switch to the other treatment approach. Broader implications include TSF and AA consideration of how the overuse of male language impacts females (and other gendered individuals). This study would add to the research on gender differences in AA (Kelly, 2013).

Several implications for researchers were drawn from this study. First, this research is the first study to examine difference of linguistic components across addiction treatment manuals. Findings may have relevance to clinicians who provide treatment for SUDs, writers of manuals, researchers who examine and develop treatment approaches, and clients with SUDs. Research demonstrates that differences exist in the broad psycholinguistic, specific linguistic, and psychological and physical process words used in the treatment manuals studied. Future research may help differentiate when texts with different authentic scores vary due to filtering and the degree of openness of the era in which they were written versus deception and dishonesty. It may be interesting to examine use of *I* words, which correlate with truth-telling, versus use of *we* words, which support community, when authors have a choice in whether to communicate from the first-person singular or first-person plural perspective. TSF and CBT had less tone, whereas MET had higher tone and less negative emotions. Given the aforementioned interest in the role of positive and negative emotions in addiction treatment, further research is warranted.

Summary of Manuscript 2

Manuscript 2 explored the language used in 12-step program literature to fill a gap and increase knowledge about language use that supports the recovery process. Pronoun use,

emotional tone, clout, authenticity, analytical thinking, gender, and psychological and biological process words were explored in hopes of expanding the knowledge base for substance use and behavioral addictions. Three research questions were designed to guide this study. The first research question was: Do differences in the level of broad psycholinguistic processes exist among the 12-step program literature? The broad psycholinguistic process categories were analytic, clout, authentic, and tone. The second research question was: Do differences in specific linguistic categories exist among the 12-step program literature? The linguistics process categories were first-person singular pronouns, Third-person singular pronouns, second-person pronouns, first-person plural pronouns, third-person plural pronouns, and impersonal pronouns. The third research question was: Do differences in specific psychological and physical processes exist among the 12-step program literature? The psychological and physical process categories were positive emotion, negative emotion, female, male, and biological processes.

For analytic words, standard scores were lower than expected in GA and OA and higher than expected in SLAA. One possible reason for this result is that GA and OA language is informal, whereas SLAA language is formal. An alternative explanation is related to the word count of each text, with lengthier texts affording more in-depth coverage of what Step One involves. Between the former and the latter, the latter is more likely as GA and OA are among the shorter texts, and SLAA is among the longer texts.

For authentic words, standard scores were lower than expected in AA, GA and OA, and higher than expected in DA and SLAA. One possible reason for the obtained results may have to do with stigma and shame, which may be higher for individuals with alcohol, gambling, or food addiction. In LIWC2015, the more a writer filters what they are writing, the lower the authentic score and vice versa (Bulkeley & Graves, 2018). Stigma and shame may affect degree of

openness. A second explanation may be related to how LIWC2015's authentic composite score was derived. This research showed that *I* words were among those associated with truth-telling, as they indicate one is speaking from the heart (Jordan & Pennebaker, 2017). AA, which served as a model to other anonymous programs, preferred *we* words over *I* words as a means to convey a sense of community (Anonymous, 2010), not to avoid the truth. A third possible reason may be that because the LIWC2015 authentic variable is a composite score based on studies of individuals' deception (Newman, Pennebaker, Berry, & Richards, 2003; Pennebaker, 2011), it may not apply to self-help texts. Between the possible explanations, the third is more likely as research does not support the first explanation, and the second does not explain the variation of results found.

For tone words, standard scores were lower than expected in AA and GA and higher than expected in SLAA. One possible reason for the obtained results is related to changes in language use over time. The AA and GA texts were written decades before SLAA. An alternative explanation is that the tone of the AA text slanted negative due to Wilson's depression at the time he authored the text (AA, 1984). GA modeled its text after AA literature as did SLAA; however, it was decades later when critiques of the book were promulgated (AA, 1984). It is possible SLAA writers referenced these critiques when writing their own literature. Between the former and the latter, the latter is more likely as Wilson's depression is well-documented.

For first-person singular pronouns, scores were lower than expected in SLAA and higher than expected in DA. One possible reason for the obtained results may have to do with research showing increased use of first-person singular pronouns with depression (Rude, Gortner, & Pennebaker, 2004). Individuals in debt may be more depressed than individuals with sex and love addiction. An alternative explanation is the increased use of first-person singular pronouns

in SLAA's first step may be for the purpose of helping members confront denial and identify with the thought patterns of others prior to recovery. Between the former and the latter, the latter is more likely as most of the first-person singular plural references in the step are in a paragraph with quotes such as, "If *I* could only get the tax authorities (or *my* spouse/partner or *my* boss or these creditors) off *my* back, *I'd* be fine" (DA, 2016, p. 4).

For third-person singular pronouns, scores were more than expected in AA. One possible reason for this finding is related to psychological correlates of word use categories. Tausczik and Pennebaker (2010) attributed social interests and social support with the third-person singular linguistic category. An alternative explanation is that the obtained results are due to high rates of male third-person singular pronouns (e.g., he, him, his) related to the fact that AA literature was written decades ago and representative of the higher prevalence of men coming forward for help at that time (Maxwell, 1982; White, 1998). Between the former and the latter explanations, the latter is most likely because the fact that AA literature reflects the high prevalence rates of males with AUD seeking help at the time of publication has been referenced (Maxwell, 1982; White, 1998). An example in the text is, "*he* would return to us convinced. *He* had hit bottom as truly as any of us" (AA, 1981, p. 23-24).

For first-person plural pronouns, scores were lower than expected in AA and higher than expected in NA. One possible reason for the obtained results may be related to the psychological correlate of social connection (Tausczik & Pennebaker, 2010), specifically that it is greater in NA than in AA. An alternative explanation relates to the evidence that shows a decrease in first-person plural pronouns with depression (Rude, Gortner, & Pennebaker, 2004). Bill Wilson was depressed for several years leading up to the writing of the AA text that is the subject of this study, which, according to AA history, is in contrast to the joy he felt upon writing the *Big Book*

(AA, 1984). Between the former and the latter, the latter is more likely. In an AA publication, *Pass It On: Bill Wilson and the AA Message* (1984), Wilson is quoted as saying, “I’ve had a dreadful hex about further writing. Figure I had been so beat up by the events of these last years that I could never bring anything more off that would be worthwhile” (p. 355).

For third-person plural pronouns, scores were higher than expected in AA. One possible reason for the obtained results concerns out-group awareness (Tausczik & Pennebaker, 2010). An example from the text is, “Many less desperate alcoholics tried AA, but did not succeed because *they* could not make the admission of hopelessness” (AA, 1981, p. 23). An alternative explanation is that the authors were aware of the health benefits of varying pronoun use, referred to as “perspective switching” (Campbell & Pennebaker, 2003; Jin, 2005; Seih, Lin, Huang, Peng, and Huang, 2008), specifically in relation to the third-person perspective (Kross, Ayduk, & Mischel, 2005). Between the former and the latter, the latter is more likely because even though the research on the perspective switching came decades after the text was written, editors of AA writings were astute to the power of pronoun usage (Anonymous, 2010). Furthermore, the quote above is the only out-group reference in the text. An example of perspective switching is, “Alcoholics who still had *their* health, *their* families, *their* jobs, and even two cars in the garage, began to recognize *their* alcoholism” (AA, 1981, p. 23).

For male words, usage was more than expected in AA. One possible reason for this obtained result is that an approach that may be considered masculine is more effective to address AUD. An alternative explanation is related to the fact that AA literature was written decades ago and, as previously stated, was representative of the higher prevalence of men coming forward for help at that time (Maxwell, 1982; White, 1998). Between the former and the latter, the latter is more likely as noted in the aforementioned explanation.

For biological process words, scores were lower than expected in DA and higher than expected in OA and SLAA. One possible reason for this result is related to the era in which each program was founded. Of the six anonymous programs studied, the three most recently formed showed differences. An alternative explanation is related to the nature of the addiction each text represented. The behaviors that lead one to DA are financial in nature, whereas the behaviors that lead one to OA and SLAA are physical in nature. Review of the texts shows that between the former and the latter, the latter is more likely as evidenced by quotes from each text. “The certain *pain* of continuing our *sex* and love addiction brought us to the admission of Step 1” (Augustine Fellowship, 1986, p. 72). “We hid from our *pain* by *eating* compulsively” (OA, 2018, p. 6).

Although results of this study advanced knowledge of the language of addiction, there were limitations. One limitation is that the LIWC2015 scores for analytic, clout, authentic, and tone do not reflect actual usage, but instead rely on a nontransparent LIWC2015 algorithm derived from large comparison samples. The outcome scores for these categories show where each standard score fell on a normal curve based on prior research. The non-transparency of the algorithm is a limitation for the researcher as it creates an element of uncertainty. In terms of external validity, results from this study were specific to the texts analyzed and therefore are not generalizable.

The literature presented has shown that the language of addiction matters. Clinical and research implications were drawn from this study. This is the first study to compare linguistic components of different 12-step programs. Findings may have relevance to writers of 12-step literature, clinicians who provide treatment and researchers who study substance use and behavioral addictions, and individuals with these issues. Results demonstrate that differences

exist in the broad psycholinguistic, specific linguistic, and psychological and physical process words used in the texts studied. From a global perspective, it is interesting that AA has the most difference compared to the other texts. The opposite would be expected. For six variables, scores were either more or less than expected. This finding is surprising. Perhaps the other 12-step programs that depend on AA literature are not modeling their texts as closely as expected.

Implications for specific variables were expected and unexpected. It makes sense that there would be more biological process words in OA and SLAA versus DA due to the former being more physical in nature and the latter being financial. The fact that first-person singular words would be greater in DA and NA, which may represent more isolative behaviors, than SLAA, which may involve others, also is understandable. Furthermore, it is well-known that AA literature is male-based. Research has shown that AA is effective for women in different ways from men (Kelly, 2013). Additional recognition of how male-dominated the AA literature is may support a call for changes to better represent AA membership. A surprising finding was that AA had fewer than expected first-person plural pronouns, considering how much attention was given to the use of *we* words in AA's original manuscript, *The Big Book*. In fact, differences in three different types of pronoun use were found in AA. The aforementioned influence of Wilson's depression on his writing or skill in pronoun use for perspective switching may be reasons. Further research may shed light on these results.

It is difficult to make inferences based on the broad psycholinguistic process studied due to the aforementioned limitation. It may be interesting to examine use of *I* words, which correlate with truth-telling, versus use of *we* words, which support community, when authors have a choice in whether to communicate from the first-person singular or first-person plural perspective. Therefore, a future study examining correlation between the broad psycholinguistic

process category authentic and *I* versus *we* words in relation to language that encourages a community approach is recommended. Finally, across all the corpora, clout was very high with scores over 92 on a percentile rank scale. This result was not discussed as there was no statistical difference per the nature of the research questions of this study. However, the reasons for such high clout levels may represent an important area for future research.

Thematic Linkage of the Two Manuscripts

The studies contained in these manuscripts are thematically linked. Both studies use LIWC2015 (Pennebaker, Booth et al., 2015) to explore the rhetorical and psychological processes in professional and self-help literature for substance misuse and behavioral addictions. The same variables were studied in each manuscript. Each document studied was written to address behaviors that are viewed as addictions by some.

There were differences between the manuscripts contained in this dissertation. Manuscript 1 was an analysis of texts that were prepared for research and are used by researchers and clinicians, whereas Manuscript 2 contains analysis of texts prepared and used primarily by laypeople who are members of 12-step programs. The first manuscript was focused primarily on AUD, whereas the second manuscript was an examination of texts used to address substance use and behavioral addictions.

Contribution to the Knowledge Base

Taken together, Manuscript 1 and Manuscript 2 add to the knowledge base regarding the problems of addiction and behavioral addiction. The research explores the language of addiction through examination of treatment manuals and self-help texts. Manuscript 1 provides the differences among the treatment manuals developed for use in Project MATCH (PMRG, 1997, 1998), which examined TSF, MET, and CBT to treat AUD. Manuscript 2 provides the

differences among self-help texts used to address substance use and behavioral addictions by studying language used in the following 12-step programs: AA, DA, GA, NA, OA, and SLAA.

Results of this study supported or disputed findings from prior research, generated new findings, and raised new questions. For example, prior to this research it was known that the language of literature in AA, and consequently TSF, which relies heavily on the AA program, is male-oriented. Findings reported in both manuscripts of this dissertation confirm this. On the other hand, it was expected based on the literature that AA and therefore TSF would use more than expected first-person plural pronouns, whereas the opposite results were found. In Manuscript 1, no difference in first-person plural pronouns in the TSF manual were reported, while in Manuscript 2 less than expected use of first-person plural pronouns in the AA text were reported. Although emphasis was placed on switching to first-person plural pronouns in AA's original text, *The Big Book* (Wilson, 2001), the emphasis may have been lost in the writing of *The Step Book*, the text examined in this study. Additional findings to note include AA's high rating on the analytic scale, which debunks long-held beliefs in the scientific community that AA practices were not to be taken seriously.

Implications of Dissertation for Research Agenda

Research findings in Manuscript 1 and Manuscript 2 generated new areas of exploration. A language analysis comparing Step One in AA's *Step Book* (Alcoholics Anonymous, 1981) and *The Big Book* (Wilson, 2001) is a logical next step in terms of furthering the findings of this study. Knowing language differences between the texts may be helpful for members of 12-step fellowships who use the information in both of these texts to guide their recovery. Additionally, it may shed light on the influence of leaders who write at the start of new endeavors and decades later, when life events such as depression may have an effect. Future examination of treatment

manuals covering other treatment approaches and texts of other 12-step programs not examined in this dissertation would also expand the knowledge base.

I also have interest in studying the use of language as an intervention in quantitative and qualitative research. An example might entail adding an expressive writing component to the alcohol awareness programs that college students showing signs of problem drinking are referred to. Linguistic analysis may add to the assessment process. This dissertation brought attention to understudied populations such as debtors, who along with other populations addressed in this study are affected by stigma and bias. Additional quantitative and qualitative research using corpus linguistics may prove helpful in understanding the experience of people who find themselves in debt due to behaviors they may have been able to manage with therapeutic or community support. Similar to Slatcher and Pennebaker's (2006) finding that expressive writing in couples is related to relationship stability, an intervention may be developed that includes the use of expressive writing for relapse prevention with individuals whose financial stability is affected by compulsive spending or shopping.

It may be interesting to examine use of *I* words, which correlate with truth-telling, versus use of *we* words, which support community, when authors have a choice in whether to communicate from the first-person singular or first-person plural perspective. Therefore, a future study examining correlation between the broad psycholinguistic process category authentic and *I* versus *we* words in relation to language that encourages a community approach would be intriguing to me. On a broader level, corpus linguistics may be used as an intervention in the area of public policy. As an introduction to the principles in the full text, the preamble to the U.S. Constitution begins with, "We the people." Elected officials are sworn in to support constitutional principles and the people the officials represent. Linguistic analysis of their verbal

and written communications may prove useful to determine the degree in which elected officials align with the principles and work they were hired to perform.

Variables in this dissertation that did not show significant difference remain interesting to me. Given the research community interest in the role of positive emotions in recovery, this variable may be one I further explore using LIWC2015 for a wide variety of recovery-related literature. Finally, I am very curious about the role of clout in substance use and behavior addictions. Clout was not closely investigated in this study as the findings were consistently high across corpora, and this dissertation sought to find whether differences existed among the texts examined.

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Appendices

Appendix A

IRB Determination of Non-Human Subjects



Oregon State University
Research Office

Human Research Protection Program
& Institutional Review Board
B308 Kerr Administration Bldg, Corvallis OR 97331
(541) 737-8008

Date of Notification	07/20/2018	Study Number	8719
Notification Type	Oversight Determination		
Principal Investigator	Cass Dykeman		
Study Team Members	Margaret O'Hara		
Study Title	A Corpus Linguistic Study of Addiction Self Help and Professional Treatment Textual Materials.		
Funding Source	None	Cayuse Number	N/A

DETERMINATION: RESEARCH, BUT NO HUMAN SUBJECTS

It has been determined that your project, as submitted, does meet the definition of research but **does not** involve human subjects under the regulations set forth by the Department of Health and Human Services 45 CFR 46.

Additional review is not required for this study.

Please do not include HRPP contact information on any of your study materials.

Note that amendments to this project may impact this determination. Please submit a new request if there are changes (e.g., funding, data sources, access to individual identifiers, interaction with research subjects, etc.).

The federal definitions and guidance used to make this determination may be found at the following link: