THE INTEGRATION OF NEUROSCIENCE AND COUNSELING USING NEUROEDUCATION IN TRAUMA TREATMENT: A QUANTITATIVE STUDY

by

Daniel Ross Wood

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

School of Behavioral Sciences

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APPROVED BY:

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ABSTRACT

Researchers in numerous professional fields, including psychology, have applied neuroscience integration in their studies. Yet research has also demonstrated a hesitancy among counselors to utilize neuro-informed principles in case conceptualization and treatment. No researchers in the studies found among the mental health counseling fields considered this issue. If left unaddressed, counselors and clinicians may avoid the use of an effective and complimentary integrative approach or unintentionally misapply neuro-informed principles and violate ethical standards in practice. This quantitative research used a survey and case study design to consider mental health professional characteristic variables of self-competency, theoretical attitude, and strength of religious beliefs as measured by the Counselor Self-Efficacy Scale, the Theoretical Orientation Profile Scale-Revised, and the Dimensions of Religiosity Scale respectively. Correlation between these variables and neuroeducation use in case conceptualization and treatment was measured via correlation analysis. Results showed a significant positive relationship between the characteristic variables and use of neuroeducation. Moderated regression analysis further indicated strength of religious beliefs had a moderating effect on the relationship between self-competency and neuroeducation use but not in relation to theoretical attitude. Results of a multivariate analysis of variance showed consistency of neuroeducation use among segments of the mental health field. A review of current literature related to neuroscience integration, neuroeducation, and neuro-informed trauma treatment clarifies pertinent issues, defines the problem of limited integration, identifies factors that influence use, and suggests areas of future research. Data was collected through an online survey via Amazon's Mechanical Turk and Survey Monkey from a diverse group of allied mental health professionals.

Keywords: neuroscience, counseling, integrated, neuroeducation, trauma

Dedication

This manuscript is dedicated to the astute caregivers from the psychological, clinical social work, and spiritual care segments of the mental health profession who have recognized the necessity and value of holistic and multidomain consideration when conceptualizing and treating people who present for care. Further, this work is dedicated to contemporary practitioners and researchers who continue to propagate the importance of integrating neuroscience with counseling through academia, practice, research, and theoretical discussions. Finally, this work is dedicated to the Author and Designer of the numerous complex, integrated, and balance-oriented internal systems that make us all human. To the One True God, eternal, immortal, invisible, full of grace, mercy, and truth.

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List of Abbreviations

American Mental Health Counselors Association (AMHCA)

Analysis of Variance (ANOVA)

College of Pastoral Supervision and Psychotherapy (CPSP)

Counsel for Accreditation of Counseling and Related Educational Programs (CACREP)

Counselor Self-Efficacy Scale (CSES)

Diagnostic and Statistical Manual of Mental Disorders, Fifth edition *(DSM*-5)

Dimensions of Religiosity Scale (DRS)

Mental Health Professional (MHP)

Multivariate Analysis of Variance (MANOVA)

National Institute of Mental Health (NIMH)

Posttraumatic Stress Disorder (PTSD)

Research Domain Criteria (RDoC)

Statistical Package for Social Sciences (SPSS)

Theoretical Orientations Profile Scale-Revised (TOPS-R)

CHAPTER ONE: INTRODUCTION

Overview

This study was designed to clarify the present shift toward integrating neuroscience and neuroeducation in trauma case conceptualization and treatment and to identify the relationship between certain characteristics of mental health professionals (MHPs) and their choices regarding neuroscience integration in clinical practice. Neuroeducation was used as representative of neuroscience in this research. Field, Beeson, et al. (2017) defined conceptualization as the way a counselor understands a client's presenting problem. Further, Jones et al. (2017) described conceptualization as the essential nature of the counselor's understanding of the brain and body response when interpreting a traumatized client's problem. A brief historical background of the tension created by neurointegration in counseling appears later in this section. The influence of neuroscience on psychology has spanned more than 3 decades, yet this work is focused on recent and specified concerns in research. Thus, the current problem is elucidated through a succinct literature review and a discussion of the purpose of the work in this chapter. Further, the significance of this endeavor is addressed via connections with recent research and measured contributions to the discussion of neuroscience integration across specified sectors of allied mental health. Finally, the research questions that drove this study and definitions of important terms related to the measured variables are addressed.

Although research with clinical mental health counselors provided the impetus for this study, the following allied mental health professions are also addressed: psychiatrists, psychologists, counselors, chaplains, and clinical social workers. The descriptive words "counselor" and "therapist" were used when referring to counselors, social workers, and chaplains; the terms "practitioner" and "clinician" identify general references to psychiatrists and

psychologists; and the phrase “MHP” depicts general references to all allied segments of the mental health profession under consideration here. This is the first study to consider such a diverse spectrum of the mental health profession in relation to the use of neuroscience in client case conceptualization and treatment planning.

Background

Expectations

A preponderance of evidence suggests neurointegration has been an emerging process for more than a decade (Beeson & Field, 2017; Field, Beeson, et al., 2019; Luke et al., 2020; Miller, 2016). Yet, the formal integration of neuroscience into the conceptualization and practice of counseling has met resistance from some within the mental health field, despite expectations and professional requirements for training over an approximate decade (Pliszka, 2016). The *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM*-5; American Psychiatric Association, 2013) presented an adjusted structure to recognize the influence of the most recent neuroscience research affecting diagnosis, an implication for practitioners to have a greater awareness of emerging knowledge. The National Institute for Mental Health (NIMH; n.d.) introduced the Research Domain Criteria (RDoC) in 2009 to promote the organization of neuroscience research and encourage interdisciplinary collaboration amid the emergence of new knowledge and understanding in the field.

Further, for the field of licensed professional counselors, the 2016 standards of the Council for the Accreditation of Counseling and Related Educational Programs (CACREP, 2015) noted required curriculum for counselors to include human growth and development incorporating neurological, physiological, and biological factors related to human behavior and development. Additionally, CACREP (2015) dictated that counseling case conceptualizations

should emerge from a systems approach, and therapists must develop an awareness of personal characteristics that influence the counseling process. Added to the concert of neuroscience-supportive guidelines, the more recent American Mental Health Counselors Association (AMHCA, 2021) standards of practice have consistently promoted the expectation that a counselor's biological bases for behavior include knowledge of the structure and function of the central and peripheral nervous systems; neural development; structural and functional neuroanatomy; physiological, biochemical, and neurobiological mechanisms; and neurocognitive processes. Despite these directives and expectations, research has suggested a deficiency in knowledge and application of neuroscience integration in counselors' clinical practice (Busacca et al., 2015; Field, Beeson, et al., 2019; Kim & Zalaquett, 2019).

Context

Research has shown the current application of neuro-informed concepts may lack standardization, and practitioners may lack sufficient depth of knowledge and understanding of neurobiology and brain structure and function (Kim & Zalaquett, 2019; Miller, 2016). In a phenomenological analysis of teaching interpersonal neurobiology to counselors, Miller and Barrio Minton (2016) found the participants changed their approach to conceptualizing client problems based on a greater understanding of brain development and early life experiences. Research has suggested a counselor or clinician's understanding of brain structure and function and neurobiology could result in greater self-confidence, widening their aperture on potential interventions and enhancing the therapeutic relationship, leading to client normalization of the experience and self-regulation of autonomic arousal (Gentry et al., 2017; Miller & Barrio Minton, 2016). The integration of neuro-informed concepts such as brain structure and function

and neuroplasticity via neuroeducation during the counseling session has been found to reduce feelings of blame and shame and produce client empowerment and hope (Miller, 2016).

These research examples have added to the continued conversation within counseling practice and research regarding the current and future roles of neuroscience integration in the evolving issues of counseling professionals' professional identity, training, and practice (Beeson, Field et al., 2019; Lamar & Helm, 2017). Researchers have further raised concerns about neuroscience integration related to reductionism, neuroessentialism, and ethical violations in practice regarding counselors and clinicians (Busacca et al., 2015; Kim & Zalaquett, 2019; Luke et al., 2020; Porter, 2020; Schwartz et al., 2016; Wilkinson, 2019; Zimmerman et al., 2020). Whereas researchers have associated reductionism with an overemphasis on neural analysis to explain psychological problems, thereby reducing humanity to scientific analysis (Schwartz et al., 2016; Wilkinson, 2019), researchers have noted that neuroessentialists connect all mental illness with brain dysfunction (Zimmerman et al., 2020). These potentially monistic pathways of neurointegration exist in the literature and thus should be considered as antagonistic to the appropriate integration of neuroscience with counseling, yet this study focuses primarily on individual characteristic variables as limiting factors.

Gentry et al. (2017) and Ward et al. (2017) promoted the concern that individuals in the counseling field had found difficulty in moving past loyalties to certain models of trauma treatment and may face a future of rigid clinical pathways if they do not integrate broader areas of research. Gentry et al. asserted cognitive behavioral treatments, stress inoculation training, and cognitive processing therapy, among other models, contain common factors that make them effective, and this is what counselors and practitioners must focus on as opposed to indiscriminate loyalties. The authors explained these common factors involve cognitive

restructuring, which includes psychoeducation on neuro-informed concepts, the therapeutic relationship, self-regulation of autonomic arousal, and exposure or narrative techniques to desensitize and integrate memories. The cost of not addressing these current tensions includes the risk of counselor and clinician avoidance of this descriptive framework or the potential of MHPs integrating neuroscience without intentional and informed consideration of ethical and empirical research factors (Kim & Zalaquett, 2019; Luke et al., 2020).

Luke et al. (2020) addressed the paradoxical nature of the ethical dilemma related to the tension between research-driven efficacy and the current pace of neurointegration into the field of counseling and MHPs' perceptive concerns regarding lack of standards, training, and supervision to ensure principled and safe application in practice. About one-fifth of respondents in the Luke et al. study on ethical concerns about integrating neuroscience and counseling noted they had no ethical concerns. Some (n = 10) reported it would be unethical not to integrate current findings. Most of the research considered in this work focused on integrating neuroscience into counseling has been conceptual in nature. Future researchers should consider ways to incorporate quantitative measures into neurointegrative studies. Although various researchers have considered incorporating neuroscience into counselor training and education (Busacca et al., 2015; Duenyas & Luke, 2019), fewer have considered its specific application in case conceptualizations (Field, Beeson, et al., 2019; Schauss et al., 2019; Ward et al., 2017), and only one investigated a comparison between counselor choice of neuro-informed conceptualizations and other theoretical approaches (Field, Beeson, et al., 2019).

Field, Beeson, et al. (2019) explored how neuroscience integration theories had been used to conceptualize and treat depressive disorders, but they found no other research on the use of a neuro-informed approach for other client problems such as trauma. Although Field, Beeson, et

al. scrutinized the prevalence of neuroscience integration, the population of interest was not representative of the broader field of MHPs, and they did not investigate the influencers that would affect the counselor or clinician's choice to incorporate neuro-informed principles or to avoid such methods. Therefore, this work was an investigation of the MHP characteristic variables of self-competency based on education, theoretically informed attitude, and strength of religious beliefs and their impact on the choice to integrate neuroeducation with clinical practice. Additionally, the population of clinical social workers has received little attention in studies regarding neuroscience integration, with just one study found related to trauma treatment (Alessi & Kahn, 2019) and another that addressed emotional regulation in clinician education (Sewell, 2020). Likewise, pastoral counselors and chaplains have been underrepresented within neurointegrative mental health research. A limited number of studies focused on integrating third-wave approaches in religious counseling (Bingaman, 2015, 2016). These findings illuminated the limited scope of research related to the noted hesitancy to incorporate neuroscience principles into counseling education and practice across the broader mental health community. The current status of neurointegration in the counseling field has been articulated through various disparities in research (Busacca et al., 2015; Field, Beeson, et al., 2019; Field, Miller, et al., 2019; Russo et al., 2021).

Gaps in Research

Despite continued interest in the application of neuroscience in the field of counseling, identified gaps existed in the research pertaining to the integration of neuroscience into the case conceptualization and treatment of client issues (Field, Beeson, et al., 2019; Miller, 2016; Russo et al., 2021; Wilkinson, 2019). In their text on neurocounseling, Field, Jones, et al. (2017) identified the four foundations of anatomy and brain development, neurophysiological

development, the biology of marginality, and neurophysiology of trauma as important tools for understanding or conceptualizing client problems. In support of incorporating these foundational aspects into practice, Miller (2016) suggested future researchers should consider counselor and client variables that inform neuroeducation integration into clinical practice and evaluate subsequent client outcomes. Relatedly, Field, Beeson, et al. (2019) pointed to a need for explorations of factors that might influence a counselor's selection of a conceptualization framework in light of emerging neuroscience insights. Luke et al. (2020) noted an associated disparity in the literature, calling for additional research on the integration of neuroscience as a prerequisite for determining training standards and treatment outcomes. More recently, Russo et al. (2021) urged further exploration into whether current neuroscience training could effectively bring about competency in counseling and proposed an investigation of the role of demographic factors in neuroscience training availability. These gaps in research led to this study's investigation into the influence of the MHP characteristic variables of self-competency, theoretical attitude, and strength of religious beliefs on the counselor's choice to integrate neuroeducation, as representative of neuroscience, into clinical practice.

Although not overtly recommending future research, Wilkinson (2019) argued from a humanistic viewpoint that there is an absence of evidence that neuroscience has brought anything useful and new to the counseling profession. This may be construed as a call for more definitive studies that parse out the specified benefits of integrating neuroscience into the therapeutic process. Wilkinson further noted the undeniable efficacy of psychoeducation and, by association, neuroeducation, yet the author suggested the term "neuroeducation" was unnecessary as it brought nothing new to clinical engagement. Relatedly, an abundance of research existed regarding the benefits of psychoeducation (Ball et al., 2013; Brady et al., 2017; Economou,

2015; Eichfeld et al., 2019), yet a dearth of studies reframed this treatment within the context of neuroeducation as associated with a neuro-informed case conceptualization (Field, Beeson, et al., 2019; Miller, 2016). This disparity may indicate the tension between neurointegrationist and humanist practitioners and therapists. A measured and circumscribed depiction of neuroscience integration through neuroeducation may result in enhanced counselor identity and provide the foundation for a reasonable counselor scope of competence within this area (Luke et al., 2020).

Movement Toward Integration

McHenry et al. (2014) identified five forces that represent the evolution of theoretical counseling. In time-ordered sequence, these included psychoanalysis, behaviorism, humanism, multiculturalism, and neurocounseling. The intent of this researcher's work was to display the broader theoretical alignment between neuroscience and other approaches, not to define each specific theory. In retrospect, researchers have intimated that all MHPs, regardless of theoretical outlook, work with clients' brains on a regular basis (McHenry et al., 2014). Further, researchers have suggested factors that affect the choice of orientation may be delineated as personal and professional variables (Demir & Gazioglu, 2017; Poznanski & McLennan, 1995). The merging of theoretical approaches during client engagements became common over the past decades, prompting researchers to depict these approaches as eclectic and integrationist in nature (Finnerty & McLeod, 2019; Larsson et al., 2010). Researchers have suggested integrative therapists have taken an interest in all factors of the client's experience and have used a variety of approaches (e.g., cognitive, emotional, behavioral, spiritual, somatic) to meet their needs (Finnerty & McLeod, 2019). Interestingly, Norcross and Wompold (2011) found the top theoretical orientations for American psychologists, counselors, and social workers were

integrative and cognitive (24% each), with only 9% of respondents selecting humanistic approaches.

Considering the complexity of neuroscience, this current study did not address associated theoretical orientations in detail, focusing instead on what was relevant (i.e., the emergence of the theories of mind, mind–body, and mind–brain connections; Field, 2019; Garrett & Hough, 2022; Kalat, 2019; Miller, 2016; Sullivan et al., 2018; Telles-Correia, 2018). These developing theoretical constructs in research have contributed to a framework through which other theoretical approaches to counseling can be viewed, resulting in a deeper understanding of client phenomenology and case conceptualization (Busacca et al., 2015). Researchers have determined a counselor and clinician's epistemic beliefs and self-efficacy have a strong influence on their choice of theoretical orientation (Bandura, 1977; Demir & Gazioglu, 2017; Poznanski & McLennan, 1995). This study addressed the milieu of theoretical concerns and the noted gaps in the literature by engaging with the allied mental health community by way of a case review and survey methodology. In this way, the researcher aimed to parse out the influence of three MHP characteristic variables on their choice to use neuroeducation as a lens for trauma case conceptualization and treatment planning.

Problem Statement

Researchers have demonstrated the efficacy of incorporating neuroscience principles into the counseling endeavor. Within the undertaking to promote neuropsychotherapy as an integrative framework for trauma counseling, Ward et al. (2017) posited neuroscience could inform psychotherapy practice and research and could be helpful in conceptualizing problems that arise in clinical practice. Researchers have elucidated concern that the field of counseling psychology has not done enough to promote neurointegration through research, education, and

practice and has failed to identify the reasons why many counselors have been reticent to understand and adopt neuro-informed principles in case conceptualization and treatment (Field, Beeson, et al., 2019; Russo et al., 2021).

Russo et al. (2021) found that although counselors had received significant training in biological bases of behavior competencies, less than half of the total sample (N = 260) reported prior training in neuroscience-related standards during their master's program. Although training and education standards represent a relevant concern in the research (Luke et al., 2020; Miller et al., 2020), in this current work, the researcher focused on individual practitioner variables of interest that could influence their clinical outlook on the client. In the Field, Beeson, et al. (2019) study, about one-half (57.7%) of all respondents (N = 334) provided neuro-informed case conceptualizations for depression, and about one-quarter of those displayed evidence of complex understanding. These findings intimate a potential barrier for neurointegration and pose relevant concerns for future research to investigate.

Field, Beeson, et al. (2019) suggested further investigation of the influences that predicated response themes related to conceptualization was necessary and postured the use of a real-life case in research as opposed to a fictional one. Although Schwartz et al. (2016) urged a balanced approach toward the integration of neuroscience and psychology, they additionally reported the scientific value of including characteristic variables such as self-perceptions, motives, and values in related research. Studies have generated concern for how neuroscience will impact counselor identity (Luke et al., 2020), and researchers have thus emphasized the importance of understanding internal psychological matters that might influence individual movement toward learning and applying neuro-informed principles in clinical practice. Although research has shown counselor characteristic variables influence a counselor's choice of

theoretical orientation and manner of case conceptualization (Duggal & Sriram, 2021; Hook & Vera, 2020; Moukaddam et al., 2019; Norton & Tan, 2019; Rihacek & Roubal, 2017), no studies emerged in the literature review in which researchers investigated the relationship between specific characteristics and a MHP's choice regarding neuroscience application. Further, this researcher located no studies addressing the integration of neuroscience into case conceptualization and treatment of trauma. Although Field, Beeson, et al. considered the integration of neuroscience into the case conceptualization of the issue of depression, they did not seek a response from the broader field of MHPs. Thus, no existing comparative research evaluated the prevalence of neuroeducation integration between the professional segments of allied MHPs.

Purpose Statement

The purpose of this study was to address the gaps in the literature related to identifying the relationship between MHP characteristic variables such as self-competency, theoretical attitude, and strength of religious beliefs and the choice regarding the use of neuroeducation in case conceptualization and treatment planning. A further aim was to suggest further research to address this problem. Through the methodology of quantitative survey research, this work addressed the broader population of the allied MHP. The researcher included three segments in the final sample: (a) psychology professionals (i.e., psychiatrists, psychologists, licensed counselors), (b) spiritual care providers (i.e., licensed or board-certified pastoral counselors and chaplains), and (c) clinical social workers. Respondents received a real-life trauma case review with statements that required scaled responses related to the importance of using neuroeducation in case conceptualization and treatment planning. Additionally, the survey included assessments that measured the influence of three characteristic variables: self-competency based on

education, theoretical attitude, and religious beliefs. The researcher performed a multiple regression correlation analysis to determine the relationship between each characteristic variable and the criterion variable (i.e., the choice regarding neuroeducation use in case conceptualization and treatment). Finally, the researcher tabulated the results from each segment of the MHP sample and performed a comparative analysis to display any thematic differences in neuroscience utilization and potential barriers to use between the allied segments of the mental health profession.

Significance of the Study

This work adds to the conversation in the literature surrounding the hesitation of some MHPs to integrate neuroscience into case conceptualization and treatment in an informed and ethically competent manner. In addition, the study provides relevant insight regarding factors that may encourage the incorporation of neuroscience into clinical practice (Field, Beeson, et al., 2019; Kim & Zalaquett, 2019; Luke et al., 2020). In this study, the researcher considered trauma case conceptualization with a focus on neuroeducation, building on the work of Field, Beeson, et al. (2019), who studied depression and prompted common neuroscience principles of concern. Kim and Zalaquett (2019) considered the characteristics of knowledge, attitudes, and intention to apply neuroscience among undergraduate students. This work also builds on their effort by measuring the relationship between similar characteristic variables of licensed and certified mental health counselors and clinicians. Furthermore, this study complements the work of Luke et al. (2020), who considered ethical concerns that were antagonistic to neuroscience integration. The current study focused on individual factors that may have ethical implications in practice. Additionally, previous researchers have considered only limited segments of the allied mental health profession and students (Field, Beeson, et al., 2019; Kim & Zalaquett, 2019; Luke et al.,

2020), and in this first-time consideration of the sample population from the broader field, the researcher sought to identify if a disparity existed in training, attitude, and application of neuroscience between licensed psychology professionals, spiritual caregivers, and licensed clinical social workers. Finally, this study enhances Miller's (2016) work by offering empirical evidence related to counselor variables associated with the choice of using neuroeducation in the conceptualization and treatment of clients.

The researcher expected contributions to the knowledge base of integrative neuroscience to include an introductory understanding of the relationship between MHP characteristic variables and the MHP's attitude toward the utilization of neuro-informed principles in client case conceptualization and treatment planning. Further, the researcher aimed for the results to inform the mental health care community regarding the moderating role that strength of religious beliefs plays in influencing other characteristic variables toward or away from a neurointegrative approach in therapy. Although education represented an important and prominent topic in the literature (Kim & Zalaquett, 2019), the researcher intended this study to offer a clearer understanding of individual characteristics, with some degree of association with education, that may limit or encourage neuroscience use. Additionally, the researcher parsed out the theoretical differences between psychoeducation and neuroeducation during this work in a manner intended to distinguish between these terms (Field, Beeson, et al., 2019; Miller, 2016; Wilkinson, 2019).

The researcher speculated these points of knowledge might inform mental health educators regarding curriculum development and instruction with the potential to influence theoretical orientation and attitude toward integrative therapies. Further, the increased awareness of the role played by self-competency, theoretical attitude, and strength of religious beliefs may help individual practitioners and educators consider their own biases and consider widening their

aperture of integration to include neuroscience principles (Field, Beeson, et al., 2019). Ultimately, this study could influence the research field to investigate additional characteristic and demographic variables that may limit the use of neuroscience in the practice of counseling and therapy, resulting in a more empirically defined path to encourage neurointegration as common practice in the conceptualization of client cases and subsequent treatment planning. Melchert (2016) argued that professional psychology should transition to curriculum and theoretical frameworks that include an integrated scientific appreciation of human psychology. The following research questions guided this research.

Research Questions

RQ1 Is there a relationship between an MHP's self-competency based on education and their choice regarding the use of neuroeducation in trauma case conceptualization and treatment?

RQ2 Is there a relationship between an MHP's strength of religious beliefs and their choice regarding the use of neuroeducation in trauma case conceptualization and treatment?

RQ3 Is there a relationship between an MHP's theoretical attitude based on their commitment level to specific or multiple orientations and their choice regarding the use of a neuro-informed approach to trauma case conceptualization and treatment?

RQ4 Is the relationship between an MHP's self-competency based on education and their choice regarding the use of neuroeducation moderated by the strength of their religious beliefs?

RQ5 Is the relationship between an MHP's theoretical attitude based on their commitment level to specific or multiple orientations and their choice regarding the use of a neuro-informed approach to trauma case conceptualization and treatment moderated by the strength of their religious beliefs?

RQ6 Is there a between-group difference regarding the choice of neuroeducation use in case conceptualization and treatment among the subgroups of allied MHPs as delineated by the characteristic variables of self-competency, strength of religious beliefs, and theoretical attitude?

Definitions

1. *Case conceptualization* – Researchers have cited case conceptualization as an important aspect of counselor competency (Constantine & Ladany, 2000). Field, Jones, et al. (2017) explained conceptualization includes the MHP's knowledge necessary to understand the client's problem, and Field, Beeson, et al. (2019) framed case conceptualization as the result of looking at a client through an informative theoretical lens. Thus, within this work, an MHP's case conceptualization represented their view of the client and their problems based on their monistic or integrative theoretical outlook. Although the counselor or clinician's case conceptualization may be indicative of a specific diagnosis or treatment modality, case conceptualization informs diagnosis and treatment planning and is not inclusive of it (Constantine & Ladany, 2000). Importantly, neuroscience provides an additional lens through which the MHP may comprehend additional factors that precipitate a holistic understanding of the client and their problem and subsequently inform the development of a relevant treatment plan.

2. *Mental health professionals* – In this study, the researcher considered numerous professional psychological care categories as MHPs within this research. The researcher aimed to broaden the population sample scope of previous neuroscience integration studies by considering a wider range of care providers while limiting the breadth through a set of inclusion criteria. These criteria included being licensed or certified within the field of practice, having practiced for a minimum of 3 years, and being currently in practice and accepting new clients. These boundaries negated the inclusion of counseling, psychology, social work, seminary, and chaplaincy students and educators not credentialed or practicing at the time of the study. Thus, the general descriptive term of MHP used in this study included all psychiatrists, psychologists, psychoanalysts, counselors, and therapists from any mental health specialty that met the inclusion criteria. Further, the researcher included segments of the mental health and psychological care community that were less represented in research under this general category. These included clinical social workers, pastoral counselors, and clinical chaplains who met the study's inclusion criteria.
3. *Neuroscience principles* – The neuroscience field has broad applications; thus, it was important to refine the principles most applicable to counseling and psychology. Researchers and authors have described the following important concepts: the role of the autonomic nervous system, left and right brain lateralization, neural development and function, memory phenomena, brain structure and function, neurogenesis, and neuroplasticity (Garrett & Hough, 2022; Miller, 2016; Siegel, 2020). These concepts inform the content and application of neuroeducation in clinical practice (Miller,

2016), which the researcher operationalized through a trauma case evaluation in this work.

4. *Neuroeducation* - Miller (2016) described neuroeducation as an experience-based intervention focused on reducing client distress by promoting an understanding of neurological processes that underlie human mental function. Importantly, many counselors assume the sharing of knowledge and information about the brain with clients (i.e., neuroeducation) equates to neuroscience integration (Luke, 2020). Anarsi et al. (2012) offered the phrases “mind, brain and education” and “educational neuroscience” as alternative descriptors (p. 105). In other words, the concept of neuroeducation combines the fields of neuroscience and education while highlighting the positive influence of neuroeducation on building neural pathways that promote learning (Anarsi et al., 2012). Thus, the use of neuroeducation as representative of neuroscience and a measure of neuroscience application is practical and was utilized in this research.
5. *Self-competency and education*: In this study, counselor education referred to acquired knowledge and self-competency in relation to a counselor’s intended use of specific theoretical approaches or the willingness to broaden their case conceptualization methodology to include an integrative approach (Bandura, 1977, 1993; Melchert, 2016; Melchert et al., 1996). The prevailing focus of such education is competency in practice, professional ethics, and the development and sustainment of a strong counselor identity (CACREP, 2015). The topic of MHP education in this study primarily related to integrating neuroscience into counseling and psychology. Further, the researcher considered the characteristic variable of the MHP’s self-

competency as deriving from education rather than experience in clinical practice. The researcher assumed that a higher level of neuroscience education would influence the MHP to integrate neuro-informed concepts into practice.

6. *Religiosity*: Joseph and DiDuca (2007) defined religiosity in a manner consistent with clinical relevance. Spirituality represents a related but separate construct not addressed in this study. Within this work, the researcher considered religious beliefs as they related to an individual's preoccupation with thinking about God, deep conviction that God is always present and aware of their actions, persistent emotional involvement with God, and acknowledgment that God provides guidance in all areas of life (Joseph & DiDuca, 2007). Researchers have described religion as obedience to specified beliefs and practices shared by a community of adherents (Duggal & Sriram, 2021). The concern in this research involved the strength of specific religious beliefs and their cognitive and emotional effect on an MHP's theoretical attitude, self-competency, and choice regarding the incorporation of neuroscience into counseling practice.
7. *Theoretical attitude* – Researchers have suggested the theoretical orientation or conceptual framework of a counselor that informs case conceptualization and treatment methodology has become fluid over the past 2 decades as MHPs have moved toward a theoretical integrative approach to understanding and addressing client problems (Barrio Minton & Myers, 2008; Poznanski & McLennan, 1995; Worthington & Dillon, 2003). Further, researchers have indicated a psychotherapist's theoretical orientation has the greatest influence on their attitude toward practice when compared to other variables (Larsson et al., 2010). A clinician's attitude could

be characterized as a “psychological tendency” conveyed via the evaluation of a specific factor with a measured degree of support or nonsupport (Eagly & Chaiken, 1993, as cited in Larsson et al., 2010, p. 161). Within this work, theoretical attitude may be understood as the psychological tendency of a counselor to use or not use neuroscience based on the influence of an adopted theoretical orientation or a tendency toward measured integration.

Summary

Although research has supported the efficacy of integrating neuroscience into counseling psychology, recent studies have indicated many counselors possess insufficient knowledge of neurointegration and lack an appreciation for using a neuro-informed lens when conceptualizing client problems and treatment plans (Field, Beeson, et al., 2019; Russo et al., 2021). Although the choice of theoretical conceptualization for the issue of depression has been a focus of study (Field, Beeson, et al., 2019), researchers have yet to consider MHP characteristic variables as influencers in the choice to use neurointegration to conceptualize a broader range of client issues (Luke et al., 2020; Schwartz et al., 2016). Additionally, previous research has focused on limited allied segments of the mental health profession.

This work addressed these gaps through a quantitative survey research method that incorporated numerous segments of the mental health profession. Statements and scaled responses based on a brief trauma case review measured the level of importance an MHP places on neuroeducation in case conceptualization and treatment. Various assessment scales additionally provided a measure of the relationship between the characteristic variables of self-competency, theoretical attitude, and strength of religious beliefs and each respondent’s choice regarding the use of neuroeducation. The researcher used a multiple regression analysis to

measure the relationship between the characteristic variables and the choice of integration. The researcher aimed for results that would show whether a correlation existed between the three personal and professional variables and a counselor's choice to conceptualize a trauma case and treatment through the lens of neuroscience. Such results would add to the discussion surrounding the factors that influence neurointegration in counselor case conceptualization and treatment planning. Further, the researcher expected this study to illuminate potential disparities among the allied segments of the mental health profession regarding clinician and counselor competence and client care related to neuroscience integration.

CHAPTER TWO: LITERATURE REVIEW

Overview

All MHPs maintain an ethical and professional responsibility to remain abreast of new and emerging research that informs clinical practice (American Psychiatric Association, 2013; Field, Beeson, et al., 2019). Notably, the integration of neuroscience theory and concepts, including neuroeducation, into the field of counseling and case conceptualization had been a subject of discussion and some consternation over the past decade (Beeson & Field, 2017; Field, Beeson, et al., 2019; Goss, 2016; Miller, 2016; Wilkinson, 2019). Other fields of practice, such as medicine, education, and segments of psychology, have more readily embraced the integration of neuroscience into research and practice (Flordellis & Kyriazis, 2012; Louw et al., 2021; Ward et al., 2017). Interestingly, a limited number of researchers have studied the dilemma of neuroscience integration with counseling (Field, Beeson, et al., 2019; Luke et al., 2020), and it appeared no studies had focused on what might influence the choice of MHPs regarding neuroscience integration. This review of the literature covers the current state of neurointegration concerns and benefits to include aspects of ethics, neurocounseling, counselor education, theoretical orientation, neuroeducation, and trauma. In this study, the researcher measured the correlated relationship between three characteristic variables and an MHPs choice to incorporate neuroeducation into trauma case conceptualization and treatment. The researcher expected the predictive results to add to recent research showing the need to identify factors that influence the choice to use neuroscience in the counseling field (Field, Beeson, et al., 2019; Luke et al., 2019).

Conceptual and Theoretical Framework

The literature demonstrated that the integration of neuroscience with counseling has been an ongoing occurrence (Field, Beeson, et al., 2019; Goncalves & Perrone-McGovern, 2016;

Miller, 2016; Russell-Chapin, 2016; Russo et al., 2021). However, Busacca et al. (2015) noted the counseling field had yet to define a meaningful framework for neurointegration with counselor training. Important to the discussion of theories and integration, Elkins (2012) summarized the historical research suggesting a trivial difference in treatment outcomes between the major theoretical orientations and interventions. This current study focused on the value of integrating relevant neuro-informed principles into or on top of existing practices of case conceptualization, regardless of a clinician's chosen theoretical construct. In the counseling field, meaning may be considered a construct of a person's perception of an experience as informed by their social and physical environment and nuanced via their unique cultural context (Heppner et al., 2016). Yet, meaning may also be understood through neurobiological and neurophysiological constructs informed by an individual's self-competence based on education, theoretical attitude, and strength of religious beliefs (Bilgrave & Deluty, 1998; Blair, 2015; Crameri et al., 2020). The incorporation of postpositivistic neuroscience with the constructivist view of humanism could be seen as contributing to or antagonizing meaning-making.

Researchers have noted a preferential humanistic viewpoint for therapy as the most congruent element for all therapy approaches (Elkins, 2012). The personal and interpersonal aspects of the therapeutic relationship have likewise been reported as the most potent variables related to a positive clinical outcome (Elkins, 2012; Wilkinson, 2018, 2019). Neuroscience, which refers to the study of the central nervous system and brain function (Luke et al., 2020), may be synthesized with the phenomenological nature of counseling while leaving room for researchers to study theories and corroborate, revise, or abandon inferences (Heppner et al., 2016). Thus, the researcher in the current study considered two theoretical frameworks as representative of plausible integration. These included a humanistic framework for counseling

and a supportive neurocounseling framework. Jones (2017) suggested the basic knowledge of neuroscience, understood as the physiology of the body and brain, serves as a metatheory for the practice of counseling based on the supposition that brain and body functioning is foundational to all counseling endeavors. Major theories would thus connect at the foundational level.

Research has suggested that a counselor's theoretical orientation stems from two dimensions characterized as objective (i.e., subjective and analytical) and experiential (Poznanski & McLennan, 1995). Yet, despite the differences in the philosophical assumptions of specific approaches (e.g., cognitive, experiential, cognitive-behavioral, psychodynamic), studies have shown minor differences in efficacy between interventions (Elkins, 2012; Poznanski & McLennan, 1995). Researchers have shown that humanistic and experiential approaches to therapy are subjective in nature, but they have also suggested an individual's practical work in treatment might not always be consistent with their theoretical orientation (Crameri et al., 2020; Poznanski & McLennan, 1995; Rihacek & Roubal, 2017). This finding allows the counselor or clinician to stretch their base orientation centered on presenting client needs thus indicating an attitude toward integrative therapy.

The American Psychiatric Association (2013) noted neurocircuitry, pathophysiology, and gene-environment interactions to be among the disease mechanisms a counselor and practitioner should understand to encourage a view of the client that integrates both subjective and objective data. Thus, researchers have likened the theoretical framework for a neurointegrative approach to counseling to a lens through which a clinician could conceptualize feelings, cognitions, and behaviors and, given this new perspective, continue with their personal theory of practice (Luke, 2020; Luke et al., 2019). Porges's (2011) formulation of polyvagal theory has provided an example of a neuroscience theory that intimates a brain–body connection regarding self-

regulation and has implications on the counseling relationship (Bailey et al., 2020; Geller & Porges, 2014; Jones, 2017; Sullivan et al., 2018). This could further inform the concept of therapeutic relationships in humanistic and experiential approaches.

The framework of neuroscience could be overlayed onto different theoretical orientations and specific approaches to inform counselors and clinicians of what they are conceptualizing through this multifaceted lens (Beeson & Miller, 2019; Busacca et al., 2015). Additional theories important for this work include the neurosequential model of therapeutics (Hambrick et al., 2018), contemporary trauma theory related to dissociation and where trauma memory resides (Lynch, 2012; Siegel, 2020; van der Kolk, 2002), and self-determination theory in which theorists have recognized the human needs of relatedness, competence, and autonomy (Quitasol et al., 2018; Ryan & Deci, 2008). Each of these theoretical frameworks informs trauma case conceptualization and treatment, an antecedent in this study. Regarding psychoanalysis, Solms (2020) intimated psychological theories must fulfill two requirements. They must first explain what people experience in their consciousness, and they must account for the internal processes that brought about the interaction of emotion and cognition that results when homeostasis is interrupted.

Interestingly, research has suggested religious beliefs have a significant impact on a therapist's theoretical orientation (Bilgrave & Deluty, 2002; Cummings et al., 2014; Duggal & Sriram, 2021), thus making a case for the viability of a theoretical lens that may influence a practitioner's primary orientation to counseling. Although an abundance of research existed regarding the application of neuroscience in other fields, a comparative dearth of studies emerged related specifically to counselor utilization of neuro-informed principles in practice

(Field, Miller, et al., 2019). The following review of recent literature informed key aspects of the concern regarding neurointegration.

Related Literature

Neuroscience Integration

The tension between humanism and neuroscience has promoted continued professional dialogue that has dismissed neither theory while also suggesting a complementary and mutually supportive relationship that dually respects the complexity of the human experience (Beeson & Miller, 2019). In recent decades, research in the cognitive neuroscience field has supported the integration of neuroscience and counseling by validating the neurobiological underpinnings of psychological processes (Goncalves & Perrone-McGovern, 2016). Yet, researchers have noted counselors should beware of oversimplifying when applying neuroscience concepts and should remain cautious of reductionistic platitudes that infer all cognitions, behaviors, and emotions are based upon brain mechanisms, thereby mitigating individual responsibility (Goncalves & Perrone-McGovern, 2016; Kim & Zalaquett, 2019). Thus, although active discussions have taken place in research and individual counselors have recently integrated neuro-informed principles into practice, there remains a hesitancy within the broader mental health field to adopt neuroscience principles as credible additions to the field of counseling. In this study, the researcher intended to address clinician characteristic variables that might feed this hesitancy. Wilkinson (2019) promoted the concern that neurointegration, as a singular or new concept, may be unnecessary because it has brought nothing new to the field, a concern echoed by Schwartz et al. (2016).

Problems With Integration

At the center of the tension related to the integration of neuroscience and counseling, a perceived gap existed between the phenomenological aspect of humanism and the perceived reductionist view of neuroscience (Wilkinson, 2019). Researchers have construed reductionism, the thought that the complex phenomenon of human experience can be explained by neuroscience concepts alone (Wilkinson, 2018), as an approach that will eventually render psychology as a field of biological constructs informed by an emerging neuroscience-driven understanding of the brain (Ward et al., 2017). Humanists have been characterized as phenomena-focused when considering case conceptualization and engagement with clients (Wilkinson, 2019). Thus, to a degree, this view has framed the integration of neuroscience with counseling as reductionistic and unnecessary. Perhaps theoretical loyalties among practitioners might promote defense responses when neuroscience perspectives are introduced in training or supervision.

The tension between the perspectives of humanistic phenomenology and neuroscience biology within the literature appeared to be based on the assumed concerns of clinicians or educators related to the possibility that MHPs would trend toward a reductionist or essentialist viewpoint of neuroscience or misuse neuro-informed principles to the harm of clients (Luke et al., 2020; Wilkinson, 2018, 2019) rather than rely on the results of empirical research or the composite of clinical results. This assertion does not dismiss the qualitative and conceptual research results that raised these concerns; instead, it provides a perspective of the findings. Schwartz et al. (2016) intimated current research and scholarship regarding neuroscience did not support a consistent reductionist viewpoint toward psychology. Thus, MHPs should be aware of the potential for an overdependence upon neuroscience in the field of psychology without

dismissing the benefits of neurointegration. Further, Luke et al. (2019) framed the incorporation of neuroscience into counseling as supportive, complementary, and informative of a deeper understanding of the client and their presenting problem.

As was previously related, a preponderance of evidence showed neurointegration has been an emerging process for more than a decade (Beeson & Field, 2017; Field, Beeson, et al., 2019; Luke et al., 2020; Miller, 2016). Therefore, if neuroscience, as an informative construct, may be utilized without a reductionist viewpoint when applied to counseling and can have a complementary value, the identification of factors that continue to impose negative assumptions related to the integration of neuroscience becomes a relevant issue deserving of further study. This assertion of the complimentary view of neuroscience does not dismiss concerns about reductionism among counseling professionals, yet it may indicate a perceptual misalignment or be indicative of some portion of the research or therapist population that has misapplied neuro-informed principles as singular and primary instead of additive and complementary (Kim & Zalaquett, 2019; Luke et al., 2019; Miller, 2016). The heuristic nature of neuroscience principles provides the impetus for the researcher, counselor, or clinician to overcome such barriers and leverage integrative conceptualization and treatment that includes humanistic and neuro-informed principles to help suffering clients (Cantor et al., 2019; Luke et al., 2019).

Relatedly some humanistic counseling professionals have espoused concern about diminished credibility (Goss, 2016; Wilkinson, 2019) as neuro-informed research, conceptualizations, curriculum, and treatments have become more commonplace. Such an outlook could stagnate the professional acumen of the counseling field as other fields, such as medicine and education continue to leverage neuroscience integration (Cantor et al., 2019; Louw

et al., 2021; Serpati & Loughan, 2012; Sica & Begali, 2020. Advocacy for neurointegration also appeared in the literature.

Integrationist Support

Field (2019) suggested a bridge between humanism and neuroscience could be found in the adjusted holistic view of all human systems, whereby all aspects of the lived human experience could be viewed through a composite physiological and neurological lens. In this manner, neurointegrated counseling could inform counselor case conceptualization and help the client understand the connection between the body and the brain and be more accepting of their self-experience (Field, 2019; Luke et al., 2019). Conversely, Tryon (2016) postured no such bridge was necessary considering the shared diagnostic and theoretical outlook between the fields. In support of both outlooks, Finnerty and McLeod (2019) found numerous benefits to increasing the capacity of the counselor to take all aspects of the client's reality into consideration. Relatedly, Quillman (2020) postured such a concept through the dyadic conceptualization of the therapist's love for the client as a humanistic experience framed by the autonomic nervous system response to a relational closeness with the client. Researchers and MHPs have outlined this interconnectedness as a process of neuroception informed by polyvagal theory (Dana, 2018; Ogden & Fisher, 2015; Quillman, 2020; Siegel, 2020).

Individual Factors of Influence

Although this holistic approach has shown merit among researchers, recent researchers have raised some practitioner- or counselor-centric concerns, suggesting neuroscience is inconsistent with counselor identity, is beyond the counselor's scope of practice, poses potential harm to counselees, and prompts concerns of quality within research (Beeson et al., 2019; Goss, 2016; Luke et al., 2020; Wilkinson, 2019). Such assertions and concerns might stem from limited

training and education or from an associated lack of confidence in practitioner adherence to ethical guidelines (Luke et al., 2020). These potential factors of influence relate to counselor-centric aspects and thus supported the current study's focus, yet a reasonable outlook might be that such assertions could only be confirmed and addressed via the study of measured neuroscience integration in practice and research.

The need to identify factors that influence an MHP's choice regarding the use of neuroscience in case conceptualization and treatment represented a noted gap in the literature (Field, Beeson, et al., 2019; Miller, 2016). As neuro-informed concepts and treatments have gained credibility in research and practice, the importance of identifying and addressing obstacles that inhibit the broader application of neuroscience in clinical practice has arisen (Field, Beeson, et al., 2019; Luke et al., 2019; Miller, 2016). Potential obstacles or influences might point toward an ideologically or philosophically informed attitude against such integration on the grounds of reducing the counselor's case conceptualization to biological and neurological constructs (Elkins, 2012; Wilkinson, 2019). Busacca et al. (2015) postured that additional barriers to the integration of neuroscience included epistemological assumptions, curricular frameworks, and competing theoretical standpoints. Such barriers to neurointegration may reflect deeply held beliefs or attitudes about remaining loyal to a purer concept of person-centered counseling or to a particular school of psychology under which the practitioner was educated and trained (Barrio Minton & Myers, 2008; Beatty et al., 2007; Crameri et al., 2020; Cummings et al., 2014; Wilkinson, 2019). These assertions may reflect an underinformed theoretical or conceptual outlook on the integrative nature of neuro-informed principles (Beeson & Miller, 2019; Field, 2019; Luke, 2019; Wilkinson, 2019). Research has suggested a counselor or therapist's theoretical orientation may be more fluid than concrete and may be influenced in

various directions throughout their career by clinical experience (Crameri et al., 2020). Additional influences have also been identified that affect a clinician's conceptualization parameters.

Interestingly, research has further suggested a clinician or counselor's political ideology or religious beliefs play a role in their preference of theoretical approach (Cummings et al., 2014; Duggal & Sriram, 2021; Moukaddam et al., 2019; Norton & Tan, 2019). Research questions related to the relationship between the factors of theoretical attitude, self-competency, and strength of religious beliefs and the clinician's choice regarding the use of neuroeducation guided this research (Cummings et al., 2014; Duggal & Sriram, 2021; Melchert et al., 1996; Worthington & Dillon, 2003). An MHP's theoretical orientation may not be as concrete as once thought.

One of the few integration studies that included a quantitative design provided an example of movement in the direction of investigating the differences in choice regarding neuroscience integration. In a study of neuroscience counselor conceptualization of depression cases, about half (57.7%) of the 334 participants offered neuroscience theories to conceptualize client cases (Field, Beeson, et al., 2019). Further, Field, Beeson, et al. (2019) noted less than one-quarter (23.2%) identified more than one neuro-informed conceptual model, and over one-third offered no neuroscience model. Although the results suggested a growing pro-integration outlook, the finding also supported that the knowledge and practice of neuro-informed counseling principles have yet to be inculcated throughout all subgroups of the mental health profession. Although Cummings et al. (2014) examined the relationship between therapist religiousness and client variables, no studies considered counselor or clinician-centric factors and their influence on the MHP's choice regarding neuroscience use in practice. With the use of a

correlational design in the current study, the researcher intended to measure such a relationship using the antecedent of trauma case conceptualization and treatment.

The evidence provided by Field, Beeson, et al. (2019) further demonstrated a paucity of neuroscience curricula in counselor training programs and continuing education opportunities, a finding supported by Russo et al. (2021). These results also showed the need for future research regarding how training and education contribute to clinician choice regarding the incorporation of neuroscience in counseling research and practice—an issue aligned with the research questions addressed in this work. The counselor or practitioner's choice of integrative therapy approach provides a foundation for the incorporation of neuro-informed principles.

Neuro-Informed Concepts

This present study neither addressed the etiologic aspects of neuroscience nor defined or elaborated on neurobiological or brain science terminology. Instead, MHP characteristic influencers on counselor and clinician choice remained the primary focus. Thus, literature related to MHP education; theoretical attitude; religious beliefs; and the neuroscience principles of brain structure and function, neuroplasticity, autonomic nervous system, homeostasis, and neurodevelopment were addressed. Basic knowledge of and competence with these concepts could help the clinician and counselor develop a neurointegrative approach.

Numerous examples of neuroscience integration existed within the literature, supporting the MHP's capacity to utilize neuro-informed concepts in practice. Researchers suggested client neurodevelopment via the promotion of positive brain plasticity and the reversal of negative plasticity falls within the capability of a counselor or clinician who possesses a proper understanding of neuroscience (Goncalves & Perrone-McGovern, 2016). Cantor et al. (2019) considered a developmental system framework for children that included epigenetics and

neuroplasticity at one end of the spectrum and human variability and relationships at the other. This approach could represent a convergence of science and human experience with application in counseling and education (Cantor et al., 2019); this would exemplify the convergence and congruence of humanism and neuroscience. Further, the literature review showed Pizzimenti and Lattal (2015) proposed that epigenetic changes may be induced by traumatic stress and drug abuse, and the authors identified related molecular, neurobiological, and behavioral mechanisms that could control the extinction of these learned maladaptive behaviors. Although these examples provided evidence of current neurointegration in practice, the measure of a proper understanding of neuroscience remained a reasonable concern. In other words, researchers should consider certain aspects of neuroscience as important to counselors and clinicians.

Research has suggested psychosocial factors (e.g., stress, emotional neglect, addiction, and environmental impoverishment) may injure brain structure and function (Goncalves & Perrone-McGovern, 2016). Considering these factors and their known effect on the brain, evidence supports the value for a clinician to comprehend the neuro-informed concept of brain plasticity and seek to apply evidence-based strategies that align with this deeper understanding of the client's experience. Researchers have consistently noted that brain structure and function are an important focus for neuro-informed practitioners (Kim & Zalaquett, 2019; Luke, 2020; McHenry et al., 2014). In their article on neuro-informed counseling, Luke et al. (2019) suggested brain structure and function and neuroplasticity are foundational concepts of neuroscience. Supportively, Flordellis and Kyriazis (2012) purported advances in neuroplasticity had opened the door for a deeper conceptualization of trauma cases through an understanding of brain adaptability to external reality and internal unconscious reality. The acknowledgment and understanding of such a neuro-informed mechanism as brain plasticity could enhance the

potentiation of reconsolidating trauma memories leading to a healthy integration of the experience (Flor & Nees, 2014), a benefit for the MHP and the client.

An additional neuro-informed viewpoint supported in the literature suggested the integrated nature of the brain could serve as the model for the incorporation of neuroscience into counseling case conceptualization and practice (Busacca et al., 2015). No single portion of the brain operates autonomously, as if having zero neural connections with other regions (Uhernik, 2017). Thus, counselors may hold true to a humanistic framework while appreciating how brain regions are affected and connected by cultural, social, biological, and psychological factors as illuminated via neuroscience research (Busacca et al., 2015; Cantor et al., 2019; Rihacek & Roubal, 2017). This outlook supported the reframing of the tension between humanism and neuroscience, as noted by Field (2019). One theoretical orientation need not dismiss another simply because of differences in language or aspects of focus. Rihacek and Roubal (2017) postured most counselors could be identified as integrationists—in a generalized way. The bridge, Field suggested, emerged in the conceptual model, where neuroscience provided an additional lens whereby client phenomenological aspects could be viewed in a deeper and more refined manner. Supportively, Schwartz et al. (2016) suggested that movement toward a balanced approach to integrating neuroscience with psychology must include an appreciation for social science concerns and be additive rather than substitutive in nature.

Human problems typically occur within a social or relational context that would represent the client's external world as it relates to why the internal disruption had occurred (Siegel, 2020). In an additive nature, neuroscience could inform the clinician of how the client feels about the issue. In other words, the clinician would be attuned to which internal response mechanisms were responsible for the presenting psychological, physiological, or somatic expressions. For

example, Goncalves and Perrone-McGovern (2016) purported internal and external stressors generate a cortical (i.e., prefrontal cortex) and subcortical (i.e., limbic region) response in the brain, as demonstrated through inhibited cognition and emotional escalation. Once conceptualized in this manner, practitioners can utilize emotional regulation interventions such as mindfulness to inhibit the limbic stress response and restore psychological and physiological homeostasis. The amygdala and hippocampal regions of the subcortical brain measure the severity of stressful events, but they do so based on a record of past experiences (Struthers et al., 2017). Thus, when a present stressful experience, although mild, triggers the memory of a previous severe traumatic event, the new experience activates a more severe stress response, overwhelming the allostatic system, and flooding the individual with excitatory neurotransmitters that translate into elevated physiological symptoms and somatic responses that are reminiscent of the past traumatic event (Struthers et al., 2017). Considering trauma's prevalence in society, it becomes important for MHPs to understand neuroscience as a lens for case conceptualization. A review of extant literature suggested certain segments of the mental health profession lack representation in neurointegrative research.

Segments Underrepresented

Although few researchers have studied the integration of neuroscience with pastoral counseling, researchers have used a mixture of theological and phenomenological theoretical orientations to consider the client's inner world at a deeper level (Bingaman, 2016). Through insights from contemplative neuroscience, Bingaman (2016) associated the daily practice of mindfulness, contemplative prayer, or meditation with an inhibition of the brain regions related to stress and fear. Clinical social work, another segment of the allied mental health field with limited representation in neuroscience research, could be seen as humanistic or

phenomenologically oriented. Yet in the limited articles found, researchers understood the impetus for neurointegration as the need to comprehend trauma clients more profoundly (Alessi & Kahn, 2019; Frydman & Mayor, 2017) and to deepen the conceptualization capacity of students and clinicians (Sewell, 2020). The dearth of research associated with the mental health profession subgroups of pastoral counselors, chaplains (no research found), and clinical social workers did not suggest an inattention to neurointegration within practice, only that these professionals have been underrepresented in studies. The current study represents the first effort to inculcate these segments into the broader mental health profession when addressing the research question related to group differences in neurointegration. Ward et al. (2017) iterated a neurointegrative framework to help psychologists conceptualize trauma cases. Such a conceptual approach could benefit all segments of the mental health profession by providing a common knowledge, language, and multilayered conceptualization of an otherwise complex phenomenological presentation of human experience (Luke et al., 2019; Miller, 2016; Ward et al., 2017). Some segments of the mental health profession have been demonstrated to possess a deeper appreciation of neuro-informed knowledge than others.

Segments That Embrace Neuroscience

Psychologists and psychotherapists represent a portion of the allied mental health field who have embraced neuroscience integration at a level that might exceed other subgroups. Hook and Vera (2020) proposed a list of best practices for psychologists that included flexibility to allow for common language, support for an integrated relationship between research and practice, and relatedly, treatment adaptation based on research findings. These best practices align with the examples of neurointegration that follow. Weiskopf (2016) noted that although neuroscience offered some constraints to psychology, both outlooks addressed lucid yet different

causal aspects within the brain. Ward et al. (2017), more distinctively, offered a neuropsychotherapeutic approach to assist with the integration of neuroscience into psychotherapy. Yet some consternation has existed. Schwartz et al. (2016) noted although neuroscience provided an informative ingredient for psychotherapy, there remained a question as to whether brain-based therapies had brought anything new to the field. Wilkinson (2019) corroborated this concern. Yet Schwartz et al. appeared to focus primarily on technical interventions such as neuroimaging, and Wilkinson concentrated on understanding the lived experience of the client. Both views highlighted instances where neuroscience could bring more definition to existing frameworks.

In response to the assertions of Schwartz et al. (2016) that brain-based therapies have limited applicability, Tryon (2016) proposed that neural network models offered through neuroscience could provide a framework for all of psychology's work, thereby providing a natural, integrative partnership. Schwartz et al. ultimately described neuroscience as an important element of psychology and neuropsychology, informing practitioners on the function and processes of brain regions and assisting in the identification of functional deficits in brain regions caused by injury with associated impacts on neurological and psychological functioning. Research has further shown the efficacy of synthesizing psychodynamic perspectives and neurobiological understanding using the lens of attachment theory as an integrative developmental model that promotes a better understanding of substance use and addiction problems (Alvarez-Monjaras et al., 2019; Pizzimenti & Lattal, 2015). Although applicable neural pathways and biological mechanisms may be different for varied diagnoses and disorders, researchers have shown the integration of neuroscience with various counseling theories promotes greater refinement of understanding and affirmation of previous assumptions related to

the psychology field. Such findings appeared in studies regarding neuroscience-informed cognitive-behavior therapy (Field, Beeson, et al., 2017; Field, Miller, et al., 2019).

Weiskopf (2016) posited that psychology's credibility need not rely on a perfect overlay with neural circuitry, and the value of neuroscience should not be wholly considered due to the identification of brain or neural mechanisms that may be causal in nature. Interestingly, Ward et al. (2017) advocated for measuring the value of neuroscience in psychotherapy in the clinician's subsequent capacity to think more deeply about their work and research. Thus, any assertion of newness in relation to what neuroscience brings to psychology may be a misnomer when considering the heuristic nature of neuroscience. More appropriately, researchers could consider neurointegration as an emerging tool that has informed perspectives, appreciated the overlapping nature of neural circuitry with human domain functionality, and widened the research and practice aperture of the MHP (Alessi & Kahn, 2019; Alvarez-Monjaras et al., 2019; Busacca et al., 2015; Crockett et al., 2017; Field, 2019). Mental illness arises from a disruption of internal systems and networks; therefore, the lens of neuroscience offers a deeper phenomenological perspective of a client as opposed to a purely medical or scientific view (Solms, 2020; Ward et al., 2017). Researchers in the field of psychotherapy have suggested that the integration of neuro-informed concepts has provided opportunities to develop new models of a client's inner world (Ward et al., 2017).

A review of 29 research articles found psychotherapists' religion and spirituality positively related to an attitude supportive of such integration in therapy (Cummings et al., 2014). Additionally, Cummings et al. (2014) suggested religion- and spirituality-related education influenced the therapist's self-competency and ultimate choice to integrate aspects of religion or spirituality in clinical sessions. A study of nine qualified counseling professionals

from diverse theoretical backgrounds in the United Kingdom showed all participants adapted their theoretical orientation to harmonize with their religious and spiritual beliefs (Blair, 2015). An earlier study included 233 clinical psychologists from the United States and found most participants' therapeutic practice was influenced by religious beliefs, and almost half reported their political ideologies influenced their approach (Bilgrave & Deluty, 2002). Additionally, in a study of 96 psychologists, Frazier and Hanson (2009) found the influence of religious and spiritual beliefs on clinical practice related to the level of self-identification with their beliefs. Interestingly, Vieten and Lukoff (2021) reported psychologists rarely, if ever, receive formal training on the integration of spiritual or religious issues. These studies serve as examples of individual characteristic variables that may impact a clinician's choice of integration, supportive of an associated research question within this work. Reductionist claims against neuroscience could have limited support.

Conceptual neuroscience literature has depicted neuroscience as an essential addition to the field of psychology, yet it has also elicited caution related to an overly consuming integration (Schwartz et al., 2016). Schwartz et al. (2016) noted the concept of eliminative reductionism suggests brain-based analysis could subsume psychological analysis (Schwartz et al., 2016). It might be fair at some level to conclude new approaches or explanative theories associated with brain science would produce excitement about new knowledge that could alter the counseling professional's approach (Luke et al., 2020). However, Schwartz et al. suggested eliminative reductionism is scarce and unreasonable considering the historical and empirical evidence that supports psychological analysis. Concern about ethical responsibility represented a concern related to the maligned approach of reductionist constructs in the literature.

Ethical Considerations

Training, education, and research tend to inform and guide a counselor's ethics. Ethical concerns related to the integration of neuroscience with counseling have been demonstrated in recent research (Luke et al., 2020). In a study of counselor perceptions of ethical concerns in neurointegration, participant responses ranged from definitively yes there were ethical concerns (65.1%) to a belief no concern existed (20%). Interestingly, 3.2% of respondents noted it would be unethical not to integrate these approaches (Luke et al., 2020). Although ethical considerations are critical for the proposed integration of any theory and might represent an obstacle to acceptance and application, research-based standards of practice represent a pathway to identify, alleviate, or confirm such concerns (Kim & Zalaquett, 2019; Luke, 2020). Within a proposal of ethical practice standards for psychologists in global mental health, Hook and Vera (2020) noted that practitioners should be self-reflective and experience ongoing supervision and mentorship. Such self-awareness includes an individual's willingness to question their motive and rationale for therapy conceptualization and treatment planning (Moukaddam et al., 2019). Collaboration within and across fields and support for an integrated partnership between research and clinical work likewise emerged as ethically sound and effective standards of practice (Hook & Vera, 2020). Ethical concerns may reflect internal tensions related to theoretical orientation (Rihacek & Roubal, 2017), previous education and training (Kim & Zalaquett, 2019), and strong religious beliefs (Duggal & Sriram, 2021). Therefore, ethical concerns and considerations could play a formative role in addressing the research questions surrounding the relationship between the characteristic variables of MHP self-competence, theoretical attitude, and strength of religious beliefs and the choice regarding the use of neuroeducation in practice. The extent of

neuroscience integration into clinical counseling may provide the impetus for tension—not only ethically but also as a matter of counselor identity.

Neurocounseling

The term neurocounseling has been used to characterize the integration of neuroscience into the clinical work of counseling (Russell-Chapin, 2016), which was a central theme in this research. Although neurocounseling is a relatively new descriptive term, it has been informed by research and educational texts in the specialized fields of cognitive neuroscience (Banich & Compton, 2011; Ward, 2015), behavioral neuroscience (Garrett & Hough, 2022), biological psychology (Kalat, 2019), and interpersonal neurobiology (Siegel, 2020). In an important observation about neurocounseling, Russell-Chapin (2016) elucidated the understanding that counseling can change functional aspects of the brain. Because research has determined counseling, consistent with the participation of the counselee, can change the brain and influence the nervous system, neurocounseling may represent an accurate, descriptive term for the process (Field, Jones, et al., 2017).

Beeson and Field (2017) asserted that the integration of neuroscience principles and related physiological processes into counseling practice comprised a defining aspect of neurocounseling. Yet, the utilization of such a distinctive term might cause some to surmise that neurocounseling is a separate field of study and practice, thus widening the gap in practical integration. An example could involve the ideological opposition to incorporating neurological and biological concepts into the field of counseling, as posited by Wilkinson (2019), who noted "neurological correlates" added "a needless layer of reductive abstraction" to a "phenomenologically grounded therapeutic process" (p. 123). Wilkinson further purported that the use of neuroscience, while valuable, creates no change to what a counselor does, and

although supportive of current practices, it has neither brought anything new to the field nor made counselors more integrative. This discussion in the literature parsed out the distinctions between a humanistic orientation and a neuro-informed approach, yet it also illuminated the mutually supportive relationship. Perhaps understanding the neuro-informed outcome of the process of counseling would effectively encourage MHPs to consider and apply neuroscience principles in their counseling practice.

Crockett et al. (2017) asserted counselors must comprehend neurobiology as a measure of client distress and wellness while also being familiar with neurocounseling interventions as a prerequisite for proper case conceptualization and treatment. Although the utilization of biofeedback and neurobiology is comparatively new to clinical practice, these approaches represent a growing sector of the counseling field, as indicated by the AMHCA (2021), the NIMH (n.d.), and the 2016 CACREP standards (2015). Additional tensions have been proposed that may limit the integration of neuroscience principles.

Tensions

Researchers have suggested a proposed alignment between neuroscience and the medical model, tension between neuroscience and humanist ideologies, and the conceptual nature of neurocounseling research could limit a fuller integration of neuroscience and counseling in research and practice (Beeson & Field, 2017). Rather than dismiss such distinctions, researchers should make them the focus of continued discussion, collaboration, and research across the allied mental health and associated fields (Hook & Vera, 2020). This endeavor would support the concept of an ecological approach that accounts for the complexity of human experience and internal systems (Field, 2019; Ward et al., 2017). In one study, Busacca et al. (2015) proposed that a clinician may not be able to accurately conceptualize a client's issue without an integrated

and balanced approach. Such a proposal has merit, as Luke et al. (2020) noted the ethical obligation of professionals, counselors, and therapists to provide the best care and bring about the most positive outcome for their clients. Supportively, Luke et al. (2019) proposed a person-first alignment in counseling as a guide for the integration of neuroscience into clinical practice—maintaining a whole-person focus would help to deride a misguided preoccupation with a certain brain region or neurological process. This approach would encourage the reasoned incorporation of neuroscience into the existing client-centered focus of humanistic counseling while acknowledging a client's problem entails more than just emotional, cognitive, and behavioral expression (Field, 2019). Such findings support the literature that recommends a neurointegrative approach to all case conceptualization and treatment (Busacca et al., 2015). Neuro-informed integration has shown prominence through the emergence of associated fields and approaches within psychology such as cognitive neuroscience, behavioral neuroscience, and neuropsychotherapy (Garrett & Hough, 2021; Hill, 2020; Ward, 2015; Ward et al., 2017).

Within a feasibility study measuring treatment fidelity of neuroscience-informed cognitive behavior therapy, researchers identified a potential concern that some licensed counselors exhibited weakness in the basic skills of attending and summarizing (Field, Miller, et al., 2019). The finding in this small study suggested—despite the application of neuro-informed principles to empirically based counseling approaches—a lack of efficacy may be related to counselor or practitioner weakness in basic humanistic principles rather than the perceived complexity of neuroscience concepts. Therefore, education and self-competency could play a role in the MHP's attitude toward neurointegration. For example, the content of neuroeducation may be only as effective as the counselor's ability to deliver it in a relationally consistent manner. Research has not suggested neurocounseling changes the protocols of an evidence-based

approach. Instead, it has suggested it merely provides deeper insight into the client's experience, thus informing case conceptualization, interventions, and treatment (Alvarez-Monjaras et al., 2019; Cantor et al., 2019; Pizzimenti & Lattal, 2015; Ward et al., 2017; Weiskopf, 2016). Russell-Chapin et al. (2016) noted a neurocounseling approach could provide the practitioner a lens through which to (a) differentiate each client as unique, (b) appreciate the physiological basis of the therapeutic relationship, (c) broaden the range of treatment approaches, and (d) conceptualize the presenting behavioral, psychological, and physiological problems of a client more deeply. As a researched theory, neuroscience has shown rewards.

Benefits

The *DSM*-5 intimated all MHPs seek a common language for depicting clients' experiences and that recent strides in neuroscience, neuroimaging, and neuropsychology have improved the specificity of such observations based on common neurocircuitry and the recognized preferred psychological state of homeostatic balance (APA, 2013). As noted earlier, professional counseling organizations and mental health experts have delineated basic expectations for the expansion of knowledge and understanding related to biological and brain processes that could apply to counseling (AMHCA, 2021; CACREP, 2015; NIMH, n.d.). Yet there remains a gap between professional expectations and the widespread application of neuro-informed principles. Luke et al. (2020) further explained this gap.

Researchers have noted potential benefits of a neuropsychotherapeutic approach. These benefits include a deeper understanding of a client's experience, insights that are helpful for the client and for the improvement of clinical practice, and new ideas and hypotheses for research (Ward et al., 2017). These benefits align well with the application of neurocounseling and support the notion that neuro-informed principles add to clinical practice and research—an

outlook echoed by evolutionary psychology researchers (Hill, 2020). Likewise, the field of neuropsychoanalysis, an interdisciplinary approach that has combined psychoanalysis and neuropsychology, has benefited from a greater understanding of the complex interactions between genetics and experience, cognition and emotion, and impulse and regulation—among others (Solms, 2020). Solms (2020) offered a demystified outlook on the central regulating homeostatic process within humans that is modulated via opposing neuronal activity. Conceptually, external experiences influence the client's internal state, causing sensory feedback that may initiate an error response in the self-organizing system, thereby initiating a receptor and effector neuronal response to maintain homeostasis (Solms, 2020).

Although this synopsis of homeostatic regulation is drastically simplified, the counselor or practitioner may appreciate the homeostatic network being persistently on guard against entropy, and when external experiences overwhelm the system's capacity to self-regulate, various forms of mental illness result. Such insights and proposed benefits would inform case conceptualization and treatment planning intended to precipitate a client's return to homeostasis. Further, evolutionary psychologist researchers have touted insights via psychoneuroimmunology as critical to identifying the pathway that predicts the inflammatory activity that influences health-dependent behaviors (Hill, 2020). These findings further supported the added benefits of neuroscience integration, showing it can differ from a humanistic approach without being antagonistic. This notion informed the underlying tension in the current study related to a clinician's choice to use a neurointegrative approach for case conceptualization and treatment. Further relevant concerns and discussions appeared in the literature. A final aspect related to neurocounseling involved the emergence of third-wave approaches to mental illness conceptualization and treatment.

Researchers have proposed mind–body interventions such as awareness- and attention-based approaches and breathwork as legitimate interventions and treatments (Crockett et al., 2017). In such treatment modalities, MHPs consider the essential balance of the autonomic nervous system necessary for psychological wellness (Crocket et al., 2017; Geller & Porges, 2014; Uhernik, 2017). Noted benefits of mind–body peripheral biofeedback interventions include a client being able to participate in and control their treatment, the promotion of self-regulation, better treatment outcomes, and the opportunity for the counselor or clinician to gather real-time information about the client's physiological state (Crockett et al., 2017). This aspect of neurocounseling reflects an approach that requires a limited depth of neuroscience knowledge and training. Bingaman (2016) found a correlation between the exercise of mindfulness and the inhibition of a fear and stress response in the brain via contemplative neuroscience. Meyer et al. (2017) likewise found the integration of third-wave behavior therapy, such as mindfulness training, helped to elevate the quality of life for veterans with posttraumatic stress disorder (PTSD). As noted earlier, polyvagal theory provides an additional example of an emerging theory involving the role of the autonomic nervous system in physiological and somatic responses to stress stimuli (Bailey et al., 2020; Geller & Porges, 2014; Jones, 2017; Sullivan et al., 2018), further supporting the credibility of neuroscience as a relevant way to conceptualize clients' phenomenological symptoms and complaints. The influence of education in the subfields of counseling psychology plays a crucial role in counselor choice regarding neuroeducation.

Counselor Education

Researchers have proposed neuroscience as an emerging field related to the counseling profession and additionally noted a current knowledge and training deficit among counselors pertaining to neurobiologically informed conceptualization and treatment (Miller et al., 2020).

The presence of topical coverage is evidenced by the release of neuroscience textbooks in recent years. These include *The Developing Mind* (Siegel, 2020), *Neuroscience for Counselors and Therapists* (Luke, 2020), *A Counselor's Introduction to Neuroscience* (McHenry et al., 2014), *Neurocounseling: Brain-Based Clinical Approaches* (Field, Jones, et al., 2017), and *Neuroscience for the Mental Health Clinician* (Pliszka, 2016). Further, Kim and Zalaquett (2019) proposed the possession of accurate knowledge regarding brain structure and function is important for a counselor who intends to integrate neuroscience into clinical practice. Such accurate knowledge must emerge from a reputable and informed source and should be consistent across educational institutions, informal professional development opportunities, and research journals. Yet, recent research on undergraduate students enrolled in counseling psychology and education programs suggested most students believed a majority of proposed neuromyths and thus lacked a proper understanding of basic neuroscience (Kim & Zalaquett, 2019). This current study has uniquely brought the discussion of neuroscience education from the graduate level to the undergraduate level. Considering not all educational institutions offer neuroscience classes in counseling programs, the issue of an accurate and consistent knowledge base for neuroscience may represent a concern (Duenyas & Luke, 2019; Kim & Zalaquett, 2019; Russell-Chapin, 2016; Russo et al., 2021). A framework for understanding the counseling context could be helpful.

Framework

McWhorter's (2021) review of Gadamer's four aspects of hermeneutic reflection contained the following important points regarding MHP development: (a) understanding is the goal for interpreting any psychological or neurobiological phenomenon, (b) open and receptive dialogue is the impetus for interpretation (i.e., self-awareness and countertransference), (c) a preceding growth in self-awareness of assumptions that relate to the procedure of interpretation

is necessary (i.e., conceptualization), and (d) understanding is comprehended as the mutual amalgamation of the interpreter and the considered phenomenon (i.e., empathy). Considering the process of counselor education and professional development, these aspects intimate the importance of understanding all factors of the human experience, being aware of internal processes, knowing case conceptualization emerges from prior assumptions, and appreciating the importance of relational interconnectedness. Busacca et al. (2015) proposed an integrally informed model for the incorporation of neuroscience into counselor training that appeared to align with McWhorter's review.

The integrally informed model formulated by Busacca et al. (2015) offered a method to incorporate neuroscience into counselor training—one framed as constructionist rather than reductionist. This proposal has added to the discussion of the continued inculcation of neuroscience into training and education. Further, researchers studying this topic described the issue of reductionism as an impediment to the proper understanding of neuroscience integration (Schwartz et al., 2016; Ward et al., 2017; Wilkinson, 2019). Conversely, research findings have equated the possession of accurate general neuroscience knowledge with the probability of believing fewer neuromyths. Further, a correlation emerged between a positive attitude toward neuroscience and the likelihood of applying it in practice (Kim & Zalaquett, 2019). These aspects conceptually support the integration of neuroscience into counseling practice and could inform approaches to counseling psychology education and training.

Status of Education and Training

Interestingly, although recent research has suggested most MHPs have received measured training in the AMHCA (2021) biological bases of behavior competencies, comparatively fewer reported training in neuro-related standards such as case conceptualization using the RDoC,

physiology, and neural anatomy (Russo et al., 2021). This research added to the consensus that despite an inculcation of neuroscience-related concepts into counselor training and education, existing resources have not been leveraged to the extent possible, and the larger community of counseling professionals has yet to embrace a deeper understanding of nervous system processes (Busacca et al., 2015). Although Duenyas and Luke (2019) purported an increased focus on incorporating neuroscience into case conceptualization, Russo et al. (2021) noted counseling research and case conceptualization in practice are two areas that have remained free of neuroscience principles. This finding informed this author's research question related to the influential relationship between self-competency based on education and neuroscience use.

The results of the Russo et al. (2021) study suggested a lack of education and training in neuro-informed principles might be associated with a lower perception of self-competency reflected in the choice to avoid neuroscience in case conceptualization. Interestingly, Crameri et al. (2020) suggested a counselor's chosen theoretical orientation may be informed to a greater degree by clinician attitude than by training. Researchers analyzed 162 psychotherapy sessions conducted by 18 psychotherapists and Crameri et al. associated 40% of interventions utilized with therapist attitude and significantly linked 14% with previous formal training. The authors noted such attitudes (e.g., curative factors, therapeutic style, basic assumptions) were subject to change across a therapist's professional career. The authors did not provide conclusive evidence that therapist attitudes cause theoretical orientation, only that they have exhibited a wide range of relationships with interventions that were often integrative in nature. These findings informed the questions in this current study regarding the influence of self-competency derived from education and theoretical attitude on an MHP's choice to integrate neuroeducation into case conceptualization and treatment planning.

The suggested links among accurate neuroscience knowledge, attitude, and the choice to integrate neuroscience pointed to the credibility of individual practitioners' characteristic variables and served as a primary focus of this study. Relatedly, Miller et al. (2020) suggested a concept of interest in counselor neuroscience education and training is the counselor-centric understanding and practice of interoceptive awareness (Miller et al., 2020). In other words, it could be difficult for the counselor to help a client recognize their internal state if they have not first learned the significance of interoception and have not practiced this level of internal awareness. Some mental health practitioners might see this observation as an affront to their professional sense of self-awareness and choose not to pursue a neuro-informed outlook that appreciates brain and body or brain and mind interconnectedness (Field, 2019; Miller et al., 2020). The implications of these propositions correspond with this current study's research questions regarding the relationship between a counselor's theoretical attitude and knowledge and the practitioner or counselor's attitude regarding the choice to use neuro-informed principles in case conceptualization and treatment. The variables of education and an MHP's theoretically informed attitude may be interrelated (Beeson, Kim, et al., 2019). Reasonably, awareness and understanding may promote application.

A Balanced Outlook

A well-adjusted outlook accounts for the implications of neurointegration on the clinician and the client, and Miller et al. (2020) associated an elevated awareness of neuroscience jargon and practice with client buy-in and expectancy during treatment. In their recent study to assess the effectiveness of training for neuroscience-informed cognitive behavior therapy with mental health counselors ($N = 42$), Miller et al. showed a statistically significant increase in the knowledge of processing cognitive appraisal and interoceptive awareness. Additionally, the

study showed a nonstatistically significant change in knowledge of processing physiological experience. This finding suggests the clinician or counselor could perceive neuro-informed concepts related to physiological experiencing as new or substantially more complex than their current level of knowledge. Miller et al. found physiological responses were often associated with nonconscious nervous system and neurobiological processes. Research continues to add support for MHPs' use of neuroscience as a lens for case conceptualization, yet knowledge- and attitude-related barriers to acceptance continue to limit greater application across the segments of the mental health profession.

Challenges to Incorporation

As noted earlier, mental health organizations have consistently raised expectations for the incorporation of neuroscience knowledge and insights into research and practice. The NIMH (n.d.) initiated the RDoC in 2009 with the intent to foster interdisciplinary collaboration and organize neuroscience research. Beeson, Field, et al. (2019) promoted RDoC as a measure for the current integration of neuroscience into counseling. Results showed less than one-quarter of research respondents (N = 358) reported being aware of RDoC, and of those who had heard of it (n = 87), the majority were exposed to it through an article. The authors suggested some mental health professionals might be unaware of, unconcerned with, or lacking the time needed to become aligned with higher level professional guidelines and expectations. This presents a concern for future research. Although research articles provide an important avenue for professional awareness and development (Goss, 2016), the inculcation of available neuro-informed platforms into formal education might have a greater effect. Additionally, this finding may reflect a gap between the research and practitioner populations that would deter from the effectiveness or relevancy of incorporating newer interventions and treatments.

Interestingly, an objective of the RDoC for MHPs has been noted as the capacity to translate neuroscience findings into psychosocial and preventative interventions (Goncalves & Perrone-McGovern, 2016). This observation offered a benefit of neuroscience integration in that the counselor could utilize the tool of the RDoC to operationalize neuroscience information in relevant client interventions. Yet, because the NIMH initiative might be construed as a research-focused platform, clinicians could overlook this opportunity unless counseling courses or continuing education programming promoted it. Empirical research has supported the assertion that limited neuroscience integration in counseling exists and has linked this, in part, with the minimal exposure of MHPs to RDoC competencies (Beeson, Field, et al., 2019).

There could exist an apparent correlation between counselor education professionals and practitioners. One study showed few educators were aware of RDoC and fewer than 10% of counselors noted using it in practice (Beeson, Field, et al., 2019). The RDoC platform may provide the impetus for conceptualizing neuroscience research, thereby extending it to clinical practice (Beeson, Field, et al., 2019). Thus, this initiative appeared underutilized and perhaps undermarketed. Reasonably, counselors and clinicians across allied segments of the mental health field might choose not to integrate neuroscience into their counseling practice because of their limited exposure to it in the professional field. This finding supported the clinician characteristic variable of self-competency based on education as a credible measure of the reasoning behind the choice to incorporate neuroscience into clinical practice. Yet studies have shown a persistent interest in neuroscience by practicing counselors.

Level of Interest

Despite the noted challenges, research has indicated a recent trend within the mental health field of counselors seeking opportunities for continued education pertaining to

neuroscience-based competencies (Russo et al., 2021). This increased individual interest could indicate the success of emerging research, educational curricula, and professional organization networks promoting the benefits of neuroscience and counseling amalgamation. Thus, future researchers should continue to measure this trend and identify variables with a positive impact. Counseling publications have taken steps to promote an informed outlook on neuroscience integration (Goss, 2016).

In a meta-analysis of the *Journal of Mental Health Counseling*, Menzies et al. (2020) found an increase in neuroscience-informed articles over recent decades, but the authors proposed an interaction gap existed between researchers and counseling practitioners, which might have contributed to the limited application of neuro-informed practices in mental health care settings. Menzies et al. reported the *Journal of Mental Health Counseling* introduced a new neuroscience-informed counseling section in 2017, resulting in a 2015 to 2019 article publication rate of 7.4% compared to other subjects. Further, through a review of professional journals, Goss (2016) found the themes of neuroscience education, biopsychosocial subjects, implications of integration, and integrating neuropsychology as the primary topics. Goss explained that an important distinction of a neuroscience-informed approach is the nascent introduction of how and why interventions work based on internal human systems. Knight and Taft (2004) recommended this shift of focus earlier by advising a change in attention for practitioners and researchers from a solely psychological lens to a neuropsychiatric outlook that considered neurobiological, neuropsychological, and neurobehavioral aspects. Integrative neuroscience may be seen as critical for the counselor and client to address neurobiological and functional brain processes that are affected by selected interventions. Relatedly, Ward et al. (2017) added to the

literature that suggested neuroscience offers a common language through which to unify critical ideas into a framework that would benefit counseling practice and research.

The concept of a common language might evoke greater alignment and understanding between the counselor and the client, promote unity across the segments of the mental health profession, provide a common framework of knowledge and language to bridge the divide between MHPs and researchers, and finally assist with collaboration between the multidisciplinary fields of psychology, medicine, and education (Field, 2019; Solms, 2020; Ward et al., 2017; Weiskopf, 2016). The movement to integrate neuroscience into the research and practice of various other fields could encourage counseling professionals to see the benefit of enhancement while addressing reductionist concerns (Weiskopf, 2016). Although competing viewpoints remain, developing a therapeutic relationship and understanding the lived experience of the client represent foundational themes of the counseling profession (Field, Beeson, et al., 2019; Luke et al., 2020; Wilkinson, 2019) and have positive implications for other multidisciplinary fields as well (Louw et al., 2021; Sica & Begali, 2020; Solms, 2020; Ward et al., 2017). The neuroscience-related concept of neuroeducation has proven valuable for this endeavor.

Neuroeducation

The integration of neuroscience principles into counseling research and practice has occurred over the past decade, yet the subsidiary concept of neuroeducation has received minimal attention (Field, Beeson, et al., 2019; Miller, 2016). This observation matters when considering the measurable importance of neuroeducation for the MHP and the client. Neuroeducation may inform the counselor's case conceptualization of the client and provide a common and descriptive language for informing the client about what they are experiencing

(Field, Beeson, et al., 2019; Miller, 2016). In the current study, the researcher considered the MHP choice to use neuroeducation in case conceptualization and treatment as representative of neuroscience integration.

The results of one study on the ethical considerations of neuroscience integration intimated most counselors and counseling educators might possess the limited view that neuroscience integration could be summed up by the aspects of neuroeducation or technical forms of treatment (Luke et al., 2020). Yet this assumption could limit the value of neuroscience to the realm of treatment and discount the clinician's benefit of gaining a deeper and more meaningful case conceptualization viewpoint (Gentry et al., 2017). Researchers have associated the benefits of neuroeducation with the accepted and often utilized treatment of psychoeducation (Briere & Scott, 2015; Luke, 2020). The researcher explores this relationship later in this section, but it is important to note the concept of neuroeducation involves more than providing information.

Quality of Practice

Researchers have proposed that neuroeducation should be based on empirical findings, not on conceptualization theories that lack research support (Field, Beeson, et al., 2019). Additionally, Field, Beeson, et al. (2019) intimated the treatment method of neuroeducation may be associated with the practitioner’s level of familiarity with neuroscience-informed approaches. Thus, neuroeducation as a treatment includes more than the utilization of neuroscience jargon or a basic application of unrelated scientific concepts. The authors claimed neuroeducation promotes a researched-based understanding of client issues and requires the clinician to be familiar with tested approaches. This claim suggests a deeper level of understanding and case conceptualization for the MHP and thus may help illuminate the gap in counselor perception of

client problems between humanistic and neuro-informed counselors. Miller (2016) noted the importance of client readiness in that the client's current psychological state and predicament must be conducive to receiving the shared neuroscience knowledge. Such a distinction intimates the necessity of bilateral awareness of the counselor and practitioner. This could include the conscious recognition of their theoretically informed attitudes, level of self-competency, and strength of religious beliefs, which would inform the MHP's understanding of the client's current psychological state and capacity to absorb neuroeducation. Foundationally, this awareness of neuroscience could also influence the MHP's choice to integrate neuroeducation into practice or not. The treatment aspect of neuroeducation facilitates interaction between the MHP and their client (Miller, 2016).

Researchers have posited that counselors should adhere to humanistic principles to establish a therapeutic relationship as this would perpetuate a better understanding of the client's problem and inform a relevant neuroeducation approach (Field, Beeson, et al., 2019). Therefore, researchers have characterized neuroscience as a noncompetitive field in relation to humanistic counseling; instead, they have framed it as complementary or mutually supportive (Field, 2019; Geller & Porges, 2014). Despite Wilkinson's (2019) concerns about neuroscience integration with counseling, he noted neuroeducation to be valuable in counseling in that it provides the capacity to frame problems and explain why clients experience present symptoms. Yet, there remains an identified tension between the theoretical viewpoints of humanists and neurocounselors. Rihacek and Roubal (2017) postured that although theoretical orientation may inform a clinician's professional identity, research has suggested techniques and interventions utilized often reflect theories unique to the context of need. Thus, neurointegration need not change or challenge a clinician's professional identity; instead, it may enhance clinical

awareness and inform treatment. The integrative use of neuroeducation has been seen as multifaceted.

Multidisciplinary Benefits and Concerns

The literature has framed neuroeducation research as not merely a psychological construct but one part of an interdisciplinary field that spans neuroscience, education, cognitive science, and psychology (Nouri, 2016). This larger framework adds to the knowledge and understanding available to counselors. Researchers have noted a benefit of neuroeducation is that it offers a common language that can be used across disciplines (Nouri, 2016). As has been a theme throughout this review of the literature, research has shown neuroscience informs the lived experience of clients at a deeper level. The human domains of cognition, learning, emotions, behavior, and somatic functioning may be conceptualized by a common neuroeducation language.

Educational researchers have found an elevated level of enthusiasm regarding the integrative role of neuroscience within the teaching profession (Serpati & Loughan, 2012). Accordingly, 94% of educator respondents (N = 421) reported the comprehension of neurological foundations for learning, thinking, and behavior mattered for teachers (Serpati & Loughan, 2012). Yet, educators provided noncongruent responses concerning the complexity of neuroscience content and jargon—some desired simplicity, and others sought a deeper understanding (Serpati & Loughan, 2012). Conversely, Sehgal Cuthbert (2015) posited education and neuroscience were incompatible fields in that neuroscience had been associated with the biological understanding of the brain and cognitive neuroscience related to the mapping of cognitive mental functions via biological networks.

Sehgal Cuthbert (2015) worried that neuroscience contained a deterministic outlook that could remove autonomy or responsibility from the individual. This caution appeared strongly associated with Wilkinson's (2019) concern about reductionism in counseling. As noted earlier, such an argument may emerge from the misunderstanding that neuroscience is a standalone field as opposed to an integrative tool for numerous fields of study and practice (Field, 2019; Luke, 2019; Nouri, 2016). Relatedly, Schwartz et al. (2016) proposed that clients may be susceptible to persuasion using neuroscience language and explanation, a concept they termed *neuroseduction*. However, the researcher in the current study found no supporting research for this type of persuasion. Professional guidelines provided through ethics and supervision could provide the accountability structure to limit such an outcome (Kim & Zalaquett, 2019; Luke et al., 2020).

Although the integration of neuroscience and neuroeducation into various fields may seem complex, professionals often see the benefits as adding to their current perspective, not as repetitive or as a replacement (Luke, 2019; Serpati & Loughan, 2012; Struthers et al., 2017). As in education, the counseling field has maintained a concern for the level of neuroscience complexity that should be integrated into research, training, and practice (Russo et al., 2021; Struthers et al., 2017). The allied concepts of psychoeducation and neuroeducation share the foundation of knowledge and learning—aspects inherently important for both parties in the counseling process (Miller, 2016; Struthers et al., 2017). One relates to the credibility of the counselor, and the other to the ethical consideration of helping the client understand what is happening and why.

Distinctiveness

Although the interventions of psychoeducation and neuroeducation include the sharing of relevant information with the client, researchers have proposed neuroeducation includes a

targeted focus on neurological processes with the intended outcome of distress reduction (Miller, 2016; Struthers et al., 2017; Uhernik, 2017). This is not to say that psychoeducation does not result in the reduction of distress, only that neuroeducation as an intervention or treatment provides emotional remediation or regulation as an intentional focus. This proposed distinction informs the clinician's approach to treatment. Struthers et al. (2017) postured the apparent usefulness of neuroscience knowledge for forming a case conceptualization of trauma clients. Researchers have long accepted informing clients about the psychological aspects of their diagnosis as a reputable approach. Because the concept of neuroeducation is relatively new (Miller, 2016), it is important to briefly consider the research related to the foundational treatment approach of psychoeducation.

Efficacy of Psychoeducation

Researchers have purported psychoeducation to be a credible and dependable practice in counseling (Bersani et al., 2017; Brady et al., 2017; Briere & Scott, 2015; Wilkinson, 2019). This may prompt the conclusion that neuroeducation, by association, is also a worthy and effective practice in counseling (Wilkinson, 2019). The intent of the current study was not to compare the meaning of these two concepts or to debate semantics. The purpose here was to note the efficacious nature of psychoeducation as a treatment for mental illness in the literature and thereby provide credence for the use of neuroeducation in case conceptualization and treatment as the criterion variable in this research. Russell-Chapin (2016) described psychoeducation as an important aspect of neurocounseling. Considering psychoeducation is a valid treatment for practitioners with a humanistic view of counseling (Wilkinson, 2019), this observation might offer a reasonable bridge between neuroscientific and humanistic viewpoints. This proposition

does not dismiss Luke (2019), who argued that no bridge was needed due to the parallel nature of these distinctive constructs.

Benefits

Psychoeducation, as an acceptable intervention within the field of psychology and counseling, has benefited clinician confidence and encouraged a greater level of client confidence in the therapist (Russell-Chapin, 2016). Research has shown client benefits include feeling less ashamed, being more reflective, having a greater degree of hope, and gaining a better understanding of themselves and their problem (Ditlefsen et al., 2020). The benefits could move beyond the transfer of knowledge to a neuro-informed understanding of the engaged prefrontal cortex, promoting the subsequent reduction in limbic system activation (Gentry et al., 2017; Struthers et al., 2017; Uhernik, 2017). This concept has been demonstrated in trauma studies.

A large study in Southeast Asia showed the use of psychoeducation and trauma stabilization techniques were effective as a sole treatment for PTSD (Eichfeld et al., 2019). Eichfeld et al. (2019) measured the remission rate (91.4%) across all PTSD symptom criteria, and the results displayed a culturally adaptive treatment approach sensitive to the needs of individual clients. Further, results of a small pilot study on the efficacy of trauma-informed brief group psychoeducation with incarcerated women with histories of traumatic abuse (N = 11 following a high dropout rate) suggested this intervention could help to stabilize psychological distress when administered in conjunction with other services (Ball et al., 2013). Strengthening the case for efficacy, researchers have found psychoeducation has an elevated level of effectiveness when applied with family members of chronic psychiatric patients experiencing schizophrenia and bipolar disorders (Economou, 2015), family caregivers of patients with major depressive disorders (Brady et al., 2017), and clients with borderline personality disorder

(Ditlefsen et al., 2020). Finally, a study of improved access to psychiatric rehabilitation at the 1-year follow-up with schizophrenia patients suggested psychoeducation treatment moderately promoted adherence to treatment and improvement in psychotic symptom severity (Dubreucq et al., 2019). These findings serve as examples of the plethora of research that alluded to the benefits of psychoeducation as an intervention or treatment for individuals or groups with mental disorders receiving treatment in a clinical or community care setting.

Additionally, trauma researchers have proposed psychoeducation offers a common language between therapist and counselor, allowing for a reasoned understanding of the internal threat response system and an associated reduction in symptom severity with no requirement of additional change work by the client (Gentry et al., 2017). This finding added to the research noted previously regarding the benefit of common language found in neuroscience and neuroeducation as it applies to clinical practice, practitioner and researcher alignment, and collaboration across interdisciplinary fields of practice and research (Miller, 2016; Ward et al., 2017). Relatedly, the mutual language assertion may further address the concerns of some that neuroscience language could confuse clients and add additional stress and that it may be unreasonable to assume counselors could attain an appropriate level of neuroscience knowledge to integrate this knowledge into their practice (Kim & Zalaquett, 2019; Luke et al., 2020).

The longstanding application of psychoeducation in therapy has set the foundation for the distinctive approach of neuroeducation. Whereas the descriptive nature of psychoeducation informs the client of their diagnosis and symptomatology, the deeper and more specified nature of neuroeducation may add a degree of client empowerment through the knowledge and practice (i.e., interventions) of internal manipulation of neurobiological and physiological processes (Gentry et al., 2017; Struthers et al., 2017). This distinction could mark a fundamental difference

between a purely phenomenological approach to counseling and one that integrates neuroscience concepts. Researchers have identified psychoeducation as a critical competency for the trauma counseling field, giving clients a basic understanding of the autonomic nervous system and brain functioning to help normalize negative perceptions and internal messages (Gentry et al., 2017; Uhernik, 2017). Within this work, Gentry et al. (2017) used the term psychoeducation as synonymous with neuroeducation because the intervention was targeted at improving the client's understanding of nervous system processes and brain functionality with the intended outcome of normalizing certain experiences. Thus, the overwhelming nature of trauma and associated symptom severity of PTSD provided a backdrop in this study of an MHP's choice to use neuroeducation in trauma case conceptualization and treatment.

Neuroscience and Trauma

Psychological research has suggested trauma to be perhaps the most notable area of concern, wherein the counselor or clinician could grasp the interrelationship among the domains of human functioning as viewed through the lens of neuroscience (van der Kolk, 2002). Trauma literature was relevant to this present research because the researcher used a trauma case as the basis for scaled survey items concerning the use of neuroeducation in case conceptualization and treatment.

Basis of Association

Vasterling and Lippa (2014) noted neural and biological oddities often occur in clients with PTSD, which has led to some conceptualizing it as a psychobiological disorder. Supportively, Flor and Nees (2014) considered the underlying mechanisms of a traumatic stress response (i.e., amygdala, hippocampus, anterior cingulate cortex, prefrontal cortex) more significant than a categorical diagnosis when considering PTSD research. Further emphasizing

neurointegration in trauma cases, some researchers have intimated certain mental disorders, such as PTSD, may be more accurately conceptualized by the clinician when viewed through the lens of neuroscience (Lorelle & Michel, 2017; Pizzimenti & Lattal, 2015; Tomko, 2012). Research has made this apparent through the association of symptoms such as distress and fear response, memory problems, dissociation, isolation, and alterations in mood and cognition with specific brain functions and neural pathways (American Psychiatric Association, 2013; Flor & Nees, 2014; Pizzimenti & Lattal, 2015; Struthers et al., 2017; Tomko, 2012). Various trauma-related theories support these findings.

Theoretical Outlook

Ward et al. (2017) postulated various theoretical viewpoints have been used to address questions about trauma treatment when what might be needed is a neuro-informed approach that accounts for the wider representational view of the client's subjective inner space. This observation supports a reasoned incorporation of neuro-informed principles and a humanistic approach to counseling. Further, this assertion accentuates the collaborative nature of neuroscience that allows other viewpoints that seek to define a client's inner experiences. Studies focused on the initiating event of complex trauma often consider the incident within a neuro-informed context (Aponte, 2020; Eckstrand et al., 2019; Homer, 2015; Ward et al., 2017).

Researchers have demonstrated a viable concern for a neurobiological and neurosequential framework for assessing and treating early childhood trauma (Hambrick et al., 2018; Ryan et al., 2017). The neurosequential model for therapeutics has been used to train MHPs to consider the early childhood timing of disruptive events, the current capacity of functioning, and the relational context within which the client is operating (Hambrick et al., 2018). The integration of a neurosequential model for therapeutics into 10 residential treatment

facilities and day-treatment psychiatric programs resulted in significant decreases in negative incidents and the necessity to use restraints (Hambrick et al., 2018). Relatedly, Ryan et al. (2017) developed a multidisciplinary model for treating complex PTSD based on the neurosequential model for therapeutics framework. This work combined play therapy and filial therapy within a classroom therapy context to grow and reinforce new neural networks to alter certain internalized traits in children while inculcating occupational therapy, mental health counselors, and educators. These instances exemplify the knowledge and utilization of neurocircuitry and the principle of neuroplasticity (Nash et al., 2014; Ryan et al., 2017). Such cases have been conceptualized through the lens of neuroscience and subsequently have shown the need for a multidisciplinary approach to inform neurodevelopmentally appropriate treatment (Blaustein & Kinniburg, 2019; Ryan et al., 2017). These findings support the notion that neuroscience does bring new knowledge and insights to the practice of counseling and therapy and precipitates an interaction between mental health and medical fields that requires a common language. Isobel and Angus-Leppan (2018) further posited advances in neurobiology have helped to clarify and define psychological trauma.

Distinctive Benefits

Research around trauma has increased understanding of the contemporary trauma theory of dissociation (Lynch, 2012; Schimmenti & Caretti, 2016). Van der Kolk (2002) purported traumatic memories do not go away; instead, they may be dissociated and stored in the body and in subcortical areas of the brain, promoting a bottom-up experience that is emotional, somatic-laden, and neurobiologically stimulated. Modern neuroscience has dictated promoting awareness of these internal states (Fisher, 2019; Ogden & Fisher, 2015; van der Kolk, 2002). Additionally, Mucci and Scalabrini (2021) noted dissociation results from the effect of trauma on the system of

the mind-body-brain due to associated neurocircuitry and an abnormal brain response. Similarly, Schimmenti and Caretti (2016) purported a proper understanding of dissociation to be critical for the clinician to conceptualize a case that has ties to childhood relational trauma.

A clinician and counselor's understanding of the phenomenon of dissociation would enable them to work toward integration by addressing these internalized depictions and imprints on the body as primary rather than taking a purely diagnostic focus (Mucci & Scalabrini, 2021). Lynch (2012) noted this contrasts with the Freudian model of repression. Further, Lynch (2012) suggested Ryan and Deci's (2000) self-determination theory is grounded in humanistic traditions and has illuminated the defensive processes and nonconscious responses present in trauma cases. McCrea (2014) supported the efficacy of self-determination theory in a child-centered treatment model for trauma that includes conscious goal setting (to replace symptomatic destructive goals) related to the associated psychological needs of relatedness, autonomy, and competence. In a study of 51 patients with major depressive disorder, Quitasol et al. (2018) likewise found that patients who fulfilled the three psychological needs of self-determination theory also experienced a reduction in symptom severity. The outcome of both studies may be understood through the relational lens of humanistic theory and the neurobiological lens of neurointegration. Various trauma-informed approaches resonate with a neurointegrated viewpoint.

Trauma-Informed Approaches

Research has suggested art therapy can benefit children and adult trauma survivors, related in part to the resultant stimulation of the brainstem and limbic regions of the brain (Homer, 2015). Homer (2015) found an example of targeted treatment that was understood and conceptualized through a neuro-informed lens. Neurodevelopmental theory and an understanding of sensory stimulation informed this study. Perryman et al. (2019) postured an elementary

understanding of neuroscience was essential for counselors to consider how this knowledge could be incorporated into their theoretical framework. The authors added that effective implementation of creative arts therapy as a treatment for trauma has been premised on the counselor or therapist's understanding of brain science. Relatedly, Alessi and Kahn (2019) presented the need for social workers to adopt trauma-informed principles of psychodynamic psychotherapy with the goals of a culturally informed case conceptualization, a focus on helping clients adapt to overcome symptoms, and the encouragement to participate in and have measured control over their treatment. The value of neuroscience as a tool for understanding and addressing a trauma response is not restricted to the field of psychology.

In a study of the effects of complex trauma on adolescent school children, Aponte (2020) recommended the implementation of neuroeducation for teachers and students that would include the effects of trauma on brain structure and function, the promotion of neuroplasticity, and trauma-informed strategies to support healthy brain development, teach emotional regulation skills, and facilitate learning. These insights from the field of education echo the importance of integrated neuroscience as a tool to assist the practitioner (i.e., teacher) and client (i.e., student) toward a state of emotional equilibrium and balanced executive function. Cantor et al. (2019) postured the need for a holistic outlook when considering child development that included the science of learning and the associated neuroscience concepts of epigenetics, neuroplasticity, and stress dynamics. These examples promote the premise that neuroscience can function as an integratory concept applied within various other fields to inform person and problem conceptualization.

Executive Function

Although the researcher in the current study did not aim to fully break down the neurobiological construct of an overwhelming stress response, the significant role of neuroeducation within this research necessitated a cursory look at executive function. Researchers have considered the role of executive functions as partially mediating the relationship between complex trauma and the symptoms of PTSD in youth (Op den Kelder et al., 2017). In other words, research has suggested that greater deficits in executive function due to trauma exposure correlate with higher levels of traumatic stress or symptom severity (Op den Kelder et al., 2017). Vasterling and Lippa (2014) postured the neuropsychological domain of executive functioning could be inhibited through trauma, hindering a client's ability to retract from trauma memories or perceived threats. Further, in their meta-analytic study, Malarbi et al. (2017) found large deficits in the executive functioning of children who had been exposed to trauma. These findings raise the question of the mechanism of action within the brain responsible for the deficit in executive function.

Research has promoted an understanding of the neurocircuitry model of PTSD in which the hyperresponsive sympathetic nervous system inhibits the prefrontal cortex, thereby negating the normal cortical response of regulating the amygdala and dismissing irrelevant cognitions (Cantor et al., 2019; Malarbi et al., 2017). An understanding of brain structure and function and neurocircuitry may thus inform the counselor and clinician of why there is presenting cognitive deficiency and subsequently promote a conceptualization that would lead to emotional regulation interventions to inhibit the overactivated limbic system. This kind of intervention could restore balance to the executive functioning that is disrupted by trauma exposure, reexposure, or during triggering events (Banich & Compton, 2011; Cantor et al., 2019; Malarbi et al., 2017; Stevens et

al., 2016; Struthers et al., 2017). Research has suggested the measured activation of the vagal social engagement network and parasympathetic nervous system could inhibit the overwhelming sympathetic trauma response and help a client return to a balanced psychological and physiological state (Fisher, 2019; Ogden & Fisher, 2015; Uhernik, 2017). Neuroeducation could likewise reduce PTSD symptoms by inhibiting the limbic response. Understanding the underlying brain structure and function and the neurobiological processes could help the counselor or clinician formulate a deeper conceptualization of the trauma client's experience and facilitate more effective treatment planning. The MHP's experience in treating trauma clients has been further illuminated through neuroscience.

Mental Health Professional

Interestingly, a conceptual study on vicarious trauma noted psychiatrists who treat trauma victims were at elevated risk of inheriting the replicated trauma through the mechanism of neuro-reciprocity (Isobel & Angus-Leppan, 2018). This process was proposed to be mediated by mirror neurons associated with empathetic attunement (Isobel & Angus-Leppan, 2018). Researchers have suggested an informed outlook on neuroscience could enhance clinicians' understanding of emotional countertransference as a preventative for vicarious trauma. It could also assist clients' emotional regulation through modeling (Alessi & Kahn, 2019; Andahazy, 2019; Isobel & Angus-Leppan, 2018). Practitioners who may be triggered by clients' trauma narratives would have a decreased capacity to process the account and conceptualize the inherited trauma (Andahazy, 2019; Isobel & Angus-Leppan, 2018).

Researchers have associated the stimulation of the limbic portion of the brain with the inhibition of the prefrontal cortex thereby restricting the therapist's ability to fully exercise executive function (Malarbi et al., 2017; Uhernik, 2017). The required neuro-informed skills

would include the clinician's capacity for inner awareness and the associated capacity for regulating system balance or tuning oneself (Andahazy, 2019). These studies provided an alternate example as to why neuroscience was important for the counselor and clinician. As a theoretical approach, the neuroscience lens provides a protective and self-care model for the practitioner treating trauma survivors. Through an internal systems-informed approach using a case review method, Ward et al. (2017) posited trauma is a catalyst for tension across neural networks; thus, a fuller understanding of this representational space would inform the practitioner to help the client integrate the experience in a manner consistent with their subjective viewpoint based on sensory, environmental, and emotional stimuli. This neuro-informed processing could bring about a renewed and nuanced verbal account trending toward emotional equilibrium (Struthers et al., 2017). Such a conceptualization may be untenable for a practitioner experiencing vicarious trauma. These examples of research represent a multitude of studies that reflect the necessity of MHPs' understanding of neuroscience integration in trauma conceptualization and treatment.

Thus, the researcher in this current study utilized a real-world trauma case as the basis for the study to ascertain potential factors that could influence an MHP's choice regarding the use of neuroeducation, as representative of neuroscience, in client case conceptualization and treatment. The reviewed literature related to neuroscience and trauma clearly portrayed the rationale for the integration of neuro-informed principles and neuroscience knowledge into mental health counseling and treatment. Therefore, if hesitation or tension exists related to the incorporation of neuroscience into case conceptualization or treatment in the counseling or therapy field, the reason may be important to define and address.

Summary

The integration of neuroscience into counseling research and practice has been notable over the past decade (Field, 2019; Field, Beeson, et al., 2019, Miller, 2016). Yet, as explained in this review of the literature, a suggested hesitancy has persisted among MHPs to utilize neuroscience and neuroeducation during case conceptualization and treatment with clients (Beeson & Field, 2017; Field, Beeson, et al., 2019; Miller, 2016; Wilkinson, 2019). Further, a gap in research emerged related to the identification of factors that influence an MHP's choice regarding the incorporation of neuroscience in clinical practice (Field, Beeson, et al., 2019; Miller, 2016). Additionally, limited quantitative research existed on this subject, and the researcher found zero studies addressing MHP characteristic factors that influence neuroscience integration in trauma case conceptualization and treatment. Although demonstrated theoretical and ideological tension has arisen between neuroscience and humanistic outlooks (Beeson & Miller, 2019; Field, 2019; Goss, 2016; Wilkinson, 2019), the literature contained much evidence for the efficacy of neuroscience integration and specifically the use of neuroeducation within case conceptualization and treatment. This current research addressed the gaps noted in the literature review to expand the understanding of why neuroscience has not been fully inculcated into the field of counseling. This study offers the first use of clinician characteristic variables and a real-life trauma case review.

In this study, the researcher used a quantitative correlational approach with a single criterion variable (i.e., choice regarding neuroeducation use) and three predictor variables. Counselor or practitioner self-competency as related to education has been shown to influence an MHP's choice of theoretical approach (Kim & Zalaquett, 2019; Miller et al., 2020; Russo et al., 2021). In this current study, the researcher employed the Counselor Self-Efficacy Scale

(Melchert et al., 1996) as a measure of counselor education and self-competency and operationalized the findings by identifying the strength of the relationship with an MHP's choice regarding neuroeducation use in practice. The researcher measured the influence of theoretical attitude using the Theoretical Orientation Profile Scale-Revised (Worthington & Dillon, 2003) and considered the results as a factor of influence on the choice of neuroeducation use as identified through case-study-based survey items. Finally, researchers have found the strength of religious beliefs can influence theoretical orientation and case conceptualization (Bilgrave & Deluty, 2002; Duggal & Sriram, 2021; Frazier & Hanson, 2009; Oxhandler et al., 2017). The researcher addressed the influence of an MHP's strength of religious beliefs as related to the choice regarding neuroeducation application through the results of the Dimensions of Religiosity Scale (Joseph & DiDuca, 2007) as correlated with the MHP's tendency regarding neurointegration.

Field, Beeson, et al. (2019) provided the only research that reflected the use of neuroscience in case conceptualization and treatment and did so using depression as the case diagnosis of focus. In this study, the researcher used a demographic questionnaire to gather descriptive data from a broad sample of MHPs, a real-life trauma case as the impetus for scaled survey items regarding case conceptualization and treatment, and three scales of measurement to gather correlational data regarding the identified characteristic predictor variables. The researcher treated the choice pertaining to the use of neuroeducation as representative of neuroscience integration in the trauma case conceptualization survey. This research adds to the discussion of the role of neuroscience in the field of counseling while addressing the risk of counselor avoidance of this informed approach and the potential pitfalls of an underinformed utilization of neuroscience principles.

CHAPTER THREE: METHODS

Overview

Research has suggested that counseling professionals hesitate to utilize neuroscience knowledge and principles in the conceptualization of mental health problems (Field, Beeson, et al., 2019; Miller, 2016). Although the need for future research to identify factors that influence counseling professionals' choice to use neuroscience and neuroeducation has been proposed, to date, no such study has occurred. The purpose of this quantitative descriptive design using variable-centered correlational research (Heppner et al., 2016) was to identify and describe the relationship between the counselor characteristic factors of self-competency based on education, theoretical attitude, and the strength of religious beliefs and a counseling professional's choice regarding the use of neuroeducation in the case conceptualization and treatment of trauma. The researcher, in part, based this approach on the work of Field, Beeson, et al. (2019), who focused on the prevalence of neuro-informed conceptualizations of depression. Cone and Foster (2016) noted researchers should identify the target of prediction within a correlational and regression analysis study—it may be the combined variable effect—or the significance of variance attributed to each individual predictor variable of concern. Thus, the researcher's secondary intent in this work was to determine the moderating effect (Heppner et al., 2016) of the strength of the religious belief predictor variable on the relationship between the predictor variables of self-competency and theoretical attitude and the criterion variable of neuroeducation use. Finally, the researcher aimed to utilize the measured relationship results of the three predictor variables and the criterion variable within each subgroup of MHPs (i.e., psychology practitioners and counselors, spiritual care providers, and clinical social workers) and conduct a between-group comparison to distinguish differences in inclination to use neuroeducation and differences in the

effect variance of predictor variables. The researcher performed a multiple regression analysis to measure the relationship between each predictor variable and the criterion variable (Heppner et al., 2016). Additionally, the researcher conducted a multivariate analysis of variance (MANOVA; Warner, 2013) to address the variance between the three groups of mental health professionals. This chapter explains the intentions and procedures for this study in detail and addresses the following aspects of the methodology: research design and underpinning questions, the participants and setting, instrumentation utilized, overall procedures of conduct, and data analysis through identified statistical procedures.

Design

This study used a quantitative variable-centered correlational survey research approach with a mixture of descriptive and survey methods to address the research questions. Whereas Field, Beeson, et al. (2019), the most topically consistent research found, used an online survey tool to collect quantitative and qualitative data, the researcher in this study used close-ended questions for demographic inquiries and Likert-type rating related to criterion and predictor variables to maintain a quantitative approach. Field, Beeson, et al. and Brochmann et al. (2019) utilized descriptive demographic responses as quantitative data by providing the answers with a numerical value, allowing for a nominal scale. Further, Brochmann et al. identified characteristics of services and clinical experiences between psychologists, social workers, physiotherapists, and medical doctors, which represented a similar survey population to this work.

Cone and Foster (2016) reported correlational designs were appropriate when a researcher desires to examine a group of predictor variables and their effect on a single criterion variable. Thus, the variable-centered correlational design included a multiple regression method

to measure the relationship between and among the characteristic variables of the MHP sample (i.e., predictor variables) and the use of neuroeducation (i.e., criterion variable). Descriptive and survey methods helped to characterize the related attitudes and opinions of counseling professionals (Heppner et al., 2016). A between-participants focus promoted the subsequent differences between participants at the time of the study (Cone & Foster, 2006). Relatedly, the researcher maintained a predictive focus to measure the relationship between the predictor and criterion variables based on the variance of influence, with no intent to determine causality.

The researcher measured these predictor variables and correlated the results with the criterion variable to identify the presence, direction, and percentage of variance associated with the relationship between each predictor variable and the criterion variable (Heppner et al., 2016). The results of this process addressed the first three research questions of this study. Additionally, because a predictor variable may influence the criterion variable positively or negatively, the researcher also conducted a test for the moderating effects of one variable using hierarchical regression (Heppner et al., 2016). The strength of MHPs' religious beliefs could have impacted the strength or direction of self-competency and theoretical attitude variables and thereby positively or negatively influenced the MHP's choice to use neuroscience. The results of this approach informed Research Questions 4 and 5 of this work. Finally, the researcher compared the findings of the multiple regression analysis across the subgroups of psychology practitioners and counselors, spiritual caregivers, and clinical social work participants through a MANOVA. The researcher aimed to identify potential themes such as greater or lesser effects on the choice of neuroeducation use based on the percentage of variance associated with self-competence related to education, theoretical attitude informed by commitment level to specific or multiple

orientations, and the strength of religious beliefs within each subgroup. The researcher intended this aspect of the design to address the final research question in this study.

Research Questions

The following six research questions guided this study.

RQ1 Is there a relationship between an MHP's self-competency based on education and their choice regarding the use of neuroeducation in trauma case conceptualization and treatment?

RQ2 Is there a relationship between an MHP's strength of religious beliefs and their choice regarding the use of neuroeducation in trauma case conceptualization and treatment?

RQ3 Is there a relationship between an MHP's theoretical attitude based on their commitment level to specific or multiple orientations and their choice regarding the use of a neuro-informed approach to trauma case conceptualization and treatment?

RQ4 Is the relationship between an MHP's self-competency based on education and their choice regarding the use of neuroeducation moderated by the strength of their religious beliefs?

RQ5 Is the relationship between an MHP's theoretical attitude based on their commitment level to specific or multiple orientations and their choice regarding the use of a neuro-informed approach to trauma case conceptualization and treatment moderated by the strength of their religious beliefs?

RQ6 Is there a between-group difference regarding the choice of neuroeducation use in case conceptualization and treatment among the subgroups of allied MHPs as

delineated by the characteristic variables of self-competency, strength of religious beliefs, and theoretical attitude?

Hypotheses

The research question generated the following hypotheses.

H1 There will be a statistically significant relationship between an MHP's level of self-competency based on education, as shown in the correlation between the Counselor Self-Efficacy Scale (CSES) responses and the MHP's choice regarding the use of neuroeducation in case conceptualization and treatment as indicated in the survey responses to the trauma case review.

H2 There will be a statistically significant relationship between the MHP's strength of religious beliefs as measured by the Dimensions of Religiosity Scale (DRS) and their choice regarding the use of neuroeducation in case conceptualization and treatment, as indicated in the survey responses to the trauma case review.

H3 There will be a statistically significant relationship between an MHP's theoretical attitude based on the Theoretical Orientation Profile Scale-Revised (TOPS-R) and their displayed preference regarding the use of neuro-informed case conceptualization and treatment, as seen in their survey responses in the trauma case review.

H4 The strength of an MHP's religious beliefs as measured by the DRS will have a significant moderating effect on the relationship between the MHP's self-competency related to education as measured by the CSES and their choice to use neuroeducation in case conceptualization and treatment as shown in their survey responses for the trauma case review.

H5 The strength of an MHP's religious beliefs as measured by the DRS will have a significant moderating effect on the relationship between the MHP's theoretical attitude as measured by the TOPS-R and the choice to use a neuro-informed approach in case conceptualization and treatment as shown in their survey responses for the trauma case review.

H6 There will be a statistically significant difference between the subgroups of allied MHPs related to their choice regarding the use of neuroeducation in case conceptualization and treatment based on the consolidated responses for each group associated with the CSES, DRS, TOPS-R, and the survey responses for the trauma case review.

Participants and Setting

Participants

The participants for this research were drawn from a diverse group of allied MHPs that included psychiatrists, psychologists, licensed professional counselors and therapists in all specializations, pastoral counselors, chaplains, licensed clinical social workers, and other related mental health professionals actively practicing in counseling and therapy. The defining characteristics of the sample included certification or licensure in their respective fields, having been involved in clinical practice for at least 3 years, and being currently active in accepting or seeing clients. Heppner et al. (2016) noted the sample of a population must be representative so inferences can be made concerning the larger population. This broad focus helped to ensure representativeness and contributed to the external validity of this study (Cone & Foster, 2016).

Heppner et al. (2016) reported the heterogeneity of the population must be wide to support generalizability; thus, this work included a broad array of MHPs. The researcher made

the survey available through Amazon's Mechanical Turk (M-Turk) platform (Engle et al., 2020; Heppner et al., 2016) and sent Survey Monkey (Rice et al., 2017) link out via email to various individuals, entities, groups, and professional associations such as the College of Pastoral Supervision and Psychotherapy (CPSP), the Spiritual Care Association, and the North Carolina clinical social work supervisors contact list. Various mental health professional psychological and social work organizations would not permit the advancement or advertisement of research not associated with members. Rice et al. (2017) proposed such platforms often result in a larger sample size and greater generalization but added they may have a low response rate and result in a nonrepresentative sample. The researcher used a snowball sampling technique by providing the Survey Monkey link to individual psychiatrists, psychologists, psychotherapists, counselors, chaplains, and social workers and encouraging them to pass it on to their peers. With these various efforts, the researcher aimed to reduce the sample bias, promote randomness, increase statistical power, and enhance the validity of subsequent inferences (Heppner et al., 2016). Participation in the survey was noted as voluntary during recruitment.

The researcher considered the following issues to address the probability of correctly rejecting a false null hypothesis to ensure appropriate statistical power in this research (Jackson, 2016; Warner, 2013). The literature review suggested the targeted number of participants should be between 300 and 500 MHPs, which exceeded the required minimum for a medium effect size ($p < .05$; Cohen, 1992; Warner, 2013). LaFountain and Bartos (2002) recommended a minimum of 30 subjects for correlational designs and 100 in each subgroup for survey research. Field et al. (2019) sought a large sample size ($N = 334$), as did Russo et al. (2021), with an overall sample of $N = 260$, yet neither offered the level of statistical power in their quantitative research.

Increasing the sample size enhances statistical power (Jackson, 2016), so these examples appear reflective of adequate statistical power and thus limit the overestimation of the population effect, as would be seen when using a multiple correlation coefficient *R* with a smaller sample (Heppner et al., 2016). Additional areas the researcher considered for statistical power analysis included scale reliability, appropriate range considerations (i.e., ceiling and floor effects), and standardization of implementation (Heppner et al., 2016). All scales related to the predictor variables have high reliability, as noted later, and express ranges of responses that are sensitive to the measured population sample of this study. Further, the online survey format limits the extraneous variance that would be associated with differences in research settings (Heppner et al., 2016).

The researcher assumed there would be some level of sampling error, outliers would be probable, and bias would occur (Sprinthall, 1997). Following the close of the survey availability, the researcher separated respondent results into subgroups of psychology professionals (i.e., psychologists, psychiatrists, and counselors), spiritual care providers (i.e., pastoral counselors and chaplains), and clinical social workers. The random sampling method addressed the need for a stratified and representative distribution (Jackson, 2016) from these designated allied segments of the mental health profession.

Inclusion criteria for the final sample consisted of the affirmation of recognized certification or licensure within any of the participant fields, acknowledgment of current and active practice, and a history of 3 years or greater in practice. Exclusion criteria included a lack of license or professional certification, not being in current practice, and having less than 3 years of mental health treatment experience. The researcher assessed identity as an MHP by the following affirmative responses: (a) current and active licensure, (b) board certification through a

recognized professional body, or (c) currently serving in a professional pastoral counselor or chaplaincy position. Participants received a real-life trauma case review (see Appendix A) upon which to base their survey answers and a demographic questionnaire (see Appendix B) that addressed inclusion and exclusion criteria.

Setting

The setting for this study was an online survey. The researcher placed the survey on the distribution platforms of Amazon's M-Turk (Heppner et al., 2016) and Survey Monkey (Rice et al., 2017). The researcher embedded a separate Survey Monkey link to an identical survey in the M-Turk invitation to participate. The researcher also distributed a recruitment message and the link for the Survey Monkey survey to the Spiritual Care Association, the Association of Clinical Pastoral Education, and various other professional mental health organizations for distribution to membership. Last, the researcher sent the link to individual mental health professionals through email with the intent they would pass it on to other mental health professionals via personal distribution. Because the participants originated from the diverse allied mental health community, the researcher targeted the following groups for distribution: licensed professional counselors and therapists; psychotherapists, psychologists, and psychiatrists; pastoral counselors and chaplains; and clinical social workers.

Instrumentation

The core constructs of this study were operationalized using one questionnaire and four scales. The demographic questionnaire (see Appendix B) yielded nominal scale data. Interval data was associated with the Wood Scale (see Appendix C) and the three predictor variables scales of CSES (self-competency), TOPS-R (theoretical attitude), and DRS (strength of religious beliefs). Detailed information for each instrument is listed below.

Demographic Questionnaire

Prior to implementing the demographic portion of the survey, the researcher provided voluntary participants the opportunity to read and affirm a statement of consent (see Appendix D). The demographic questionnaire addressed such items as age, gender, race, ethnicity, education level, professional certification, theoretical orientation, years of practice, and religious affiliation. The researcher assigned the results of all categorical demographic variables numerical values to allow for frequency distribution and measure of central tendency (i.e., mean). Important demographics that informed the results of this research included education level, neuroscience training, theoretical orientation, and religious affiliation. The researcher used descriptive statistics to compare the overall prevalence of neuroscience use found in the results of the study with the frequency and mean of these categorical variables to identify relevant descriptive trends that added to the value of this research, increased its generalizability, and could inform future studies related to influential predictors of MHPs' choice to use neuroscience. The demographic questions related to professional certification and years of practice were used to inform the inclusion and exclusion criteria for this work. The researcher protected the confidentiality of all participants' demographic data by downloading all survey results directly into IBM's Statistical Package for Social Sciences (SPSS) and maintaining output on an encrypted hard drive. The researcher focused the next measure on gauging the criterion variable.

The Wood Scale

The researcher operationalized the criterion variable of choice regarding neuroeducation using the Wood Scale developed by this researcher to align with the case review. The purpose of this instrument was to elucidate each respondent's importance level of neuroeducation in the case conceptualization and treatment planning for a trauma survivor. The scale consists of 11

items measured on a 5-point Likert-type scale where 1 equals *strongly disagree,* and 5 equals *strongly agree*. The utilization of a Likert rating scale allowed for the conversion of data to an interval scale to support statistical analysis (Jackson, 2016). A higher total score with a maximum of 55 intimated a greater inclination on the part of the respondent to use neuroeducation in case conceptualization and treatment, and a lower total score with a minimum of 11 inferred the use of neuroeducation as unimportant in this case conceptualization and treatment planning or that the respondent was unfamiliar with the depicted principles of neuroscience. Each item related to the importance of using neuroeducation concepts in the conceptualization of the presented case review and in planning for subsequent treatment. Examples of items include the following: "My understanding of neuroplasticity is important for a proper conceptualization of this case," and "This client's understanding of the autonomic nervous system is important for a positive case outcome." To ensure all respondents used the scale in a consistent manner, the researcher assigned a descriptor to each numerical alternative (Jackson, 2016). The anchors of scale were as follows: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, and 5 = *strongly agree*. The selected measure of MHP self-efficacy was intended to reflect the influence of education.

The Counselor Self-Efficacy Scale

The researcher operationalized education as a predictor variable descriptively via a demographic questionnaire (e.g., educational level, neuroscience training) and the use of the CSES (see Appendix E) that Melchert et al. (1996) developed. The CSES is a 20-item self-report measure related to counselor knowledge and skill competency. The researcher employed this instrument to provide a measure of the MHP's confidence in their counseling skills. The CSES includes a 5-point Likert-type, 1-factor scale ranging from *strongly disagree* to *strongly agree*.

Thus, the instrument has a potential low score of 20, which indicates a low level of counselor self-competency based on current knowledge and a high score of 100, which indicates a strong level of self-competency related to education and training. Ten of the item statements (3, 4, 6, 9, 10, 11, 12, 14, 17, 19) were negatively worded to protect against response bias and thus were inversely recoded, so higher scores related to high self-competence. Melchert et al. (1996) sought statements that would measure normal counseling skills unassociated with specific theoretical orientations. Examples of statements from the scale include the following: "I am able to effectively develop therapeutic relationships with clients;" "I cannot discriminate between meaningful and irrelevant client data," and "I am able to keep my personal issues from negatively affecting my counseling."

The internal consistency of the CSES was rated as .91 using the Cronbach alpha procedure, and the test–retest reliability coefficient was .85 after readministering the test with 89 of the original 138 participants after a 1-week interval (Melchert et al., 1996). The correlation between clinical experience and levels of training was found at .48 and accounted for almost half (43%; $R = .65$) of the variance in assessment scale scores. Further, Melchert et al. (1996) found the CSES construct validity correlated very well ($r = .83$) with the Self-Efficacy Inventory (Friedlander & Snyder, 1983).

Because this scale was tested with participants from first-year master's students in counseling and psychology to practicing psychologists, it appeared to possess external validity for the population sample of this research. Melchert et al. (2016) noted the differences in the scores of the students and psychologists aligned with expected stage of development models for counselors. Mullen et al. (2015) utilized the CSES in a longitudinal study of 179 master's level counseling students and found differences in counselor self-efficacy at three measure points of

CSES administration. Interestingly, results showed counselor training had a greater effect on self-efficacy than clinical experience. The benefits of the CSES in the current study included the measurement of respondents' counseling self-competency based on knowledge (separate from theoretical orientation) and the identification of a negative or positive relationship between this characteristic variable and the respondent's choice regarding neuroeducation use. The influence of theoretical orientation represented another important aspect of this work.

The Theoretical Orientation Profile Scale-Revised

The therapist and clinician's theoretical attitude functioned as a predictor variable, was informed through responses to the Wood Scale based upon a trauma case review, and was operationalized through the 18-item self-report TOPS-R (see Appendix F), developed by Worthington and Dillon (2003) and adapted from a previous unpublished version that measured the theoretical orientation of counselors by the same authors. The researcher employed this newer scale to measure the MHP's level of identity, conceptualization, and methodological use related to various theoretical approaches (Worthington & Dillon, 2003). The researcher measured the theoretical identification (i.e., extent of identity), conceptual orientation (i.e., extent of conceptualized perspective), and methodological orientation (i.e., extent of theoretically aligned methods) used to engage with clients using a 10-point Likert-type scale across the six theoretical subscales of psychoanalytic/psychodynamic, humanistic/existential, cognitive-behavioral, family systems, feminist, and multicultural approaches (Worthington & Dillon, 2003). The respondents rated the 18 items on a 10-point Likert-type scale, with 1 equaling *not at all* and 10 equaling *completely* for theoretical identification items. For conceptual orientation and methodological items, 1 equaled *never,* and 10 equaled *always*. Although the maximum score is 180, this would be unlikely due to the implausible nature of a respondent being "completely"

identified with all six theoretical approaches. A minimum score of 18 is likewise inconsistent with the nature of this scale.

The level of respondent endorsement reflected the degree of self-identity, conceptualization practice, and methodology use as associated with specific theoretical orientations. The relevance of the TOPS-R to this research varied. First, a higher level of commitment to one or two theoretical orientations, conceptualization approaches, and associated methodologies revealed loyalty to a single or a few frameworks of psychology, thereby displaying a potential attitudinal aversion to an integrative theoretical mindset displayed by a lower overall score. Next, a lower sense of loyalty to numerous theoretical orientations, conceptualization outlooks, and applied methodologies could suggest the MHP is an integrationist and would be comfortable with conceptualizing clients and their problems through a neuro-informed lens, as displayed through a score closer to the median overall score. Finally, varied high, median, and low scores across the six theoretical orientations related to identity, conceptualization, and methodologies of treatment could indicate an eclectic attitude toward counseling and therapy that could result in a greater positive influence on the choice to incorporate neuroeducation into clinical practice, as reflected by a high overall score. Each subscale provided three statements with one each related to identification (i.e., “I identify myself…”) with a theoretical orientation, the use of that orientation to conceptualize a client and their problem (i.e., “I conceptualize my clients…”), and the utilization of associated methods or techniques to treat the client (i.e., “I utilize…”).

Worthington and Dillon (2003) noted 87.5% of their data variance was associated with their six factors of measure, and the factor loading ranged from .86 to .96. High internal consistency reliability was found with the subscale alpha scores of .96 for

psychoanalytic/dynamic, .95 for cognitive-behavioral, .95 for humanistic/existential, .95 for family systems, .95 for feminist, and .94 for multicultural. Construct validity was based on positive and negative correlations with items from the Etiology Contribution Scale, the Cross-Cultural Counseling Inventory-Revised, and the Hoffman Gender Scale.

Barrio Minton and Myers (2008) found the six scales to yield the following alpha coefficients: multicultural = .91, feminist = .94, psychoanalytic/dynamic = .94, cognitive-behavior = .95, family systems = .96, and humanistic/existential = .97. Additionally, research aimed at exploring the validity and reliability of a Turkish version of TOPS-R found similar Cronbach's alpha coefficients for subscale reliability (i.e., multicultural = .90, feminist = .93, psychoanalytic/dynamic = .86, cognitive-behavior = .89, family systems = .91, and humanistic/existential = .90; Demir & Gazioglu, 2017). Further, after administering the scale to a group of 43 undergraduate seniors two more times within a 2-week period, the following test–retest coefficients were found: multicultural = .74, feminist = .71, psychoanalytic/dynamic = .82, cognitive-behavior = .80, family systems = .72, and humanistic/existential = .78 (Demir & Gazioglu, 2017). The research results suggested the preference of theoretical orientation among Turkish MHPs strongly linked with professional variables such as professional efficacy and clinical training (Demir & Gazioglu, 2017) to a greater degree than personality. Ogunfowora and Drapeau (2008) utilized the TOPS-R with 493 practitioners and students, and the results suggested personality predicted a preference for humanistic/existential, cognitive-behavioral, psychodynamic, and feminist theoretical orientations across two samples. The preference for multicultural and family systems orientation was also influenced by personality but only in one sample.

Demir and Gazioglu (2017) reported the 10-point scale provided a measure of theoretical attitude or commitment toward a specific orientation intimating an inclination to be integrated or loyal to a specific school. Previous researchers have considered integration as the counselor or practitioner's attitude toward an orientation as opposed to the orientation itself (Rihacek & Roubal, 2017), a focus also in this work. Worthington and Dillon (2003) further posited, despite a drive in psychotherapy for loyalty to one theoretical orientation, many counselors have embraced an integrative approach, adopting various orientations. Therefore, this scale was consistent with the purpose of this research. The researcher used a correlation analysis to measure the relationship between the results of the TOPS-R and the respondents' choice regarding the use of neuroeducation based on the trauma case review. The literature also showed religiosity to be a characteristic variable of interest.

The Dimensions of Religiosity Scale

Finally, the researcher operationalized the third predictor variable descriptively by the demographic questionnaire (i.e., religious identification) and further quantified via the DRS, developed by Joseph and DiDuca (2007). The purpose of this instrument was to measure the strength of an MHP's religious beliefs that may affect clinical outlooks and approaches. The DRS (see Appendix G) is a 20-item self-report measure of religious preoccupation, guidance, conviction, and emotional involvement. Each item is scored on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The strength and subsequent influence level of respondents were identified via the overall score, with 100 depicting very strong religious beliefs and 20 reflecting minute or no religious beliefs. Thus, a higher score suggested a higher level of influence of beliefs regarding clinical choices, and a lower score suggested little or no impact of beliefs on the MHP's outlook or approach to practice. Additionally, the scoring is reversed for

item 11, which is negatively worded and thus was recoded prior to analysis. Although the questions on the DRS were distinctively Christian and, therefore, might limit application to some respondents' religiosity, the results nevertheless identified the presence, strength, and absence of religious beliefs. Three of the five statements in each of the four subscales of preoccupation, conviction, emotional involvement, and guidance contain the religiously neutral language of "God" and "prayer," yet two statements in each subscale use the precise identifiers of Jesus, Christ, Bible, and Christian. Examples of statements include the following: "I think about God all the time;" "I am sure that Christ exists;" Being a Christian is a joyous way to live," and "I pray for guidance."

Through a study of 656 participants in England, reliability of each of the four scales was satisfactory via Cronbach's alphas for preoccupation (0.94), conviction (0.95), emotional involvement (0.94), and guidance (0.90). Although subscales are intercorrelated, the strength of association seemed to be related to the scope of religiosity (Joseph & DiDuca, 2007). Joseph and DiDuca (2007) analyzed the proponent structure of their previous work (DiDuca & Joseph, 1997) that framed religiosity along motivational and attitudinal constructs and addressed the deeper cognitive-emotional ties with religion. The authors originally conceptualized religiosity through the lens of delusional thinking research. They tested the four dimensions using six questions for each dimension of behavior and thinking from their DRS to determine statistical separateness. The reliability analysis of the 4-item scale displayed Cronbach's alpha above .80 for each dimension. Joseph and DiDuca subsequently dropped the lowest scoring question in each dimension. The 24-item scale was reduced to a 20-item scale, which brought the alphas of all dimensions to .90 and above. The focus and intent of this scale was the measure of religiosity as related to mental health thus offering support of external validity for the use of this scale with

MHPs in this research. Chaboki and Safara (2021) recently utilized the DRS to measure the moderating role of religiosity in the relationship between body management and the identity of participants. They further showed religious beliefs had the highest moderating effects on this noted relationship. Additionally, Amponsah et al. (2021) integrated the DRS into a study of what influenced cheating among 333 Ghanaian undergraduate students. Religiosity was found to indirectly influence the relationship between the attitude toward cheating and conscientiousness. Each of these studies verified the influence of religious beliefs on an individual's view of self and choice of behaviors. Thus, although not directly associated with the topic of this work, the DRS has nonetheless been actively used to measure the influence of religious beliefs. The researcher also considered other scales for use in this study.

The Assessment of Spirituality and Religious Sentiments scale, also known as ASPIRES, was found to be sensitive to cultural variables and able to have cross-faith generalizability (Piotrowski et al., 2021). Further, Piotrowski et al. (2021) showed the two dimensions of measure, spiritual transcendence and religious sentiment, were valuable in measuring psychological constructs and empirically robust and generalizable across cultures. Yet the combination of spirituality and religiosity and the value in community aspects were inconsistent with this research focus on identifying the strengths of religious beliefs and related attitudes and the influence of those beliefs on the integration of neuroscience into practice. Additionally, the researcher considered using the Therapist's Religious Attitude Scale (Levinson et al., 1999), as reviewed by Beatty et al. (2007), due to its focus on therapist attitude, the 20-item length, and its use of a 5-point Likert scale. Although it contained good content, face, and construct validity (Beatty et al., 2017), the attitudinal statements regarding religious beliefs related to the context of the clinical session and the interaction with the client. This research focused on the strength of

the MHP's religious beliefs and how they may influence theoretical orientation and attitude toward the integration of neuroscience in practice.

The researcher correlated the individual findings of the DRS with each respondent's expressed choice regarding the use of neuroeducation based on the provided case study and associated scale responses. The relationship between strength of religious beliefs and the MHP's choice regarding neuroeducation use was positively or negatively correlated, noting whether a high commitment to religious beliefs could be associated with either a high or low level of importance regarding the use of neuroeducation in case conceptualization and treatment. Likewise, results informed as to whether a lower or no identification with religious beliefs may predict a respondent's level of importance regarding their choice to integrate neuroeducation into case conceptualization and treatment or not. Finally, the researcher analyzed the predictor variable of strength of religious beliefs using the results of the DRS for moderating effects on the relationship between the predictor variables of MHP self-competency (using results from CSES) and theoretical attitude (using results from TOPS-R) and the criterion variable of neuroeducation use, as identified through the Wood Scale related to the trauma case review. Although the researcher found no studies demonstrating religiosity as a moderator with these variables, studies have shown dimensions of religiosity to have a moderating influence in relationships associated with identity (Chaboki & Safara, 2021) and attitude (Gyasi-Gyamerah & Akotia, 2016). Further, as noted earlier, research has demonstrated religious beliefs have a significant impact on a therapist's theoretical orientation (Bilgrave & Deluty, 2002; Cummings et al., 2014; Duggal & Sriram, 2021), which relatedly could influence a counselor or practitioner's choice pertaining to neurointegration.

Procedures

Prior to initiation, the institutional review board approved this study (see Appendix H), falling under exemption Category 2. (i), covering survey procedures as noted in 45 CFR46:104(d) in accordance with the American Psychological Association (2020) standards for ethical research. Following this approval process, the researcher sent an abbreviated pilot survey link to 30 MHPs via the email collector in Survey Monkey to validate the demographic questions, case review items, and the CSES assessment tool for comprehensibility and the operational ability of the Survey Monkey platform. A total of 17 individuals responded to the pilot survey. Following the execution of the pilot survey and review of the results, the researcher extended the consent form from three to four pages to enhance comprehensibility, then added an extra page to include the final consent agreement paragraph with an acceptance button. The researcher also added a unique survey code to the last page for Survey Circle users when the survey was posted on the Survey Circle website. No other adjustments were made to the survey. The M-Turk collector required a separate set of actions.

The researcher set the parameters within the M-Turk platform to reflect the inclusion criteria and then selected the qualification category of health care to narrow the field of potential respondents. Discriminators of psychology or mental health were not offered on this platform. The researcher developed a separate yet identical version of the survey on the Survey Monkey platform with a specific link and completion code designated for M-Turk users. This “job” was then posted on the crowdsourcing site and reached the designated limit of hits or responses within 48 hours (N = 212). The researcher reviewed the resultant data for obvious discrepancies related to the inclusion criteria, missing data, and completion rate. Although some discrepancies

emerged, the researcher took no action due to the existence of an appropriate function in IBM's SPSS Version 27 to identify and address these issues.

Additionally, the researcher distributed the survey through email and weblink collectors on the Survey Monkey platform and distributed participant invitations through the Survey Monkey collectors and direct emails to various psychology, spiritual care, and social work professional networks and agencies. The survey also went to individual counselors, psychologists, psychiatrists, psychotherapists; chaplains and pastoral counselors; and licensed clinical social workers. The survey included a series of demographic questions and the 11-item Wood Scale to measure the attitudinal tendency related to the integration of neuroeducation into the conceptualization and treatment of trauma. Further, the researcher included three assessment instruments to measure dimensions of MHP self-competency, theoretical attitude, and strength of religious beliefs. The researcher asked voluntary participants, as affirmed by informed consent (see Appendix D) to provide demographic information related to education level, time in clinical practice, religious affiliation, theoretical orientation, and neuroscience education exposure. The researcher also provided participants with a real-life case review of a trauma client that served as the impetus for the Wood Scale items concerning the integration of neuroscience using neuroeducation in the conceptualization of the case and treatment planning.

The Survey Monkey platform loaded all data onto an excel spreadsheet, which the researcher downloaded directly into IBM's SPSS for analysis. It proved unnecessary to follow the initial plan for converting the demographic responses into numerical values to provide nominal scale data or to convert the Wood Scale responses based upon the case review, CSES, DRS, and TOPS-R results into an interval scale on an excel spreadsheet. The researcher recoded 10 items from the CSES and one item from the DRS in SPSS due to the need for reverse scoring.

The researcher then organized the results of all instrumentation to determine frequency distribution, mean, and standard deviation to promote meaningful descriptive conclusions such as percentages of the sample that related to each variable, the central tendency of categorical and variable responses, and the measure of variance (Jackson, 2016). Standard deviation could not be considered for nominal data (Jackson, 2016).

Following the collection of survey responses and subsequent encoding of data in SPSS, the researcher categorized the information into subgroups representing the MHP segments of psychology, spiritual care, and social work. Subsequently, a predictive study was used to measure the relationship within each group through a correlation analysis between their composite responses related to the importance of neuroeducation use and the reflected average of responses associated with the characteristic variables of self-competency, theoretical attitude, and strength of religious beliefs. In this manner, the researcher processed the survey and demographic questionnaire data for each group to affirm or deny the hypotheses. Additionally, the researcher conducted a test for the potential moderating effects of strength of religious beliefs on the relationship between the other predictor variables (i.e., self-competency and theoretical attitude) and the criterion variable of choice regarding neuroeducation use. Finally, the researcher performed a between-group comparative analysis to determine any differences in predictor variable variance of effect and choice regarding neuroeducation to affirm or deny the null hypothesis.

The protection of confidentiality represented a continuous process throughout this research, as prescribed by Cone and Foster (2016). In accordance with section 8.02 of the American Psychological Association (2017) code of ethics, all participants received an informed consent document that fully explained the research as part of the survey, and changes to the

survey based on the trial version have been annotated in this work. Although the survey was anonymous and did not require informed consent (American Psychological Association, 2017), the trauma case review could result in minimal distress for respondents; therefore, the researcher utilized an informed consent form. The researcher also selected settings on the Survey Monkey platform that precluded the collection of any personal data, including IP addresses. All survey responses and related data were downloaded from the Survey Monkey platform directly into the SPSS program, thereby securing the data for coding and analysis. The researcher transferred additional spreadsheet downloads, datasets, and SPSS outputs that had been downloaded to a personal computer to an encrypted hard drive.

Further, the researcher sent all required analysis work completed on a personal computer to the external hard drive following computation and deleted the data from the computer. During the process of building the final dissertation, the researcher maintained all data on an external hard drive. Given the generality of the demographic information and the encoding of responses, the risk of exposing personal identifying information of respondents was null. Thus, as required by the American Psychological Association's (2017, 2020) ethical conduct requirements for research, this author did not withhold raw data or data and analysis results from faculty members. Moreover, the researcher adjusted the real-life case review through the addition of extraneous factors and altering specifics about the client, such as the number of siblings, current age and age at the time of traumatic events, and the geographical area where trauma occurred (American Psychological Association, 2020). Further, the client provided consent for the use of this case review (see Appendix I). No deception or expectation for respondents to change their beliefs was intimated or required in this research (Heppner et al., 2016). Permissions for the use

of the CSES, TOPS-R, and DRS instruments through requests to appropriate entities (see Appendices J, K, L). A review of subsequent analysis follows in the next section.

Data Analysis

The researcher used IBM's SPSS Version 27 for analysis, downloading all data directly from the Survey Monkey platform directly into SPSS, which resulted in a spreadsheet with variables as columns and participant cases in rows, each with structured identity numbers. The researcher then recoded all data into numerical values and imputed missing data through an analysis of the data or leaving the appropriate block blank. Once all data had been recorded and proper coding verified, the researcher conducted screening for the following potential problems: errors in coding, inconsistent responses, missing values, nonnormal distributions, and extreme outliers (Warner, 2013). Although the researcher planned to correct the identification of these issues prior to uploading an excel file to SPSS, they discovered these capabilities existed in the package once rules for variables had been applied. Remaining quality errors were identified and corrected once initial dataset outputs were reviewed. The researcher recorded a summary of the detected problems and the steps taken to remedy issues in the final research report.

The initial review of the data within SPSS revealed violations of the inclusion criteria and resulted in the exclusion of respondents. The researcher used descriptive statistics for frequency counts and for finding the mean for demographic and Likert scale survey results, noting the standard deviation for Likert scale results only. The researcher planned to use percentages of question responses and the chi-square test for independence to examine the demographic variables of MHP education, theoretical orientation, religious affiliation, and neuroscience training and to note subgroup differences in the ratings of each instrument and subscale scores (Jackson, 2016), but this required a large number of tests. Therefore, the researcher used

Cronbach's alpha as an alternative method to display correlation results. The results assisted in the identification of trends related to the predictor variables of self-competency, theoretical attitude, and strength of religious beliefs and further clarified or confirmed the multiple regression analysis of these three predictor variables and their relationship with the criterion variable of choice to use neuroeducation. This approach proved helpful in the Rihacek and Roubal (2017) study related to the correlation between therapist self-orientation and orientation related to techniques.

In the first three hypotheses within this work, the researcher assumed a statistically significant relationship between the MHP's self-competency based on education, theoretically informed attitude, and strength of religious beliefs and their choice regarding the use of neuroeducation in trauma case conceptualization and treatment. Prior to the next statistical procedure, the researcher reviewed a histogram of the three individual predictor variable scores and their relationship with one another and with the criterion variable to ensure linear relationship and homoscedasticity (Warner, 2013). These data, along with the distribution shape portrayed as reasonably normal, represented a correlation coefficient (Jackson, 2016). The researcher ran further analysis pertaining to missing data and dropped those noted to have greater than three missing answers from the sample. Finally, the researcher conducted assumption testing based on the requirements for multiple regression and MANOVA statistics (Laerd, 2022); this analysis resulted in a further reduction of viable participants. These procedures allowed for the verification of no impossible score values or outliers.

Following these processes, the researcher conducted the statistical procedure of parametric multiple regression using the results of the CSES, TOPS-R, and DRS, which represented the three predictor variables to measure how these variables related to one another

and to the criterion variable of neuroeducation use as expressed by the multiple correlation coefficient *R* (Heppner et al., 2016). The researcher used Pearson's *r* squared to determine the quantity of variability of the criterion variable associated with each predictor variable (Heppner et al., 2016; Warner, 2013). Additionally, Spearman correlations were included for statistical verification. These tests identified the singular interaction of each predictor variable with the criterion variable and the combined effects. Cone and Foster (2016) noted parametric multiple regression analysis accounts for the fact numerous predictor variables could correlate with one another, producing a redundant effect. Checks for multicollinearity were conducted through variance inflation factor statistics (Laerd Statistics, 2022), and the researcher performed casewise diagnostics to further identify outliers or residuals (Warner, 2013). Within this work, the predictor variables of self-competency and theoretical attitude could cause such a redundancy because a theoretically informed attitude may arise in part from the MHPs' formal education and training associated with self-competency.

Additional hypotheses of this work inferred the predictor variable of an MHP's strength of religious beliefs would have a significant moderating effect on the relationship between the individual predictor variables of self-competency and theoretical attitude and the criterion variable of choice to use neuroeducation in trauma case conceptualization and treatment. The researcher addressed these hypotheses using a moderated regression model to measure the variance of effect between the predictor variables and the criterion variable and the interaction effect of strength of religious beliefs on their relationship while applying the standardized regression Beta coefficient as a predictor of variable scores (Heppner et al., 2016; Warner, 2013). This analysis addressed the potential third variable problem and determined if the strength of religious belief was responsible for the magnitude of variance associated with self-competency

and theoretical attitude. The researcher used a scatterplot in separate trend lines to display the variance of effect the predictor variables had on the criterion variable (Warner, 2013). The moderating effect of dimensions of religiosity had been noted in previous studies related to identity and attitude (Chaboki & Safara, 2021; Gyasi-Gyamerah & Akotia, 2016). Additionally, the researcher used Cohen's *d* inferential statistic to measure the effect size of the variance in the criterion variable that may be accounted for by each of the three predictor variables (Jackson, 2016). Cohen (1992) noted the effect sizes for multiple partial correlations were .02 (small), .15 (medium), and .35 (large). The assumptions of moderated regression were met through a studentized residual histogram. Warner (2013) noted residuals represent variance not accounted for by data analysis or the predictor variables. The focus of this research was to note inference, not causality.

The final hypothesis in this work suggested there would be a statistically significant difference between the allied subgroups of MHPs related to the choice regarding the use of neuroeducation in trauma case conceptualization and treatment. The researcher used the one-way MANOVA test to compare the mean scores of the three outcome predictor variables for the participants across the three allied subgroups of MHPs to determine if the three characteristic variables influenced the choice of neuroeducation use (criterion variable) differently across these segments (Cone & Foster, 2016; Warner, 2013). Kornblith et al. (2020) used the MANOVA analysis to likewise compare the results of three treatment score variables for each different cluster of veterans with a history of traumatic brain injury based on the group's level of cognitive functioning. Research related to executive functioning has further demonstrated the utilization of multiple regression analysis and MANOVA to compare predictive results between groups of participants and to annotate the variance of effect for each instrument and subscale utilized

(Kalbe et al., 2020; Sharfi & Rosenblum, 2016). The risk of error in analysis presented a concern in this research.

Lowering the risk of a Type 1 error without increasing the risk of a Type 2 error was addressed partially by seeking a larger sample size during the survey distribution part of the research. This also increased statistical power in this study. The researcher used G*Power software (Hyun, 2021) to test for adequate sample size. Cone and Foster (2016) and Warner (2013) additionally noted the use of MANOVA could decrease the risk of a Type 1 error by reducing the number of statistical tests conducted. Bonferroni post hoc tests were used to further verify results by setting a more rigorous alpha level for numerous tests to minimize the potential of a Type l error (Jackson, 2016). The researcher expected each correlation to have a medium effect size and be significant based on a p value of $< .05$ (Warner, 2013). A research hypothesis of this work anticipated a difference in the choice of neuroeducation use between the subgroups of the mental health profession; thus, it was essential to clarify whether to accept or reject the null hypothesis.

The researcher utilized various statistics to check for univariate or multivariate outliers and shape normality (i.e., univariate box plots, Mahalanobis distance test, and Kolmogorov-Smirnov tests) and homogeneity of variance (i.e., Box's test, Levine's tests, and Kruskal-Wallis H statistics; Jackson, 2013; Warner, 2013). Further, the researcher used Wilk's lambda statistic to examine the significance of differences between segments of MHPs based on correlative test results (Warner, 2013). Prior to combining the results for comparison during the MANOVA, the researcher used the analysis of variance (ANOVA) step-down procedure to examine each variable for significance levels with the outcome variable. Supportively, the Kruskal-Wallis test and Bonferroni post hoc tests were applied to verify the results of the ANOVA statistic (Cone &

Foster, 2016; Jackson, 2016). Heppner et al. (2016) noted there are numerous threats to conclusion validity, and thus, it is difficult to be certain that statistically significant results mean a relationship exists between variables or that insignificant results definitively determine no relationship.

Although internal validity presented little concern because there was no intent to determine a causal relationship (Heppner et al., 2016), the researcher addressed certain concerns. The extraneous variable of respondent history could have threatened internal validity due to the diverse environments and influences experienced by those taking the survey. Painful life events or recent client encounters could have caused the therapists to question their professional identity. LaFountain and Bartos (2002) proposed that randomly assigning participants to groups would help alleviate this threat. Further, instrumentation can threaten internal validity in that each scale contains a midpoint, and respondents might have been inclined to score in that direction for reasons of ease or time constraints. All participants answered the same survey inquiries, thus reducing a skewed result. The acceptable levels of internal validity for scales utilized within this work have already been noted.

A threat to external validity might have existed in the focused generalization to counselors who were currently in practice, thus avoiding psychology and counseling students or those who have been on hiatus. Yet, shared histories, experiences, and theoretical orientations allowed for an expanded representation (Jackson, 2016). Demand characteristics were also thought to have played a role in that respondents would recognize the study was neuroscience focused and could presume they needed to answer questions in a way that supported such an outlook (LaFountain & Bartos, 2002).

Summary

The purpose of this work was to address the gap in research related to what factors influence an MHP's choice of whether to use neuroscience in case conceptualization and treatment considering the notable emergence of professional requirements, research, and educational curriculum that confirm its efficacy in clinical practice over the past 2 decades. This quantitative correlational survey research relied on descriptive and predictive analysis and illuminated three potential influences that could affect an MHP's choice regarding neurointegration. The researcher queried a sample from a diverse group of MHPs using a variable-centered survey method that included items related to demographics, a trauma case review, and several scales. The researcher recoded these measures and analyzed them for strength levels, separated them into three subgroups reflective of the allied segments of the mental health profession, and analyzed them for statistical significance.

The individual and group results of the CSES, TOPS-R, and DRS (measures of predictor variables) were tested for correlation via a multiple regression analysis with the criterion variable (choice of neuroeducation use) as ascertained through responses to the Wood Scale that were based upon a trauma case review. The researcher used these results to confirm the various hypotheses that anticipated a statistically significant relationship between each of the three predictor variables and the criterion variable to influence the MHP's choice regarding the use of neuroeducation. Once the researcher determined the variance of effect on the relationship between each predictor variable, they used a hierarchal regression analysis to test if the strength of religious beliefs had a moderating effect on the individual predictive variance between self-competency and theoretical attitude and the choice regarding neuroeducation use. These results confirmed strength of religious beliefs had a moderating effect on the relationship between self-

competency and the choice regarding neuroeducation use but not on the relationship between theoretical attitude and the criterion variable. Finally, the researcher employed a MANOVA analysis to determine if there were differing results between the noted segments of MHPs related to the choice of neuroeducation use and the group mean variance of effect between each of the predictor variables and the criterion variable. This result supported the final hypothesis in this work, which proposed there would be a statistically significant difference between the subgroups of allied MHPs related to the choice to use neuroeducation in case conceptualization and treatment. Although differences occurred, they were weak. The results of the descriptive statistical analysis of the related demographic items further informed these findings.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this study was to query a sample of MHPs regarding neuroeducation use and identify a potential correlation between their self-competency, theoretical attitude, and strength of religious beliefs and their choice of whether to integrate neuroeducation with case conceptualization and treatment planning for trauma. Further, the author aimed to identify if strength of religious beliefs had a moderating effect on the correlative relationship between an MHP's self-competency and theoretical attitude and their choice regarding the use of neuroeducation. A third purpose of this research was to identify differences among three segments of MHPs related to each group's composite level of inclination to integrate neuroeducation in counseling practice based upon the correlative results of the three predictor variables. Sample results for $N = 186$ participants appear in this section. The researcher reviewed study findings through generalized descriptive results and via hypotheses analysis based on survey outcomes.

Data Cleaning and Assumption Testing

Initially, 311 respondents responded to the Survey Monkey survey. Eighty-six were dropped because they did not meet the study requirements of being at least 18 years old, having a minimum of 3 years of practice experience, and be in a current practice accepting new clients. Eliminating those respondents who had four or more missing answers further reduced the sample to $N = 197$. Missing answers were estimated or imputed using the grand mean if it was a continuous variable or the grand mode if it was a categorical variable. Assumption testing removed 11 more respondents, leaving the final sample for this study at $N = 186$.

Laerd Statistics (2022) prescribed the following nine assumptions must be met for moderated multiple regression:

- a continuous dependent variable,
- a continuous independent variable,
- a dichotomous moderator variable,
- independent observations,
- a linear relationship between the dependent variable and each nondichotomous independent variable, both individually and collectively,
- no multicollinearity,
- no significant outliers and high leverage points or highly influential points,
- homoscedasticity, and
- normally distributed residual scores.

Assumptions regarding a continuous dependent variable, continuous independent variable, dichotomous moderator variable, and independent observations were met based on the study design. The linear relationship assumption was met based on the scatterplots of the dependent variable and the independent variables. No multicollinearity was met by inspection of the variance inflation factor statistics in the regression models. The assumption of no outliers or other influential points was met based on examination of the casewise diagnostics, identifying no studentized deleted residuals greater than ± 3 standard deviations, with Cook's scores all less than 1.0, and leverage values all less than 0.20. After the examination, the researcher removed two respondents based on casewise diagnostics and removed three based on studentized deleted residuals greater than ± 3 standard deviations. The assumption of homoscedasticity was met based on inspection of the scatterplot of studentized residuals against the unstandardized

predicted values. The assumption of normally distributed residuals was met based on the inspection of the two studentized residual histograms. Taken together, along with the general linear model being robust to assumption violations in large samples (N = 186), the researcher determined the assumptions for moderated multiple regression were adequately met. However, both Pearson and Spearman correlations were included for statistical verification purposes.

According to Laerd Statistics (2022), one-way MANOVA has 10 assumptions that must be met:

- two or more continuous dependent variables,
- a categorical independent variable with two or more independent groups,
- independence of observations,
- no univariate or multivariate outliers,
- multivariate normality,
- no multicollinearity,
- a linear relationship between the dependent variable for each group of the independent variable,
- adequate sample size,
- homogeneity of variance—covariance matrices, and
- homogeneity of variances.

The assumptions regarding two or more continuous dependent variables, a categorical independent variable, and independence of observations were met based on the design of the study. The researcher examined the no univariate or multivariate outliers assumption using univariate box plots and the Mahalanobis distance test. The researcher removed 10 univariate outliers and one multivariate outlier from the sample. The assumption regarding multivariate

normality was examined using Kolmogorov-Smirnov tests. Eight of the 12 tests were significant, so this assumption was not met. The assumption of no multicollinearity was examined based on intercorrelation matrices for each of the three groups. No intercorrelations were greater than $r >$ .60, so this assumption was met. The assumption of a linear relationship between the dependent variable and each of the independent variables was examined by looking at scatterplots. No readily discernible nonlinear patterns were noted. The assumption of adequate sample size was tested using the G*Power software (Hyun, 2021). For the MANOVA test for a sample of N = 186 with three groups and four dependent variables, the resulting power was .95, so this assumption was met. The assumption of homogeneity of variance–covariance matrices was examined using Box's test. The Box's M value was $M = 133.81$, $p < .001$, which violated that assumption. The last assumption, homogeneity of variances, was examined using Levene's tests for the four independent variables. The assumption was met for three of the four variables, with violation occurring for religiosity ($p = .001$). Taken together, along with the difference in sample sizes for psychology ($n = 108$), spiritual care ($n = 41$), and social worker ($n = 37$), the Kruskal-Wallis H statistics were included for statistical verification purposes.

Descriptive Statistics

The total number of original respondents was 311, and following the reduction due to exclusion criteria and missing data, the final sample was $N = 186$. Table 1 displays the frequency results for selected variables. Females reflected 68.3% ($n = 127$) and males 31.7% ($n = 59$) of respondents, of which 88.2% identified as White or Caucasian and the remaining 11.8% identified as non-White across five racial and ethnic categories. Most of the sample (58.6%) were between 18 and 34 years old, with a median age of 29.50 years. Greater than 90% ($n = 169$) of respondents affiliated with the Christian religion or belief system. More than half (57.5%) had

completed a master's (90) or doctoral (17) degree. The largest segment of the sample (58.1%) was represented by psychology professionals, including psychiatrists (20), psychologists (66), and counselors (19). The remaining respondents (41) identified as spiritual care providers (41) and clinical social workers (37). One-half (93) of mental health professionals noted being in practice for 3–5 years. The most common (47.8%) theoretical orientations were psychoanalytic/psychodynamic (48), cognitive-behavioral (41), or family systems (*n* = 40, 21.5%). The sources of neuroscience education or exposure most represented were attending or taking online neuroscience professional development training (48.9%) and participating in formal coursework in master's or doctoral programs (26.9%; see Table 1).

Table 1

Frequency Counts for Selected Variables

Variable and category	*n*	%
Gender		
Female	127	68.3
Male	59	31.7
Race/ethnicity		
White or Caucasian	164	88.2
Black or African American	13	7.0
Hispanic or Latino	6	3.2
Asian or Asian American	1	0.5
Native American or Alaska Native	1	0.5
Mixed ethnicity or race	1	0.5
Age [a]		
18–24	78	41.9
25–34	31	16.7
35–44	23	12.4
45–54	19	10.2
55–64	17	9.1
65+	18	9.7
Religious affiliation or belief system		
Buddhist	5	2.7
Christian	169	90.9
Jewish	2	1.1

Variable and category	*n*	%
Hindu	2	1.1
Other	4	2.2
None	4	2.2
Education		
Associate's degree	4	2.2
Bachelor's degree	75	40.3
Master's degree	90	48.4
Doctoral degree	17	9.1
Professional license or certification		
Psychiatrist	20	10.8
Psychologist	66	35.5
Professional counselor or therapist	19	10.2
Pastoral counselor	15	8.1
Chaplain	26	14.0
Clinical social worker	37	19.9
Other	3	1.6
Segments of mental health professionals		
Psychology	108	58.1
Spiritual care providers	41	22.0
Clinical social workers	37	19.9
Period of clinical practice		
3–5 years	93	50.0
6–9 years	37	19.9
10+ years	56	30.1
Theoretical orientation		
Cognitive behavioral	41	22.0
Family systems	40	21.5
Feminist	15	8.1
Humanist/existential	18	9.7
Multicultural	9	4.8
Psychoanalytic/psychodynamic	48	25.8
Integrationist	9	4.8
Other	2	3.2
Sources of neuroscience exposure		
Courses at master's or doctoral level	50	26.9
In-person or online professional courses	91	48.9
Research or professional journals	40	21.5
No training or exposure	5	2.7

Note. $N = 186$

[a] *Mdn* = 29.50 years old.

Table 2 displays the psychometric characteristics for the four summated scale scores of neuroeducation, self-competency, theoretical attitude, and strength of religious beliefs. Theoretical attitude was represented by the six subscales, the total theoretical scale (alternative measure), and the number of orientations scale (primary measure). The use of the number or orientations scale for correlational statistics offered greater granularity and explanatory capacity for results because of the higher correlations with neuroeducation than found for the theoretical orientations scale. The Cronbach alpha reliability coefficients for 10 scales ranged from a = .80 to a = .94, with a median alpha of a = .89. Thus, the analysis indicated that all scales had adequate levels of internal reliability (Heppner & Heppner, 2004; see Table 2).

Table 2

Psychometric Characteristics for Summated Scale Scores

Scale	Items	*M*	*SD*	Minimum	Maximum	*a*
Neuroeducation	11	3.95	0.45	2.73	5.00	.80
Self-competence	20	3.66	0.65	2.70	5.00	.91
Psychoanalytic/psychodynamic	3	6.98	1.87	1.00	10.00	.90
Humanist/existential	3	7.13	1.55	1.00	10.00	.84
Cognitive behavioral	3	7.53	1.44	2.67	10.00	.86
Family systems	3	7.33	1.55	1.00	10.00	.88
Feminist	3	6.19	2.39	1.00	10.00	.93
Multicultural	3	7.27	1.64	1.00	10.00	.87
Strength of religious beliefs	20	3.94	0.64	1.10	5.00	.94
Total theoretical scale	18	7.07	1.23	2.78	9.94	.91
Theoretical attitude	6	2.14	2.06	0.00	6.00	N/A

Note. N = 186.

The researcher sent a beta survey to 40 respondents and made the results received prior to the full survey available to MHPs during recruitment. The trial survey contained the case review, the Wood Scale, the CSES, and the demographic survey questions. The researcher aimed to verify the process of sending and utilizing the Survey Monkey link and to validate the formatting of the survey responses. Although 85% of invitees opened and scrolled through the survey, only 17 of 40 completed it. The data analysis program within Survey Monkey was easy to utilize, affirming the platform selected for this study.

Results

Research Questions and Hypotheses

RQ1 was: Is there a relationship between an MHP's self-competency based on education and their choice regarding the use of neuroeducation in trauma case conceptualization and treatment? Table 3 shows significant positive correlations between neuroeducation and self-competency using both the Pearson correlation (r = .35, p = .001) and the Spearman correlation (r_s = .35). These findings aligned with Hypothesis 1.

Table 3

Comparison of Correlations for Selected Variables With Neuroeducation

Variable	Pearson's *r*	Spearman's *r*
Self-competence	.35***	.35***
Psychoanalytic/psychodynamic	.24***	.33***
Humanistic/existential	.19**	.26***
Cognitive behavioral	.35***	.41***
Family systems	.33***	.39***
Feminist	.08	.18*
Multicultural	.28***	.32***
Strength of religious beliefs	.37***	.49***
Total theoretical scale	.32***	.33***
Theoretical attitude	.52***	.55***

Note. $N = 186$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

RQ2 was: Is there a relationship between an MHP's strength of religious beliefs and their choice regarding the use of neuroeducation in trauma case conceptualization and treatment? Table 3 shows significant positive correlations between neuroeducation and strength of religious beliefs using both the Pearson correlation ($r = .37$, $p = .001$) and the Spearman correlation ($r_s = .49$). These findings aligned with Hypothesis 2.

RQ3 was: Is there a relationship between an MHP's theoretical attitude based on their commitment level to specific or multiple orientations and their choice regarding the use of a neuro-informed approach to trauma case conceptualization and treatment? Table 3 shows

significant positive correlations between neuroeducation and theoretical attitude using both the Pearson correlation (r = .52, p = .001) and the Spearman correlation (r_s = .55). These findings aligned with Hypothesis 3.

RQ4 was: Is the relationship between an MHP's self-competency based on education and their choice regarding the use of neuroeducation moderated by the strength of their religious beliefs? To answer this question, Table 4 displays the results of the moderated regression model. This first step of the model was significant, $F(2, 183) = 40.07$, p = .001, R^2 =.305. Both the self-competency variable (β = .25, p = .001) and religiosity (β = .44, p = .001) were significant predictors of neuroeducation. The inclusion of the interaction effect in Model 2 was also significant (β = -.21 p = .023), which added 1.9% to the explained variance. This suggested that strength of religious beliefs moderated the relationship between self-competency and neuroeducation. The scatterplot in separate trend lines in Figure 1 shows that for the low religiosity condition, self-competency explained 17.6% of the variance in use of neuroeducation, and in the high religiosity condition, self-competency explained 2.3% of the variance in use of neuroeducation. These findings confirmed the study's third hypothesis.

Table 4

Moderated Multiple Regression Model Predicting Neuroeducation Based on Self-Competency Moderated by Strength of Religious Beliefs

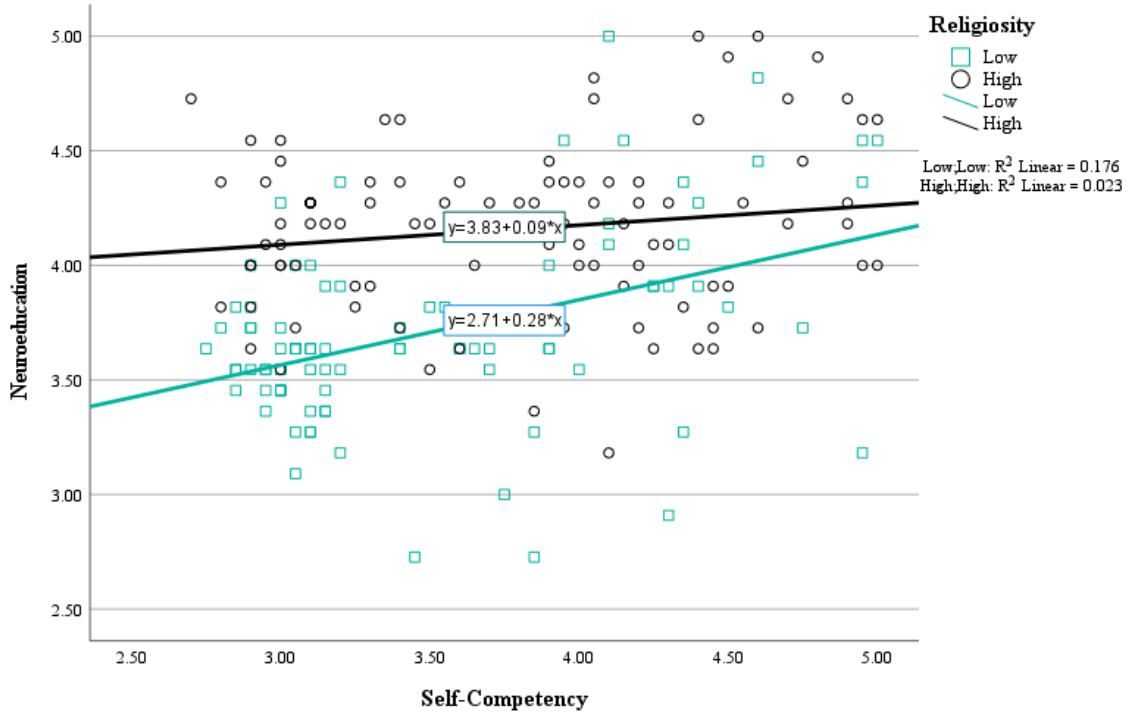
Model	Variable	*B*	*SE*	β	*p*	VIF
1						
	Intercept	3.74	0.04		.001	
	Self-competency (centered)	0.18	0.04	.25	.001	1.05
	Strength of religious beliefs [a]	0.40	0.06	.44	.001	1.05
2						
	Intercept	3.76	0.04		.001	
	Self-competency (centered)	0.28	0.06	.41	.001	2.31
	Strength of religious beliefs [a]	0.39	0.06	.43	.001	1.05
	Self-competency x strength of religious beliefs	-0.20	0.09	-.21	.023	2.23

Note. N = 186; VIF = variance inflation factor; Model 1: $F(2, 183) = 40.07$, $p = .001$, $R^2 = .305$; Model 2: $F(3, 182) = 29.07$, $p = .001$, $R^2 = .324$, $\Delta R^2 = .019$ ($p = .023$).

[a] Religiosity: 0 = *Low;* 1 = *High*.

Figure 1

Scatterplot of Regression Models Predicting Neuroeducation Based on Self-Competency Moderated by Religiosity



Note. N = 186.

RQ5 was: Is the relationship between an MHP's theoretical attitude based on their commitment level to a specific or multiple orientations and their choice regarding the use of a neuro-informed approach to trauma case conceptualization and treatment moderated by the strength of their religious beliefs? To answer this question, Table 6 displays the results of the moderated regression model. This first step of the model was significant, $F(2, 183) = 48.75$, $p = .001$, $R^2 = .348$. Both the theoretical attitude variable ($\beta = .36$, $p = .001$) and strength of religious beliefs ($\beta = .32$, $p = .001$) were significant predictors of neuroeducation. However, the inclusion

of the interaction effect in Model 2 was not significant (β = -.12 p = .255), which suggested that strength of religious beliefs did not moderate the relationship between theoretical attitude and neuroeducation. The scatterplot in separate trend lines in Figure 2 shows that for the low strength of religious beliefs condition, theoretical attitude explained 15.6% of the variance in use of neuroeducation, and in the high strength of religious beliefs condition, theoretical attitude explained 13.0% of the variance in use of neuroeducation. These findings aligned with Hypothesis 5, which suggested strength of religious beliefs would have a significant moderating effect on the relationship between theoretical attitude and neuroeducation use.

Table 5

Moderated Multiple Regression Model Predicting Neuroeducation Based on Theoretical Attitude Moderated by Strength of Religious Beliefs

Model	Variable	*B*	*SE*	β	*p*	VIF
One						
	Intercept	3.79	0.04		.001	
	Theoretical attitude (centered)	0.08	0.01	.36	.001	1.28
	Strength of religious beliefs [a]	0.29	0.06	.32	.001	1.28
Two						
	Intercept	3.81	0.05		.001	
	Theoretical attitude (centered)	0.10	0.02	.46	.001	3.32
	Strength of religious beliefs [a]	0.28	0.06	.31	.001	1.30
	Orientation X religious beliefs	-0.03	0.03	-.12	.255	2.87

Note. N = 186; VIF = variance inflation factor; Model 1: $F(2, 183) = 48.75$, p = .001, R^2 =.348; Model 2: $F(3, 182) = 32.99$, p = .001, R^2 =.342, Δ R^2 =.005 (p = .255).

[a] Strength of religious beliefs: 0 = *Low*; 1 = *High*.

Table 6

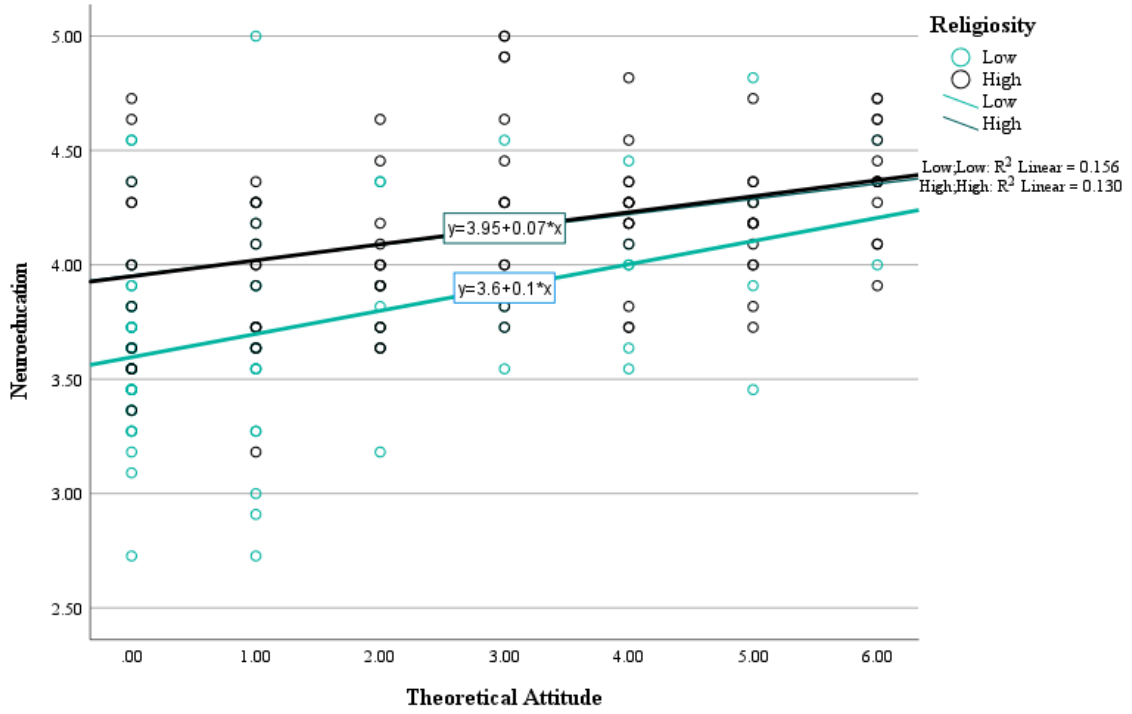
Tests for Normality Based on Professional Subgroups

Scale	Subgroup	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	*df*	*p*	Statistic	*df*	*p*
Neuroeducation							
	Psychology	0.12	108	.001	0.98	108	.134
	Spiritual care	0.11	41	.200	0.98	41	.627
	Social worker	0.07	37	.200	0.99	37	.983
Self-competency							
	Psychology	0.18	108	.001	0.91	108	.001
	Spiritual care	0.13	41	.078	0.93	41	.011
	Social worker	0.13	37	.109	0.93	37	.016
Strength of religious beliefs							
	Psychology	0.10	108	.015	0.98	108	.044
	Spiritual care	0.15	41	.015	0.91	41	.004
	Social worker	0.18	37	.006	0.89	37	.002
Theoretical attitude							
	Psychology	0.22	108	.001	0.83	108	.001
	Spiritual care	0.19	41	.001	0.89	41	.001
	Social worker	0.19	37	.002	0.89	37	.001

Note. $N = 186$.

Figure 2

Scatterplot of Regression Models Predicting Neuroeducation Based on Number of Orientations Moderated by Religiosity



Note. N = 186.

RQ6 was: Is there a between-group difference regarding the choice of neuroeducation use in case conceptualization and treatment among the subgroups of allied MHPs as delineated by the characteristic variables of self-competency, strength of religious beliefs, and theoretical attitude? To answer this question, Table 7 displays the results of the one-way MANOVA test. The Wilk's lambda statistic was significant, $\lambda = 0.797$, $F(8, 360)$ 5.40, $p = .001$, partial $\eta^2 = .107$. Using the ANOVA step-down procedure, there were almost significant differences based on professional type for use of neuroeducation with the ANOVA model ($F = 2.54$, $p = .082$), and

there were significant differences based on the Kruskal-Wallis test ($H = 7.95$, $p = .005$). Bonferroni post hoc tests showed the psychology group tended to have lower use of neuroeducation than the social worker group ($p = .078$).

Table 7

MANOVA for Selected Variables Based on Allied Mental Health Professional

Variable	Profession	*n*	*M*	*SD*	η	*F*	*p*	*H*	*p*
Neuroeducation [a]					.16	2.54	.082	7.95	.005
	Psychology	108	3.90	0.43					
	Spiritual care	41	3.93	0.53					
	Social work	37	4.09	0.40					
Self-competency [b]					.27	7.13	.001	4.94	.026
	Psychology	108	3.51	0.57					
	Spiritual care	41	3.84	0.69					
	Social work	37	3.90	0.72					
Strength of religious beliefs [c]					.26	6.71	.002	4.02	.045
	Psychology	108	3.96	0.46					
	Spiritual care	41	4.15	0.54					
	Social work	37	3.65	1.00					
Theoretical attitude [d]					.13	1.66	.193	0.51	.476
	Psychology	108	1.96	2.07					
	Spiritual care	41	2.15	1.90					
	Social work	37	2.68	2.16					

Note. $N = 186$; MANOVA= multivariate analysis of variance. MANOVA: $\lambda = 0.797$, $F(8, 360)$ 5.40, $p = .001$, partial $\eta^2 = .107$.

[a] Bonferroni post hoc tests: $1 \approx 2$ ($p = 1.00$), $1 \approx 3$ ($p = .078$), $2 \approx 3$ ($p = .354$).

[b] Bonferroni post hoc tests: $1 < 2$ ($p = .017$), $1 < 3$ ($p = .005$), $2 \approx 3$ ($p = 1.00$).

[c] Bonferroni post hoc tests: $1 \approx 2$ ($p = .271$), $1 < 3$ ($p = .024$), $2 \approx 3$ ($p = .001$).

[d] Bonferroni post hoc tests: $1 \approx 2$ ($p = 1.00$), $1 \approx 3$ ($p = .210$), $2 \approx 3$ ($p = .771$).

The ANOVA step-down procedure showed significant differences based on professional type for self-competency in both the ANOVA model ($F = 7.13$, $p = .001$) and the Kruskal-Wallis test ($H = 4.94$, $p = .026$). Bonferroni post hoc tests showed the psychology group had significantly lower self-competency than both the spiritual care group ($p = .017$) and the social worker group ($p = .005$; see Table 7).

The ANOVA step-down procedure showed significant differences based on professional type for religiosity in both the ANOVA model ($F = 6.71$, $p = .002$) and the Kruskal-Wallis test ($H = 4.02$, $p = .045$). Bonferroni post hoc tests showed the psychology group had significantly lower religiosity than the spiritual care group ($p = .024$; see Table 7). These results affirmed the sixth hypothesis, suggesting significant differences between the subgroups of MHPs related to neuroeducation use.

Additional Findings

As part of an exploratory analysis, Table 8 displays the Spearman correlations between seven demographic variables and the four primary scale scores. For the resulting 28 correlations, 11 were significant at the $p < .05$ level. The most notable correlations occurred between self-competency with age ($r_s = .51$, $p < .001$), highest education ($r_s = .44$, $p < .001$), and years of clinical practice ($r_s = .51$, $p < .001$).

Table 8

Spearman Correlations for Demographic Variables With Selected Scale Scores

Demographic variable	Scale score							
	1		2		3		4	
Gender [b]	-.08		-.11		.09		-.13	
White [c]	-.08		-.06		-.25	***	-.14	
Age	.23	**	.51	***	.15	*	.11	
Christian [c]	.03		-.10		.25	***	.03	
Highest education	.08		.44	***	.07		.04	
Years of clinical practice	.23	**	.51	***	.09		.15	*
Source of neuroeducation [d]	-.22	**	-.22	**	-.01		-.06	

Note. $N = 186$.

* $p < .05$.

** $p < .005$.

*** $p < .001$.

[a] Scale score: 1 = *neuroeducation*; 2 = *self-competency*; 3 = strength of *religious beliefs*; 4 = *theoretical attitude.*

[b] Gender: 1 = *female*; 2 = *male*.

[c] Coding: 0 = *no*; 1 = *yes*.

[d] Source: 1 = *graduate coursework*; 2 = *professional development*; 3 = *exposure from articles*; 4 = *no training or exposure*.

Summary

This study used survey data from 186 respondents to query a sample of MHPs regarding neuroeducation use and identify a potential correlation between their self-competency, theoretical attitude, and strength of religious beliefs and their choice of whether to integrate

neuroeducation with case conceptualization and treatment planning for trauma. Further, the researcher aimed to identify if strength of religious beliefs had a moderating effect on the correlative relationship between an MHP's self-competency and theoretical attitude and their choice regarding the use of neuroeducation. A third purpose of this research was to identify differences among three segments of MHPs related to each group's composite level of inclination to integrate neuroeducation in counseling practice based upon the correlative results of the three predictor variables. For Research Question 1, a significant positive correlation emerged between self-competency and use of neuroeducation (see Table 3). For Research Question 2, a significant positive correlation emerged between strength of religious beliefs and use of neuroeducation (see Table 3). For Research Question 3, a significant positive correlation was found between theoretical attitude and use of neuroeducation (see Table 3). For Research Question 4, strength of religious beliefs was found to moderate the relationship between self-competency and use of neuroeducation (see Table 4 and Figure 1). For Research Question 5, strength of religious beliefs was found not to moderate the relationship between theoretical attitude and use of neuroeducation (see Table 5 and Figure 2). For Research Question 6, significant differences were found between the three groups of professionals, with the psychology group having lower self-competency than either of the other two groups and the psychology group having lower religiosity than the spiritual care group (see Table 7). In the final chapter, the researcher compares these findings to the literature, draws conclusions, discusses implications, and makes a series of recommendations.

CHAPTER FIVE: CONCLUSIONS

Overview

The results of this study showed MHP characteristic variables have a statistically significant effect on their choice to use neuroeducation, and one finding suggested strength of religious beliefs could have a moderating effect on the relationship between self-competency and neuroeducation use. In this chapter, the researcher elaborates on the meaning of the results through a systematic review and discussion of the research questions by considering the outcomes of the data analysis, making comparisons with previous studies, and engaging the current conversation concerning neurointegration in the literature. Further, the chapter addresses implications and conclusions regarding clinical practice, counselor education, and research. The researcher examines the findings through the lens of a Christian worldview, which provides for additional implications and interpretations of results. Some threats regarding internal and external validity existed in this research, so potential impact and mitigation steps are also addressed. Based on the composite of these findings and assertions, the researcher makes recommendations regarding key findings and future research. A summary of the research questions and results appears first.

Discussion

Summary of Findings

The purpose of this research was to continue and inform the discussion regarding the integration of neuroscience into counseling and therapy. In this section, the researcher reviews this study's findings by presenting each research question and offering a brief review of how the results answered these queries. The purpose of this study is further explicated through the research questions that postulated (a) a relationship between various MHP characteristic

variables and the use of neuroeducation, (b) an interaction effect of strength of religious beliefs in the relationship between the other predictor variables and neuroeducation use, (c) and the presumed difference between segments of the mental health profession regarding neuroeducation use.

RQ1 was: Is there a relationship between an MHP's self-competency based on education and their choice regarding the use of neuroeducation in trauma case conceptualization and treatment? The results of the study indicated a positive relationship between a counselor or practitioner's level of self-competency and the level of importance they place on using neuroeducation in client case conceptualization and treatment, as seen through the positive Pearson (r = .35, p = .001) and Spearman correlations (r_s = .35; see Table 3). Thus, an MHP with a high level of self-competency based on education is likely to consider the use of neuroeducation as an important factor in case conceptualization and treatment.

RQ2 was: Is there a relationship between an MHP's strength of religious beliefs and their choice regarding the use of neuroeducation in trauma case conceptualization and treatment? The findings suggested a positive yet weakly correlated relationship between an MHP's strength of religious beliefs and their prioritization of using neuroeducation to theorize, comprehend, and devise a treatment plan for clients. This was seen through significant positive correlations between neuroeducation and strength of religious beliefs using both the Pearson correlation (r = .37, p = .001) and the Spearman correlation (r_s = .49; see Table 3). Thus, an MHP with stronger levels of religious beliefs is likely to suppose neuroeducation as an important component of case conceptualization and treatment.

RQ3 was: Is there a relationship between an MHP's theoretical attitude based on their commitment level to specific or multiple orientations and their choice regarding the use of a neuro-informed approach to trauma case conceptualization and treatment? The findings suggested a strong positive correlation between having a diversified outlook toward the use of numerous theoretical orientations and expressing a higher level of importance regarding the use of neuroeducation as a neuro-informed approach for client case conceptualization and treatment. This was expressed through the MHPs' identification with numerous approaches and a higher measure of communicated intent to use these different approaches in the conceptualization and treatment of client problems, as noted by the significant positive correlations between neuroeducation and theoretical attitude using both the Pearson correlation (r = .52, p = .001) and the Spearman correlation (r_s = .55; see Table 3). Thus, an MHP with a higher probability of integrating various theoretical orientations would also tend to integrate neuroeducation into case conceptualization and treatment frameworks.

RQ4 was: Is the relationship between an MHP's self-competency based on education and their choice regarding the use of neuroeducation moderated by the strength of their religious beliefs? The results of the moderated regression model suggested strength of religious beliefs had a moderating effect on the relationship between an MHP's self-competency and choice regarding the use of neuroeducation in clinical practice. Both the self-competency variable (β = .25, p = .001) and religiosity (β = .44, p = .001) were significant predictors of neuroeducation. The inclusion of the interaction effect of strength of religious beliefs was also significant (β = -.21 p = .023), which added 1.9% to the explained variance (see Table 4). Thus, an MHP with strong religious beliefs would likely experience an interaction effect with high levels of self-competency resulting in a firmer inclination to use neuroeducation in clinical practice.

RQ5 was: Is the relationship between an MHP's theoretical attitude based on their commitment level to specific or multiple orientations and their choice regarding the use of a neuro-informed approach to trauma case conceptualization and treatment moderated by the strength of their religious beliefs? The outcome of the analysis suggested strength of religious beliefs had no moderating effect on the relationship between an MHP's theoretical attitude and their choice regarding the use of neuro-informed approaches to case conceptualization and treatment. Although both the theoretical attitude variable ($\beta = .36$, $p = .001$) and strength of religious beliefs variable ($\beta = .32$, $p = .001$) were significant predictors of neuroeducation, the inclusion of the interaction effect within the model did not result in a significant moderating effect ($\beta = -.12$ $p = .255$; see Table 5). Thus, an MHP with stronger religious beliefs would not likely experience an associated influence on their theoretical attitude pertaining to the use of neuroeducation in case conceptualization and treatment.

RQ6 was: Is there a between-group difference regarding the choice of neuroeducation use in case conceptualization and treatment among the subgroups of allied MHPs as delineated by the characteristic variables of self-competency, strength of religious beliefs, and theoretical attitude? The findings indicated statistically significant differences between the noted segments of the mental health profession related to their choice regarding neuroeducation use based on the correlated interaction of self-competency, strength of religious beliefs, and theoretical attitude. The results of the one-way MANOVA test and subsequent ANOVA step-down procedure demonstrated this finding. The Kruskal-Wallis test and Bonferroni post hoc tests verified the strength of differences between the segments (see Table 7). Thus, MHPs from the different segments of the mental health field will likely display variations in neuroeducation use in clinical

practice. Further, an MHP from the psychology segment could portray lower self-competency and religiosity than professionals from other groups.

Support From Literature

The researcher answered five out of six research questions in the affirmative and found four out of six research hypotheses to be statistically significant. Results associated higher levels of self-competency, strength of religious beliefs, and theoretical attitude among MHPs with a stronger intention to use neuroeducation, a finding supported by the literature (Demir & Gazioglu, 2017; Poznanski & McLennan, 1995). Further, greater levels of strength of an MHP's religious beliefs were found to moderate or reduce the level of variance explained by self-competency in its relationship with neuroeducation use—a concept further supported by previous research (Bilgrave & Deluty, 2002; Blair, 2015). The finding that strength of religious beliefs had no interaction effect on the relationship between theoretical attitude and neuroeducation use contradicted the literature. Further, no previous research had been conducted regarding the between-group difference related to the use of neuroeducation among the three subgroups of this study. Finally, previous literature supported the less significant themes of neuroscience training and education and counselor competence and identity (Kim & Zalaquett, 2019). The data concerning the predictor variables was highly important in this study.

Characteristic Variables

Self-Competency. The researcher used the CSES to determine the level of self-competency for respondents because it was developed to reflect education as the primary discriminator. The researcher correlated the results with the respondents' scores on the Wood Scale, which portrayed the importance level each respondent placed on the use of neuroeducation in case conceptualization and treatment planning. Findings indicated a positive moderate

correlate linear relationship between the variables, with a Pearson's *r* of .35 significant at the .001 level (2-tailed). The mean self-competence score among participants was 3.66 (out of 5), and the mean neuroeducation use score was 3.95 (out of 5). These results suggested that a higher level of self-competence based upon supportive education would influence an MHP's likelihood to consider neuroeducation as an important aspect of understanding and treating trauma clients.

The moderate linear relationship and the summated scale score ($M = 3.66$) for self-assessed competency represented a mutually supportive relationship between these variables. This result could suggest the higher the self-competency and strength of identity as an MHP, the more likely the professional would use neuroeducation in clinical practice. A further inference is possible. Perhaps a broad base of knowledge related to conceptualizing a client, their problem, and the available theoretical approaches to treatment would be predictive of a greater propensity for the integration of emerging research and practice standards. Supporting research has suggested an association between counselor training in neuroscience and the depth to which they are likely to apply neuro-informed principles and neuroeducation in case conceptualization and treatment (Field, Beeson, et al., 2019). Conversely, Beeson, Field, et al. (2019) found the absence of neuroscience education equated with no awareness of the RDoC, an important tool to link research and clinical practice. Interestingly, Crameri et al. (2020) found therapists' training and theoretical attitude acted as mutually supportive predictors of practice approaches.

Although counselor education influences professional identity (Beeson, Field, et al., 2019), the researcher found no studies supporting the idea that neuroscience training would compromise an individual's distinctiveness as a professional. Yet, some researchers have posited that the delineation of neuroscience integration through neuroeducation could result in enhanced counselor identity and provide the foundation for a prudent counselor scope of competence

(Luke et al., 2020). Notably, some MHPs have been reluctant to integrate neuroscience into case conceptualization and treatment in an informed and ethically competent manner (Field, Beeson, et al., 2019; Kim & Zalaquett, 2019; Luke et al., 2020). Results of the current research suggested the broad-spectrum application of neuroscience training into psychology and counselor training could enhance professional self-competence, quell concerns about unethical practices, and enhance treatment by providing an additional lens through which to understand and treat clients. This current study demonstrated that MHPs from diverse segments of the field with disparate theoretical orientations were inclined to integrate neuroscience at levels predicted by their self-competency based on education. The researcher also determined the aspect of religiosity to be important.

Strength of Religious Beliefs. The DRS self-report instrument measured the dimensions of religious preoccupation, guidance, conviction, and emotional involvement (Joseph & DiDuca, 2007). The correlative results, when tested against the Wood Scale for neuroeducation use, produced a Pearson's *r* effect size of .37. This finding suggested a moderate correlation, yet the relationship was found to be significant at the .001 level (2-tailed). Higher scores on the DRS (maximum five per item) would suggest a higher level of strength of religious beliefs, which was thought to result in a strong effect on the decision to use neuroeducation in clinical practice. The mean DRS score of 3.94 reflected an overall above-average strength of religious beliefs among the population sample. The results suggested MHPs with stronger religious beliefs were more inclined to use neuroeducation, and those with lower scores were less inclined but only minimally so. These findings were supported by a review of research articles suggesting a psychotherapist's religion and spirituality positively related to an attitude that supported theoretical integration in therapy (Cummings et al., 2014).

Supportive research suggested religious- and spirituality-related education influenced the therapist's self-competency and ultimate choice to integrate aspects of religion or spirituality in clinical sessions (Bilgrave & Deluty, 2002; Blair, 2015; Cummings et al., 2014). Measures of religiosity have long been a consideration in psychology and counseling research, often in relation to the client. Research has demonstrated the practitioner's religiosity also represents an important variable (Blair, 2015; Duggal & Sriram, 2021). Interestingly, within this study, most respondents self-identified as being associated with a certain religious affiliation (97.8) and subsequently scored high on strength of religious beliefs (M = 3.94). Although the researcher determined discriminants of low and high religiosity (see Tables 1 and 2), further research is necessary to ascertain the comparative results for MHPs who have no religious beliefs and the effect that has on the use of neuroeducation or neuroscience in general. Additionally, certain population demographics may have led to skewed results, such as religion (Christian, 90.9%), race/ethnicity (Caucasian, 88.2%), and the limited representation of certain theoretical orientations such as feminist (8.1%) and humanist/existential (9.7%).

Theoretical Attitude. The TOPS-R measure tested respondents' level of loyalty to six major theoretical orientations associated with (a) professional identification, (b) use in case conceptualization, and (c) the extent to which they would devise treatment aligned with each approach. The researcher measured these results for correlation with the Wood Scale scores, and the analysis suggested a moderate positive relationship with a Pearson's r effect size of .52, significant at the .001 level (2-tailed). A higher overall score across the six scales (M = 7.07) indicated a greater eclectic or integrative theoretical attitude among MHPs who supported neurointegration via neuroeducation use as expressed by the positive correlative relationship.

The findings further suggested those with a strong allegiance to one or a few theoretical orientations tended to be less likely to integrate neuroscience with clinical practice.

These analytical results align methodologically with research suggesting factors that affect the choice of orientation may be delineated as personal and professional variables (Demir & Gazioglu, 2017; Poznanski & McLennan, 1995). Such characteristic variables have already been noted, and although neuroeducation is not a theoretical orientation, it represents the theoretical lens of neuroscience, which has been found effective in enhancing empirically substantiated clinical approaches (Field, Beeson, et al., 2017; Miller et al., 2020). Relatedly, the significant results are methodologically congruent with Kim and Zalaquett's (2019) use of characteristic variables as measures of relationship with the intention to apply neuroscience among undergraduate students. Their work verified knowledge and attitude as important influencing factors regarding the application of neuroscience, thus supporting the results of this research that self-competency based on education and theoretical attitude influences the MHP's likelihood to use neuroeducation.

Additionally, this study showed that theoretical attitude was the greatest predictor of neuroeducation use (r =.52) when compared with the predictors of self-competency (r = .35) and strength of religious beliefs (r = .37; see Table 3). These findings align with research indicating a psychotherapist's theoretical orientation would have the greatest influence on their attitude toward practice when compared to other variables (Larsson et al., 2010; see also Barrio Minton & Myers, 2008). This finding suggests that MHPs who consider numerous theoretical orientations when conceptualizing and selecting treatment for clients are more likely to integrate neuroscience into their clinical practice. Thus, neuroscience, presented in curricula as an overarching tool to enhance client conceptualization and treatment, may naturally enhance

educational and training institutions that provide curricula on a diverse set of psychological orientations. Recent literature supported the results of this work pertaining to the first three research questions. As an emerging area of interest in the field of counseling, neuroscience (and, by association, neuroeducation) represents important concepts to consider for future research, education, and clinical practice (Beeson & Field, 2017).

Neuroeducation

The positive correlations between neuroeducation and the predictor variables and the high average score on the Wood Scale (M = 3.95) validated the assumption that neuroeducation is a valued tool in treating trauma clients. Numerous research findings supported these results. First, research has affirmed the value to the client that results from a neuroeducation approach that informs, educates, provides a common and descriptive language, and facilitates interaction between the client and the counselor or therapist (Field, Beeson, et al., 2019; Miller, 2016; Ward et al., 2017). Further, researchers have suggested that a neurointegrative approach is necessary for an MHP to conceptualize a client's issue in a balanced way that considers and moves beyond emotional, cognitive, and behavioral expressions (Busacca et al., 2015; Field, 2019). Supportively, Solms (2020) prompted two requirements for psychological theories: they must explain what people experience in their consciousness and provide a framework for understanding the internal processes that brought about the interruption of homeostasis. The neurobiological underpinnings of such internal psychological processes have been validated through recent research in the cognitive neuroscience field (Goncalves & Perrone-McGovern, 2016). Thus, neuroeducation may mediate neuroscience integration into therapy in a way that deepens the conceptualization of the counselor, informs the client of the underlying processes that are producing symptoms, provides fodder for client and clinician interaction, and offers a

neuro-informed roadmap for treatment that anticipates a shared therapeutic journey. Although not primary variables within this study, MHP education and training represent foundational elements of the discussion and indicate the breadth of neuroscience integration.

Education and Training

The inclusion of neuro-informed principles in counselor and psychology training, research, and practice has risen in popularity over the past decade, as demonstrated in Chapter 3 (Beeson, Field, et al., 2019; Busacca et al., 2015; Duenyas & Luke, 2019; Kim & Zalaquett, 2019; Louw et al., 2021; Russo et al., 2021). Yet comprehensive standards for the integration of neuroscience have yet to be identified and distributed to the field (Busacca et al., 2015). Future researchers should consider this issue. The results of this study have demonstrated that self-competency has a positive correlation with an MHP's choice to use neuroeducation ($r = .35$). Further, considering the strong relationship between an MHP's self-competency based upon education and the nonparametric correlative results measured with the demographics of education level ($r_s = .44$, $p < .001$), age ($r_s = .51$, $p < .001$), and years of practice ($r_s = .51$, $p < .001$; see Table 8), education, maturity, and experience have been demonstrated as important variables of an MHP's sense of self-efficacy.

An inference could be made that the earlier the inculcation of a neuroscience curriculum into college and university psychology and counseling programs, the more significantly the training will lead to an integrative methodology used within the mental health profession. Interestingly, 48.9% of respondents in this study reported they received training on neuro-informed topics through courses or seminars offered outside of formal institutions, and 26.9% of participants reported gaining their knowledge of neuroscience through formal educational programs, a finding supported by Russo et el. (2021). This could reflect a desire within the field

to incorporate neuroeducation into practice that may not be currently supported through formal counselor training programs. This supposition stems from the median age (29.50 years) of respondents in this research, intimating younger mental health professionals experienced no or minimal exposure to neuroscience training during their degree programs. These findings were supported by Busacca et al. (2015), who noted a paucity of neuroscience curricula in counselor training programs, and Luke et al. (2020), who called for additional research on the integration of neuroscience as a prerequisite for determining training standards. Additionally, Russo et al. noted a trend within the field of counselors to seek opportunities for continued education pertaining to neuroscience-based competencies. Higher levels of MHPs, including psychiatrists, psychologists, and psychoanalysts (46.3% of respondents), would reasonably have been exposed to neuroscience training as part of their programs, yet they have been found to struggle with the role of neuroscience in case conceptualization and the framing of educational requirements (Russo et al., 2021; Ward et al., 2017).

The outcome score of the Wood Scale (M = 3.95) represented the high-level importance respondents placed on the use of neuroeducation as illustrative of neuroscience integration with counseling. The correlation between neuroeducation and self-competency based on education (r = .35) and theoretical attitude (r = .52) indicated a need to identify standards for neuroscience training and treatment in counseling programs at academic institutions. These findings are supported by the work of Jones (2017), who described neuroscience as a foundational discipline that could serve as a metatheory for counseling efforts, and Field, Beeson, et al. (2019) and Miller (2016), who noted a need for research clarifying the association of neuroeducation with neuro-informed practice standards. Neuroeducation, represented within this work, included the following neuroscience principles: (a) brain structure and function (Kim & Zalaquett, 2019;

Luke, 2020; McHenry et al., 2014; Russell-Chapin, 2016); (b) neuroplasticity (Flordellis & Kyriazis, 2012); (c) autonomic nervous system (Jones, 2017); (d) psychological homeostasis (Briere & Scott, 2015; Hall & Walker, 2017); and (e) neurodevelopment (Malarbi et al., 2017). These principles represent the heuristic nature of neuroscience in the literature, which could serve as the impetus for educators, researchers, and MHPs to pursue integrative standards for the conceptualization and treatment of clients and their problems (Cantor et al., 2019; Luke et al., 2019). Various findings contradict previous research.

Contradictions With Literature

The researcher noted various points of inconsistency with previous research related to neurointegration, religiosity, theoretical orientation, neuroeducation, education, and the reductionist viewpoint. Whereas previous researchers suggested about half of the population of counselors utilized a neuro-informed approach in the conceptualization and treatment of clients (Field, Beeson, et al., 2019), this current study suggested most MHPs recognize the importance of a neuro-informed approach (M = 3.95). This distinction could be attributed to research population differences or the variance between a focus on specific diagnoses and broad neuro-informed conceptualizations and this study's narrow concentration on the use of neuroeducation in trauma treatment. Additionally, numerous studies showed religion has a moderating effect on personal variables (Chaboki & Safara, 2021; Gyasi-Gyamerah & Akotia, 2016) and has a significant impact on a therapist's theoretical orientation (Bilgrave & Deluty, 2002; Cummings et al., 2014; Duggal & Sriram, 2021). Yet this current study suggested a weak correlation (r .28) between an MHP's strength of religious beliefs and their loyalty to specific theoretical orientations. It also showed no correlation (r -.07) between religious beliefs and self-competency. Furthermore, the data supported no moderating effect of strength of religious

beliefs on the relationship between theoretical attitude and neuroeducation use and a minimal (3%) moderating effect between self-competency and neuroeducation use (see Table 5). These contradictions with the literature could relate to the disparity between the operational definitions of religiosity or religious beliefs within the literature or the distinct approach of the DRS to measure the strength of only certain dimensions of religiosity. Because religiosity was the main result that lacked congruence with other research findings, the researcher analyzed it in further detail.

Religiosity Effects

Despite theoretical attitude and strength of religious beliefs being significant predictors of neuroeducation (see Table 3), the results showed that an MHP's strength of religious beliefs had no moderating effect on the relationship between their theoretical attitude and choice regarding neuroeducation use. Outcomes demonstrated a diminished interaction effect. When the strength of religious beliefs was low, the variance of interaction was 15.6%. However, when the strength was high, the variance dropped to a 13% effect size (see Figure 2). These results contrast research suggesting religious beliefs have a significant impact on a therapist's theoretical orientation (Bilgrave & Deluty, 1998, 2002; Cummings et al., 2014; Duggal & Sriram, 2021). Within this work, 97.8% of respondents self-associated with some type of religious tradition and reported a strong sense of religious beliefs (M = 3.94).

This difference may be associated with the strength of the cognitive domain of function (focus on science) dominating the theoretical attitude of MHPs as promoted via a particular school of psychology. Cummings et al. (2014) associated the tendency for therapists to integrate religion and spirituality into practice with their personal level of beliefs or affiliation with a tradition. Some MHPs may compartmentalize religious beliefs as separate from standards of

practice and neurointegration despite the research that indicates religious worldview can operate as a steering mechanism of theoretical orientation relating to conceptualization and treatment of clients (Cummings et al., 2014). These differing results may also, in part, relate to a historical hesitancy to engage with the spiritual or religious domain in counseling or therapy (Worthington & Aten, 2009). One study showed the association between religious commitment and theoretical orientation to be nonexistent (Kellems et al., 2010). Other explanations for this difference could involve the fact this is the first study to consider the moderating effect of strength of religious beliefs on the relationship between theoretical attitude and neuroeducation use. Additionally, it was the first study to include spiritual caregivers as part of the mental health profession, and the DRS is a decidedly Christian measure of religiosity. Although the results associated theoretical attitude with neuroeducation in this work, some less significant inconsistencies with previous studies merit mention.

Theoretical Orientation

Results suggested that most MHPs identify with psychoanalytic/psychodynamic (25.8%), cognitive behavioral (22%), and family systems (21.5%) practices, yet Norcross and Wompold (2011) found the top American MHP theoretical orientations were integrative and cognitive (24% each). Relatedly, Rihacek and Roubal (2017) suggested most counselors could generally be identified as integrationists. More consistently, Norcross and Wompold found 9% of respondents selected humanistic approaches, and in this current study, 9.7% of respondents identified as humanistic/existential. One potential reason for the discrepancy is this study included spiritual care providers in the population of interest, whereas Norcross and Wompold included only psychology and social work professionals. Further, Bilgrave and Deluty (1998) found psychologists who ascribed to Christian beliefs typically endorsed a cognitive-behavioral

orientation, and those who acknowledged mystical and Eastern beliefs often adopted humanistic and existential orientations. Notably, the population in the current study identified as 90.9% Christian and 3.8% Buddhist and Hindu (see Table 1). A final consideration for differences is that a portion of respondents may have come from regions throughout Europe.

The diversity of self-acclaimed theoretical orientations in this study was broad, and greater than 95% of respondents acknowledged training in neuroscience (see Table 1). These results led to the inference that theoretical attitude positively associated with an MHP's choice to use neuroeducation in case conceptualization and treatment. Other research has shown various barriers to neurointegration to be prominent, such as competing theoretical standpoints, epistemological assumptions, and curricular frameworks (Busacca et al., 2015). Additionally, researchers have identified impediments as deeply held beliefs or attitudes loyal to the concept of person-centered counseling or to educational or training-based theoretical frameworks (Barrio Minton & Myers, 2008; Beatty et al., 2007; Crameri et al., 2020; Cummings et al., 2014; Wilkinson, 2019). In this current study, the researcher did not discover any such hindrances across the broad segments of the mental health profession. This could be related to the case diagnosis of trauma used in this study, the criterion variable of neuroeducation, or a perceived need by the respondents to connect the two as a supportive measure of the research. Neuroeducation as an emerging construct was central to this work. The concept is understudied, so the researcher expected some inconsistencies might surface.

Distinctiveness of Neuroeducation

Neuroeducation is a contemporary term with a distinctive meaning emerging from the recent trend toward neurointegration with counseling and the approach of neurocounseling (Field, Jones, et al., 2017; Luke, 2020; McHenry et al., 2014; Miller, 2016). The participants in

this study displayed a recognition of neuroeducation and a positive inclination to integrate. The first question of the Wood Scale, which measured neuroeducation, addressed the importance of neuroeducation use in trauma cases. The high level of responses (M = 4.04) suggested broad support for this concept in case conceptualization and treatment. Further, as noted earlier, the three predictor variables were positively correlated with the use of neuroeducation (see Table 3), which the Wood Scale portrayed as the targeted focus on neurological processes with the intended outcome of distress reduction. These findings stand in contrast with the theoretical work of Wilkinson (2019), who described psychoeducation and neuroeducation as the same, suggesting the latter was unnecessary because it brought nothing new to clinical engagement. Yet researchers should consider the implication of the structure of these terms, neuroscience and neuroeducation, specified. The Wood Scale included five neuro-informed principles to differentiate between psychological and neurological aspects of conceptualization and treatment. Perhaps there is more than semantics at play here. Professional standards organizations (American Psychiatric Association, 2013; AMHCA, 2021; CACREP, 2015; NIMH, n.d.) have noted the importance of the contemporary neuroscience lens for clinical practitioners, and recent research has borne out the benefits and uses of this differentiated outlook (Anarsi et al., 2012; Kim & Zalaquett, 2019; Luke et al., 2019; Miller, 2016; Miller & Barrio Minton, 2016). The result of this research adds weight to the distinction between these therapy and counseling constructs, not as a means of replacement but as an additional lens through which to understand the client. Counselor education rightly represents a central point of concern in the neurointegration discussion.

Education and Training

This first-time consideration of a research sample population from the broader mental health field has suggested that although there may be inadequate neuroscience curricula in formal counselor training programs (26.9% of sample), over 60% of the sample identified exposure through professional development and research options as their primary source of neuroscience knowledge. This finding contrasts with the findings of Luke et al. (2019), who found limited opportunities for continuing education related to neuroscience within the professional mental health community. Miller et al. (2020) likewise noted a current knowledge and training deficit among counselors pertaining to neurobiologically informed conceptualization and treatment. These differences may relate to the sample population utilized in each study, or they may reflect an increase in neuroscience interest and online or in-person training opportunities in recent years. Additionally, the increase in availability may reflect a recent acknowledgment of required training standards from professional psychology and counseling organizations and agencies. There has been little research related to the use of neuroscience or neuroeducation by clinical social workers or spiritual caregivers. This study showed a commensurate level of interest and training in these areas among members of all segments of the population sample, an unexpected result based on this researcher's assumption. Researchers conducting conceptualized studies of neurointegration have noted tension over the concern that such an application of neuroscience could reduce the person-centered practice of counseling and the client to merely a scientific framework (Wilkinson, 2018, 2019), but the broader literature did not support this point.

Reductionistic Viewpoint

Although this researcher did not investigate the concern of a reductionist viewpoint pertaining to the use of neuroscience, the results of this study suggested a broad acceptance of the use of neuro-informed principles among mental health professionals: psychologists (M = 3.90); spiritual care workers (M = 3.93); and clinical social workers (M = 4.09). These results may suggest the scientific nature of neuroeducation was not a decisive or divisive factor that reduced the MHP's understanding of the client, the selection of treatment, or the relational aspects of the engagement. This inference would apply to the subgroups of social workers, spiritual care providers, and psychology professionals. Trauma and PTSD represent inherently complex psychological and physiological constructs, yet interestingly, the results suggested the psychology subgroup tended to have lower use of neuroeducation than the clinical social worker subgroup (p = .078; see Table 7). This could suggest that psychiatrists, psychologists, and LPCs are more inclined to utilize neuro-informed principles in case conceptualization and treatment planning than chaplains and social workers. This slight differentiation could relate to a greater loyalty to certain theoretical orientations among those practicing psychology than among clinical social workers. All theoretical orientations contain threads of neuro-informed principles; therefore, the brief operational definition offered on the survey scale might have been inconsistent with the respondent's orientation. Thus, the use of a mixed-method design with a qualitative interview could result in slightly different outcomes.

The appearance of these near-neutral results among diverse subgroups intimates little tension exists pertaining to reductionism. This assertion contrasts with Wilkinson's (2018) conceptual argument warning that the complex phenomenon of human experience could not be explained by neuroscience concepts alone, as if that was the intent or characterized application of

neurointegration. Ward et al. (2017) further reported concern that neurointegration could eventually render psychology a field of biological constructs. Additionally, Sehgal Cuthbert (2015) proposed this tension, framed as a deterministic outlook, had the potential to remove autonomy and responsibility from the person. Whereas Sehgal Cuthbert's concern pertained to the field of education, there appeared a close association with Wilkinson's (2019) concern for reductionism related to counseling. Considering the available research on the integration of neuroscience with counseling, few studies have elaborated on the concern of reductionism. The concept of neurointegration with counseling is comparatively new; thus, the results of this research add new insights into the ongoing discussion in the literature.

New Contributions to Research

This study offered the first consideration of a sample population from the broader field of MHPs that included psychology professionals, spiritual care providers, and licensed clinical social workers. Researchers in previous studies had considered limited segments of the allied mental health profession and students in their population samples (Field, Beeson, et al., 2019; Kim & Zalaquett, 2019; Luke et al., 2020). In this study, the researcher assumed a significant disparity would exist among the three represented segments of mental health professionals pertaining to their respective relationships with neuroeducation use. The Wilk's lambda statistic displayed significant between-group differences ($\lambda = 0.797$, $F(8, 360)$ 5.40, $p = .001$, partial $\eta^2 = .107$) as did the Kruskal-Wallis test ($H = 7.95$, $p = .005$), and the ANOVA step-down procedure portrayed almost significant differences ($F = 2.54$, $p = .082$) regarding the importance level placed on neuroeducation use in the three subgroups. Although these findings for psychology professionals (58.1% of the sample) were consistent with those of Field, Beeson, et al. (2019), these data, although limited in scale for spiritual care providers (22%) and licensed clinical social

workers (19.9%), bring new information to the discussion of neurointegration with counseling. This information may be valuable for seminaries, chaplain training organizations, and clinical social work programs pertaining to the interest in neuroscience among constituents and the development of curricula. Future researchers should consider a larger sample size for these segments to test these results.

Other key findings included the fact licensed clinical social workers placed a slightly higher level of importance on the use of neuroeducation (M = 4.09) in case conceptualization and treatment than psychology professionals (M = 3.90), according to the Bonferroni post hoc tests (p = .078). Interestingly, licensed clinical social workers also reported a higher degree of self-competency (M = 3.90) and theoretical attitude (M = 2.68) than did the psychology professionals (M =3.51; M = 1.96) and spiritual care providers (M = 3.84; M = 2.15). Although the sample of licensed clinical social workers was lower (N = 37) than the psychology professionals segment (N = 108), it was well correlated with the spiritual care providers (N = 41) subgroup. Further, although expectantly, the mean score for spiritual care providers on strength of religious beliefs was the highest (M = 4.15), licensed clinical social workers' reflected the lowest score (M = 3.65). These results offer the first data suggesting licensed clinical social workers and spiritual care providers consider neuroeducation specifically and neuroscience generally at a level comparative to psychology professionals; they also validate the influence of characteristic variables on neuroscience use. All significant differences pertaining to between-group predictor variables were confirmed via the ANOVA model and the Kruskal-Wallis and Bonferroni post hoc tests (see Table 7).

The composite of the above findings supports the work of Bingaman (2016), who proposed a mixture of theological and phenomenological theoretical orientations had been used

by pastoral counselors to consider the client's inner world at a deeper level (Bingaman, 2016). In this case, the term "deeper level" refers to the neuro-informed heart and mind concepts of the individual. This suggests the dearth of previous research does not imply an inattention to neurointegration by licensed clinical social workers or spiritual care providers in practice, only that they have been underrepresented in studies. Thus, some researchers have assumed psychologists and psychotherapists represent the portion of the allied mental health field who have embraced neuroscience integration at a level that might exceed other subgroups (Hook & Vera, 2020; Ward et al., 2017; Weiskopf, 2016), these results indicate the exposure to and appreciation for neurointegration may be comparable. A larger study is needed to confirm these findings.

Researchers have noted but have not pursued MHP characteristic variables and their influence on the choice to use neuroscience and neuroeducation in their studies (Field, Beeson, et al., 2019; Luke et al., 2020). Although Cummings et al. (2014) alternatively examined the relationship between therapist religiousness and client-variables, this current study is the first to focus on MHP variables related to neurointegration. The outcomes of this work indicate the characteristic variables of self-competency, strength of religious beliefs, and theoretical attitude have a positive correlation effect on the MHP's choice regarding neuroeducation use as demonstrated by the positive Pearson *r* of .35 (moderate), .37 (moderate), and .52 (strong), respectively (see Table 3). All correlations were found to be significant at the .0001 level (2-tailed). These results suggest psychology and counselor education, which supports self-competency, should include robust neuroscience-informed curriculum to meet the proposed professional standards of the field. Further, greater diversification in exposure to theoretical orientations could nurture integrationist mindsets that would promote a willingness among

MHPs to inculcate neuro-informed principles into their conceptualization of client problems and treatment planning. A decrease in loyalty to a single or limited number of approaches may result in a broader need-based therapy approach that includes the wider lens of internal nervous and endocrine system disruptions manifested through physiological symptoms. Finally, the importance of religious beliefs or religiosity has been generally consistent in psychology and counseling research and practice standards. This initial research using the strength of religious beliefs as a predictor of neuroscience use among MHPs further validates the topic in the classroom and clinical setting.

The final relevant contribution to new research made by this study involves the examination of the integration of neuroeducation into trauma case conceptualization and treatment. Miller (2016) focused on neuroeducation in their work, and Field, Beeson, et al. (2019) considered the measure of neuroscience conceptualization in depression cases, but this current study utilized neuroeducation as representative of neuroscience and provided a real-life trauma case as the impetus for respondent answers. Such a conceptual approach benefited the investigation of various segments of the mental health profession as a tertiary means of assessing common knowledge, language, and multilayered conceptualization of a complex phenomenological presentation of human experience (Luke et al., 2019; Miller, 2016; Ward et al., 2017). The use of a real-life trauma case review represents an added layer of newness to the literature. This approach may have promoted a clinical mindset within MHP respondents that could have encouraged a practice-oriented approach to the research survey.

Alignment With Theoretical Frameworks

A theoretical focus for this work was to demonstrate the value of integrating relevant neuro-informed principles with existing practices of case conceptualization and treatment

planning. Various researchers have suggested an emerging fluidity regarding the integration of theoretical and conceptual frameworks by MHPs (Barrio Minton & Myers, 2008; Poznanski & McLennan, 1995; Tryon, 2016; Worthington & Dillon, 2003). Further, after affirming this trend, Ward et al. (2017) promoted the additional need for a neuro-informed approach that includes a wider representational view of the client's subjective inner space. Supportively, Busacca et al. (2015) asserted a need for an objective underpinning framework that would provide a deeper understanding of client phenomenology and case conceptualization through which other theoretical approaches to counseling could be viewed. The results of this research suggest neuroscience application, as represented using neuroeducation related to various neuro-informed principles, aligns with higher levels of self-competence, theoretical attitude, and strength of religious beliefs among MHPs, a viewpoint supported by the literature (Bilgrave & Deluty, 1998; Blair, 2015; Crameri et al., 2020). Importantly, the addition of neuroscience as a tool for practitioners and counselors has been found congruent with a client-centered approach.

Norcross and Wampold (2011) emphasized the individuality of patients and their present contexts as critical precursors for treatment; merely matching a therapeutic orientation to a diagnosis contradicts current research findings. In other words, the competent therapist or counselor must possess a theoretical attitude that is flexible enough to meet the patient at the point of their contextual need (Duncan et al., 2010). The incorporation of neuroscience with counseling and therapy is inherently individual, as proposed in the neuro-informed principles representing neuroeducation within this study. From understanding the negative influences on neurodevelopment due to insecure attachment during childhood to the visible physiological responses of a hyperresponsive autonomic nervous system in an adult trauma client, the depth of the individual and contextual perception is clear. Therefore, the postpositivistic and heuristic

nature of neuroscience operationalizes the core elements of the constructionist view of humanism (personal and interpersonal) noted by Elkin (2012), providing the therapist with a distinctive view of and appreciation for the client's inner world (Ward et al., 2017).

The results of this work suggest the integration of neuroeducation with the common theoretical frameworks of psychoanalysis, cognitive behavior therapy, family systems, humanism, and others, may be normative in case conceptualization and treatment planning. The category of integrationist represented 4.8% of respondents, and 91.9% of participants identified with one of six other theoretical orientations, leaving 3.2% who chose other (see Table 1). Yet the summation of responses regarding the importance of neuroeducation use in case conceptualization and treatment reached almost the 80th percentile (see Table 2). These findings support previous research. Past researchers have shown minor differences in the efficacy among interventions (Elkins, 2012; Poznanski & McLennan, 1995), and research has suggested an MHP's practical work in treatment might not always align with their theoretical orientation (Crameri et al., 2020; Poznanski & McLennan, 1995; Rihacek & Roubal, 2017). This current study has affirmed a strong positive relationship between diversity of an MHP's theoretical attitude and the inclination to incorporate neuroeducation into case conceptualization and treatment (r = .52; see Table 3). Not only may those who have identified with a specific orientation readily integrate neuro-informed principles into practice, but those who identify with numerous approaches likewise see the benefits of neuroscience use. This suggests the possibility that all theories and approaches in the professional mental health field could be expanded to incorporate neuroscience without threat of reductionism or antagonism. Schwartz et al. (2016) intimated current research regarding neuroscience did not support a consistent reductionist viewpoint toward psychology, a view supported by the findings of this work.

The results of this study confirm the trend in literature that the interest in and use of neuroscience among counseling professionals is on the rise. The gap in prior research related to variables that may influence an MHP's choice to use neuroscience has been initially addressed by the results that suggest the characteristic variables studied here possess a significant positive correlation with the use of neuroeducation, a relationship supported by the literature. Findings showed the strength of an MHP's religious beliefs produced a small but significant amount of the variance between self-competency and neuroeducation, yet it displayed no effect on the relationship with theoretical attitude, despite research suggesting a greater moderating strength. This study validated the variable of neuroeducation as representative of neuroscience integration as a tool that can provide MHPs with an additional and important lens through which to view the client and treatment. Although some contradictions with the literature emerged, the researcher attributed most to differences in research methodology, population sample, and operational definitions. A significant contributive theme of the results and of recent literature involved the seeming disparity in neuroscience curricula in formal psychology and counseling education programs when contrasted with the emerging interest within the fields. The various new contributions to research within this work were indicative of the diversity of new studies needed to investigate this emergent topic in professional counseling. Neuroeducation, as is consistent with recent research, proved acceptable as an integrative concept across the broad scope of theoretical orientations and segments of the mental health field. The findings of this research also offer various insights into the field of counseling.

Implications

The implications of this study align with the ongoing discussions related to the integration of neuroscience with counseling. All segments of the mental health profession have

been impacted by this emerging knowledge, as seen in psychology, counseling, ministry, and social work endeavors. Collaboration among research, educational and training entities, and professional organizations must occur to ensure the integration of neuroscience into clinical practice is standardized, ethically sound, and not fraught with unsubstantiated conceptual or theoretical points of tension. The following section presents various inferences related to neurointegration in practice, education, and research and the Christian worldview based on the findings of this study and the existing body of knowledge and theory.

Practice

The significance of this study stems from its contributions to the knowledge base related to integrative neuroscience and includes an introductory understanding of the relationship between MHP characteristic variables and MHPs' attitudes toward the utilization of neuro-informed principles in client case conceptualization and treatment planning. The results of this research suggested a positive correlative relationship between MHP's common characteristic variables (i.e., self-competency, religious beliefs, and theoretical attitude) and the importance MHPs attributed to using neuroeducation in trauma conceptualization and treatment. Additionally, the between-group differences among the sample segments of MHPs related to all study variables were demonstrated to be statistically significant yet more similar than anticipated by the researcher. These results provide three important inferences related to practice: (a) neuro-informed principles have infiltrated experienced MHPs' clinical practice in the segments of psychology, spiritual care, and clinical social work; (b) a widespread interest in neurointegration exists among MHPs; and (c) a subsequent need exists for a field-wide standard of neuroscience practice that is affirmed by and inculcated in the curricula for psychology, counseling, ministry, and social work institutions and training entities.

The emergence of neurointegration is best seen through studies and texts that have explicated the newer terms of neurocounseling and neuroeducation (Beeson & Field, 2017; Field, Jones, et al., 2017; Goncalves & Perrone-McGovern, 2016; McHenry et al., 2014; Miller, 2016). Yet, recent researchers have noted the continued presence of ethical concerns and internal tensions related to the practice of integration pertaining to practitioner characteristics, education, and personal religious beliefs (Duggal & Sriram, 2021; Kim & Zalaquett, 2019; Rihacek & Roubal, 2017). However, Hook and Vera (2020) cited collaboration within and across fields and support for an integrated partnership between research and clinical work as examples of effective standards of practice. This current study demonstrated the integration of neuroeducation across the mental health fields of psychology, spiritual care, and social work that aligns with existing research (Bingaman, 2016; Goss, 2016; Schwartz et al., 2016; Sewell, 2020). Ethical concerns and tensions regarding the integration of neuroscience may reflect an MHP's lack of familiarity with neuro-informed principles and the way in which they could be integrated into clinical practice.

The finding of a commensurate level of interest in and application of neuroeducation among the segments of MHPs represented in this work was inconsistent with this researcher's assumption that spiritual care providers and social workers would have a significantly lower level of clinical concern. The interest in neurointegration with counseling psychology may be characterized as questioning and supportive in recent research. Some researchers have expressed concern that neurointegration could threaten the humanistic aspect of counseling. Elkins (2012) noted a humanistic viewpoint is preferential for therapy and asserted that humanism offers the most congruent element for all therapy approaches because it involves the personal and interpersonal factors of the therapeutic relationship; some see this outlook as threatened by

neurointegration (Wilkinson, 2018, 2019). Conversely, research has suggested that counselors and therapists could maintain allegiance to a humanistic framework while maturing in their understanding of neuro-informed principles by availing themselves of neuroscience research (Beeson & Miller, 2019; Busacca et al., 2015; Cantor et al., 2019; Rihacek & Roubal, 2017). Additionally, some researchers have described humanistic and existential approaches as subjective in nature, an observation that relates harmony with other orientations that display consistency between theoretical orientation and practical work (Crameri et al., 2020; Poznanski & McLennan, 1995; Rihacek & Roubal, 2017). In a broader sense, Heppner et al. (2016) suggested neuroscience could be synthesized with the phenomenological nature of counseling without hindering the practice or research of other theoretical approaches.

Considering the current widespread interest in neuroscience, the increasing availability of neuroscience research, and the noted utilization of neuro-informed principles within the mental health fields, comprehensive and equitable expectations and standards of practice are necessary across the fields of psychology, ministry (i.e., spiritual care), and social work. Recently identified problems and tensions have included the emergence of neuro-myths among psychology students (Kim & Zalaquett, 2019); ethical considerations of practice (Luke et al., 2020); concerns about neuroessentialism and reductionism (Porter, 2020; Wilkinson, 2019; Zimmerman et al., 2020); and the debate regarding the inclusiveness or exclusiveness of neuroscience (Beeson & Miller, 2019; Luke, 2019; Schwartz et al., 2016; Wilkinson, 2018, 2019). A related tension remains between the fields of psychology and theology (Hathaway & Yarhouse, 2021; Neff & McMinn, 2020; Worthington, 2010). The results of this current study demonstrated the significance of neuroeducation use in case conceptualization and treatment, yet it did not address the nuances of application in treatment. The implication for the fields of

psychology, counseling, ministry, and social work, when considering the issues and concerns noted above, is the need for a collaborative effort to identify the relevant and applicable principles of neuroscience that can be integrated with counseling and the need to establish standards for interventions and treatment protocols. The integrative nature of neuroeducation could signify this construct as a means to promote consistent neuroscience understanding across the areas of practice, education, and research.

Education and Research

The results of this study have added to the literature suggesting a paucity of consistent and aligned neuroscience education at formal psychology and counselor training institutions (Beeson et al., 2019; Russo et al., 2021). Recent studies have shown the main sources of neurointegrative knowledge come from varied professional development opportunities as opposed to formal educational courses. Some researchers have offered approaches and models that may be considered as initial guidelines for such a collaborative initiative among training institutions (Busacca et al., 2015; Duenyas & Luke, 2019). Considering that therapist training is an important predictor of attitude toward intervention use (Crameri et al., 2020), the promotion of an integrative attitude toward counseling, with the prime antecedent being the client's presenting need and experiential contexts, should be foundational in counselor training programs. The researcher has consistently maintained the clinical credibility of an integrative orientation toward therapy and treatment throughout this work. Distinctively, researchers have presented neurointegration as an emerging tool that has informed perspectives, been appreciated for the overlapping nature of neural circuitry with human domain functionality, and widened the research and practice aperture of MHPs (Alessi & Kahn, 2019; Alvarez-Monjaras et al., 2019; Busacca et al., 2015; Crockett et al., 2017; Field, 2019).

Melchert (2016) argued that professional psychology should transition to curricula and theoretical frameworks informed by an integrated scientific appreciation of human psychology. Researchers in recent studies have viewed the incorporation of neuroscience into counseling as supportive, complementary, and informative of a deeper understanding of the client as viewed through a composite physiological and neurological lens (Field, 2019; Finnerty & McLeod, 2019; Luke et al., 2019). In support of neurointegrative curricula and subsequent practice, research has suggested neurocounseling does not change the protocols of an evidence-based approach (Alvarez-Monjaras et al., 2019; Cantor et al., 2019; Pizzimenti & Lattal, 2015; Ward et al., 2017; Weiskopf, 2016). A neuroscience-based integrative curriculum would not suggest a new approach to counseling; rather, it would provide an additional lens through which practitioners could differentiate each client as unique, appreciate the physiological basis of the therapeutic relationship, broaden the range of treatment approaches, and conceptualize a client's presenting behavioral, psychological, and physiological problems in a distinct way (Russell-Chapin et al., 2016). Recent studies have identified specific inconsistencies in counselor education.

The *DSM*-5 (American Psychiatric Association, 2013) intimated all MHPs should seek a common language for depicting their clients' experiences. Further, recent strides in neuroscience, neuroimaging, and neuropsychology have been shown to improve the specificity of such observations based on common neurocircuitry and the recognized preferred psychological state of homeostatic balance (American Psychiatric Association, 2013). Interestingly, although recent research has suggested graduate programs provide most MHPs measured training in the AMHCA (2021) biological bases of behavior competencies, comparatively fewer schools reported training in neuro-related standards such as case conceptualization using the RDoC,

physiology, and neural anatomy (Russo et al., 2021). Russo et al. further reported a struggle within psychiatry, counseling psychology, and social work fields to frame the role of neuroscience in case conceptualization and encapsulate supportive training in neuro-informed principles. Relatedly, Beeson et al. (2019) found most counselors were unfamiliar with the RDoC instituted by the NIMH. Goncalves and Perrone-McGovern (2016) explained that an objective of the RDoC is for MHPs to have the capacity to translate neuroscience findings into psychosocial and preventative interventions. Yet, because this NIMH initiative might be construed as a research-focused platform, clinicians could overlook this opportunity unless it was promoted through counseling courses or continuing education. Empirical research has supported the assertion of a limited integration of neuroscience with counseling and has linked this, in part, with the minimal exposure of MHPs to RDoC competencies (Beeson, Field, et al., 2019). The introduction and explication of neuroeducation could help to connect the research of RDoC to clinical practice.

Common neuroeducation concepts promoted by Miller (2016) could serve as a conduit through which to formally integrate neuroscience into counseling curricula while incorporating the research benefits of RDoC (NIMH, n.d.). Structurally, the curricula could be incorporated with Gadamer's four philosophical hermeneutics, as reported by McWhorter (2021) and elucidated earlier in this work. The concepts include neuroplasticity, brain structure, brain function, and memory phenomena (Miller, 2016). Further neuroscience principles that would be appropriate for curricular use include those supported by the literature for measuring neuroeducation. These principles include the autonomic nervous system (Jones, 2017; Uhernik, 2017), psychological homeostasis (American Psychiatric Association, 2013; Briere & Scott, 2015; Hall & Walker, 2017), and neurodevelopment (Hambrick et al., 2018; Malarbi et al.,

2017). Based on the positive responses to the principles of neuroscience gathered in this current research, the aforementioned implications could inform mental health educators regarding curriculum development and instruction in a manner that would address aspects that have the potential to influence theoretical orientation and attitude toward integrative therapies. This author conceptualized the research through a Christian lens, which leads to further implications.

Christian Worldview

The positive results of this study intimate how important it is for MHPs to understand the complex design of the client's internal operating system when distortions and disruptions occur. The majority of the population sample identified as Christian (90.9%), resulting in strong accounts of religious beliefs (M = 3.94). The integration of neuroscience with counseling supports the lens of a Christian worldview based on current trends in training, research, practice, and theory. Neff and McMinn (2020) identified spirituality and religion as current markers for diversity commonly offered in training programs for clinical workers. Previous research has demonstrated that the strength of an MHP's religious beliefs affects their choice of theoretical orientation (Bilgrave & Deluty, 1998, 2002) and approach to clinical practice (Blair, 2015; Duggal & Sriram, 2021). Further, a Christian clinician's spirituality has been found to predict the use of interventions that were noted as accommodating a Christian worldview (Sutton et al., 2016). In support of the credibility of such approaches, Worthington et al. (2013) purported various Christian evidence-based treatments to be favorable. Examples included religious or Christian accommodative cognitive behavior therapy, acceptance and commitment therapy, and various mindfulness meditation approaches (Koenig et al., 2015; Neff & McMinn, 2020; Pimental et al., 2018. Additionally, in a review of recent literature, Smothers and Koenig (2018) found that spiritually integrated approaches used with veterans experiencing PTSD positively

affected symptom severity. Finally, research has suggested a positive neuroscience-informed effect exists for religious and spiritual interventions when applied to trauma cases (Peres et al., 2007). This supports the supposition that many viewed the principles of neuroeducation through a Christian lens that accentuates a divine design and capacity for restoration.

Various forms of mental illness could be considered distortions or disruptions of the human psyche. A Christian worldview provides a theoretical framework that offers insight into the Judeo-Christian God and the neuroscience of humanity in a manner that supports accommodation and integration with many secular orientations of therapy. The theological premises at play here include the following: (a) humans are the product of a Divine Creator and possess an intricate and purposeful design; (b) God created human beings in His image, which the Bible frames as holy, righteous, and true; (c) when there are distortions or disruptions of that image resulting from the universal effects of sin, there is a resultant imbalance of internal systems causing various negative internal responses; and (d) equilibrium may be restored through a proper understanding of the intricacies of the internal systems to include regulating functions designed to help reestablish balance. Worthington (2010) proposed the integration of Christianity with psychological science must be relational in nature; psychological science could help Christians know more about God, and Christian theology could provide psychological scientists with insights regarding people. Although incongruities will emerge in this relationship, the conversation about integration must continue, and the MHP's strength of religious beliefs must be considered a valid construct in the discussion.

Limitations

Although internal validity was of little concern because the researcher did not intend to determine a causal relationship between variables (Heppner et al., 2016), certain matters

remained relevant. The extraneous variable of respondent history could have threatened internal validity due to the diverse environments and influences experienced by those taking the survey. Painful life events or recent client encounters could have caused the therapist to question their professional identity. Yet this threat had little potential to skew the results, and no direct responses from participants suggested the presence of this issue. Although 28 subjects were dropped due to more than three unanswered questions, the researcher found no signs of inconsistencies. Survey data collection methods promoted the random assignment of participants in the study (LaFountain & Bartos, 2002). Although three instrument scales contained a midpoint, mean, and standard deviation, results showed no pattern of respondents scoring to the center for reasons of ease or time constraints. All participants answered the same survey inquiries, thus reducing a skewed result.

The methodological use of Amazon's M-Turk crowdsourcing construct presented a limitation due to the broad distribution of the survey and no regulatory tool other than the self-report questions to ensure respondents met the inclusion criteria. The researcher noted various discrepancies with the M-Turk batch due to inconsistencies between self-ascribed licensure, age, and education level. One potential reason for perceived problems with the results pertained to distribution of the survey to respondents in Europe, where degree requirements for MHP licensure differ from those in the United States (Demir & Gazioglu, 2017). Yet the researcher dropped 86 participants for not meeting the inclusion criteria. Other collector methods primarily focused on mental health organizations, businesses, and individuals directly associated with the mental health field in the United States.

The researcher recognized a threat to external validity existed because the study included only MHPs who were currently in practice, accepting clients, and possessing at least 3 years of

experience in practice. These restrictions discounted psychology, counseling, ministry, and social work students. The criteria also excluded those who may have been on hiatus from practice, licensed but new to practice, or were currently serving as educators. Although a threat to generalizability existed, other researchers in neurointegration had considered students and educators. In this study, the researcher aimed to measure the response of those who were actively participating in clinical practice and had a measure of maturity in practice, thus enabling the researcher to measure the importance of neuroeducation use based on education and current experiences in practice. The shared histories, experiences, and varied theoretical orientations of the final sample allowed for appropriate statistical power (.95) and representativeness (Jackson, 2016). Although demand characteristics could have played a role in that respondents might have recognized the study as neuroscience-focused and presumed they should answer questions supportively, scatterplots showed a relatively even disbursement (LaFountain & Bartos, 2002). The results of this research prompt suggestions for future studies.

Recommendations for Future Research

Future Research Questions

The perceived tension surrounding the integration of neuroscience with counseling and the associated issues of practice, education, methodology, and policy necessitate further discovery regarding variables that influence an MHPs choice pertaining to neurointegration. The results of this research suggested most MHPs possess a clinically adaptive knowledge of neuroeducation and are significantly influenced in that course by their level of self-competency, theoretical attitude, and strength of religious beliefs. Further, findings suggested the strength of an MHP's religious beliefs influences the relationship between their self-competency and neuroeducation use. Finally, MHPs from the psychology, spiritual care, and clinical social work

segments displayed commensurate interest and intent of application regarding neurointegration in case conceptualization and treatment.

Current best practices have been identified in research and academia, including a progressive increase in neuroscience integration studies and the emergence of neuroscience and neurocounseling textbooks and curricula in formal counseling programs. Additionally, professional organizations such as the AMHCA, American Psychological Association, CACREP, and American Counseling Association and agencies such as the NIMH have iterated expectations for MHPs regarding neuroscience knowledge, research, and practice. Considering the integration of neuroscience with counseling, researchers in the field lack a fuller knowledge regarding factors that influence MHPs to integrate neuro-informed principles into counseling case conceptualization and treatment, among other areas.

Practice

Although some researchers have investigated personal and professional variables related to neuroscience integration with counseling (Kim & Zalaquett, 2019), more studies—in addition to this one—are needed. Such research could address demographic variables such as age and socioeconomic levels and their relationship with neuroscience competence levels and use in clinical practice. Further, whereas this researcher considered the conceptualization and treatment choices of a trauma case and Field, Beeson, et al. (2019) explored the use of neuroscience in major depressive disorder, future works should address other diagnoses, such as neurodevelopmental, sexual dysfunction, addiction, and impulse control disorders. This could expand the understanding in the field of current applicability levels of neuroscience use among MHPs and illuminate other disorders that have been viewed through a neuroscience lens. Finally, upcoming researchers should measure the neuroeducation competency level of the clinicians and

practitioners who are integrating neuroscience into practice and identify issues that hinder or accentuate the development of needed expertise (Duenyas & Luke, 2019; Kim & Zalaquett, 2019; Russell-Chapin, 2016; Russo et al., 2021).

Education

Recent researchers have raised concerns about the limited availability of neuroscience education and training (Field, Beeson, et al., 2019; Russo et al., 2021). Future researchers who consider how training and education influence factors related to neurointegration in counseling research and practice could uncover beneficial insights. Relatedly, a research-based listing of relevant and required neuroscience principles for counseling psychology students and MHPs may represent a worthy area of focus for future investigation (Duenyas & Luke, 2019; Kim & Zalaquett, 2019; Russell-Chapin, 2016; Russo et al., 2021). The results would provide a valuable basis for collaborative curriculum and treatment standards across mental health education and training programs and institutions. This and other studies have identified the current trend toward increased individual interest and utilization of neurointegration (Russo et al., 2021). Thus, future researchers should continue to measure this trend and identify variables that have a positive impact. Finally, as suggested in this study, pastoral counselors, chaplains, and clinical social workers have been underrepresented in research. Future neuroscience integration researchers should continue to pursue population samples that include these subgroups, including the colleges, universities, seminaries, and chaplain training entities (e.g., CPSP, Association of Clinical Pastoral Education, Spiritual Care Association) that educate and prepare them for the field of counseling and therapy. Such research could enhance the collaborative integration of neuroscience into the curricula and practice of all segments of the mental health field.

Improved Study Methodology

As noted earlier, future researchers could consider diverse populations of MHPs to inform educational institutions and credentialing authorities and to create consistent standards of practice. A plethora of conceptualization studies has informed the integration of neuroscience with counseling (Luke, 2019; Quillman, 2020; Schauss et al., 2019; Solms, 2020; Tryon, 2016, 2017; Wachtel, 2011; Ward et al., 2017; Wilkinson, 2018, 2019). Although this current study helps to move the discussion forward among researchers and practitioners, a need exists for differing research designs focused on the progress of neuroscience integration to empirically inform standards of care and to enhance education, training, and practice. This current work offers an example of a quantitative study on neuroscience integration, and Field, Beeson, et al. (2019) provided an example of a credible mixed-method design. Future research endeavors should include additional quantitative and mixed-method designs leading toward a longitudinal approach that could result in more comprehensive and definitive data to enhance neurointegration. The use of a mixed-method design to clarify inclusion criteria and operational definitions would have addressed this current study's limitations.

The researcher found no comparative type of research measuring differing clinical outcomes that could be associated with neurointegration and the absence of integrating neuroscience in practice. Future researchers could consider a between-group design that incorporates a neurointegration group and a control group with no treatment or a group conceptualized and treated through a humanistic lens without the inculcation of neuro-informed principles. This design would help answer the question regarding the effect strength of neuroscience integration. Relatedly, although some MHPs adhere to a humanist theoretical orientation and fear neurointegration may reduce the counselor's case conceptualization to

biological and neurological constructs (Elkins, 2012; Wilkinson, 2019), little research supported this assertion. Future researchers could investigate whether the integration of neuroscience in clinical practice reduces the clinical aperture of case conceptualization or broadens it in ethically coherent ways. Further, upcoming researchers should investigate the operational definitions of case conceptualization, neuroscience principles, and neuroeducation. Such efforts would help clarify the language across the segments of the mental health field and allied fields of medicine and education.

The final recommendations relate to instrumentation and data collection. The researcher developed the Wood Scale for this study because no other existing scale measured the use of neuroeducation. Future investigators could consider the validation of the Wood Scale as a measurement for neuroeducation use among MHPs. Lastly, the researcher used the M-Turk crowdsourcing collector for the first time in research to solicit respondents for a neuroscience study in the mental health profession, an approach that researchers could replicate in later studies to test the reliability of this data collection method in counseling research.

Policy Recommendations

During the year of this study, new research emerged suggesting increasing interest in neuroscience and the application of neuro-informed principles in the mental health profession. This current research corroborates this trend and provides new data related to the subgroup of spiritual care professionals. An issue demonstrated by the research and affirmed within this study involves the gap between interest and practice and the collective counseling educational community's ability to provide comprehensive training and standards regarding the integration of neuroscience with counseling and therapy. This trend has continued despite available guidance and tools provided by the RDoC (NIMH, n.d.), the bases of biological behavior

(AMHCA, 2020), the 2016 Annual Report from CACREP (2017), and the American Psychiatric Association (2013). The challenge remains, therefore, that continuing education is a self-directed process (National Association of Social Workers, 2003). Thus, without a collaborative effort across educational institutions, professional organizations, and credentialing agencies, comprehensive standards of practice and ethical guidelines relating to neurointegration will not reach all levels of practitioners and all segments of the mental health profession.

Thus, this researcher recommends establishing a collaborative committee under the auspice of the NIMH and in conjunction with CACREP that has representation from the psychology, clinical social work, and spiritual care communities (i.e., education, practice, and research) to holistically consider appropriate neuroscience principles and standards of practice for the safe and ethical integration of neuroscience with counseling. Further, guidelines and expectations must align with the identified scope of practice at each level of the profession. The RDoC initiative (NIMH, n.d.) and biological bases of behavior (AMHCA, 2020) could serve as foundational documents to assist in framing future policy. Due to the complex and broad nature of neuroscience with application in psychology, medicine, and education, allied fields should additionally be represented. Future comprehensive policy must encompass technical and nontechnical applications of neuroscience while accounting for the breadth of *DSM*-5 (American Psychiatric Association, 2013) diagnoses while also addressing the scope of practice of clinical social workers and spiritual care providers (i.e., pastoral counselors and chaplains). The distribution and implementation of the subsequent policy must likewise be broad and include state mental health boards and licensure entities, the educational institutions and certifying agencies of all segments of the mental health field, professional mental health organizations, and applicable publications (e.g., journal, article, and textbook) organizations.

Summary

Despite current professional guidelines, research findings, and available neuroscience literature and education, the practice of neurointegration in the field of counseling for case conceptualization and treatment has been deficient. Research to identify reasons why MHPs have underutilized neuroscience principles in clinical practice has also been limited (Field, Beeson, et al., 2019; Russo et al., 2021). Thus, this researcher aimed to add to the discussion by identifying the characteristic variables that influence an MHP's choice regarding neurointegration and to suggest areas of future research. This study associated higher levels of self-competency, theoretical attitude, and strength of religious beliefs with increased use of neuroeducation. Further, results showed strength of religious beliefs affected the relationship between an MHPs level of self-competency and neuroeducation use in a positive way. These results have strong support in recent literature, as do the efficacy of using neuroeducation as representative of neuroscience and the marked need for comprehensive neuroscience education in formal counselor training programs. Some previous studies do not support other findings.

The trend toward neurointegration has continued and excelled in recent years. This study's results suggested that most MHPs incorporated neuroeducation, despite differences in theoretical orientation, and took advantage of available neuroscience training opportunities. Some previous works reported less use of neuroscience principles and a deficit in training opportunities. Thus, neuroeducation, as a distinctive representation of neuroscience, appeared acceptable to respondents and provoked no worries about reductionism, which contradicts Wilkinson's (2018) concerns. The new aspects of this research, including a broader population sample, the investigation of characteristic variables that influence neuroscience use, and the use of a real-life trauma case as the antecedent for respondents' answers regarding neuroeducation

use, inform the associated gaps in the literature and progress the conversation pertaining to neurointegration in counseling practice. An important inference from the results involves the positive correlation between various theoretical frameworks and the use of neuroscience principles, which supports a trans-diagnostic and integrative lens that provides a deeper understanding of a client and their problem. This observation supports the noted implications of this research regarding application in clinical practice, and it stresses the need for formal educational institutions to catch up with the neuroscience interest demonstrated in the field and provide comprehensive content and standards of practice to gauge the fast-paced emergence of use with clients.

The themes and results of this work aligned with the Christian worldview of this author. The integration of neuroscience with counseling and the integration of Christianity and psychology represent parallel and associated processes in time. These initiatives meld well together due to the intricate design of internal human systems, the person-centered and relational aspect of therapy, and the desired outcome of healing and restoration. The limitations of this study related to the collector methods and the scope of the population sample, but they appeared to have little effect on the outcome. Due to the limited number of studies on neurointegration with counseling, recommendations for future research regarding practice, education, methodology, and policy are numerous. Research findings conclusively demonstrate the growing presence and practice of neuroscience integration in the allied mental health field. Thus, related institutions, agencies, and organizations must promote or produce empirical research and ethically informed standards of practice commensurate with the needs of the field.

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APPENDIX A

REAL-LIFE CASE REVIEW

The client is a 46-year-old female who will be addressed by the pseudonym of Rosalina. She is of Central American decent and has lived in the United States her whole life. She is recently divorced and has three adolescent children who live with their father because of the divorce decree. Rosalina has struggled with anxiety and depression for as long as she can remember and her adult years have been spent in and out of counseling, sporadically being prescribed antidepressant and antianxiety medications to help stabilize her emotions. The recent extended divorce litigation process and the subsequent loss of her children confirmed for her that she is unlovable, will never have a normal life or relationship, and that she is a bad person. Rosalina, the oldest of three sibling sisters, grew up in an impoverished home with parents who regularly abused alcohol and drugs and rarely displayed affection to their children. Physical, emotional, and sexual abuse characterized her life from toddler to adolescent years. She and her sisters were often sent to spend time with their grandparents and although their grandmother was affectionate, her grandfather fondled the three girls. Rosalina saw herself as the protector of her siblings yet is ashamed about how she failed in that role. As a teenager, no longer living at home, she became pregnant through a relationship with an adult male and had to give up her child to relatives. As a young adult, Rosalina was seeking to reengage with her father who was at that time estranged from her mother. One day, she walked into his home and found that he had hung himself. In all of her years of counseling and medication, no counselor had engaged her complex trauma or linked her pattern of emotional dysregulation and relational dysfunction with posttraumatic distress.

APPENDIX B

DEMOGRAPHIC QUESTIONNAIRE

What is your gender?

- Female
- Male
- Nonbinary
- Transgender
- Gender Neutral
- Prefer not to answer

What best describes your race or ethnicity?

- Asian
- American Indian or Alaska Native
- Black or African American
- Latino
- Mixed Ethnicity or Race
- Native Hawaiian or Pacific Islander
- White

What is your age?

- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65 years or older

What is your religious affiliation or belief?

- Buddhist
- Christian
- Jewish

- Hindu
- Muslim
- Other
- None

What is your highest level of completed formal education?

- Bachelor's degree
- Master's degree
- Doctoral degree
- No formal degree

What is your licensure or certification?

- Psychiatrist
- Psychologist
- Licensed Professional Counselor or Therapist (any specialty)
- Pastoral Counselor
- Clinical Chaplain
- Licensed Clinical Social Worker
- Other

What is your period of clinical practice?

- 1-2 Years
- 3-5 Years
- 6-9 Years
- 10+ years

Are you currently seeing or accepting clients?

- Yes
- No

What is your theoretical orientation?

- Cognitive-Behavioral

- Family Systems
- Feminist
- Humanist/Existential
- Multicultural
- Psychoanalytic/Psychodynamic
- Integrationist
- Other

Which answer best depicts the main source of your neuroscience education or exposure?

- Coursework at doctoral or master's level
- Attendance at in-person or on-line professional development sessions
- Some exposure through journal or research articles
- No neuroscience training or exposure

APPENDIX C

WOOD SCALE

Following the review of the trauma case, respond to the following prompts with the answer that best reflects your conceptualization (understanding of the client's problem) and treatment outlook (approach and interventions). Your answers will be based on a 5-point Likert-type scale where 1 is *strongly disagree* and 5 is *strongly agree*.

1. The use of neuroeducation (the targeted focus on neurological processes with the intended outcome of distress reduction) in my case conceptualization and treatment planning for this trauma case is important.
    - 1 Strongly disagree
    - 2 Disagree
    - 3 Neither agree nor disagree
    - 4 Agree
    - 5 Strongly agree

2. My understanding of brain structure and function is important for a proper conceptualization of this case.
    - 1 Strongly disagree
    - 2 Disagree
    - 3 Neither agree nor disagree
    - 4 Agree
    - 5 Strongly agree

3. This client's understanding of brain structure and function is important for a positive case outcome.
    - 1 Strongly disagree
    - 2 Disagree
    - 3 Neither agree nor disagree
    - 4 Agree
    - 5 Strongly agree

4. My understanding of neuroplasticity (the capacity of the brain to repair and build neural pathways) is important for a proper conceptualization of this case.
    - 1 Strongly disagree
    - 2 Disagree
    - 3 Neither agree nor disagree
    - 4 Agree
    - 5 Strongly agree

5. This client's understanding of neuroplasticity is important for a positive case outcome.
    - 1 Strongly disagree
    - 2 Disagree
    - 3 Neither agree nor disagree
    - 4 Agree
    - 5 Strongly agree

6. My understanding of the autonomic nervous system (processes of the sympathetic and parasympathetic nervous system related to distress response) is important for a proper conceptualization of this case.
    - 1 Strongly disagree
    - 2 Disagree
    - 3 Neither disagree nor agree
    - 4 Agree
    - 5 Strongly agree

7. This client's understanding of the autonomic nervous system is important for a positive case outcome.
    - 1 Strongly disagree
    - 2 Disagree
    - 3 Neither agree nor disagree
    - 4 Agree
    - 5 Strongly agree

8. My understanding of psychological homeostasis (balance between cognition and emotion) is important for a proper conceptualization of this case?
    - 1 Strongly disagree
    - 2 Disagree
    - 3 Neither agree nor disagree
    - 4 Agree
    - 5 Strongly agree

9. This client's understanding of psychological homeostasis is important for a positive case outcome?
    - 1 Strongly disagree
    - 2 Disagree
    - 3 Neither agree nor disagree
    - 4 Agree
    - 5 Strongly agree

10. My understanding of neurodevelopment (growth and change of the brain in early life as effected by childhood experiences) is important for a proper conceptualization of this case?
    - 1 Strongly disagree
    - 2 Disagree
    - 3 Neither agree nor disagree
    - 4 Agree
    - 5 Strongly agree

11. This client's understanding of neurodevelopment is important for a positive case outcome?
    - 1 Strongly disagree
    - 2 Disagree
    - 3 Neither agree nor disagree
    - 4 Agree

- 5 Strongly agree

APPENDIX D

SURVEY CONSENT FORM

Title of the Project: The Integration of Neuroscience and Counseling Using Neuroeducation in Trauma Treatment: A Quantitative Study
Principal Investigator: Daniel R. Wood, Ed.D. Candidate, MDiv., MRE, MAR

Invitation to be Part of a Research Study

You are invited to participate in a research study. To participate, you must be either a board certified or licensed psychiatrist, psychologist, professional counselor or therapist, pastoral counselor, chaplain, or clinical social worker with a minimum of three years of practice experience and be currently active in accepting or seeing clients. Taking part in this research project is voluntary.

Please take time to read this entire form and ask questions before deciding whether to take part in this research.

What is the study about and why is it being done?

The purpose of the study is to investigate why many mental health providers have chosen not to integrate neuroscience into their clinical practice. Previous research has suggested a lack of neuroscience knowledge and integration among mental health professionals, but no study has addressed contributing factors to this choice. This work will measure the relationship between several counselor or clinician characteristic variables and their choice to use or not use neuroscience in client case conceptualization and treatment planning to inform this gap and to inform future research in this area.

What will happen if you take part in this study?

If you agree to be in this study, I will ask you to do the following things:

1. Complete an anonymous online survey consisting of demographic questions, review of a trauma case and subsequent questions relating to the case, the Counselor Self-Efficacy Scale (CSES), the Theoretical Orientation Profile Scale-Revised (TOPS-R), and the Dimensions of Religiosity Scale (DRS). It should take about 20 minutes to complete the survey.

How could you or others benefit from this study?

Participants should not expect to receive a direct benefit from taking part in this study, yet this study promotes societal benefits. These potential societal benefits include a more informed discussion of factors related to the neuroscience integration with counseling within academic, research, and counseling professional fields. The findings may be useful for the development or alteration of neuroscience curriculum that takes individual characteristic variables into account. Further, the results could highlight the awareness of the influence self-competency, theoretical

attitude, and religious beliefs can have on the mental health professional's willingness toward neuro-integration.

What risks might you experience from being in this study?

The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

How will personal information be protected?

The records of this study will be kept private. Research records will be stored securely, and only the researcher will have access to the records. Participant responses will be anonymous. Data will initially be stored on a password-locked computer and then moved to an encrypted hard drive. After three years, all electronic records will be deleted.

How will you be compensated for being part of the study?

Participants will not be compensated for participating in this study.

Is study participation voluntary?

Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time prior to submitting the survey without affecting those relationships.

What should you do if you decide to withdraw from the study?

If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

Whom do you contact if you have questions or concerns about the study?

The researcher conducting this study is Daniel Wood. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact him at [redacted] or by email at [redacted]. You may also contact the researcher's faculty sponsor, Dr. Kelly Orr, at [redacted].

Whom do you contact if you have questions about your rights as a research participant?

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at irb@liberty.edu.

Disclaimer: The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.

Your Consent

Before agreeing to be part of the research, please be sure that you understand what the study is about. You can print a copy of this document for your records. If you have any questions about the study later, you can contact the researcher using the information provided above.

APPENDIX E

THE COUNSELOR SELF-EFFICACY SCALE (CSES)

Answer each of the prompts by selecting the number that best describes the extent to which you agree with each statement. Scale developed by Melchert et al. (1996).

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	My knowledge of personality development is adequate for counseling effectively.	1	2	3	4	5
2.	My knowledge of ethical issues related to counseling is adequate for me to perform professionally.	1	2	3	4	5
3.	My knowledge of behavior change principles is not adequate.	1	2	3	4	5
4.	I am not able to perform psychological assessment to professional standards.	1	2	3	4	5
5.	I am able to recognize the major psychiatric conditions.	1	2	3	4	5
6.	My knowledge regarding crisis intervention is not adequate.	1	2	3	4	5
7.	I am able to effectively develop therapeutic relationships with clients.	1	2	3	4	5
8.	I can effectively facilitate client self-exploration.	1	2	3	4	5
9.	I am not able to accurately identify client affect.	1	2	3	4	5
10.	I cannot discriminate between meaningful and irrelevant client data.	1	2	3	4	5
11.	I am not able to accurately identify my own emotional reactions to clients.	1	2	3	4	5
12.	I am not able to conceptualize client cases to form clinical hypotheses.	1	2	3	4	5
13.	I can effectively facilitate appropriate goal development with clients.	1	2	3	4	5
14.	I am not able to apply behavior change skills effectively.	1	2	3	4	5
15.	I am able to keep my personal issues from negatively affecting my counseling.	1	2	3	4	5

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
16.	I am familiar with the advantages and disadvantages of group counseling as a form of intervention.	1	2	3	4	5
17.	My knowledge of the principles of group dynamics is not adequate.	1	2	3	4	5
18.	I am able to recognize the facilitative and debilitative behaviors of group members.	1	2	3	4	5
19.	I am not familiar with the ethical and professional issues specific to group work.	1	2	3	4	5
20.	I can function effectively as a group leader/facilitator.	1	2	3	4	5

APPENDIX F

THEORETICAL ORIENTATION PROFILE SCALE-REVISED

Select the answer from the Likert scale where 1 = not at all and 10 = completely that best reflects the extent which you identify with each theoretical orientation item. Select the answer from the Likert scale where 1 = never and 10 = always that best reflects the extent to which you conceptualize cases and utilize methods associated with each orientation item. Scale developed by Worthington and Dillon (2003) and retrieved from PsycTESTS.

Not at all |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----| Completely
1 2 3 4 5 6 7 8 9 10
Never |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----| Always

Items	
	Psychoanalytic/Psychodynamic subscale
1.	I identify myself as psychoanalytic or psychodynamic in orientation.
2.	I conceptualize my clients from a psychoanalytic or psychodynamic perspective.
3.	I utilize psychoanalytic or psychodynamic methods.
	Humanistic/Existential subscale
4.	I identify myself as humanistic or existential in orientation.
5.	I conceptualize my clients from a humanistic or existential perspective.
6.	I utilize humanistic or existential methods.
	Cognitive-Behavioral subscale
7.	I identify myself as cognitive or behavioral in orientation.
8.	I conceptualize my clients from a cognitive or behavioral perspective.
9.	I utilize cognitive or behavioral methods.
	Family Systems subscale
10.	I identify myself as family systems in orientation.
11.	I conceptualize my clients from a family systems perspective.
12.	I utilize family systems methods.
	Feminist subscale
13.	I identify myself as feminist in orientation.
14.	I conceptualize my clients from a feminist perspective.
15.	I utilize feminist therapy techniques.
	Multicultural subscale
16.	I identify myself as multicultural in orientation.
17.	I conceptualize my clients from a multicultural perspective.
18.	I utilize multicultural therapy techniques.

Note. The theoretical identification items are rated on a 10-point Likert-type scale (1=not at all to 10=completely). The methodological and conceptual orientation items are also rated on a 10-point Likert-type scale (1=never to 10=always).

APPENDIX G

THE DIMENSIONS OF RELIGIOSITY SCALE

The 20-item Dimensions of Religiosity Scale (2006) was developed by Stephen Joseph (Joseph & DiDuca, 2007).

Please read the following statements and indicate to what extent you agree or disagree with each one.
Strongly disagree = 1
Disagree = 2
Neither disagree or agree = 3
Agree = 4
Strongly agree = 5

1. I feel happy when I think of God	1	2	3	4	5
2. I will always believe in God	1	2	3	4	5
3. My thoughts often drift to God	1	2	3	4	5
4. Being a Christian is a joyous way to live	1	2	3	4	5
5. I am sure that Christ exists	1	2	3	4	5
6. I think about God all the time	1	2	3	4	5
7. I pray for guidance	1	2	3	4	5
8. My thoughts turn to Jesus every day	1	2	3	4	5
9. God does not help me to make decisions*	1	2	3	4	5
10. I know that God hears my prayers	1	2	3	4	5
11. Prayer lifts my spirits	1	2	3	4	5
12. Everything that happens to me reminds me of God	1	2	3	4	5
13. I try to follow the laws laid down in the Bible	1	2	3	4	5
14. I know that Jesus will always be there for me	1	2	3	4	5
15. I cannot make important decisions without God's help	1	2	3	4	5
16. I am certain that God is aware of everything I do	1	2	3	4	5
17. When I'm feeling miserable, thinking about Jesus helps to cheer me up	1	2	3	4	5
18. I like to talk about Jesus	1	2	3	4	5
19. Jesus' life is an example to me	1	2	3	4	5
20. God fills me with love	1	2	3	4	5

Note: *Item 9 is reverse-scored.

APPENDIX H

INSTITUTIONAL REVIEW BOARD APPROVAL

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

May 24, 2022

Daniel Wood
Kelly Orr

Re: IRB Exemption - IRB-FY21-22-924 The Integration of Neuroscience and Counseling Using Neuroeducation in Trauma Treatment: A Quantitative Study

Dear Daniel Wood, Kelly Orr,

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under the following exemption category, which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:104(d):

Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording).
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

Your stamped consent form(s) and final versions of your study documents can be found under the Attachments tab within the Submission Details section of your study on Cayuse IRB. Your stamped consent form(s) should be copied and used to gain the consent of your research participants. If you plan to provide your consent information electronically, the contents of the attached consent document(s) should be made available without alteration.

Please note that this exemption only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued exemption status. You may report these changes by completing a modification submission through your Cayuse IRB account.

If you have any questions about this exemption or need assistance in determining whether possible modifications to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,
G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
Research Ethics Office

APPENDIX I

WRITTEN CONSENT FOR CASE REVIEW

To: Daniel R. Wood Ed.D Candidate
Liberty University
Lynchburg, VA

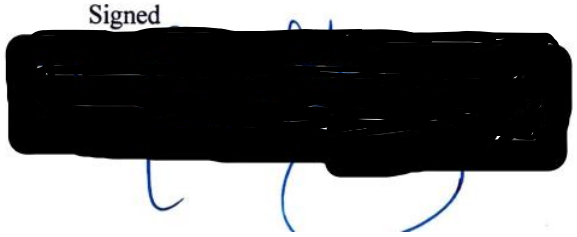
February 23, 2022

From [redacted]

Dear Daniel,

I hereby consent to the use of a review of my trauma case by Daniel Wood for the purpose of this research as part of the requirements for his doctoral dissertation. I further acknowledge this review is representative of my life story and that certain aspects have been adjusted to protect my identity. I am not receiving any compensation for this agreement and understand this research may be published in a journal at some later date.

Signed [redacted]



Signed copy will be maintained by researcher.

APPENDIX J

PERMISSION FOR THE USE OF

THE COUNSELOR SELF-EFFICACY SCALE

To: Dr. Timothy P. Melchert
Department of Psychology
Texas Tech University
Box 42051
Lubbock, TX 79409-2051

From: Daniel R. Wood Ed.D Candidate
Liberty University
School of Behavioral Sciences
1971 University Blvd.
Lynchburg, VA 24515

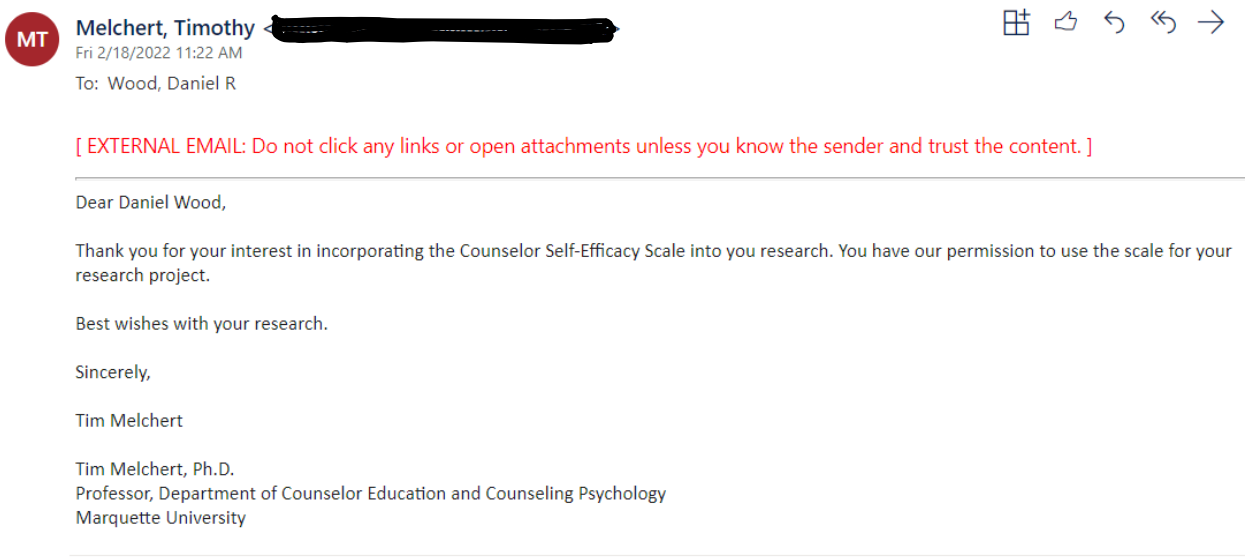
Dear Dr. Melchert,

My name is Daniel Wood, and I am a student in the Doctor of Education Program in the Department of Community Care and Counseling in the School of Behavioral Sciences at Liberty University in Lynchburg, Virginia. I am writing to request permission to reproduce the Counselor Self-Efficacy Scale as found in the journal article Melchert, T. P., Hays, V. L., Wiljanen, L. M., & Kolocek, A. K. (1996), Testing models of counselor development with a measure of counseling self-efficacy, *Journal of Counseling & Development*, *74*, 640–655.

This research will examine the choice of counseling professionals to integrate neuroscience into the case conceptualization and treatment planning of clients. The objectives are to identify and measure the relationship between the counselor characteristic variables of education, theoretical orientation, and religious beliefs, and the counselor's choice to use or not use neuroscience. Research has suggested that counselors' education and self-competency have a significant influence on the lens through which a client's case is conceptualized and treatment planned. Yet no study has been found that considered what factors influence a counselor to utilize or reject neuro-informed principles in clinical practice. The purpose of this study is to address this gap in the literature and inform the current discussion surrounding factors that influence counselors' choice regarding neuroscience integration in counseling.

Sincerely,

Daniel R. Wood



MT **Melchert, Timothy** [redacted]
Fri 2/18/2022 11:22 AM
To: Wood, Daniel R

[EXTERNAL EMAIL: Do not click any links or open attachments unless you know the sender and trust the content.]

Dear Daniel Wood,

Thank you for your interest in incorporating the Counselor Self-Efficacy Scale into you research. You have our permission to use the scale for your research project.

Best wishes with your research.

Sincerely,

Tim Melchert

Tim Melchert, Ph.D.
Professor, Department of Counselor Education and Counseling Psychology
Marquette University

To: American Counseling Association
PO Box 31110
Alexandria, VA 22310-9998

From: Daniel R. Wood, Ed.D. Candidate
Liberty University
School of Behavioral Sciences
1971 University Blvd.
Lynchburg, VA 24515

Dear Sir or Ma'am,

My name is Daniel Wood, and I am a student in the Doctor of Education Program in the Department of Community Care and Counseling in the School of Behavioral Sciences at Liberty University in Lynchburg, Virginia. I am writing to request permission to reproduce the Counselor Self-Efficacy Scale as found in the journal article Melchert, T. P., Hays, V. L., Wiljanen, L. M., & Kolocek, A. K. (1996), Testing models of counselor development with a measure of counseling self-efficacy, *Journal of Counseling & Development*, *74*, 640–655.

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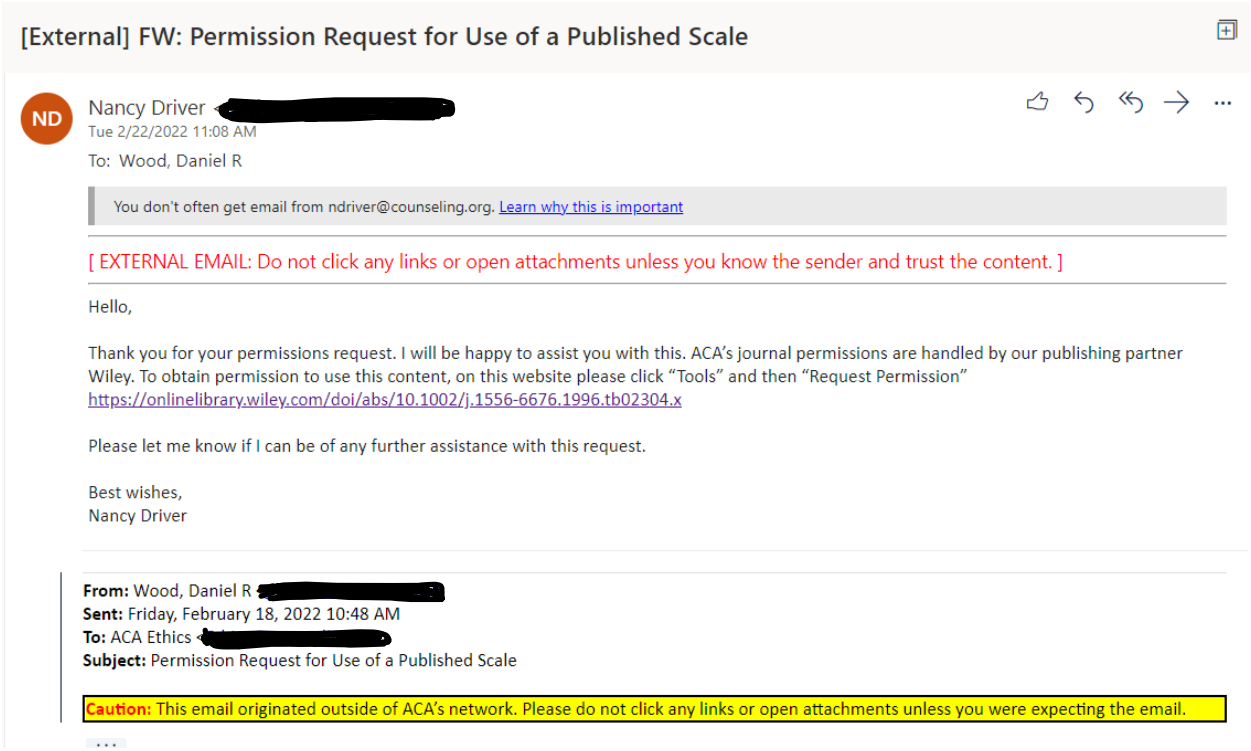
significant influence on the lens through which a client's case is conceptualized and treatment planned. Yet no study has been found that considered what factors influence a counselor to utilize or reject neuro-informed principles in clinical practice. The purpose of this study is to address this gap in the literature and inform the current discussion surrounding factors that influence counselors' choice regarding neuroscience integration in counseling.

Sincerely,

Daniel R. Wood



[External] FW: Permission Request for Use of a Published Scale

ND Nancy Driver <[redacted]>
Tue 2/22/2022 11:08 AM
To: Wood, Daniel R

You don't often get email from ndriver@counseling.org. Learn why this is important

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https://onlinelibrary.wiley.com/doi/abs/10.1002/j.1556-6676.1996.tb02304.x

Please let me know if I can be of any further assistance with this request.

Best wishes,
Nancy Driver

From: Wood, Daniel R <[redacted]>
Sent: Friday, February 18, 2022 10:48 AM
To: ACA Ethics <[redacted]>
Subject: Permission Request for Use of a Published Scale

Caution: This email originated outside of ACA's network. Please do not click any links or open attachments unless you were expecting the email.

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Feb 22, 2022

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Licensed Content Author	Ann K. Kolocek, Lynn M. Wiljanen, Victoria L. Hays, et al
Licensed Content Date	Dec 23, 2011
Licensed Content Volume	74
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Type of use	Dissertation/Thesis
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Format	Print and electronic
Portion	Figure/table
Number of figures/tables	1
Will you be translating?	No
Title	The Integration of Neuroscience and Counseling Using Neuroeducation in Trauma Treatment: A Quantitative Study
Institution name	Liberty University
Expected presentation date	Jun 2022
Portions	Appendix on pages 643-644
Requestor Location	DANIEL WOOD [redacted] [redacted] United States Attn: DANIEL WOOD
Publisher Tax ID	EU826007151
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APPENDIX K

PERMISSION FOR THE USE OF

THE DIMENSIONS OF RELIGIOSITY SCALE

To: Dr. Stephen Joseph
School of Sociology and Social Policy
University of Nottingham
University Park
NG7 2RD

From: Daniel R. Wood Ed. D Candidate
Liberty University
School of Behavioral Sciences
1971 University Blvd.
Lynchburg, VA 24515

Dear Dr. Joseph,

My name is Daniel Wood, and I am a student in the Doctor of Education Program in the Department of Community Care and Counseling in the School of Behavioral Sciences at Liberty University in Lynchburg, Virginia. I am writing to request permission to reproduce the Dimensions of Religiosity Scale as found in the journal article Joseph, S. & DiDuca, D. (2007). The Dimensions of religiosity scale: 20-item self-report measure of religious preoccupation, guidance, conviction, and emotional involvement. *Mental Health. Religion & Culture*, 603-608.

This research will examine the choice of counseling professionals to integrate neuroscience into the case conceptualization and treatment planning of clients. The objectives are to identify and measure the relationship between the counselor characteristic variables of education, theoretical orientation, and religious beliefs, and the counselor's choice to use or not use neuroscience. Research has suggested that counselors' religious beliefs have a significant influence on the lens through which a client's case is conceptualized and treatment planned. Yet no study has been found that considered what factors influence a counselor to utilize or reject neuro-informed principles in clinical practice. The purpose of this study is to address this gap in the literature and inform the current discussion surrounding factors that influence counselors' choice regarding neuroscience integration in counseling.

Sincerely,

Daniel R. Wood

SJ

Stephen Joseph <[redacted]>
Thu 2/24/2022 4:43 PM
To: Wood, Daniel R

[EXTERNAL EMAIL: Do not click any links or open attachments unless you know the sender and trust the content.]

Dear Daniel,

You are welcome to use the scale. sounds like interesting research. I hope it goes well.

Best wishes,
Stephen

...

APPENDIX L

PERMISSION REQUEST FOR THE USE OF

THE THEORETICAL ORIENTATION PROFILE SCALE-REVISED

To: Dr. Frank R. Dillon
Arizona State University
College of Integrative Sciences and Arts
446 Payne Hall, MC-0811
Tempe, Arizona 85287-0811
College Park, MD 20742

From: Daniel R. Wood, Ed.D Candidate
Liberty University
School of Behavioral Sciences
1971 University Blvd.
Lynchburg, VA 24515

Dear Dr. Dillon,

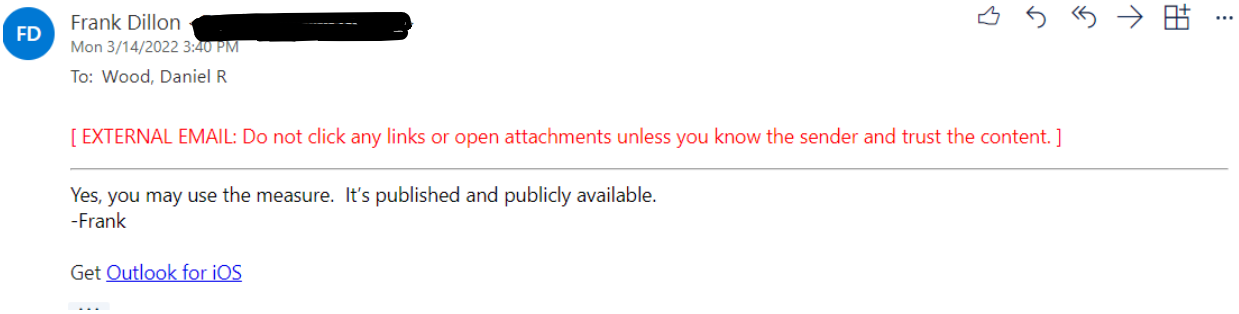
My name is Daniel Wood, and I am a student in the Doctor of Education Program in the Department of Community Care and Counseling in the School of Behavioral Sciences at Liberty University in Lynchburg, Virginia. I am writing to request permission to reproduce the Theoretical Orientation Profile Scale-Revised as found in the journal article *The Theoretical Orientation Profile Scale-Revised: A Validation Study* (2003) by Roger Worthington and Frank Dillon. This article was found through PsycTESTS (https://dx.doi.org/10.1037/t66582-000). The article is in Measurement and Evaluation in Counseling and Development, Volume 36(2). Additionally, I am requesting a copy of the Theoretical Orientation Profile Scale-Revised and a pictorial representation of the scoring scale that displays the 1-10 measurement if this exists.

This research will examine the choice of counseling professionals to integrate neuroscience into the case conceptualization and treatment planning of clients. The objectives are to identify and measure the relationship between the counselor characteristic variables of self-competency based on education, theoretically informed attitude, and strength of religious beliefs, and the counselor's choice regarding the importance of neuroscience use in case conceptualization and treatment. Research has suggested that a counselor's theoretical orientation has a significant influence on the lens through which a client's case is conceptualized and treatment planned. Yet no study has been found that considered what factors influence a counselor to utilize or reject neuro-informed principles in clinical practice. The purpose of this

study is to address this gap in the literature and inform the current discussion surrounding factors that influence counselors' choice regarding neuroscience integration in counseling. Thank you for your assistance in this matter.

Sincerely,

Daniel R. Wood, MDiv.
[redacted]



FD

Frank Dillon [redacted]
Mon 3/14/2022 3:40 PM
To: Wood, Daniel R

[EXTERNAL EMAIL: Do not click any links or open attachments unless you know the sender and trust the content.]

Yes, you may use the measure. It's published and publicly available.
-Frank

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