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Finding Consensus on Integrating Neuroeducation into Trauma-Informed Counseling Practice: A Delphi Study

Cover Page Footnote

We would like to acknowledge Dr Sherry Todd, University of the Cumberlands, for her support of this project.

Finding Consensus on Integrating Neuroeducation Into Trauma-Informed Counseling Practice: A Delphi Study

Jenna Epstein, Rachel McRoberts

The authors conducted a Delphi study to identify what experts considered essential components for integrating neuroeducation into trauma-informed counseling practice. Fourteen trauma-informed counseling experts participated in a 4-round Delphi study, in which they identified main areas of brain education and associated educational methods and discussed a richer description of the perceived impact of neuroeducation on clients. The results of this Delphi study support the integration of a number of neuroeducation topics and methods into trauma-informed counseling practice and further support the need for incorporation of neuroeducation into counselor education and supervision.

Keywords: trauma-informed counseling, counselor education, neuroeducation, Delphi study, qualitative

Advances in neuroscience over the past decade have led to increased scientific understanding of the links between the environment and brain activation, resulting in changes in various mental health systems and new layers of discourse around the infusion of neuroeducation into counselor training (Busacca et al., 2015; Ivey & Zalaquett, 2011). Neuroeducation (NE) describes how neurological processes are the basis for brain functioning and mental health, and how responsive framing may increase understanding of human suffering and growth, resulting in enhanced collaboration between and resilience building among counselor and client (Ardito & Rabellino, 2011; Busacca et al., 2015; Miller, 2016). NE has been integrated into trauma informed care (TIC) models from education to mental health, due to the prevalence of trauma in the general population, and potential for resulting physical, emotional, and social implications (Felitti et al., 1998; Freedle, 2019; Maguire-Jack et al., 2019; Substance Abuse and Mental Health Services Administration [SAMHSA], 2014; Wass et al., 2018). Trauma is considered both a public health crisis and a social justice issue (CDC, 2019; Dolan et al., 2019). Research in the capacity for resilience and post-traumatic growth in both clients and therapists

shows promising results (Isobel & Angus-Leppan, 2018; Manning-Jones et al., 2017). However, the need for counselor access to NE is emerging and ongoing, and many of the most widely recognized trauma treatment modalities in counseling require post-graduate training for specialization (SAMHSA, 2014).

Aspects of Trauma-Informed Neuroeducation

The brain is a complex structure, full of interconnected systems that adapt to environmental conditions and relationships (Luke, 2015), that forms and processes from the bottom up (Perry, 2009). Identifying specific brain structures, how they form, and their associated functions help with visualization of the mind in a way that promotes conscious understanding of how the brain develops, reacts, and regulates in response to stressors (Perry, 2009; Siegel, 2012). Experiences that are highly emotional or occur frequently influence neural architecture in such a way that the resulting thinking, feeling, and acting becomes largely automatic, or unconscious (Miller, 2016). The limbic region, also referred to as the “downstairs brain, midbrain, mammalian brain, and dolphin brain,” assists in regulating emotion, motivation, and goal-directed behavior, and also plays a

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primary role in integrating memory (Miller, 2016, p. 108). Multisensory interventions involving the creative use of symbols, such as sandplay and the expressive arts, may assist with increasing neuroplasticity (Freedle, 2019). The fear circuitry that inhabits this area of the brain is geared toward negative bias as a method of protection; soothing experiences preceding presentation of NE may assist in mitigating stress levels and further overexposure to cortisol (Cozolino, 2010). Through the safety of the therapeutic relationship and reparative experiences, increased openness to understanding brain development and response may assist with further reorganization and integration of the various neural systems (Davidson & McEwen, 2012; Siegel, 2012). Discussion of implicit and explicit memory may assist with alleviating feelings of guilt and shame related to client struggles with relationships, which are common trauma responses (Mann, 2010; Miller, 2016).

When painful memories and emotions surrounding trauma become reactivated, the intensity can be overwhelming, or outside the individual's *window of tolerance*, resulting in flooding or avoidance; it is important for counselors to be capable of recognizing and engaging within the window of tolerance (Siegel, 2010), which is akin to an emotional Zone of Proximal Development (Vygotsky, 1978), to encourage movement toward further trauma processing (Hariri et al., 2000). Research has demonstrated that naming internal experiences and emotional states helps regulate the nervous system and calm the amygdala, allowing the prefrontal cortex to complete its role in emotional regulation (Siegel, 2010). Dan Siegel's Hand Model of the Brain (2012) is an exercise that has since appeared in numerous publications, and acts as a metaphor to describe the impact of trauma to the brain stem, limbic, and cortical regions; using the visual of a closed fist with the thumb tucked to the palm, fingers folded over, "flipping the lid" occurs when the prefrontal cortex is unable to inhibit surges from the brainstem and limbic regions due to high levels of stress or poor development as discussed earlier. This results in the individual's inability to moderate emotion with logic when responding to stimuli. *The Body Keeps the Score* (Van der Kolk, 2015) is a book that provides psychoeducation and several tools to address the impact of trauma on the body

and mind, as well as practical techniques; activities that increase self-efficacy, such as yoga, meditation, EMDR, neurofeedback, and play, are recommended. A variety of other techniques may assist with awareness and regulation of emotions, and making cognitive shifts toward self-acceptance (Fisher, 2009). Methods of calming include deep breaths, rubbing the arms and hands, expanding the chest, stretching, shaking the arms and legs, and shifting positions (Dion & Gray, 2014), grounding and visualization, and mindfulness of the present (Fisher, 1999).

Trauma-Informed Competencies for Counselors

Trauma-informed neuroeducation provides structured language around conceptualizing patterns of dysregulation to reduce confusion, shame, and fear (Miller, 2016). Trauma-informed competencies are also multicultural competencies, the latter of which are recommended to be interwoven into all aspects of counselor education and supervision (ACA, 2014; Cook et al., 2014; Feather et al., 2019; Ratts et al., 2016). These competencies include the ability to identify and navigate intersectional identities, systems, and the impact of traumas to deconstruct and appropriately tailor the presentation of knowledge, assessment, and interventions to increase feelings of safety, trust, and empowerment, supporting and building resilience (Cook et al., 2014). Concerns about preserving counseling's humanistic foundations have been raised as systems adopt a reductionist medical model, of which NE may be included. However, through a counseling lens, NE may reinforce the profession's values of autonomy and agency while supporting clients, as it enhances the client's ability to understand how their biogenetic makeup, combined with their individual life circumstances, has resulted in their current state of mind (Busacca et al., 2015; Hansen, 2014; Rønnestad & Skovholt, 2003).

An integrally-informed model of incorporating neuroscience into case conceptualization, client treatment, and counselor training through a balanced, inclusive and integral perspective (Busacca et al., 2015) provides insight into how biological, psychological, cultural, and social factors impact the brain. It is based on a four-quadrant framework for exploring the whole-self that focuses on the

Subjective-Individual (“I”), the Objective-Individual (“It”), the Collective-Individual (“We”), and the Objective-Collective (“Its”), identifying the individual as a combination of experiences felt from the inside, behaviors as seen from the outside, experiences as a part of a group from the inside, and behaviors as a part of a group in the outside world. Through its focus on metacognitive processes, the integrally-informed model offers an opportunity to teach clients, counselors, and counseling students how to work through alternative approaches to etiology and diagnosis through increased insight into how their unique combination of biopsychosocial factors contributes to their set of characteristics and worldview. While an excellent start to addressing use of NE in practice and education, the integral model does not suggest how counselors obtain specific NE or when to address it with clients, requiring additional efforts for counselors to link “theory, evidence, and technique” (Zarbo et al., 2016, p. 2).

While CACREP (2015, section 2.F.) standards require that biological, neurological, and physiological processes be addressed as foundational knowledge required of entry-level counselors, current research suggests this topic has been largely neglected by counselor educators (Field et al., 2016). There are currently no NE competency assessments for counselors cited in the literature. Mental health counselors are responsible for maintaining a current and critical knowledge base of biopsychosocial factors, which may impact brain architecture and functioning; neural development and cognition across the lifespan, as well as the mind–body connection; components of relationships; psychopathology; medication and more, in addition to how to skillfully communicate this information to, and advocate for, clients (American Mental Health Counselors Association, 2018). Integration of NE into practice may enhance the therapeutic relationship, client empowerment, and treatment outcomes (Field, 2016; Field et al., 2017; Miller, 2016; Panskepp & Biven, 2012) through an increase in sense of counselor professional efficacy. When addressing salient issues through trauma-informed NE within the context of their theoretical framework (Wilson, 2017), counselors maintain an ability to increase sense of client control within and motivation to continue therapy (Hopkins et al., 2016), while simultaneously addressing issues of impairment related to unresolved

personal concerns (Panskepp & Biven, 2012; Wilkinson, 2018). However, limited research has been conducted on the experiences and decision-making processes of counselors working to provide NE (Beeson et al., 2019; Charmaz, 2014; Kaplan & Gladding, 2011; Miller, 2016).

Research Question

Throughout the existing literature on NE, there is a gap in information that addresses exactly what NE information is considered essential to know and use when working with clients. Accordingly, the purpose of this Delphi Study was to investigate essential components for integrating neuroeducation into trauma-informed counseling practice. This study was guided by the following research question: What would experts agree is the basis for trauma-informed neuroeducation for counselors to use with clients?

Method

This Delphi Study (Dalkey & Helmer, 1963; Day & Bobeva, 2005; Yousuf, 2007) was designed to examine the practices and preferences of experts in the Trauma Informed Care (TIC) counseling community to create a NE training regimen for use by counselors for the purpose of client psychoeducation. A Delphi Study generally involves three to four rounds of questioning and includes 10–50 experts (Iqbal & Pison-Young, 2009; Turoff, 2002). In this study, experts were asked to complete web-based questions in four rounds via Qualtrics (2019), providing feedback and working to create consensus on what should be included in a basic NE training (Iqbal & Pison-Young, 2009). We used survey anonymity, controlled feedback, and statistical analysis to reduce influences of dominant participants, group pressure, and confidentiality (Dalkey, 1972; Helmer & Rescher, 1959; Hsu & Sanford, 2007; Ludlow, 1975). Consistent with Delphi methodology, we also used levels of consensus between members, choice of experts, and data collection procedures to provide evidence of the credibility of the NE platform created by this Delphi Study (Thangaratinam & Redman, 2005).

Panel Selection

Participants were recruited through purposive, criterion sampling. Participants were required to be

practicing clinicians, utilizing trauma-informed modalities, and meeting the highest training standards for one or more areas of practice. We located participants through registration websites, including the EMDR International Association (EMDRIA) registry of consultants and trainers, and the Humanitarian Assistance Program (HAP) website, and we sent each potential participant a letter detailing the purpose of the study and the role of participants. We invited 50 TIC experts to participate, with a 36% response rate (18 responses, 4 declining). The 14 final participants included 2 males and 12 females practicing across nine U.S. states plus Puerto Rico. Participants had between 10–25 years of experience in the field ($M = 20.36$, $SD = 10.47$). Participants ranged in age from 38–73 years old ($M = 60.14$, $SD = 11.60$), and 86% self-reported as Caucasian ($n = 12$), with 14% not answering the question ($n = 2$). Final participants included 10 counselors, 2 social workers, 2 psychologists, and 1 nurse, with therapeutic approaches in Eye Movement Desensitization and Reprocessing (EMDR; $n = 14$), Trauma Focused-Cognitive Behavioral Therapy (TF-CBT; $n = 1$), Cognitive Behavioral Therapy (CBT; $n = 4$), Dialectical Behavior Therapy (DBT; $n = 2$), Expressive Arts ($n = 2$), and Holistic ($n = 2$).

Data Collection

Participants were invited to complete four rounds of survey questionnaires. We sent an initial email invitation for each round, followed by a reminder email after 1 week, and then a final reminder email 2 days prior to the round closing. Participants completed their surveys over a 2-week period, with 1 to 2 weeks in between each round (Delbecq et al., 1975).

We gathered and aggregated results from each online survey in the 2-week break between each survey, and we created the next round's survey using the results from the round before. During the first three rounds, content and process information were collected; during the fourth round, participants reviewed the resulting consensus and had an opportunity to provide feedback. The number of participants varied in each round, with a 93% participation rate in Round One, 64% in Round Two, 57% in Round Three, and 43% in Round Four.

Round One. The Delphi Study began with an open-ended questionnaire, which provided information for subsequent rounds (Custer et al., 1999; Hsu & Sanford, 2007). Participants were asked to free-respond to the cornerstone question of: What would you include when providing neuroeducation to clients? Following the 2-week window, responses were collected, reviewed, and summarized, and then used to create the Round Two questionnaire.

Round Two. The second questionnaire was developed out of responses to the foundational question mentioned in Round One, in which participants listed 15 concepts and associated interventions. Participants were encouraged to rank order these concepts by what they thought was most important for clients to know. They were not required to rank all items to avoid coercion or inaccurate understanding of consensus (Hsu & Sanford, 2007). Next, the interventions mentioned in Round One were listed under each concept, and participants chose the interventions they used to describe that concept. A free-response space was also available for additional responses that may not have been shared in Round One.

Round Three. The third questionnaire included the five concepts listed as those that participants prioritized in their completion of NE with clients. These top five concepts were those that fell within the prescribed range (Miller, 2006) of 75% consensus. Since interventions for each of these concepts were already named, it was not necessary to include this information during Round Three. Since payoff usually decreases after the third round (Worthen & Sanders, 1987), this round was the last for consensus building. In this round, we provided participants with the top five concepts and asked them to rate them in order of discussion in a NE session. Participants were asked to list topics in order of what they would choose to discuss first, second, third, fourth, and/or fifth. They were not required to list all five, only the ones they used and found relevant. Two free-response questions were also provided that asked participants to answer how they would describe their decision-making process to include NE with clients, and to describe how they have experienced integrating NE into work with clients. These

questions were strictly added for the purpose of collecting qualitative data on the experiences of these participants.

Round Four. In the fourth and final round, we provided participants with a summary of the data compiled in Rounds Two and Three in which they provided consensus on what topics and interventions to discuss when providing NE. We also provided participants a list of the top five topics from Round Three, as well as the top three associated interventions in table form. They were also encouraged to complete two 10-point Likert scale questions where they were asked to rate how comfortable they were with the provided information, as well as how likely they would be to provide this information to other counselors to use. There was also an additional open text box for free response to allow for any additional feedback.

Results

Round One. In the initial round, 13 of 14 (93%) participants responded. They named 15 topics, along with 9 interventions (see Table 1). These data were aggregated and used for the Round Two questionnaire.

Round Two. Nine individuals (64%) participated in prioritizing the 15 topics from 1–15, with one being the most important topic to discuss and 15 being the least important. They also chose which interventions from Round One would be used to discuss these 15 topics (Table 1). Topics were prioritized modally, with the top five selected (as marked with checks in Table 1). We chose to provide a list of the top five topics determined by the calculation of the mode in the next round, or the items with the greatest percentage of consensus by participants. The top five categories by mode were *limbic brain* (1.857), *bias of brain* (2.285), *trauma as unconscious* (2.428), *memory* (4), and *how the brain forms* (4.428).

Round Three. In the third round, 8 individuals (57% of participant pool) provided input on the top five topics in preferential order of appearance within a psychoeducation curriculum. Participants ordered items, and we aggregated the results using a mean calculation of where each topic fell, on average, from participant answers. From the mean measurements, the top five were placed in order of

appearance from 1 to 5 (Table 2). Associated interventions were also listed underneath each topic.

Participants also provided descriptive feedback that NE increases client understanding and participation, provides clarity, empowerment, relief, and reduces shame. Participants commented that “clients tend to feel empowered and relieved through education”; “clarifying patient challenges through the consultation has been very patient beneficial”; “when well-timed and well-connected to their experience, clients experience neuroeducation as shame-reducing”; and “psychoeducation is a pathway to clarity and understanding which results in greater patient participation.” One outlier within these themes was a single participant comment regarding how NE could potentially damage the therapeutic relationship. This participant shared that “if poorly timed or connected to a defense, clients may feel a shame response/increase.”

Round Four. In Round Four, 6 participants (43%) responded with feedback by Likert-scale (0–100) regarding their overall view on whether these results represented how they provided NE to clients as well as whether they would recommend the NE method to other clinicians (see Figure 1). Mean consensus regarding overall views of representation was 76.8% (SD= 24.44), while mean consensus of whether to provide this NE method to others was 83.5% (SD= 22.66). Participants 1 and 6 chose not to answer the “recommend to others” prompt, and therefore, they were not incorporated into consensus in this area.

Discussion

This Delphi Study identified the components that a panel of trauma-informed experts reached a consensus regarding what the basis for trauma-informed neuroeducation should be for counselors to integrate into practice with clients. Five major themes, with two to three specific interventions were listed for each theme with some overlap (see Table 2). Themes included *how the brain forms*, *the limbic brain*, *bias of the brain towards negative information*, *memory*, and *trauma as unconscious/processed and processed through symbol*. Interventions included Dan Siegel’s *Hand Model of the Brain*, *the window of tolerance*, *The Body Keeps the Score*, and *calming/stabilization techniques*. The overlap

Table 1

Round One Results with Round 2 and 3 Consensus on NE Topics and NE Interventions

Neuroeducation Topic ✓	Round 2 % of approval	Round 3 Consensus	Neuroeducation Interventions ✦	Round 2 % of Approval	Round 3 Consensus
How the brain forms	78%	✓	3D Brain App	25%	
Adaptive Information Processing model (AIP)	56%		Calming/Stabilization Techniques	55%	✦
Triune Brain	56%		The Body Keeps the Score	61%	✦
Prefrontal Cortex	67%		Dan Siegel Hand Metaphor	65%	✦
Limbic Brain	78%	✓	“The metaphor of a dandelion for past (root), present (leaves), and future (flower/seeds)”	6%	
Neurofiber Bridge	67%				
Polyvagal theory	67%		Grey Matters Diagram	16%	
Bias of brain towards negative information for survival	78%	✓	Teachable skills that foster calming	37%	
Fight, Flight, Freeze Response	67%		Janine Fischer flip chart	8%	
Implicit, declarative, and explicit memory	78%	✓	Window of Tolerance	61%	✦
Difference between introverts and extroverts	56%				
The effect of stress response on structures of the brain	67%				
The effect of stress on neurochemicals (serotonin, dopamine)	67%				
Trauma responses as largely unconscious, accessing through symbol, bringing them into awareness	78%	✓			
Trauma’s interference with memory consolidation	56%				

suggests numerous ways that NE may assist in conceptualizing various aspects of trauma responses.

Each of these themes and associated interventions can be found in current articles and publications, as well as through Internet searches that will take you to results like Dan Siegel’s (2012) “Hand Brain Model” video; the books *The Body Keeps the Score* (Van der Kolk, 2015) and *The Developing Mind* (Siegel, 2012), which addresses the hand

model of the brain. These resources are accessible to the general population, which align with counseling’s humanistic roots and wellness focus. Results support recent efforts to create neuroscience-based frameworks for integrated use with a variety of existing methods of therapy, such as neuroscience-based-CBT, Interpersonal Neurobiology (IPNB), EMDR, and Neurofeedback, enhancing already existing approaches to NE and TIC suggested previously (Field et al., 2016; Miller, 2016).

Notably, the NE topics of neuroplasticity, NMT, and bilateral processing were not addressed by participants in this study, although they are frequently addressed in the literature. The reasons for this are unknown, and surprising, since there were experts in EMDR on the panel.

The outlier of a single participant’s concern over NE causing potential harm to the

therapeutic relationship was not addressed, as the Delphi Study does not fully explore ideas not supported by consensus (Barnes, 1987; Linstone & Turoff, 1975). This concern may be related to the noted importance of timing in the therapeutic rela-

Table 2

Round Three Findings/Final Results from Round 4 Consensus

Limbic Brain	Bias of the brain towards negative information	Trauma as unconscious	Implicit, declarative, explicit memory	How the brain forms
Dan Siegel Hand Metaphor	Dan Siegel Hand Metaphor	Dan Siegel Hand Metaphor	Window of Tolerance	Dan Siegel Hand Metaphor
Window of Tolerance	The Body Keeps the Score Calming/Stabilization Techniques	The Body Keeps the Score		The Body Keeps the Score Calming/Stabilization Techniques

Overall, these themes and interventions demonstrate a desire to make neuroeducation accessible to counselors and clients. These results are generally in line with current literature re-

garding the incorporation of NE and TIC principals into counselor education as well as client care. Additionally, they support ACA efforts to inform the “practice standards of the future,” and the recognition of the need for a unified vision of how NE can explain and enhance counseling practice (Field et al., 2017, p. vii).

relationship so as to enhance framing of NE in an empowering way, the concerns previously voiced in the counseling community against resistance to over reliance on the medical model (Busacca et al., 2015; Ivey & Zalaquett, 2011), or a therapeutic approach where NE may not be directly presented to the client, such as in more nondirective or expressive modalities. Because this is a discussion of trauma-informed practices, nuances of personalized emotional safety are likely being considered.

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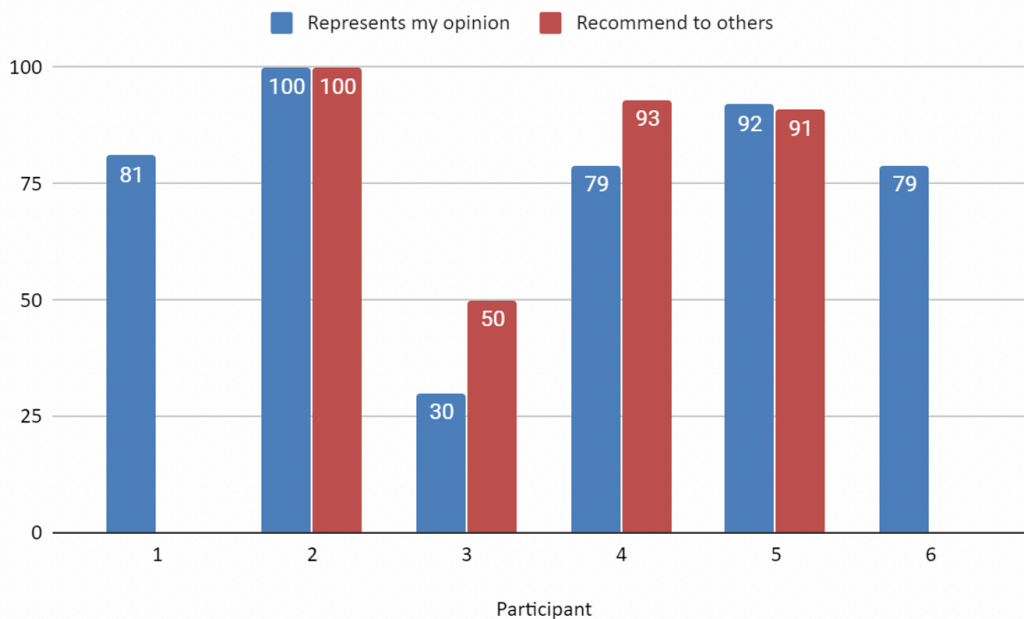
Limitations

Limitations of the Delphi Study include the particular expertise of these experts and potential bias toward neuroeducation. Since the majority of partic-

ipants were primarily EMDR practitioners, a practice with investment in the incorporation of NE, and white females, these results may not be reflective of all populations of counselors. Participant demographics also indicate that while all maintain clinical practice and provide NE and TIC to clients, they are not all licensed counselors. As a result, this study may have benefitted from additional information regarding how these individuals view these methods as beneficial, or how they might benefit counselor education

Figure 1

Participant Sense of Representation vs. Recommendation to Others



Note. Participant 1 and 6 chose not to answer the “recommend to others” prompt.

and supervision, specifically. While the end consensus on topics and techniques remained within range, participation rates varied throughout, within only 43% participation in Round Four. As a result, participation could be viewed as a limitation in terms of whether final consensus is representative of a larger sample group, which is a common limitation found in Delphi Studies (Ludlow, 1975).

Implications

The resulting feedback process and information from this study may help to inform potential directions counselors, educators, and supervisors can take when integrating NE into practice. It also offers insight into potential areas of need related to increased counseling-trainee competency on the brain and its relationship to client outcomes.

Potential implications of this study and others like it may assist in solidifying counseling as a profession supported by science, increasing counselor credential recognition across state lines, with funding sources, and as part of an interdisciplinary team to ultimately improve client care outcomes. Counselors are also encouraged to incorporate this information through resilience-based programs as aspects of trauma-informed prevention efforts in the schools and greater community.

An additional implication of this study relates to the professional's own experiences with traumatic life events and how increased awareness of the physiological processes behind their reactions, their evolutionary basis, and methods for intervention have the ability to address potential ethical issues related to unresolved personal concerns (Panskepp & Biven, 2012; Wilkinson, 2018). NE-informed supervisors and educators can address salient ethical issues that may arise in parallel processing (ACA, 2014), while also enhancing the supervisory relationship through modeling empathy, skillful integration, and wellness practices that reduce shame and prevent impairment (Blount & Lambrie, 2016; Corley et al., 2020). All of the implications mentioned require that counselor educators maintain awareness of the most current methods of providing care, and how to integrate topics like neuroeducation into already existing therapeutic models.

Future areas of study may include continued exploration of NE methods and associated interventions on broader and more specific scales, as well as specific impacts on diverse provider and client populations, the therapeutic alliance, various perspectives, and integration of NE counseling curriculums and assessments. How cognitive therapists view the role of the unconscious and the symbolic may also be an area of interest in the area of integration, not only for NE but for the expressive arts and other depth practices as well. Further study may explore connections between NE and post-traumatic growth in both clients and counselors (Isobel & Angus-Leppan, 2018; Manning-Jones et al., 2017) or application to counselor developmental and supervision models (Bussaca et al., 2015; Rønnestad & Skovholt, 2003).

Conclusion

Neuroeducation is an emerging area of clinical relevance. By exploring how to incorporate scientific information about the mind, counselor educators can assist with increasing foundational knowledge for professional counselor identity development. While this study is a first effort at addressing what topics in neuroeducation are currently being used by trauma experts, it also concretely names areas that could be incorporated into counselor education programs, increasing the ability of educators to not only meet CACREP (2015) and AMHCA (2018) standards, but provide opportunities for personal and professional growth. There is clear evidence that environmental, political, and social issues are constantly requiring that counselors, counselor educators, and supervisors maintain an enhanced understanding of the roots of human thought, feeling, and behavior to maintain perspective on salient client issues (ACA, 2014; Robino, 2019). Far from deterministic, neuroscience provides hope that healing relationships can protect and repair minds affected by trauma.

References

- American Counseling Association. (2014). *2014 code of ethics*. <http://www.counseling.org/Resources/aca-code-of-ethics.pdf>
- American Mental Health Counselors Association. (2018). *AMHCA standards for the practice of clinical mental health counseling*. <https://www.amhca.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=15a3f054-c284-c0f8-7ac6>

- d1ac96ca20d4&forceDialog=0
- Ardito, R. B., & Rabellino, D. (2011). Therapeutic alliance and outcome of psychotherapy: Historical excursus, measurements, and prospects for research. *Frontiers in Psychology*, 2(270). <https://doi.org/10.3389/fpsyg.2011.00270>
- Barnes, J. L. (1987). *An international study of curricular organizers for the study of technology*. Unpublished doctoral dissertation, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
- Beeson, E. T., Kim, S. R., Zalaquett, C. P., Fonseca, F. D. (2019). Neuroscience attitudes, exposure, and knowledge among counselors. *Teaching and Supervision in Counseling*, 1(2), 1–19. <https://doi.org/10.7290/tsc010201>
- Blount, A. J., Lambie, G. W., & Kissingner, D. B. (2016). Wellness matters. *Counseling Today*. <https://ct.counseling.org/2016/11/wellness-matters/>
- Busacca, L. A., Sikorski, A. M., & McHenry, B. (2015). Infusing neuroscience within counselor training: A rationale for an integrally-informed model. *Journal of Counselor Practice*, 6(1), 33–45. https://www.journalofcounselorpractice.com/uploads/6/8/9/4/68949193/busacca_et_al_vol6_iss1.pdf
- Council for Accreditation of Counseling and Related Educational Programs. (2015). *2016 standards*. <https://www.cacrep.org/for-programs/2016-cacrep-standards/>
- Center for Disease Control (CDC). (2019). *Violence prevention: Behavioral risk factor surveillance system ACE data*. <https://www.cdc.gov/violenceprevention/childabuseandneglect/acestudy/ace-brfss.html>
- Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). SAGE.
- Cook, J. M., Newman, E., & The New Haven Trauma Competency Group. (2014). A consensus statement on trauma mental health: The New Haven Competency Conference process and major findings. *Psychological Trauma: Theory, Research, Practice, and Policy*, 6, 300–307. <https://doi.org/10.1037/a0036747>
- Corley, S. M., Lloyd-Hazlett, J., Schuermann, H., & Blessing, N. (2020). A phenomenological investigation of doctoral students' gatekeeping experiences. *Teaching and Supervision in Counseling*, 2(1), 95–105. <https://doi.org/10.7290/tsc020109>
- Council for the Accreditation of Counseling and Related Educational Programs. (2015). *2016 CACREP standards*. <http://www.cacrep.org/for-programs/2016-cacrep-standards/>
- Cozolino, L. (2010). *The Norton series on interpersonal neurobiology: The neuroscience of psychotherapy: Healing the social brain* (2nd ed.). W.W. Norton & Co.
- Custer, R. L., Scarcella, J. A., & Stewart, B. R. (1999). The modified Delphi technique: A rotational modification. *Journal of Vocational and Technical Education*, 15(2), 1–10.
- Day, J., & Bobeva, M. (2005). A generic toolkit for the successful management of Delphi studies. *The Electronic Journal of Business Research Methodology* 3(2), 103–116.
- Dalkey, N. C. (1972). The Delphi method: An experimental study of group opinion. In N. C. Dalkey, D. L. Rourke, R. Lewis, & D. Snyder (Eds.), *Studies in the quality of life: Delphi and decision-making* (pp. 13–54). Lexington Books.
- Dalkey, N., & Helmer, O. (1963). An experimental application of the Delphi method to the use of experts. *Management Science*, 9(3), 458–467.
- Davidson, R. J., & McEwen, B. S. (2012). Social influences on neuroplasticity: stress and interventions to promote well-being. *Nature Neuroscience*, 15(5), 689–695.
- Delbecq, A. L., Van de Ven, A. H., & Gustafson, D. H. (1975). Group techniques for program planning: A guide to nominal group and Delphi processes. Scott Foresman.
- Dion, L., & Gray, K. (2014). Impact of therapist authentic expression on emotional tolerance in synergetic play therapy. *International Journal of Play Therapy*, 23(1), 55.
- Dolan, K., Slaughter-Johnson, E., & Sampson, M. (2019). *Report: Students under siege*. Institute for Policy Studies. <https://ipsdc.org/report-students-under-siege/>
- Feather, K. A., Bordonada, T. M., Nelson, K. A., & Evans, K. M. (2019). Social justice advocacy training: An innovative certificate program for counselor education. *Teaching and Supervision in Counseling*, 1(1), 67–84. <https://doi.org/10.7290/tsc010205>
- Felitti, V., Anda, R., Nordenberg, D., Williamson, D., Spitz, A., Edwards, V., Koss, M. P., & Marks, J. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. *American Journal of Preventive Medicine*, 14, 245–258. [https://doi.org/10.1016/S0749-3797\(98\)00017-8](https://doi.org/10.1016/S0749-3797(98)00017-8)
- Field, T. A., Beeson, E. T., & Jones, L. K. (2016). Neuroscience-informed cognitive-behavior therapy in clinical practice: A preliminary study. *Journal of Mental Health Counseling*, 38(2), 139–154.
- Field, T. A., Beeson, E. T., Jones, L. K., & Miller, R. (2017). Counselor allegiance and client expectancy in neuroscience-informed cognitive-behavior therapy: A 12-month qualitative follow-up. *Journal of Mental Health Counseling*, 39(4), 351–365. <https://doi.org/10.17744/mehc.39.4.06>
- Field, T. A., Jones, L. K., & Russell-Chapin, L. A. (Eds.). (2017). *Neurocounseling: Brain-based clinical approaches*. John Wiley & Sons.
- Fisher, D. S. (2009). *The relationship between cognitive style and emotional/behavioral expression in a clinical sample of children*. Widener University, Institute for Graduate Clinical Psychology.
- Fisher, R. (1999). Thinking skills to thinking schools: Ways to develop children's thinking and learning. *Early Child Development and Care*, 153(1), 51–63.
- Freedle, L. R. (2019). Making connections: Sandplay therapy and the neurosequential model of therapeutics. *Journal of Sandplay Therapy*, 28(1), 91–109.
- Hansen, J. T. (2014). *Philosophical issues in counseling and psychotherapy: Encounters with four questions about knowing, effectiveness, and truth*. Rowman & Littlefield.
- Hariri, A. R., Bookheimer, S. Y., & Mazziotta, J. C. (2000). Modulating emotional responses: Effects of a neocortical network on the limbic system. *Neuroreport*, 11(1), 43–48.
- Helmer, O., & Rescher, N. (1959). On the epistemology of the inexact science. *Management Science*, 6, 25–53.
- Hopkins, E. J., Weisberg, D. S., & Taylor, J. C. (2016). The seductive allure is a reductive allure: People prefer scientific explanations that contain logically irrelevant reductive information. *Cognition*, 155, 67–76.
- Hsu, C.-C., & Sandford, B. A. (2007). The Delphi technique: Making sense of consensus. *Practical Assessment Research & Evaluation*, 12(10). <https://scholarworks.umass.edu/pare/vol12/iss1/10/>
- Iqbal, S., & Pison-Young, L. (2009) The Delphi method. *The Psychologist*, 22, 598–601.
- Isobel, S., & Angus-Leppan, G. (2018). Neuro-reciprocity and vicarious trauma in psychiatrists. *Australasian Psychiatry*, 26(4), 388–390.
- Ivey, A. E., & Zalaquett, C. P. (2011). Neuroscience and counseling: Central issues for social justice leaders. *Journal for Social Action in Counseling and Psychology*, 3, 103–116. <https://openjournals.bsu.edu/jsacp/article/view/341>
- Kaplan, D. M., & Gladding, S. T. (2011). A vision for the future of counseling: The 20/20 principles for strengthening the professional. *Journal of Counseling & Development*, 89, 367–372. <https://www.counseling.org/docs/licensure/principles-for-unifying-and-strengthening-the-profession.pdf?sfvrsn=0>

- Linstone, H. A., & Turoff, M. (1975). *The Delphi method: Techniques and applications*. Addison-Wesley Publishing Company.
- Ludlow, J. (1975). Delphi inquiries and knowledge utilization. In H. A. Linstone, & M. Turoff (Eds.), *The Delphi method: Techniques and applications* (pp. 102–123). Addison-Wesley Publishing Company.
- Luke, C. (2015). *Neuroscience for counselors and therapists: Integrating the sciences of mind and brain*. SAGE.
- Maguire-Jack, K., Lanier, P., & Lombardi, B. (2019). Investigating racial differences in clusters of adverse childhood experiences. *American Journal of Orthopsychiatry*. <http://dx.doi.org/10.1037/ort0000405>
- Mann, M. (2010). Shame veiled and unveiled: The shame affect and its re-emergence in the clinical setting. *The American Journal of Psychoanalysis*, 70(3), 270–281.
- Manning-Jones, S., de Terte, I., & Stephens, C. (2017). The relationship between vicarious posttraumatic growth and secondary traumatic stress among health professionals. *Journal of Loss and Trauma*, 22(3), 256–270. <http://dx.doi.org/10.1080/15325024.2017.1284516>
- McHenry, B., Sikorski, A. M., & McHenry, J. (2013). *A counselor's introduction to neuroscience*. Routledge.
- Miller, L. E. (2006). *Determining what could/should be: The Delphi technique and its application*. Paper presented at the meeting of the 2006 annual meeting of the Mid-Western Educational Research Association, Columbus, Ohio.
- Miller, R. (2016). Neuroeducation: Integrating brain-based psychoeducation into clinical practice. *Journal of Mental Health Counseling*, 38(2), 103–115.
- Panksepp, J., & Biven, L. (2012). *The archaeology of mind: Neuroevolutionary origins of human emotions* (Norton series on interpersonal neurobiology). W. W. Norton & Company.
- Perry, B. D. (2009). Examining child maltreatment through a neurodevelopmental lens: Clinical application of the neurosequential model of therapeutics. *Journal of Loss Trauma*, 14, 240–255.
- Qualtrics. (2019). Version (XM).[Computer software]. <https://www.qualtrics.com>
- Ratts, M. J., Singh, A. A., Nassar-McMillan, S., Butler, S. K., & McCullough, J. R. (2016). Multicultural and social justice counseling competencies: Guidelines for the counseling profession. *Journal of Multicultural Counseling & Development*, 44(1), 28–48.
- Robino, A. E. (2019). Global compassion fatigue: A new perspective in counselor wellness. *Professional Counselor*, 9(4), 272–284.
- Rønnestad, M. H., & Skovholt, T. M. (2003). The journey of the counselor and therapist: Research findings and perspectives on professional development. *Journal of Career Development*, 30(1), 5–44.
- Siegel, D. J. (2012). *The developing mind: How relationships and the brain interact to shape who we are* (2nd ed.). Guilford Press.
- Substance Abuse and Mental Health Services Administration (SAMHSA). (2014). *Trauma-informed care in behavioral health services: Treatment Improvement Protocol (TIP) Series, No. 57* (HHS Publication No. [SMA] 13-4801). Substance Abuse and Mental Health Services Administration.
- Tasca, G. A., Sylvestre, J., Balfour, L., Chyurlia, L., Evans, J., Fortin-Langelier, B., Francis, K., Gandhi, J., Huehn, L., Hunsley, J., Joyce, A. S., Kinley, J., Koszycki, D., Leszcz, M., Lybanon-Daigle, V., Mercer, D., Ogrodniczuk, J. S., Presniak, M., Ravitz, P., . . . Wilson, B. (2015). What clinicians want: findings from a psychotherapy practice research network survey. *Psychotherapy*, 52, 1–11. <https://doi.org/10.1037/a0038252>
- Thangaratinam, S., & Redman, C. W. (2005). The Delphi technique. *The Obstetrician & Gynaecologist*, 7(2), 120–125.
- Tracey, T. J., & Kokotovic, A. M. (1989). Factor structure of the Working Alliance Inventory. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, 1(3), 207–210. <https://doi.org/10.1037/1040-3590.1.3.207>
- Turoff, M. (2002). The policy Delphi. In H. Linstone & M. Turoff (Eds.), *The Delphi method: Techniques and applications* (pp. 80–96). <https://web.njit.edu/~turoff/pubs/delphibook/delphibook.pdf>
- van der Kolk, B. (2015). *The body keeps the score: Brain, mind, & body in the healing of trauma*. Penguin Books.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Wass, S.V., Noreika, V., Georgieva, S., Clackson, K., Brightman, L., Nutbrown, R., Santamaria Covarrubias, L., & Leong, V. (2018). Parental neural responsivity to infants' visual attention: How mature brains influence immature brains during social interaction. *PLoS Biology*, 16(12), e2006328. <https://doi.org/10.1371/journal.pbio.2006328>
- Wilkinson, B.D. (2018). The limits of neuroscience in counseling: A humanistic perspective and proposed model. *Journal of Humanistic Counseling*, 57(1), 70–78. <https://doi.org/10.1002/johc.12067>
- Wilson, E. (Ed.). (2017). *School-based research: A guide for education students*. SAGE.
- Worthen, B. R., & Sanders, J. R. (1987). *Educational evaluation: Alternative approaches and practical guidelines*. Longman.
- Yousuf, M. I. (2007). Using experts' opinions through Delphi technique. *Practical Assessment, Research & Evaluation*, 12(4), 1–8. <https://scholarworks.umass.edu/pare/vol12/iss1/4/>
- Zarbo, C., Tasca, G. A., Cattafi, F., & Compare, A. (2016). Integrative psychotherapy works. *Frontiers in Psychology*, 6, 1–3. <https://doi.org/10.3389/fpsyg.2015.02021>