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TRANSFORMING SOCIAL WORK FIELD EDUCATION: NEW INSIGHTS FROM PRACTICE RESEARCH AND SCHOLARSHIP

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How to Enhance Brain Potential in Fieldwork Education? The Multimodal Integration of Imagination and Trauma (MIIT) Framework

Ricardo Diego Suárez Rojas

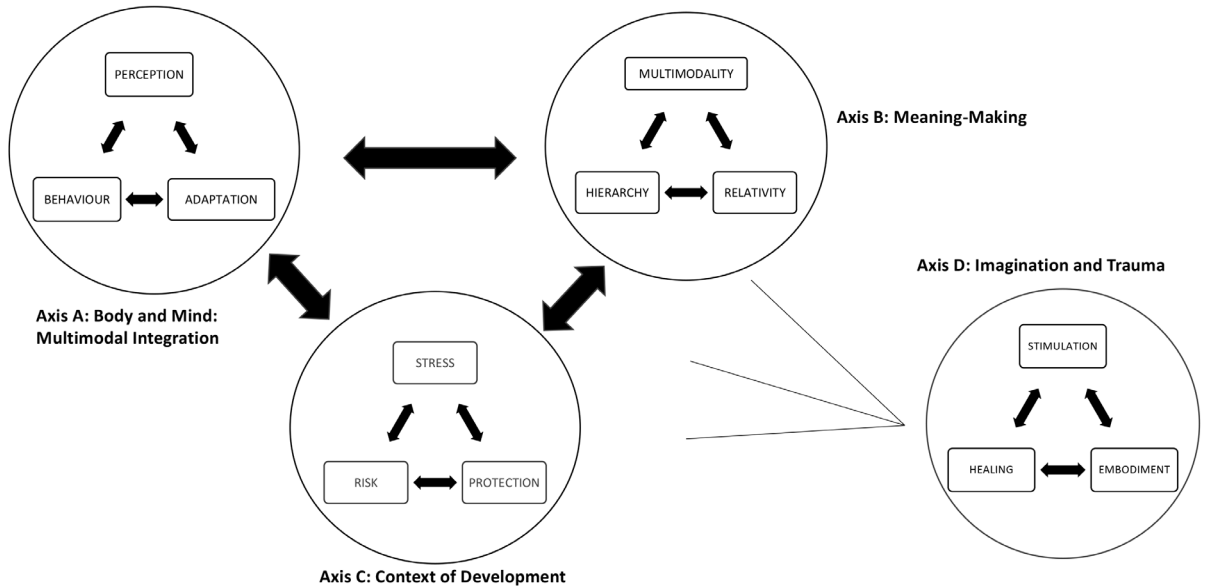
Humans are capable of both involuntary and voluntary acts of imagination: for example, dreaming of a dystopia and writing about a utopia (Vyshedskiy, 2020). The neuroscientific discovery of our conscious and unconscious creativity has several implications for improving health and social conditions (Agnati et al., 2013; Fox, 2013; Vyshedskiy, 2019). For example, voluntary imaginative actions are necessary to empower clients and transform systems in the social work profession. However, chronic and toxic exposure to stressors can harm practitioners' inventive performance, in turn impacting their adaptability and spontaneity (Ashley-Binge & Cousins, 2020; Parker & Maestripieri, 2011; Sapolsky, 2004; Vyshedskiy, 2020). As a sign of concern, there is growing research regarding social work students in the United States who experience vicarious trauma, discrimination, and isolation caused by interpersonal and institutional factors (Cowie et al., 2018; Evans et al., 2018; Garcia-Williams et al., 2014; Rasheem & Brunson, 2018). How can social work students remain creative to navigate the challenges of their training and future professional practice?

The signature pedagogy in social work education is the field placement experience. Students can apply concepts and techniques learned in the classroom, alongside clients, under the guidance of an experienced field instructor (Bogo, 2020; Hummell et al., 2010; Wayne et al., 2010). However, besides field placement's potential to be a site for learning and growth, students also may face challenges beyond their capacities, inadequate supervision, and suffer from demoralization and exhaustion (Bogo, 2015; Wayne et al., 2006). Given how challenging it is to become a trauma-informed social worker, field education must be preventive, healing, and stimulating.

How is the study of imagination relevant for developing trauma-informed education and practice? To address this question, the present chapter introduces the novel *Multimodal Integration of Imagination and Trauma (MIIT) framework*. As a theory in development, it seeks to understand how perception relates to the evolution of imagination types. The purpose of this research is to contribute to the healing of psychosocial and historical trauma. The MIIT framework was developed by synthesizing the author's years of interdisciplinary and community practice with collaborators in Chiapas, Mexico City, Chicago, and Boston. Furthermore, its evolution is continuously disseminated through social media (Suárez Rojas, 2022).

The MIIT framework seeks to provide a schematic logic for interpreting and enhancing human development. Moreover, it intends to produce a methodology for integrating healing and learning in various settings and among diverse populations (see Figure 16.1). Therefore, this chapter introduces the MIIT framework's nine working principles, accompanied by respective recommendations for field education. In addition, each section is prefaced by a transdisciplinary dialogue, intending to situate this work in a larger intellectual context, synthesize findings, and derive implications (Anastas, 2014). Lastly, the recommendations for unleashing brain potential may be adapted, with congruent modifications, to other academic disciplines, workplace training settings, and age groups.

Figure 16.1: Conceptual Model of the Multimodal Integration of Imagination and Trauma (MIIT) Framework



Note: The MIIT Framework seeks to offer a comprehensive view of human development. Axis A represents how multimodal integration is essential for perception and behaviour, thus allowing countless species to adapt in novel ways. Axis B touches on the social world of meaning (multimodality), recognizing the vastness of possibilities while also being mindful of power dynamics that privilege certain modalities over others. Finally, Axis C establishes that an individual may be exposed to protective and risk factors, and the stress response system can result in distinctive coping mechanisms. In turn, the synthesis from this theoretical dialogue informs an approach for intervention and implementation that considers imagination and trauma in a continuum (Axis D). Stimulation is a catalyst for healing and embodiment as long as the specific stimuli lead to growth.

Unity Principle: Commonalities Among Learners, Educators, and Clients

How is it possible that social workers can imagine a better future for society? For understanding the voluntary imagination, it is necessary to start from perception, an evolutionary older mechanism (Thomas, 1999). *Multisensory* or *multimodal integration* (MI) is the name given to how the nervous system differentiates and processes multisensory stimuli automatically and reflectively (Stein & Stanford, 2008). MI allows processing sensory inputs, consciously and unconsciously, by integrating types of data and thus reacting with a motor or behavioural response (Gingras et al., 2009). If a coherent representation of experience gets produced, performance in a determined task can improve (Stein et al., 2020).

The remarkable velocity in which neuronal ensembles arrange categories and reactions may partially be thanks to *schemas* — representations of data structures and types of events — that facilitate success in future problems based on past experiences (Gick & Holyoak, 1980; Richland et al., 2012). Moreover, schemas are conceptual and embodied: our bodies create and enact blueprints to keep our posture, allowing us to move with naturality and even mastery effortlessly (Reinersmann & Lücke, 2018). Maintaining an interconnected network of schemas can enhance several cognitive and sensorimotor capabilities. Therefore, by synthesizing relevant schemas (such as clinical and macro theories), the social work student may be better equipped to perceive, find coherence, and respond (MI).

Both biologically and metaphorically, MI entails motivated communication, a mindful and unconscious dialogue between the self and the world. MI is present in every human being, regardless of developmental capabilities, culture, or contextual resources (Stein & Stanford, 2008). Moreover, MI is essential for cooperation and competition across species, from social mammals to worms with relatively simple nervous systems (Ghosh et al., 2017; Viaud-Delmon et al., 2011). MI is also a relevant system in artificial intelligence (AI), robots, and machines (Zeng et al., 2020).

How is it possible that MI is so prevalent across life and technology? The answer is elegant in its simplicity: the intersection between sensory and motor maps. Any perception occurs in the space-time continuum, even if distorted or virtual (Stein et al., 2020). MI is involved in how a

bat navigates the darkness, the mantis shrimp recognizes colours beyond the human visual spectrum, or a social worker makes a judgment call. By considering the previous insights from the neuroscientific literature, the first principle of the MIIT framework states:

> 1. **Unity Principle**: "Unity" refers to the commonalities concerning perceptual systems across living beings and machines, robots, and AI. Multimodal Integration (MI) names the capacity to perceive multisensory inputs and respond with an output. Perception is simultaneously a conscious and unconscious process, which actively differentiates and integrates data to form conceptual and embodied schemas. Any perceptual event happens in the space-time continuum, even those distorted or virtual.

Informed by the unity principle, the first recommendation for field education is to *avoid categorizing students, as they are all capable of integration*. Students arrive at an agency with different trajectories and capabilities, making it compelling to classify them under the maxim that "everyone learns differently." However, if a field instructor conceives a student as a "visual, interpersonal learner," does that not entail reducing that person's potential? Learning styles lack empirical evidence to firmly prove their existence (Kirschner, 2017). Moreover, their arbitrary definitions are mutually exclusive, making us believe that we are incapable of anything beyond our box, thus limiting exploration and discovery (Newton & Miah, 2017). Instead of classifying students, or clients, through inconsistent categorizations, the alternative is to recognize that differences arise from the same source: an evolutionary system that allows us to perceive, integrate, and respond.

It is essential to underscore that the MIIT framework's first principle and recommendation by no means intend to reduce the complexity inherent to diversity — an issue covered in the next section. Furthermore, the framework does not suggest the possibility of instituting a mechanistic academic structure that can be appropriate to the vast variety of field placement contexts (Andharia, 2011). Instead, the emphasis of this section is to present unity concerning perception (multimodal integration) and

its extended presence across the life continuum. By recognizing commonalities, social workers will be better equipped to understand differences — and vice versa.

Divergence Principle: Differences among Learners

MI is present in all perceptual scenarios, building from a complex blueprint. And yet, there are countless gradations in how living and artificial beings perceive, integrate, and act. This recognition leads to the MIIT framework's second principle:

> 2. **Divergence Principle**: "Divergence" refers to the countless variations in perceptual systems. Anatomical and behavioural gradations influence the perception of multisensory stimuli, data integration, and performance in the space-time continuum.

Divergence leads to the second recommendation for field education: *respect differences, but do not obviate power disparities*. Being capable of MI does not mean that every student and staff member in the agency has the same preferences, resources, and motivations. Flexibility and inventiveness are always a requirement for an instructor who wishes to honour the particularity of each individual. Despite field placement being regulated by academic institutions and, allegedly, uniform administrative frameworks, fieldwork learning is highly heterogeneous and intricate — thus mirroring the students and instructors themselves (Bogo, 2020).

Furthermore, it is essential to challenge how racism and interrelated inequities created by capitalism and patriarchy impact social work education and practice (Rao et al., 2021). This reckoning requires courage and embracing discomfort. If a student or group feels that their identities are not recognized, misrepresented, or outright threatened, the teaching experience will become traumatizing. Establishing rapport with students through an intersectional logic (Atewologun, 2018) is one of the most important goals for a field instructor. Therefore, it is imperative to create a space that respects differences while not ignoring them.

Semiotic Infinity Principle: Humanity's Double-Edged Sword

The differences in MI across species may partially explain survival and domination. According to the *semiotic relativity hypothesis*, humans have a particular evolutionary advantage in creating collective meaning (Lucy, 2016). How else can we hold the potential to produce art, scientific breakthroughs, and technology to save or destroy lives if not by perceiving and communicating? The evolution of language, intertwined with that of MI, partly explains such abilities: linking words to objects (Broca's area in the brain) and organizing grammatical sentences (Wernicke's area) to share complex thoughts (Lucy, 1997; Mufwene, 2013; Vyshedskiy, 2019).

Language evolution also has relied on the most advanced form of voluntary imagination: *prefrontal synthesis*, the conscious juxtaposition of mental images, which activates the lateral prefrontal cortex (Vyshedskiy et al., 2020). This imaginative faculty is the basis for synthesizing objects from memory into a novel production. Furthermore, it leads to complex operations such as self-reference: how words themselves provide the means to think about the nature of words. For example, prefrontal synthesis allows the social work intern to engage with clients and institutions, recognize patterns and exceptions, and act on critical awareness of self and society.

Furthermore, meaning-creation is also a cultural phenomenon. *Semiotic modes* are material resources agreed upon socially to communicate — e.g., speech, written word, gestures, numbers, images, colour, music, and virtual coding, to name a few. Despite ecological variations, every culture creates *signs* (a concurrence of form and meaning), motivated by their members' interests and composed with available resources (Kress, 2010). By bearing in mind these insights, the MIIT framework's third principle is:

3. **Semiotic Infinity Principle**: "Semiotic infinity" refers to how human beings are different than other species given their endless capacity for meaning-creation. Multimodal integration (MI) in humans is distinctive owing to the emergence of complex language, prefrontal synthesis, and self-awareness. This evolutionary advantage makes

Figure 16.2: How to Encourage Students to Co-create Solutions in Their Field Placements

	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating
Clinical Social Worker	Identify symptoms. Recall how they relate to disorders and empowering treatments.	Interpret and summarize a client's narrative.	Implement clinical techniques into the ways you listen and ask questions.	Develop self-awareness. Distinguish risk from protective factors.	Monitor your biases and your performance.	Generate an action plan alongside your client.
Macro Social Worker	Identify organizational practices. Recall relevant policies.	Interpret and summarize the organization's functions.	Implement a cost-benefit analysis and a budget plan.	Organize observations. Distinguish risk from protective factors.	Introduce strategies to monitor organizational biases and performance.	Generate a logic model alongside your client.

Note: An example of how the revised Bloom's Taxonomy can guide field educators in encouraging the creation of solutions. This example represents a continuum, where each dimension may require factual, procedural, conceptual, or metacognitive knowledge.

> humans capable of countless forms of creation, destruction, and reconfiguration through diverse modalities.

By understanding what makes human beings unique, the third recommendation for field education is : *encourage students to co-create solutions alongside their clients*. According to Bloom's revised taxonomy of education, creativity is a rigorous process that requires mastery of several cognitive skills: higher learning areas (where voluntary imagination is located) depend on previous foundations (Armstrong, 2016). From the bottom to the top, the taxonomy includes the following cognitive dimensions: Remembering > Understanding > Applying > Analyzing > Evaluating > Creating (Forehand, 2010). Furthermore, the following types of knowledge are present in each area: factual (e.g., terminology), conceptual (e.g., theories), procedural (e.g., techniques), and metacognitive (e.g., thinking about our own thinking). Importantly to note, the elements of both the cognitive and knowledge dimensions are related in a continuum, rather than simply being superior or inferior to others (Stanny, 2016).

In contrast to faculty liaisons, field instructors who supervise students in practicum do not have a syllabus. Therefore, the revised Bloom's taxonomy can assist the latter in measuring progress with concrete verbs (e.g., remembering, understanding, etc.) while maintaining a flexible structure. For the MIIT framework, "solutions" are conceptualized as a joint effort between different agents in a system (e.g., students and supervisors). This critical awareness is crucial, as clients have the same potential as social workers to create meaning that leads to further healing or trauma — yet with different power dynamics. Instead of conceiving students as vessels to be filled and tested (Freire, 1996; Kress, 2009), field instructors should facilitate engagement with multiple sources of meaning. Through a continuum logic, the goal of experiential learning should be empowering students' creative potential (see Figure 16.2).

Imperative Congruency Principle: Intersection of Theory and Practice

How can field instructors further emphasize meaning-creation among students? The discovery of the superior colliculus in cats, a structure in

the midbrain capable of combining visual, auditory, and somatosensory stimuli (May, 2006; Wallace & Stein, 1997), offers answers for this question. The superior colliculus led scientists to realize how multisensory structures combine inputs to orient individuals in space and time. Across species, the predominant modality system varies (e.g., eyesight in humans and smell in mice), thus producing very distinctive behaviours.

These inquiries led to a unified principle: *MI follows an intuitive logic to improve behaviour as long as sensory inputs are perceived congruently* (Stein & Stanford, 2008). Congruency in perception means the degree to which stimuli get arranged cohesively. If a clear picture of the situation gets produced, the more likely that brain plasticity and performance will improve. Such enrichment will be proportionally higher thanks to blends of less effective stimuli in an *inverse-effectiveness logic*. In other words, when attention toward an individual sensory stimulus decreases, the capacity for integrating multiple inputs increases. For example, a social worker may better understand a problem and propose solutions by gathering different data types rather than just focusing on quantitative variables. Therefore, the inverse effectiveness mechanism is the reason why some authors say that MI can produce "something" from "nothing" (Stein et al., 2020).

However, suppose a social worker's perception develops an incongruent representation of reality by failing to understand the complexity of a client or institution; their performance will in turn degrade. The success of a stronger synaptic connection, and thus the action taking place, depends on whether the stimuli get derived from the same source and how advantageous it would be to combine information from independent sources (Stein & Stanford, 2008). For a social worker trying to grasp a specific context, multiple data sources also can introduce noise into a conclusion. Therefore, expertise and wisdom entail knowing when and how to apply theory and (or) intuition into a professional experience. As such, the MIIT framework's fourth principle emerges:

4. **Imperative Congruency Principle**: "Imperative congruency" refers to the need of a perceiver to process sensory inputs and produce a successful output. Multimodal Integration (MI) follows an intuitive logic to enhance performance and neural connections, depending on whether

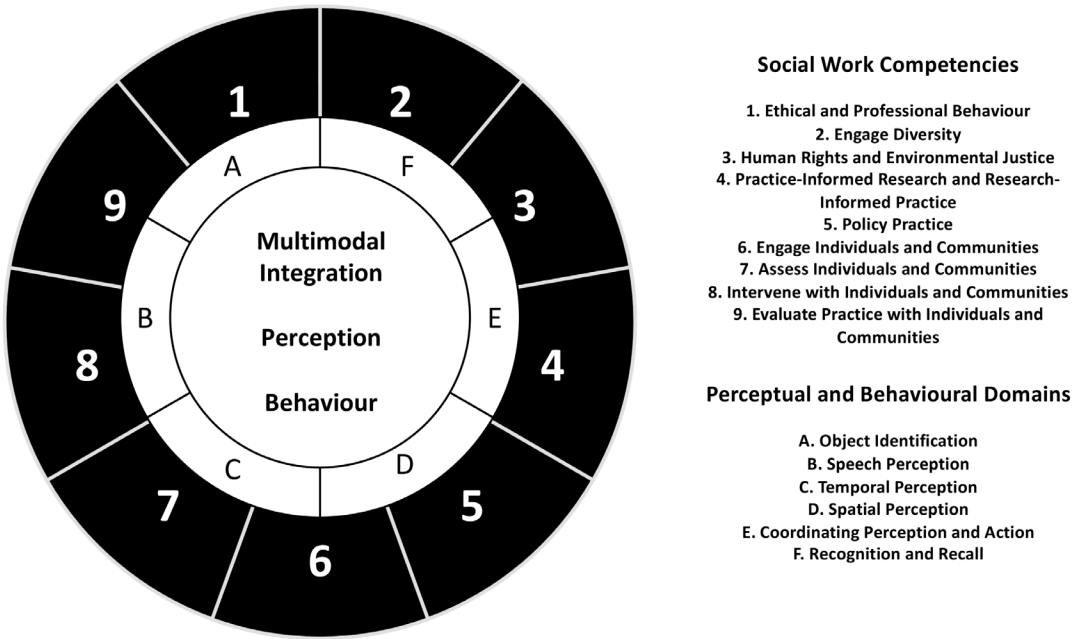
> data get arranged congruently. If attention to one stimulus decreases, the odds of integrating multisensory stimuli increase (inverse-effectiveness). Therefore, congruent multisensory stimulation may improve human potential.

The fourth recommendation for field education is: *amplify congruency between theory, practice, and self.* For a fruitful practicum, field instructors must establish a close relationship with faculty liaisons who serve as consultants and who understand a given school's curricula design and objectives. With the help of both types of educators, it is expected that students will learn how to practice the profession through two interwoven processes: a subjective reflection about ongoing field experiences and connections between practice events and acquired knowledge (Wayne et al., 2010).

However, what if the relationship between field instructors, faculty liaisons, and students gets precluded by personal or institutional factors? As field instructors naturally spend more time with practicum students, they are in a privileged position to encourage a more congruent understanding of the profession. Supervision times, either group or individual, should include a discussion concerning how the learning in the classroom mirrors or not the events in the placement. If there is no congruency between the two realms, the MIIT framework's fourth principle leads us to believe that the perception and performance of social workers in training will erode. Therefore, field instructors are responsible for providing continuous feedback to the faculty liaisons and, if possible, to field education coordinators and directors.

Furthermore, field instructors should also reflect on how concepts and procedures are congruent with students' identities, skillsets, and experiences. If becoming a social worker relies on data saturation (an excess of information from training, class contents, and clients' experiences), students will get overwhelmed and their retention and recall will diminish (Bjork & Bjork, 2011; Bjork et al., 2012). The better alternative is to approach learning via the inverse-effectiveness logic discussed in this section: congruently combine elements from independent sources (field, classroom, personal life) to improve perception and behaviour. These changes will allow students to navigate vast information networks with less stress, making practice meaningful and studying less cumbersome.

Figure 16.3: Multimodal Integration and the Development of Social Work Competencies



Note: Multimodal Integration (MI) enhances performance in several perceptual and behavioural domains (represented by letters A to F, Stein et al., 2020). In turn, these abilities may inform the social work competencies, represented by numbers 1 to 9 (Council on Social Work Education, 2020). The idea of this figure is that of a roulette: one may argue that "Engage Diversity" benefits from any of the domains enhanced by MI, as long as the data are perceived congruently (e.g., speech perception). This image means to show the relevance of MI for the social work profession.

These assertions illustrate why multimodal integration (MI) is highly relevant for cultivating social work competencies (see Figure 16.3).

Disintegration Principle: Lost Communication

If integration is a synonym for communication, I define multimodal disintegration as the broken dialogue between body, brain, and the world. Such rupture brings in turn great suffering to individuals and groups. This working definition makes sense concerning relevant scientific literature. There is a growing trend in how MI's deterioration, which I take as a synonym for "disintegration," is associated with aging decay (de Dieuleveult et al., 2017) and specific disorders, including anxiety (Viaud-Delmon et al., 2011); schizophrenia (Tseng et al., 2015); autism spectrum disorder (Feldman et al., 2018); traumatic brain injury (Sarno et al., 2003); distortions in perception that result in delusions (Wallace et al., 2020); and post-traumatic stress disorder (Rabellino et al., 2018), to name a few. These studies do not assume simple causality between less effective MI and a particular condition. However, they may help us unravel how suffering and resiliency play out.

Furthermore, relevant to the MIIT framework's understanding of suffering, "trauma" has been defined as a loss of integration: a bio-psychological response created by a past injury, which overwhelms the self-defense system (Briere & Scott, 2014; Ford & Courtois, 2020). People who undergo traumatic experiences may present distortions in perception, emotional regulation, and memory recall, given the impairment in brain areas such as the thalamus, the amygdala, and the hippocampus (Van der Kolk, 2015). By losing integration between their minds and bodies, traumatized individuals grapple with a pessimistic or shameful personal narrative plagued by nightmares (acts of imagination). Problematically, the stories they tell themselves affect how they navigate daily life and think about the future (embodied and conceptual schemas).

In addition, there is a growing literature that defines the injuries provoked by colonialism and corruption on mental health as *psychosocial trauma* (Martín-Baró, 1989), *historical trauma* (Conching & Thayer, 2019; Gone et al., 2019), or *indigenous historical trauma* (Middelton-Moz et al., 2021; Panofsky et al., 2021). These authors have in common the recognition of the ripple effects of oppression on health and learning

disparities. They also agree that our ancestors' experiences and living environments can predispose us to specific adaptations, as past and present events influence the *epigenome* — which regulates gene expression and its influence on phenotypes and behaviours (Singh, 2012; Thayer & Non, 2015). Consequently, the distribution of these "social injuries" largely depends on differences in the constraints and opportunities that people experience. Therefore, those who benefit or suffer from any political order embody varying degrees of resiliency and vulnerability.

As a biomedical concept, disintegration can contribute to the etiology and treatment of several mental and motor disorders. Furthermore, disintegration (in its political significance) also can help us interpret inequality, polarization, and violence. The MIIT framework's fifth principle summarizes these insights:

> 5. **Disintegration Principle**: "Disintegration" represents miscommunication between the body, the mind, and the world. This concept helps to understand several mental disorders, aging decay, and trauma. However, it has not only a biomedical but political dimension as well. Exploitative systems thrive by systematically diminishing creative potential, and isolating institutions and individuals. Moreover, past disintegration does not simply vanish in future generations, as historical trauma threatens the healthy development of oppressed populations around the globe.

By recognizing the dangers of disintegration, the fifth recommendation states: *hold space for tension and healing.* Social workers have an ethical obligation to observe and assess oppressive systems and seek transformations through various means (Andharia, 2011). Field instructors and faculty liaisons must grapple with how educational structures can harm students, and devise and implement strategies to mitigate such adverse effects. For immediate practices, field instructors should create space for self-care during placement hours, rather than asking students to be fully responsible for such an essential practice. For long-term strategies, one may suggest having a robust conversation regarding unpaid internships (Burke & Carton, 2013), expanding on tuition remissions, or turning the

first-year placement into lab simulations and agency visits — so students lose only one year of income (Wayne et al., 2006).

Field supervision and assignments should not be stressful or dull. The consequences of being so can be damaging for health (Lee & Zelman, 2019; Sapolsky, 2001). Furthermore, field instructors must recognize the tremendous effort students make to complete their degrees while providing unpaid labour (Burke & Carton, 2013). Given the unrelenting demands of the job market, students require skills beyond menial administrative tasks — a need that can often be impeded by unstructured supervision. Therefore, field education must provide excellent training for future caregivers while building a considerate and stimulating environment. Such a mission cannot be fully accomplished without recognizing and openly discussing oppressive practices and structures.

Reimagination Principle: Boundless Potential for Healing or Trauma

If the disintegration principle makes us reflect on continuing injuries, conversely, what does continuing health entail? Imagination is the answer, yet its definition is complicated (Dor, 2017; Gerard, 1946). Importantly, MI is crucial for understanding its evolution. For example, the discovery of *mirror neurons* and their role in empathy (Gallese, 2011) and *Von Economo Neurons* and their importance to self-awareness (Butti et al., 2013) shed light on humanity's inventiveness. Significantly, these insights may help explain how *imagery* (the production of explicit and implicit mental pictures that we have experienced before) gave evolutionary rise to our creative drives.

As mentioned throughout this chapter, imagination is an umbrella term for voluntary, involuntary, and hybrid mechanisms. These types depend on the brain's functional modules, comparable to Russian dolls: a top-down series of nested structures that control various vital functions, from the autonomic ("bottom-up," brainstem to cortex signals) to the conscious ("top-down," cortex to brainstem signals).

Involuntary imagination types follow a bottom-up brain logic, depend on the posterior cortex, and develop early in a baby's life (e.g., REM dreaming and amodal completion). Voluntary types of imagination follow

a top-down brain logic, activate the lateral prefrontal cortex, and develop once children engage with symbolic play (e.g., mental rotation, prefrontal analysis, and prefrontal synthesis). Lastly, hybrid types require interaction between previous mechanisms, such as lucid dreaming and categorically primed spontaneity popularly known as "eureka moments" (Vyshedskiy, 2019; 2020; Vyshedskiy et al., 2020).

Imagination types likely developed when existing imagery skills transformed through *exaptation*: an evolutionary trait that consists of manifesting a different function from its original purpose (e.g., using language for satires). Moreover, these novel possibilities appeared without affecting previously existing neural networks. Instead, the initial potential gets reused via *redeployment* (Agnati et al., 2013), as in the case, for example, of interns developing a new tactic based on their studies (exaptation) and integrating various elements from past training (redeployment), as if they were in a schema game where unlocking new abilities depends on how well past skills get rearranged.

The complex brain architecture behind creativity leads to a crucial question for social work: what are the social determinants of imagination? Neural circuitry depends on *myelin*, a fatty substance that coats axons and ensures a faster and more integrated flow of nerve impulses. Therefore, myelin is crucial for healthy brain functions and plasticity. Moreover, environmental influences continuously impact myelin integrity, as well as developmental trajectories (Forbes & Gallo, 2017). Consequently, numerous elements can either enhance (e.g., healthy diet, cognitive stimulation, loving relationships) or degrade (e.g., poor nutrition, social isolation, discrimination, boredom) myelination, which is essential for creative potential (Hackman et al., 2010; Lee & Zelman, 2019).

Thanks to these clarifications, now we can define a *thriving imagination* as a state of gray and white matter integrity, which may lead to increasingly effortless synthesis and mastery (voluntary imagination) and dreaming that does not disrupt well-being (involuntary imagination). Moreover, proper myelination could facilitate a more robust and integrated network, thus increasing the chances of developing spontaneous insights to solve problems (hybrid imagination). Therefore, imagination has specific properties to promote human potential, which can get harnessed through policy.

However, prefrontal synthesis, the most advanced type of voluntary imagination, has a strong critical period, which ends between five years old and puberty: children require recursive conversations to promote myelination of frontoposterior connections between the lateral prefrontal cortex and the posterior cortex (Vyshedskiy et al., 2020). Moreover, traumatic stress can reshape brain anatomy (Van der Kolk, 2015), thus wreaking havoc through nightmares and intrusive symptoms (involuntary imagination), eroding spontaneity (hybrid imagination), and engendering self-loathing and despair instead of positive narratives about the self and the world (voluntary imagination).

In brief, the boundless potential of imagination can be either for the benefit or detriment of an individual or group (Van der Kolk, 2015; Walsh, 2020). The sixth principle of the MIIT framework states:

> 6. **Reimagination Principle**: "reimagination" encapsulates the tension between healing and further trauma concerning humans' inventive capabilities. More specifically, imagination is an umbrella term for voluntary, involuntary, and hybrid abilities related to creating meaning. Imagination's types depend on the brain's functional modules on both a bottom-up and top-down structural logic, and they likely evolved through exaptation and redeployment.

The sixth recommendation for field education is: *promote the development of metaknowledge through analogical reasoning.* As stated previously, metaknowledge is a component of the revised Bloom's taxonomy (Stanny, 2016). It refers to the capacity to recognize the origins and consequences of phenomena (e.g., asking how instead of what). If students engage with second-order thinking, they can monitor their beliefs and judgments while controlling their behaviours. In other words, thinking about our thinking (metacognition) and memories (metamemory) can improve adaptability (Schwartz et al., 2011). Therefore, metaknowledge is heavily associated with self-awareness and voluntary imagination, which is essential for social work interns to mitigate their psychological stress.

For promoting metaknowledge, the MIIT framework endorses *analogical reasoning*, the process of identifying similarities between a familiar

source and a less known target (Gick & Holyoak, 1980; Richland et al., 2012). Given how challenging it can be to bridge theory, practice, and self in field placements (Bogo, 2020), students may benefit from a model that explicitly endorses articulating multiple definitions, meaningful relations, and procedures to solve problems. During supervision times, field instructors can motivate students to establish analogical reasoning as a basic logic to approach every experience with clients. As an interdisciplinary field, social work requires thinking across systems of knowledge in connection with the lived experiences of community members. Moreover, research has shown that students greatly enjoy and benefit from peer learning (Hummell et al., 2010). Thus, field instructors and faculty liaisons can create plenty of opportunities for peers to interact and build complex webs of analogies together, rather than relying upon traditional teacher-centered learning.

If students struggle with analogical reasoning, Bloom's taxonomy can orient which areas need reinforcing so they can handle intricate maps of analogies without much effort. For example, understanding might be a weak link in the chain, thus requiring patience, support, and a progressive flow towards developing metaknowledge.

Multimodal Dialogue Principle: Methodology for the Healing Imagination

If imagination represents hope for historical healing, what else can we do to unleash it? This section will discuss how an educational model built on the biological basis of perception has higher chances to motivate voluntary, involuntary, and hybrid imagination while combating trauma from a bottom-up, top-down brain logic (Van der Kolk, 2015; Vyshedskiy, 2019, 2020).

Despite the infinite possibilities to transmit wisdom, some ways of creating meaning get valued higher than others. There are modes, such as literacy and numeracy, that provide higher rewards to those who can master them while punishing those who fail to conform (Benjamin, 1986; Freire, 1996; Gee, 1989). Knowledge hierarchies maintain oppression: those who cannot follow the expectations (either due to capabilities or ideology) are explicitly or implicitly branded as *maladapted*, being more likely to experience stigmatization and traumatic stress (Gravlee, 2009; Romero et al.,

2009; Parker & Maestripieri, 2011; Rangel & Keller, 2011; Sapolsky, 2004; Singh, 2012; Spencer, 2007). Suppose administrators and educators fail to understand the reductive nature of unimodal models (e.g., assessing students only on their literacy or numeracy skills): In that case, they will perpetuate an unjust education system that excludes millions (Hamilton et al., 2015; Lankshear et al., 1996).

Besides stressful learning conditions, other dominant emotional states in learning — confusion, frustration, boredom, absence of engagement, delight, and surprise (Graesser, 2011) — represent a danger for congruency. To counter such realities, students and instructors require *enhanced cognitive stimulation*: the participation in appealing and challenging activities that reinforce executive functioning, associated with a decrease in rates of brain decay and dementia. Furthermore, stimulation may even buffer the effects of low socioeconomic status (SES) on development, increase self-esteem, and reduce aggression, especially on those students who have suffered from trauma and deprivation (Hackman et al., 2011). In the case of field education, if the learning experience results in a tedious or stressful event, brain potential will be compromised (Sapolsky, 2001; Lee & Zelman, 2019).

To counter such a problem, *multimodal pedagogy* (MP) is an educational approach that encourages meaning-creation through diverse modalities while recognizing the oppressive nature of unimodal learning. MP deploys several multisensory stimuli and modes for instruction and assessment, emphasizing learners' agency (Kress, 2013).

Due to its person-centered nature and enriched stimulation, the MIIT framework hypothesizes that MP may promote *neurogenesis*, the generation of new neurons, in the hippocampus. This brain area in the limbic system contributes to perception, emotional regulation, memory formation, and discrimination between similar information units. Moreover, it is one of the only structures of the adult brain where new neurons arise, a fact also relevant for treating and preventing anxiety and depression symptoms (Lima & Gomes-Leal, 2019; Sapolsky, 2001). In conclusion, the MIIT framework assumes that congruent multisensory stimulation in a caring environment may promote daily neurogenesis, which will have an impact in several cognitive, sensorimotor, and emotional dimensions.

Congruent multisensory stimulation also may increase *brain diffusion*, consisting of tissue connections and white matter integrity (Black & Conway, 2018). Further studies are needed to investigate if MP affects the activation of the reward circuitry, communication between the left and right hemispheres, and top-down, bottom-up trauma healing via neurogenesis in the hippocampus.

Aided by multimodality, education can become preventive, stimulating, and healing. From these considerations, the MIIT framework's seventh principle emerges:

> 7. **Multimodal Dialogue Principle**: "multimodal dialogue" refers to how human communication integrates and produces multisensory inputs and outputs. Instruction and assessment should reflect the rich nature of the world and focus on learners' agency. Such a pedagogy may help students and teachers tap into their creative potential, resulting in a caring and challenging environment. Significantly, congruent multisensory stimulation may have preventive and healing effects across the life course by promoting neurogenesis in the hippocampus and brain diffusion.

The resulting recommendation elaborates further on pedagogy: *introduce and value multimodality in supervision and process recordings*. For the former, field instructors and faculty liaisons should not limit engagement with students through verbal and written mediums only. Each semiotic mode has different affordances and limitations (e.g., music can tap into brain circuits that writing alone cannot, and vice versa). The critical element for field instructors to remember is that multimodal resources may strengthen arguments and analogies if combined congruently (Ross et al., 2020).

Alternating during supervision between videos, songs, images, small group discussions, games, and other modalities follows the inverse-effectiveness logic. This assertion means that different sensory inputs in tandem are more likely to enhance integration, inviting students to pay attention to a more complete picture (Stein et al., 2020). Moreover, these multimodal activities have different effects in both a bottom-up (e.g., dance, music, meditation) and top-down (e.g., reflection, debate, writing) logic (Van

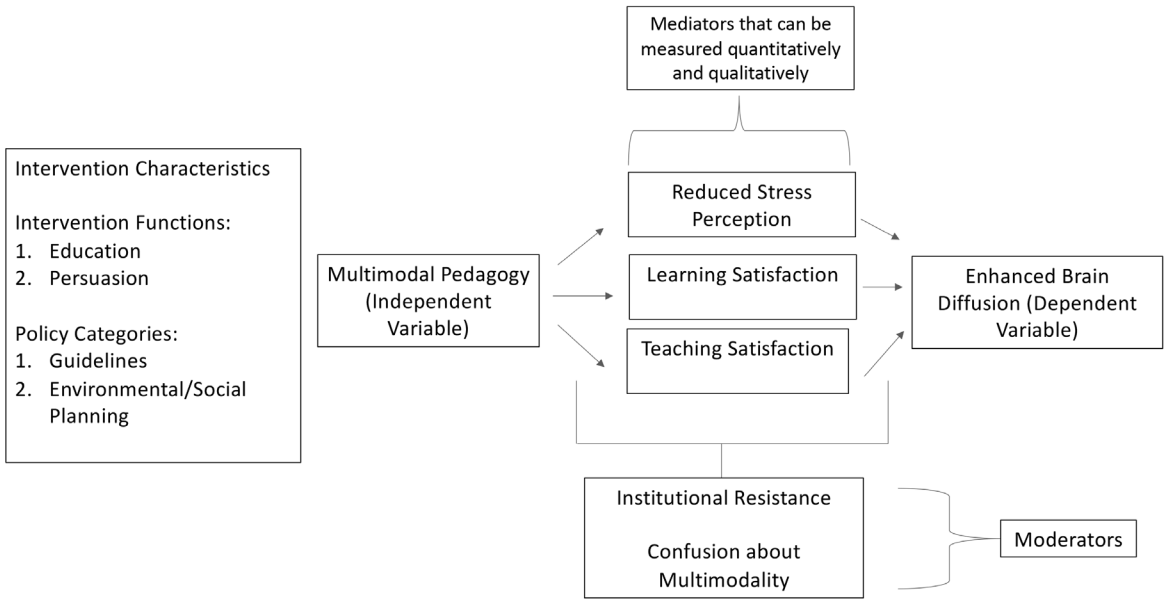
der Kolk, 2015), thus potentially stimulating imagination types. However, such improvements are contingent on students experiencing congruency. For example, a field instructor may include music in meditation exercises. Still, if the students dislike the chosen song or think the exercise is shallow, a congruent engagement will not ensue. Nevertheless, further research is required.

Social work students are constantly asked to produce written content in their field placements, such as process recordings and competency papers. Students often consider these administrative tasks "busy work," yet field coordinators and directors may find it difficult to challenge the standards due to accreditation constraints (Wayne et al., 2006). As a countermeasure, field instructors can implement low-scale changes and allow students to go beyond the written medium to produce their process recordings: podcasts, diagrams, poems, dance, etc., that integrate social work theory and their passions. Field instructors can appreciate these multimodal productions as integrated wholes rather than isolating their components.

The goal of multimodal education is the expansion of students' semiotic resources by engaging them with specific aspects of the world, rather than just making them regurgitate the learning contents (Kress, 2013). Therefore, field instructors should invite their students to implement multimodal resources in their dialogues with clients, expanding their range of strategies into developing confidence in conversation.

Importantly, MP is not simply adding pictures and music to a slide presentation; it represents a paradigm change. To further clarify this recommendation, one may imagine being interested in testing the positive effects of *multimodal pedagogy* (independent variable) in students' *brain diffusion* (dependent variable). The MIIT framework underscores mediators that can be measured quantitatively and qualitatively (e.g., learning satisfaction and stress perception) to show treatment effects. Moreover, institutional resistance and confusion about multimodality get hypothesized as potential moderators. Thanks to the theoretical principles, if there is a change in the mediators, one could assume a transformation on the dependent variable (see Figure 16.4).

Figure 16.4: Logic Model for Interventions Employing Multimodality



Note: This conceptual model represents an intervention where multimodal pedagogy gets tested to influence the brain diffusion of both the instructor and the students. The intervention characteristics are in accordance with the "behavior change wheel" framework (Michie et al., 2011). Researchers, supervisors, and teachers can adapt this model to either formal or informal education settings. There is an inclusion of mediators that can be easily measured if there is insufficient funding or a lack of technical knowledge/collaboration to obtain biomarker data. However, thanks to the MIIT's framework working principles, if mediators show improvement, one could argue that the dependent variable will change for the better.

Intervention Integrity Principle: Philosophy and Implementation

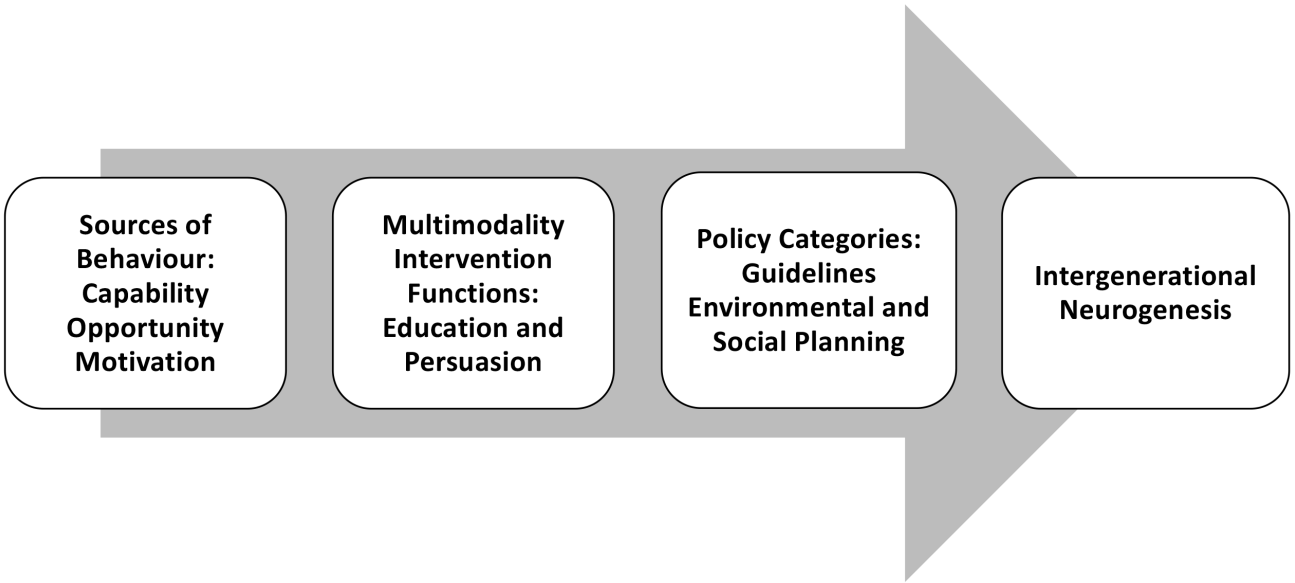
MP has been thoroughly studied (Kress, 2009, 2010, 2013); however, the MIIT framework integrates it with biosocial evidence and expands its implications for field education. Finally, by following the "behavior change wheel" (Michie et al., 2011), multimodality can be relevant for various intervention with an educational function (Suárez Rojas, 2019), thus showing its versatility and relevance for social workers and researchers alike (see Figure 16.5).

The MIIT framework emphasizes interventions with a participatory design for challenging intergenerational trauma and promoting imagination. Its working principles intend to expand our understanding of human development and contribute to preventive and healing training for social workers in their field placements. The following principle represents a stance towards the production of knowledge:

8. **Intervention Integrity Principle**: "intervention integrity" refers to three philosophical considerations in intervention design. (1) Ethics: self-awareness is an ongoing and perpetual component to identify oppressive practices, values, and institutional frameworks; (2) Epistemology: knowledge is multimodal by nature. Therefore, mixed methods, biomarkers, longitudinal mindsets, and techniques beyond one discipline are required to tackle complex problems; (3) Aesthetics: academics should consider how to reach wider audiences to share their insights and resources.

From this principle, the following recommendation arises: *inspire your students to consider ethics, epistemology, and aesthetics to create meaning.* For ethics, field instructors can confront students with the harsh realities in the field of social work, such as how researchers are failing to confront structural inequality by focusing primarily on micro-level interventions (Corley & Young, 2018). Therefore, field instructors should encourage their students to pursue transforming actions and forming trust. And for

Figure 16.5: Intervention Rationale



Note: By expanding on the "behavior change wheel" framework (Michie et al., 2011), this image represents the characteristics of an intervention that may have an educational and persuasive function. The sources of behaviour refer both to the individual (conscious and unconscious) and contextual elements behind any given action. The third box shows the policy categories meant to be influenced. The last box touches on the intergenerational transmission of human potential, particularly on brain plasticity. The MIIT framework affirms that any intervention with an educational component may use multimodality, given the certainty concerning how multimodal integration is a fundamental perceptual and learning system for any human being. Thus, the expectation is that researchers can implement multimodal pedagogy and expect the promotion of neurogenesis, regardless of the population and research questions.implement multimodal pedagogy and expect the promotion of neurogenesis, regardless of their population of interest and research questions.

those interns with more modest ambitions, supervision can become an avenue to practice self-awareness.

For epistemology, field instructors must underscore how knowledge is multimodal by nature. Given that each mode has virtues and limitations, academic language is just one among many ways to create meaning. In contrast, field education gets centered around clients' perceptions and narratives. Therefore, social workers in training will benefit if their instructors privilege the integration of different data types, thus conveying a more congruent representation of reality.

Finally, field instructors must underscore that social workers need to take on the aesthetic challenge of translating science to larger audiences. A social work student must learn to communicate clearly with clients and diverse communities while also thinking about the inequities concerning access to educational resources. Field instructors should remind their students of other ways of presenting knowledge beyond academic journals and books, seeking manners to fuse science and art (Boehm, 1961). For example, social work theories and findings can be transformed into virtual content to share on social media platforms, making knowledge freely accessible. For a specific example, one may review the social media contents of *Laboratorio en Movimiento*, an initiative launched in 2018 to develop the MIIT framework (Suárez Rojas, 2022).

Motivated Uncertainty Principle: Finding a Purpose Amidst Tragedy

The intricate relationship between MI and imagination brings clarity and hope to challenge trauma and disintegration. Yet, in recognizing its limitations, potential, and ongoing refinement, the MIIT framework's last principle consists of embracing uncertainty without losing its purpose:

9. **Motivated Uncertainty Principle**: "motivated uncertainty" refers to the tension between acknowledging the countless ambiguities in life while maintaining our purposes. Embracing uncertainty entails recognizing knowledge revision in degrees of confidence without intellectual arrogance or determinism. Thus, the MIIT framework remains

> open to confirming or disconfirming data without losing sight of their purpose: dismantling historical trauma by developing a methodology for therapeutic imagination.

In turn, the last recommendation for educators is to *instill a sense of tragic hope*. Field instructors cannot thoroughly plan the transmission of knowledge given the indeterminate nature of field education. Students can get disheartened in the face of adversity, the death of a client, or despair at the thought of facing a monstrous system (Andharia, 2011; Baum, 2011; Millard, 1977). Instead of relying on cruel optimism or cynicism, field instructors should support their students through tragic hope. By this, I mean a stance towards history that believes in how the most mature utopias do not close their eyes to horror, but rather face it and find wisdom in it. No baby can fully understand how complex cruelty and hate can be, and there is a promise in this realization. The motivation to transform and create goes beyond a mere lifetime. Resistance is a tradition.

Conclusion

Field education is the signature pedagogy of the social work profession, as it represents the space where students integrate theory and practice. Yet, despite the merits of this approach, fieldwork also can become a challenging and even traumatic experience for students, thus underscoring the need for a preventive and healing training process. Moreover, despite the heterogeneous nature of field education, administrative constraints have harmed the profession by forcing such vast divergence into a rigid mold.

Therefore, to address these issues, I present the original *Multimodal Integration of Imagination and Trauma* (MIIT) *framework* and its nine working principles, which have several implications for expanding imagination and healing trauma (see Figure 16.6). Moreover, specific recommendations for field education got intertwined with the theoretical assumptions, with a particular emphasis on prevention, stimulation, and healing (see Figure 16.7).

The MIIT framework recognizes that perception and movement depend on multimodal integration (MI), a structure and mechanism present in countless species. Therefore, studying MI helps to understand commonalities and differences across the life continuum. Furthermore,

Figure 16.6: The Working Principles of the Multimodal Integration of Imagination and Trauma (MIIT) Framework

1. Unity: multimodal integration (MI) is an essential perceptual and behavioural system for countless species, thus helping us to understand commonalities across the life continuum.
2. Divergence: MI also allows us to understand differences in adaptation across and within the same species.
3. Semiotic Infinity: MI in humans has evolved to allow complex symbolization and language, distinguishing us from other species, given our creative and destructive capabilities.
4. Imperative Congruency: if there is data congruency, MI enhances perception and behaviour. Therefore, life gets enriched by congruency — an ethical imperative for any society.
5. Disintegration: multimodal disintegration represents miscommunication between the body, the brain, and the world. This fragmentation is biomedical and political, as historical trauma exemplifies.
6. Reimagination: imagination can either bring healing or further trauma. Imagination is an umbrella term for different mechanisms which likely developed via exaptation and redeployment.
7. Multimodal Dialogue: humans learn by integrating multisensory stimuli and communicating through diverse modalities. Education that expands this basis may have clinical effects by promoting neurogenesis.
8. Intervention Integrity: to implement interventions that promote MI and imagination, researchers must accept ongoing self-awareness, the multimodal nature of knowledge, and the translational challenge.
9. Motivated Uncertainty: the MIIT framework embraces uncertainty and remains open to confirming or disconfirming data (degrees of confidence) without losing its goal of enhancing life through multimodality.

Figure 16.7: The Nine Recommendations for Social work Educators, as They Relate to Each One of the Principles of the Multimodal Integration of Imagination and Trauma (MIIT) Framework

1. Avoid categorizing your students, as they are all capable of integration.
2. Respect differences but do not obviate power disparities.
3. Encourage students to co-create solutions alongside their clients.
4. Amplify congruency between theory, practice, and self.
5. Hold space for tension and healing.
6. Promote the development of metaknowledge through analogical reasoning.
7. Introduce and value multimodality in supervision and process
8. Inspire your students to consider ethics, epistemology, and aesthetics to create meaning beyond the classroom.
9. Instill a sense of tragic hope.

human beings are exceptional in producing complex communication through several modalities. This evolutionary advantage also helps understand the emergence of imagination types. Therefore, the MIIT framework concludes that individuals can strengthen their neural pathways through multimodal stimulation as long as congruency expands. Through numerous examples and recommendations, these ideas were shown to be relevant for field education.

The main limitation of the MIIT framework is its lack of extensive empirical testing, given that it is in its early stages of development. Future studies should test the relationships between imagination types with other health and performance outcomes. Another rich area of application of the

MIIT framework is examining how multimodal pedagogy could improve learning patterns (memory, recognition, recall, perception) across the life course while slowing cognitive and sensorimotor decay. Finally, the MIIT framework requires further investigation into replicating multimodal interventions across academic disciplines and beyond classrooms (e.g., informal learning contexts).

Overall, the MIIT framework offers insights to transform social workers' education by focusing on the congruency between the classroom and the field agency. This novel approach will be open to refinement and intellectual dialogue, while continuously recognizing the corrosiveness of historical trauma and the healing potential of imagination. As they evolve into a schematic theory, the working principles and recommendations may contribute to education across fields. By implementing multimodal integration, experiential instructors can become imagination architects.

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