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ARTICLE



Learning styles in counseling: a scoping review of the empirical evidence

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ABSTRACT

The concept of learning styles is popular among educators and the general public; however, many have highlighted the lack of empirical evidence supporting its relevance. We conducted a systematic literature search to identify the scope of empirical studies on learning styles applied to counseling and counseling education. Only 17 empirical studies were identified, indicating a relative lack of research. Four studies reported on the application of learning styles in treatments (of either the client, the counselor, and/or the treatment), suggesting that matching learning styles of intervention and client might be beneficial. Thirteen studies reported on learning styles in training settings (of students and their supervisor/teacher or field instructor). Although students' learning styles appeared flexible, social work students frequently reported an active experiential learning style and counseling students as well as more experienced clinicians appeared more abstract and reflective. The majority of studies were cross-sectional survey studies and many reported minimal psychometric data on the used self-report measures of learning styles, which appeared to conflate the concepts of learning preference and learning ability. At present, there is no adequate evidence to justify incorporating learning styles assessments into counseling practice or training.

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Introduction

Learning Styles in Counseling: A Scoping Review of the Empirical Evidence

In the past three decades, the proposition that students learn in different ways has emerged as a prominent pedagogical issue within the field of education (Doolan, 2004; Hawk & Shah, 2007). Many papers, books, and assessments have been devoted to the exploration of "learning styles" (LS); an individual's preferred mode of receiving and processing information, such as a preference for theoretical or practical methods of learning (see Cimermanová, 2018; Griggs, 1991; Kolb, 1981, 1984, 1999; Newton & Miah, 2017; Sugarman, 1985; for examples of works focused on LS theory and application). Learning styles reflect the unique way in which each person absorbs and retains information and/or skills (Dunn, 1984). Admittedly, the general idea of LS, that people are different in the way they learn new information, is intuitively appealing (i.e. promising

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to reveal secret brain processes with just a few questions), has pedagogic relevance, and possibly large implications for classrooms around the world (Romanelli, Bird, & Ryan, 2009). Learning Style theory has experienced a surge in popularity, with more than 90% of teachers in various countries believing in the relevance of LS (Howard-Jones, 2014). The LS concept also appears to have wide acceptance among parents and the general public, possibly because it reflects the fact that people want to be seen and treated as unique individuals by their educators. Also, it is a comforting thought that all people have the potential to learn effectively and easily, if only instruction is tailored to their individual LS.

The LS framework is often applied by school-counselors to identify a child's LS and how best to individuate the child's experience in the classroom and at home (1991). Similarly, adult-learners are also thought to benefit from seminars, workshops, testing, and individual consultation on LS to better prepare for specific academic challenges in higher education (MacKinnon-Slaney, 1994), as well as within the health professions (Griggs, Griggs, Dunn, & Ingham, 1994). The potential importance of assessing students' LS has been widely researched within undergraduate education and in the field of psychology (Diseth, 2011). LS theory has been embraced in educational psychology textbooks (e.g. Entwistle, 2013; Omrod, 2014). Moreover, testing of student's LS has been recommended by organizations at all levels of education (LeBlanc, 2018). There is even a thriving industry devoted to publishing LS tests and guidebooks for teachers, and many organizations offer professional development workshops for teachers and educators built around the concept of LS, despite the limited empirical support.

Learning style theory

Despite the ubiquity of LS theory in the field of education, educators vary in the way they examine and conceptualize LS (Fox & Guild, 1987). Learning styles have been described in at least 71 different theoretical models (Coffield, Moseley, Hall, & Ecclestone, 2004), and have been conceptualized in many different ways (see Cassidy, 2004 for a review). Oftentimes, these models describe individual's learning styles in diametrically opposed positions (i.e. feeling versus thinking, diverger versus converger). These dichotomizing typologies are likely an oversimplification of the individual's complexity of preferred modes of receiving and processing information. The most popular model, pioneered by Kolb, posits that learning is the product of a four-stage cycle of "concrete experience, reflective observation, abstract conceptualization, and active experimentation" (Kolb, 1984; Kolb & Kolb, 2018). Furthermore, Kolb suggests that individuals' LS can be described as "convergent, divergent, assimilative, or accommodative" based upon self-report scores derived from the Learning Style Inventory (Kolb, 2013; Kolb & Kolb, 2005a). Divergers learn mostly through feeling and reflecting, assimilators learn through thinking and reflecting, convergers accentuate thinking and acting, and accommodators learn mostly through acting and feeling. Numerous other LS questionnaires have also been designed. In the United States, for example, Campbell (1991) documented 32 commercially published instruments used to assess different dimensions of LS, resulting in a bewildering range of definitions concerning LS and their conceptualization (Curry, 1990).

There are also different perspectives related to the interplay with related constructs, such as how much attention is given to personality styles and cognitive traits (Curry, 1990). For example, some conceptualize LS as an aspect of personality style (i.e. a cluster

of personality that influences how a student perceives, remembers, thinks, and solves problems; Holland, 1982), whereas others simply state that the construct of personality style and LS might be related (Curry, 1987).¹ Although seemingly similar, LS differs from cognitive styles, that are general attitudes and beliefs hypothesized to underlie a propensity for negative thinking (Hardy et al., 2001). Learning styles may be viewed as comprising one aspect of a person's broader cognitive style (Lachman, Lachman, & Butterfield, 2015) or cognitive style may be classified itself as a type of LS (Claxton & Ralston, 1978). Although Kolb and his followers did not directly address the relationship between cognitive styles and learning processes, Kolb did state that LS should be recognized as the self-description of one's preference in different modes of learning (Kolb, 1981, p.290) and should not be confused with one's learning competence (Tennant, 2019). Different from a student's competence or conceptual level, Kolb argues that LS do not reflect linear developmental stages but a learning cycle of different stages of learning that all need to be tapped into in order for the most effective learning to occur (Kolb & Kolb, 2018).

Matching

Assuming that people learn differently, educators can diagnose individuals' LS, in order to tailor their instruction to accommodate this particular LS (Dunn & Dunn's framework; Dunn & Griggs, 1995). The most common hypothesis about the instructional relevance of LS (Dunn, Griggs, Olson, Beasley, & Gorman, 1995; Griggs et al., 1994;), suggests that instruction is best provided in a format that matches the preferences of the learner (e.g. for a "visual learner," emphasizing visual presentation of information). Surveys conducted among the general public and educators in Western and industrialized countries suggest that 80–95% believe that people learn better when they receive instruction that matches their dominant way of learning (Nancekivell, Shah, & Gelman, 2020). This idea that the presentation should match with the learner's own proclivities (also called "meshing hypothesis") suggests that different modes of instruction might be optimal for different people because different modes of presentation exploit the specific perceptual and cognitive strengths of different individuals.

These findings suggest that learning outcomes will be better when the teacher/teaching differentiates instruction and utilizes methods consistent with a student's preferred LS, because that is their natural, and therefore most efficient, way of processing information (i.e. assumed to be their strength; (Dunn, 1984). If new information is encountered using the preferred mode, then processing load is reduced, with corresponding facilitation of acquisition and consolidation of the relevant information (Nor Azan, 2009). In other words, when instructors introduce materials in a way that is congruent with students' LS, this is thought to lead to more effective learning (Miller, McGlothlin, & West, 2013). Indeed, empirical studies have shown that matching teaching methods to students' (Burke & Dunn, 2002; Ford & Chen, 2001; Nor Azan, 2009), supervisors' (Wolfsfeld & Haj-Yahia, 2010) and medical clients' (Arndt & Underwood, 1990) LS may maximize learning. A meta-analytic review by Dunn et al. (1995) suggest that students whose LS are accommodated are expected to achieve 75% of a standard deviation higher than students who have not had their LS accommodated.

In contrast to this matching-hypothesis, there are also suggestions that the mismatching of LS might be useful for the student in allowing the development of alternative learning strategies (Shipman & Shipman, 1985). Some evidence suggests that learners may benefit from teachers of an opposite style (Sadler-Smith, 1996). Indeed, complementarity of LS were shown to have positive results in digital learning (Krassmann, Rossi Filho, Tarouco, & Bercht, 2017); and organization's LS (e.g. (Roldán Bravo, Lloréns Montes, & Ruiz Moreno, 2017). Although students might prefer the learning strategy that matches their LS, a mismatch between student-teacher or student-method might be beneficial (Doyle & Rutherford, 1984) presumably because the strategies compensate for the learner's weakness (Alesandrini, Langstaff, & Wittrock, 1984). In other words, by strengthening the LS in which one is weaker and thereby closing the learning cycle (Rothaermel & Boeker, 2008).

Learning style theory & counseling

In this review, we contend that knowledge from the field of adult learning theory may also be helpful in suggesting some tangible implications for the field of counseling and counseling-training. Our particular emphasis is on identifying LS as indicators of preferred ways of learning as therapist, trainee or client. Counseling reflects an educational process in three ways; the training process of becoming a therapist, therapists' professional preferences, and the counseling treatment process.

First, LS might be relevant for the training and supervision of student therapists (Sugarman, 1985), which is integral to our field (Orlinsky & Rønnestad, 2005; Sharkin & Plageman, 2003). LS might guide the type of instruction student trainees prefer and might inform the professor's lesson plans in the didactic learning in graduate classrooms, it also has direct practical application in the clinical practice teaching arena, as students attend numerous clinical practice, placements, internships and externships (Cartney, 2000). Kolb's premise of the four stages in the learning cycle, along with the need for counseling students to learn both theory and its practical application, suggests that students might have to make use of both abstract and concrete learning experiences, and have to be adaptable in different contexts. Moreover, given the number of different supervisors students work with throughout their training, the implication of similar or different and matching or mismatching of LS in the supervisory relationship is thus important to address (Cartney, 2000). Within practice teacher's training, the importance of understanding LS in the supervisor-student relationship has been noted, so that the supervisor might try to match the student's LS (Shuk-fong Ng-wan, 1996). Similarly, within clinical supervision, if the supervisor recognizes the student's LS, the supervisor can design the most individualized instructive methods (Fox & Guild, 1987). Attending to supervisees' LS is a noted component of supervision best practices (Tangen, 2018) possibly reflecting the broad content and methods of supervision training (Milne, Sheikh, Pattison, & Wilkinson, 2011).

Second, LS framework might also help explain the socialization of learning norms that affects the choice of mental health profession (Heffler & Sandell, 2009; Katz & Heimann, 1991) and preferred counseling modality (Buckman & Barker, 2010; Rihacek & Danelova, 2015). Given the professional difference in emphasis on practical skills (e.g. social work Masters' degree) and more abstract intellectual knowledge (e.g. clinical psychology PhD) within different mental health trainings, it is not unreasonable to expect differences

among trainees in the different professions. Similarly, more behaviorally or experientially focused therapies might be preferred over more insight-focused psychoanalytic modalities by those who prefer a concrete method of learning themselves.

Finally, the concept of LS appears to be aligned with the treatment process itself. Some theoretical orientations and therapeutic approaches emphasize the overall didactic goal of the counseling process itself, with the client as learner and the therapist as teacher (Lightburn & Beck Black, 2001; Riess, 2002).² Applying the LS framework to the counseling treatments to improve counseling outcomes might involve (a) diagnosing clients' LS preferences in intake or assessment procedures, and (b) prescribing and using complementary (matching) or compensatory (mismatching) counseling techniques (structured or non-structured, experiential or analytic interventions), approaches (e.g. psychodrama or art-therapy; Dunn & Griggs, 1995), treatment modalities (i.e. behavioral or analytic) and formats (i.e. group or individual; Griggs, 1991) or (c) considering the matching/mismatching of the LS of the client, in relation to the LS of the therapist in assigning or referring clients. It might be relevant to assess the therapists' LS, as it is expressed in the therapist's interpersonal communication style (Keteyian, 2011). As therapists achieve greater understanding of their own LS, they more easily recognize clients' learning experiences and are less likely to make assumptions about their clients. This validates clients because it allows therapists to use interventions that are more individually focused and based on the inherent strengths of clients (Keteyian, 2011). This emphasis on therapist and client differences, fits within the current literature on individualized counseling treatments (Lutz, 2002; Norcross & Cooper, 2021).

The matching hypothesis would suggest the importance of tailoring to the clients' natural and most efficient way of processing information (Babor, 2008), by matching counselor style and using compatible counseling techniques or formats (i.e. matching, Nor Azan, 2009). Similarly, Taber, Leibert, and Agaskar (2011) argue for similarity in the psychotherapy dyad, as a better psychotherapy outcome would be expected if clients are treated by therapists who are like-minded. Alternatively, one could also argue for the benefit of teaching clients' compensatory skills (i.e. mismatching), asserting that successful psychotherapy involves the client learning new skills that the client would not have learned by themselves. As such, if a client is too similar to the therapist in the way they approach new material, the therapist will not be able to impart any alternative perspective or novel ideas that can facilitate change for the client (Herman, 1998; Propst, Ostrom, Watkins, Dean, & Mashburn, 1992). All in all, this possible parallel between the educational process and the therapeutic (training) process implies that the identification of a client/student's LS may possibly aid the learning process.

Controversy about learning styles

Despite the fact that many educators, students, and parents believe in the positive effects of adapting to students' LS, this does not appear to be supported by empirical data. In recent years, scientists have thus questioned the relevance of the concept of LS in the field of education (An & Carr, 2017; Coffield et al., 2004; Dembo & Howard, 2007; Kirschner, 2017; Kirschner & Van Merriënboer, 2013). Some go as far to say that the notion of LS is a pseudoscientific concept, with a superficial appearance of science but lack of substance (Lilienfeld, Ammirati, & David, 2012), and that the "LS myth" is one of the most pervasive

misconceptions in educational science (Coffield et al., 2004; Kirschner & Van Merriënboer, 2013; Sharp, Byrne, & Bowker, 2007).

Indeed, there has been ample empirical evidence that matching instruction to someone's self-reported LS does not actually affect their ability to learn new information (e.g. (Knoll, Otani, Skeel, & Horn, 2017; Krätzig & Arbuthnott, 2006; also see Pashler, McDaniel, Rohrer, & Bjork, 2008 for a review). Overall, the number of studies that report a significant effect of LS on educational achievement (e.g. Uzuntiryaki, 2007) is outnumbered by studies reporting very little evidence for the effect of LS on educational outcomes (Irvine & York, 1995; Kirschner, 2017; Kozhevnikov, Evans, & Kosslyn, 2014; Willingham, Hughes, & Dobolyi, 2015), without possible additional unpublished null-results (Rohrer & Pashler, 2012).

Moreover, there are fundamental difficulties in diagnosing LS and aligning instruction to these styles (Kirschner, 2017). More specifically, Pashler et al. (2008)'s review of the scientific evidence for LS-based instruction suggested that students will, if asked, express preferences about how they prefer information to be presented to them (Dunn, 1984). Students also have shown to differ in the degree to which they have some fairly specific aptitudes for different kinds of thinking and for processing different types of information. However, they concluded that many empirical studies on LS and their effect on student learning lack the methodological rigor to test the validity of LS applied to education (for methodological reviews see Coffield et al., 2004; Romanelli et al., 2009). For example, many of the LS measures lacked validity, reliability (Kirschner, 2017), and a coherent explanatory framework (An & Carr, 2017). Also, several of the methodologically sound studies found results that contradicted the popular matching hypothesis (Pashler et al., 2008; Rohrer & Pashler, 2012).

Aims

In sum, the multitudes of writings on LS in the field of education indicate its popularity and face validity for teaching and training purposes. The assessment of LS is commonplace in many different educational settings seeking to determine the most compatible teaching strategies and improve educational outcomes. However, the lack of robust empirical findings has led scientists to critique its widespread use in education. Within the field of counseling, identifying LS might be applicable to client assessments, decisions of treatment techniques and modality, or counseling students' academic and practical training and supervision. We sought to explore the empirical literature within the field of mental health practice and training, in the broadest sense, to allow us to determine if LS assessments in counseling training and practice might be warranted. More specifically, with this scoping review we aimed to identify all published empirical studies on LS applied to counseling training and practice by using a systematic literature search, and to conduct a narrative synthesis of the study characteristics and reported study findings.

Methods

Systematic search

We conducted a scoping review (Arksey & O'Malley, 2005; Grant & Booth, 2009) in order to explore broadly the nature of research activity in the application of LS in training as well as

treatment settings, including different populations (i.e. clients, therapists, counseling students, instructors). In line with guidelines for scoping reviews (Arksey & O'Malley, 2005), we applied a systematic literature search method. Several steps were taken to ensure the literature search was systematic. Firstly, we followed published guidance for systematic reviews of evaluations of healthcare interventions (Liberati et al., 2009), including the five PICOS components (population, intervention, comparators, outcome, and study design) identified as preferred reporting items for systematic reviews and meta-analyses (PRISMA; Moher, Liberati, Tetzlaff, & Altman, 2009). In line with these guidelines, we predetermined the kind of data that would be extracted from studies (research question, design, comparison groups where applicable, sample size and population, LS measures, and the reported study results) that we synthesized both in a table (see Appendix B) and narratively in this review. Secondly, we used operational definitions to identify and clarify constructs of interest. In line with the scoping nature of this review, we chose the broadest, most inclusive definitions used in the field. "Learning style" was defined as the most effective mode of instruction or study for an individual, in line with the definition by Pashler et al. (2008). For counseling, we used the definition developed by the delegates from the most representative 30 counseling associations in the United States, who defined "counseling" as a professional relationship that empowers diverse individuals, families, and groups to accomplish mental health, wellness, education, and career goals (Kaplan et al., 2014). Based on this inclusive definition, this scoping review aimed to reflect professional relationships in the broader mental health field, reporting on all possible types of clients (e.g. clinical/subclinical) and mental health trainees and practitioners of different professional training backgrounds (e.g. counselor, psychologist, social worker, nurse practitioner, psychiatrist, & psychoanalyst). To create a comprehensive overview of the application of LS in counseling, the systematic literature search also included empirical studies of different types of counseling training, either at graduate level, or post licensure (e.g. didactic courses or workshops, clinical training, or supervision). Thus, in order to be inclusive of the wide scope of counseling-related research, we focus on LS of the client, therapist, or counseling technique as well as on counseling students and teachers.³

Inclusion and exclusion criteria. Six inclusion criteria were used: (i) the study was reported in the English language and published in a peer-reviewed journal before August 2020; (ii) the study reports on an original empirical investigation, rather than a clinical or theoretical description; (iii) the study reported on a measurement of LS, regardless of conceptualization or framework,⁴ but different from cognitive style or personality style (Hardy et al., 2001; Lochner & Melchert, 1997); (iv) the study reports on adults (18 or older), in line with a focus on the implications of the review for counseling training and adult mental health services, as well as with the majority of existing counseling research (Stewart & Chambless, 2007); (v) the study reported on clinically directed education at graduate pre-licensing or post-licensing level (i.e. counseling skills or theories being taught or psychological interventions being provided). We thus excluded studies on undergraduate education (e.g. Busato, Prins, Elshout, & Hamaker, 2000; Diseth, 2011), or nursing education (Lockie, Van Lanen, & Mc Gannon, 2013); (vi) LS was reported of the therapist, client, supervisor or student; (vii) LS was measured at least once, either before or during or after treatment/training.

The following databases were searched according to the established search terms and inclusion- and exclusion criteria: ERIC, MEDLINE, PsycInfo, Academic Search Complete, and PsycArticles. Search terms included variations on the terms for: (a) learning (learn*, cogn*, intellect*, mind, thinking, teaching); (b) style (style, type, mode, preference, strategy); (c) counseling and counseling training (psychotherap*, therap*, intervention, clinician, "mental health", "therap* training", supervis*, psycholog*, counsel*).⁵ Truncation symbols were used to search for all possible forms of a certain search term. The search was conducted on abstracts of peer-reviewed journals with Boolean operators "AND" entered into the database search to link the different categories, and "OR" entered in between each version of the term within each category (a, b and c) of search terms.

To further increase the rigor of this systematic review, backward and forward reference checking was applied exhaustively,

Systematic search results. For the systematic literature search on LS and counseling (training), the third author conducted the Boolean search and reviewed 6,127 abstracts for an initial screening. A total of 35 articles appeared to meet inclusion criteria and were read in full by all three authors independently. All three authors identified the exact same (number of) studies that met inclusion criteria. Of the 35 studies, 27 were excluded because they reported on theoretical models rather than original empirical data, reported on training of undergraduate students, and/or did not include an assessment of LS. Eight empirical studies were included for review. Subsequently, the first and second authors independently conducted the forward and backward citation and reference tracking of these eight identified studies and identified the same additional nine studies that met inclusion criteria (Cartney, 2000; Keri, 2003; Kruzich et al., 1986; Marshall, 1985; Miller, Kovacs, Wright, Corcoran, & Rosenblum, 2005; Smith & Martinson, 1971; Torbit, 1981; Tsang, 1993; Van Soest & Kruzich, 1994). All three authors reached consensus on the identified 17 studies that met inclusion criteria, and that were reviewed for this scoping review.

See Figure 1 for an overview of the steps during the systematic search procedures. See Appendix A for a full list of references of the 17 reviewed studies. Information about study design, types of LS definitions, measures of LS, and effect of LS were extracted and integrated using a narrative approach. A meta-analysis was not conducted due to high heterogeneity of the study aims, LS theories, and the wide range of independent and dependent variables across studies. For transparency, the authors consensus discussions of the reported information on each study design and the LS measures' psychometric properties are reflected in Appendix C, D, & E, respectively.

Results

Characteristics of the reviewed studies

See Appendix B for an overview of the characteristics of the 17 reviewed studies, as well as their reported results. Across the 17 studies, sample sizes ranged from relatively small (Cartney, 2000; $n = 14$) to relatively large (Katz & Heimann, 1991; $n = 629$). Most studies were conducted in North America; USA ($n = 7$), Canada ($n = 3$), but others were conducted in the United Kingdom ($n = 3$), Israel ($n = 2$), Sweden ($n = 1$), and China ($n = 1$). Notably, the publication dates ranged from 1980 (Fry & Charron, 1980) to 2012 (van Doorn et al., 2012),

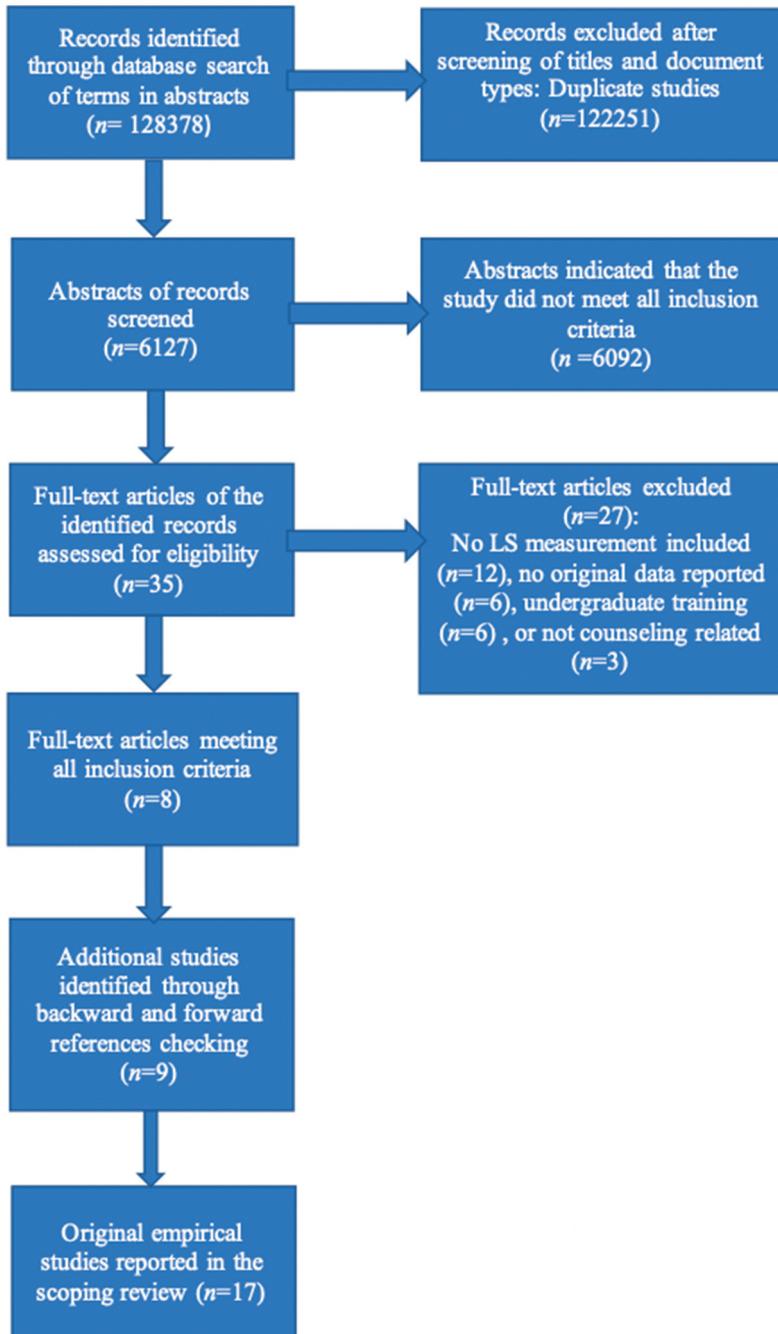


Figure 1. PRISMA flowchart of the systematic search strategy.

with five studies published since the publication of Coffield et al. (2004) critical review of the LS literature within the field of education, three published since Dembo and Howard (2007)'s critique and none published since the publication of subsequent similarly critical papers (An & Carr, 2017; Kirschner, 2017; Kirschner & Van Merriënboer, 2013). Across the

17 studies, two studies (Cartney, 2000; Smith & Martinson, 1971) deployed a mixed-methods strategy, where standardized measures were used; but where the analysis conducted was primarily qualitative. One study utilized a purely qualitative approach and did not include standardized measures of LS (Miller et al., 2005).

Study aims. Each of the 17 identified studies sought to investigate the roll of LS in therapist training ($n = 13$) or in client treatment ($n = 4$). The sample sizes of the 13 training studies ranged from relatively small ($n = 14$) to large ($n = 629$). The four treatment studies reported on participant pools that ranged from 20 to 280 participants.

In the 13 training studies, several different research questions were addressed. Eight studies explored students' LS in relation to other student characteristics, such as age, gender, experience, education level, research interest, career choice, mental health profession or theoretical orientation (Heffler & Sandell, 2009; Katz & Heimann, 1991; Keri, 2003; Raschick et al. 1998; Torbit, 1981; Tsang, 1993; West et al., 2007; Wolfsfeld & Haj-Yahia, 2010), of which three also examined the change in LS over time (Heffler & Sandell, 2009; Tsang, 1993; Wolfsfeld & Haj-Yahia, 2010). Seven of the 13 training studies (also) examined similarities and differences between students and their supervisor/teacher/field instructor (Cartney, 2000; Kruzich et al., ; Miller et al., 2005; Raschick et al. 1998; van Soest & Kruzich, 1994; Wolfsfeld & Haj-Yahia, 2010) or between students and licensed practitioners of the same profession (Katz & Heimann, 1991).

Of the four treatment studies, one study investigated the effect of matching treatment strategies to clients' LS (van Doorn et al., 2012). Van Doorn et al., (2012) examined the effect of matching a behavioral or cognitive intervention with clients' LS on clients' belief change.

Fry and Charron (1980) examined the effect of client-therapist matching of LS (field independence vs dependence & serialism vs holism) on the improvement of clients' self-exploration skills. Similarly, Smith and Martinson (1971) studied the effects of clients and therapists' (impulsive vs constructive) LS on behavioral interactions. Marshall (1985) considered whether clients' LS could be used to predict client preferences for a counselor's approach profile (i.e. experiential, behavioral, client-centered or rational).

Study design

The 13 training studies mostly used a cross-sectional survey design, either completed by students (Heffler & Sandell, 2009; Irvine & York, 1995; Katz & Heimann, 1991, Keri, 2003; Torbit, 1981, West et al., 2007) or also by teachers/supervisors/lab instructors (Cartney, 2000; Kruzich et al., 1986; Miller et al., 2005; Raschick et al. 1998; van Soest & Kruzich, 1994; Wolfsfeld & Haj-Yahia, 2010) or by licensed practitioners (Katz & Heimann, 1991). Three studies (also) used a longitudinal design, including repeated measurements of LS over the course of several years of training (Heffler & Sandell, 2009; Tsang, 1993; Wolfsfeld & Haj-Yahia, 2010). Although many studies compared the LS of students with different characteristics, none of the training studies included an experimental comparison group. Four of the thirteen training studies reported on how they controlled for potential confounders (Irvine & York, 1995; Kerri, 2003; Kruzich et al., 1986; Van Soest & Kruzich, 1994). Most studies used the definition of LS developed by Kolb (1984) ($n = 11$), as assessed by different versions of the Learning Style Inventory (Kolb, 1984, 1999; Kolb & Kolb, 2005b). The reporting of the psychometric properties of the respective LS measures was incomplete

in most identified studies. Only two training studies (Heffler & Sandell, 2009; West et al., 2007) reported on their internal consistency, test/retest reliability, construct validity, and predictive validity. See Appendix C, D, & E for an overview of study methodologies, operationalizations of LS, and reported LS measure psychometrics.

One of the treatment studies used a cross-sectional survey design to compare the LS in a clinical as well as a non-clinical sample (Marshall, 1985). The other three treatment studies used a (quasi) experimental design, in which they compared matched and mismatched client-therapist dyads (Smith & Martinson, 1971) or client-treatment conditions (Fry & Charron, 1980; van Doorn et al., 2012). Van Doorn et al. (2012) examined the difference between matched and unmatched conditions post-hoc. Fry and Charron (1980) assigned clients to the matched or unmatched conditions but did not report randomization. And Smith and Martinson (1971) reported randomization of clients to therapists with the same or different LS. With regard to the LS measures that were used in these treatment studies, one study (van Doorn et al., 2012) reported their LS measure to have sufficient validity and reliability, whereas one treatment study reported good validity but mixed evidence about the reliability of their LS measures (Smith & Martinson, 1971). The other two treatment studies reported good reliability of the LS measure but did not report on its validity (Fry & Charron, 1980; Marshall, 1985).

Types of participants. Seven of the thirteen training studies (Cartney, 2000; Kruzich et al., 1986; Miller et al., 2005; Raschick et al., 1998; Tsang, 1993; Van Soest & Kruzich, 1994; Wolfsfeld & Haj-Yahia, 2010) included students, as well as their teachers/supervisors/field instructors, whereas the other six studies included student participants only. Social work students were most frequently examined (Cartney, 2000; Kruzich et al., 1986; Miller et al., 2005; Tsang, 1993; Raschick et al., 1998; van Soest & Kruzich, 1994; Wolfsfeld & Haj-Yahia, 2010), and other student groups included undergraduate psychology students (Smith & Martinson, 1971), graduate and post-graduate counselling students (Fry & Charron, 1980; Irvine & York, 1995; Keri, 2003; Torbit, 1981), and graduate students in psychology (Heffler & Sandell, ; West et al., 2007). Katz and Heimann (1991) compared LS of students and licensed clinicians from five health professions: occupational therapy, social work, nursing, physical therapy, and clinical psychology.

Two of the four treatment studies (Marshall, 1985; Smith & Martinson, 1971) reported on clinical samples of individual sessions with (university) counseling center clients (ranging from $n = 16$ to 205 clients). Marshall (1985) reported on both a clinical sample of counseling clients ($n = 205$) and a non-clinical comparison sample of university students ($n = 75$) without specifying the students' level or education or the degree they were pursuing. The other treatment studies used non-clinical samples of undergraduate students to participate in a brief experiment (van Doorn et al., 2012; $n = 59$) or asked these students to volunteer to play a client or counselor (Fry & Charron, 1980; $n = 32$).

The role of learning styles

Learning styles and training. The training studies that tracked LS over time, reported on a trend toward radicalization or purification of LS throughout psychotherapy training. For example, the average psychodynamic student tended to stick to the "feel and watch" style, the cognitive-behavioral therapy student tended to move toward "think and do" (Heffler & Sandell, 2009), whereas social work students showed a further shift toward

accommodating and diverging LS (in line with their supervisors' diverging LS) over the three years of their educational program (Wolfsfeld & Haj-Yahia, 2010b). Other studies that also used Kolb's LSI and examined LS of social work students, reported similar findings. Similarly, in a range of health professions, there appeared to be a greater variance in LS among students than practitioners (Katz & Heimann, 1991). Although Kruzich and colleagues (1986) did not find an effect of student age on LS they did report that those with more work experience were more likely Assimilators (abstract, reflective) than those with less experience.

With regard to choosing a profession, students were inclined to choose those academic/vocational fields that were consistent with their LS (Torbit, 1981). Several training studies further identified a difference in LS among professions, with occupational therapists, social workers, nurses and physical therapists identifying a concrete and active LS (i.e. accommodator), and clinical psychology students and practitioners more abstract and reflective LS (i.e. assimilator) (Katz & Heimann, 1991). Raschick et al. (1998) also reported similar findings for social work students and supervisors who identified as Accommodators, in that they were more concrete than abstract, and more active than reflective. Similarly, van Soest and Kruzich (1994) reported that social work students and their supervisors preferred Accommodator LS, and that the greater the difference on the "concrete experience" scale, the more negatively they tended to rate the quality of the relationship and the skills of the other. The greater the difference between supervisor and student on the "abstract conceptualization" scale, the more positively the students rated the field instructor's clinical skills.

Training studies that did not use Kolb's LSI but used different operationalizations of LS provided additional information about students' LS. For example, Keri (2003), who used the KPLSI based on social learning theory, reported that counselling students most strongly endorsed learning procedurally and systematically, and that younger students favored sensational and superficial LS over the other six LS categories described by Keri. Another study on counseling students that used Honey and Mumford (1986)'s categories of LS found that those who prefer to "do" (activists & pragmatists) were more positive about group exercises than those who prefer to "think" (theorists & reflectors) (Irvine & York, 1995). Moreover, based on these same categories of LS, Cartney (2000) reported that teachers taught their social work students in the way they learnt best themselves, but that they did not judge differences between their students' LS and their own LS as problematic. Furthermore, based on Felder and Soloman (2000)'s LS constructs, West et al. (2007) reported that graduate students with more active and intuitive (versus reflective & sensing) LS reported greater research self-efficacy, and students with verbal LS (as opposed to visual) reported greater research interest.

Raschick et al. (1998) did not identify significant associations between students' LS and their overall outcome ratings of the placement; however, the students who matched their supervisors' active experimentation-reflective observation LS showed higher ratings of their overall placement (Raschick et al., 1998). Similarly, greater differences between student and supervisor on the abstract conceptualization scale led to more positive student-ratings of their supervisor's clinical skills (van Soest & Kruzich, 1994), whereas unmatched LS appeared to have a negative effect on educational outcome, as larger

differences on the “concrete experience” LS, increased the likelihood that the supervisor rated the student lower (van Soest & Kruzich, 1994).

Learning styles and treatment

The treatment study that examined the effect of matching interventions to clients’ LS on treatment outcome reported positive findings. According to van Doorn et al. (2012), matching treatment interventions to clients LS might be beneficial, in that cognitive-behavioral techniques (thought records or behavioral experiments) that matched the client’s LS (active experimentation vs. abstract conceptualization) resulted in increased belief change (van Doorn et al., 2012).

With regard to the effect of matching therapists’ LS to clients’ LS, the results appeared to be mixed. Fry and Charron (1980) for example reported that when therapist-client pairs were matched on their LS (i.e. field dependence vs. field independence) they showed increased subjective improvement in clients’ self-exploration skills (Fry & Charron, 1980), whereas no differences were found for serialism-holism matching (Fry & Charron, 1980). Marshall (1985) did not find the expected preference patterns for experiential, behavioral, client-centered, or rational therapist approach, however, when only two therapist approaches were considered (directive vs nondirective), the findings suggested that clients preferred therapists with a different learning style. More specifically, they found that clients who preferred directive counselors tended to be more abstract thinkers and learners. Conversely, those clients who preferred nondirective counselors were more likely to think and learn concretely. Similarly, Smith & Martinson (1971) did not find an effect of matching restrictive counselors with restrictive clients, but did report differences in directive behaviors between groups of impulsive counselors and constricted counselors when interviewing impulsive clients.

Discussion

The concept of learning styles (LS) has considerable popularity among educators, parents and the general public. However, the lack of robust empirical findings has led scientists to question the existence and relevance of LS in the field of education. The purpose of this scoping review was to examine if and how LS theory has been applied within empirical studies on counseling training and practice.

The systematic literature search resulted in 17 empirical studies; four studies reported on the effect of LS within counseling treatment settings, and 13 reported on the effect of LS in counseling training. Narrative synthesis of the study characteristics illustrated the wide diversity in study aims, LS models and operationalizations of LS among the 17 identified studies. More specifically, the majority of studies were cross-sectional survey studies, and used relatively small convenience samples without comparison groups. Comparison of study findings were further complicated by the fact that many different LS theories were used, and even the eleven studies that applied Kolb’s conceptualization of learning styles used different versions of Kolb’s learning style inventory. Most studies reported minimal psychometric data on the used self-report measures of learning styles, which is surprising, given that there is ample literature on the psychometric weaknesses of several of the measures used in the reviewed studies. In this scoping review, we merely reported the authors’ description of the reliability and validity of their LS measure, and

thus reflect the emphasis that the authors placed on LS measure psychometrics, more than the exact psychometric quality of the measures per se.

The four treatment studies had different aims, either describing clients' LS more generally, matching an intervention type to a clients' LS, or matching counselors' and clients' LS, and only three of these studies used clinical samples. None of the studies used objective measures of treatment outcomes (e.g. symptom levels), and their findings are likely not generalizable to treatment settings. For example, Fry and Charron (1980), who assessed subjective improvement in clients' self-exploration skills, used a sample of students who roleplayed the client or therapist interaction. Van Doorn and colleagues (2012) assessed belief change following a 30 min intervention for a non-clinical sample of undergraduate students. It is thus possible that matching of treatment interventions and clients' preference is beneficial but matching the LS of the client and the LS of the therapist appears unlikely to be helpful.

The study aims and designs of the training studies were also very diverse. Many training studies aimed to describe students' LS in relation to other demographic variables such as profession, training or age, whereas three studies tracked students' LS over the course of training, and seven studies described the LS of students in comparison to their supervisor/teacher/field instructor, or licensed professionals. Social work students were most frequently examined, and other student groups included undergraduate, graduate, and post-graduate psychology and counseling students. Although some studies reported on training satisfaction, comfort or self-reported usefulness, none of the training studies included objective training outcomes. In other words, the self-reported LS ratings appeared to be used to assess learning preferences, rather than learning ability or effectiveness.

Taken together, the relative lack of methodological rigor of these 17 LS studies within the realm of counseling practice and training appears consistent with the previous critiques raised within the field of education (An & Carr, 2017; Coffield et al., 2004; Dembo & Howard, 2007; Kirschner, 2017; Kirschner & Van Merriënboer, 2013). Notably, all identified studies were relatively old, conducted between 1971 and 2012, with only few studies conducted after 2004, when Coffield's critique was published (Coffield et al., 2004). That said, one of the older studies appeared to have relatively more robust study designs, with random assignment of the treatment groups (Smith & Martinson, 1971), even though the samples sample size in the comparison group ($n=4$). Marshall (1985)'s study appeared to display some methodological strengths by reporting on LS in both a clinical group of 205 counseling clients, as well as a comparison group of 75 non-client students. However, the study was limited by its cross-sectional survey design and the method of pairing of the groups, which did not appear to be based on relevant criteria.

With regard to study findings, it appeared that students' learning styles are relatively flexible, and that overtime clinicians become more set in their ways with regard to preferred LS. More practical mental health students, such as social work students, frequently reported an active experiential learning style whereas students in counseling or clinical psychology as well as more experienced clinicians appeared more abstract and reflective in their LS preference. Some might perceive people with the same LS as more skilled and prefer to work with a student or supervisor with the same LS. However, having a different LS did not appear to be perceived as a problem per se, and the effect of LS and LS matching on objective training outcomes has not (yet) been assessed. Moreover, based

on the few limited treatment studies, it is possible that matching of treatment interventions and clients' preference is beneficial but matching the LS of the client and the LS of the therapist appears unlikely to be helpful. All in all, based on the current (limited) research findings, there is no compelling evidence to suggest that LS should be considered in counseling and its educational programs.

Possible reasons for the lack of research

In contrast to the volume of educational papers, books and assessments devoted to LS, this scoping review indicated a sparsity of empirical studies on LS applied to the field of counseling. This lack of focus on LS in counseling research might be explained in several ways. First, following the recent controversy around the scientific evidence for LS in the field of education, counseling researchers might have disregarded the concept of LS. This would also explain why no empirical studies were identified in the last six years (the most recent study was by van Doorn et al., 2012), since the publication of several prominent critiques of LS in the field of education (e.g. An & Carr, 2017; Kirschner, 2017; Kirschner & Van Merriënboer, 2013). Another possible reason for the lack of research is that psychotherapists might not see themselves as educators (Tharp, 1999), and therefore might not view the educational literature as relevant. Moreover, it is possible that other empirical studies on LS in counseling were in fact conducted, however, that these results were disappointing or unpublishable and therefore not searchable in peer-reviewed journals (described as the "file-drawer effect" in Bartolucci & Hillegass, 2010). Admittedly, we decided to exclude unpublished papers and dissertations from this scoping review, because we deemed the peer-review process, a crucial screening of the quality of empirical studies, especially, in light of the previously identified lack of methodological rigor in this field. Furthermore, it is also possible that there is counseling research on the concept of LS, but that psychologists used different jargons, not identified in this systematic search. Arguably, research on possibly overlapping concepts, such as cognitive style (Kozhevnikov et al., 2014), cognitive flexibility (Keshavan, Vinogradov, Rumsey, Sherrill, & Wagner, 2014), therapy preferences (e.g. Cooper & Norcross, 2016), and individualized treatments (e.g. Sales & Alves, 2016) might complement the empirical literature on LS in counseling.

Study limitations

First, with this review we aimed to provide a snapshot of the breadth of research activity in an accessible and summarized format, while using a systematic search method. This review should be seen as a scoping review, in that it provides a rigorous and transparent method for mapping a complex area of research, in terms of the volume, nature and study characteristics (Arksey & O'Malley, 2005). In line with the aims of a scoping review, we did not identify specific study designs in advance, did not address specific research questions, did not conduct a meta-analytic synthesis of comparable studies, nor assessed the quality of included studies (Arksey & O'Malley, 2005; Grant & Booth, 2009). We acknowledge that this is one review method amongst many that might be beneficial to the field, and hope that counselors, training directors, supervisors and psychotherapy researchers will be well placed to build upon our reported findings.

Although no formal assessment of study quality was conducted, the findings of the reviewed studies should not be weighed equally, as some larger-scale studies (e.g. Katz & Heimann, 1991) are more rigorous than some small exploratory and clearly under-powered studies (e.g. Cartney, 2000).

Arguably, including evidence from unpublished studies and the grey literature, could have reduced the possible publication bias. However, many identified peer-reviewed published papers were of limited methodological quality, and under-powered. In line with scoping nature of this review, we did not focus on quality assessment (Grant & Booth, 2009) and by the reporting of peer-reviewed studies we tried to ensure some baseline of quality standard. Moreover, given the critiques with regard to the scientific rigor within the empirical studies on LS, we deemed it important that the systematic search would be replicable by others in the future.

Besides the sheer lack of empirical research and the methodological and psychometric issues raised in the quality assessments, there are three other limitations of the reviewed studies that need to be considered. First, the reviewed studies all used self-report measures of LS and treatment/training outcomes. Although the use of self-report is common in counseling research, it means that the records of learning behavior, student achievement or therapy outcomes were one-sided and possibly inaccurate (Kirschner, 2017). Self-report measures of LS are likely unreliable (Kirschner & Van Merriënboer, 2013), in that the relationship between what people say about how they learn and how they actually learn is weak (Massa & Mayer, 2006). This means that what people prefer might not be what is best for them. A perhaps even more worrying implication of the use of self-report measures of LS is that the concepts of preference and ability appeared to be conflated. The LS measures reported on learning preferences rather than on the notion of the person having different aptitude or ability to process one kind of information or another. A preferred LS indicated that subjects liked certain types of information (e.g. words or pictures) better, but should not be seen to indicate that they were better able to process these types of information in their memories (Knoll et al., 2017) or that optimal instruction for the student would need to take this preference into account. Moreover, most learning styles measures classify people into supposedly distinct groups, rather than assigning people graded scores on different dimensions (Pashler et al., 2008). People do not fit exclusively in one category and not others; a person may benefit equally from multiple ways of learning. Third, the studies reported on different operationalizations of LS. The most commonly used measure was Kolb's LSI, praised for its face validity (Pigg, Lawrence, & Lacy, 1980), but often criticized in that the LSI has no capacity to adequately measure the degree of integration of learning styles. Moreover, even the studies that used the same measure (LSI), used different versions of the instrument (Kolb, 1984, 1999; Kolb & Kolb, 2005b) that cannot be regarded as parallel tests (Heffler & Sandell, 2009). These same six studies also reported on different combinations of LS (divergers vs. active experimentation), different subscale labels (watch & do vs. observe & experiment), and applied different scoring methods of the LSI, which further complicates systematic comparisons. Thus, similar to recent critiques in the field of education (An & Carr, 2017; Kirschner, 2017), in our review, the use of different study designs, theoretical frameworks, LS categories and measurements made it difficult to compare and contrast empirical findings.

Future research

Within the current trends in psychotherapy research, the assessment of LS in relation to training and treatment outcome might still hold potential. The assessment of LS fits within the current focus on evidence-based bespoke therapies, and the role of considering clients' in-session activity preferences on alliance and treatment outcome (Cooper, Van Rijn, Chryssafidou, & Stiles, 2021; Norcross & Cooper, 2021). Treatment questions that remain to be explored include: What is the effect of matching clients' LS to treatment technique on treatment outcome? What client LS facilitates the process of change for what skills or behaviors at which point of therapy under what relational conditions in which model of therapy?

Besides the importance of attuning to the clients' LS, therapist factors are also known to play an important role in psychotherapy treatment outcomes. The fact that counsellors differ significantly in their effectiveness, might be explained by therapy-specific therapist effects, such as interventions or training, but also by personal qualities that are relatively constant across clients (i.e. inferred traits; Beutler et al., 2004), such as the counsellor's LS (Heinonen & Nissen-Lie, 2020). Potential research questions include: Are counsellors with certain LS more effective in providing certain therapies or in working with certain client groups? Does a counsellor's awareness of their own or their client's preferred LS improve the quality of the therapeutic alliance, or reduce treatment dropout?

Similarly, within the current trend of evidence-based training of professional psychology (Callahan & Watkins, 2018), it will be important to examine the assessment of LS in relation to immediate training outcomes, and its ripple effect on treatment outcomes. Example questions include: Do the respective training outcomes of students who are matched or unmatched to their supervisor's LS differ? When considering a group of students with different LS as a whole, do students benefit from the more pragmatic approach of using different methods of instruction (i.e. moderate LS-teaching mode mismatch strategy; Hamza, Inam-Ul-Haq, Nadir, & Mehmood, 2018)? Are certain professional development methods more effective for some students than for others? For example, in line with suggestions by Pashler et al. (2008), the matching hypothesis could be tested by experimental research designs that examine the crossover interaction between LS and method (where learners must be divided into two or more groups, randomly assigned to groups, provided with the same test of achievement, indicating if performance differs between learning-style groups). Alternatively, a naturalistic research design could be applied within a counseling training clinic, where clients, therapists and supervisors complete a LS measure, and track their session-by-session treatment and training outcomes over time.

Also, conducting a more detailed analysis of potential confounders might help to identify the specific role of LS, for example, in relation to cognition and personality. For example, when designing instructions that take differences between learners into account, one could assess cognitive abilities rather than preferred LS. These cognitive abilities may be objectively measured on an ordinal scale, rather than by subjective self-reports that are used to assign people to types on the basis of one or more arbitrary criteria (Massa & Mayer, 2006). It is possible that a learning method that they do not prefer, might be more effective in increasing educational outcomes (Kirschner, 2017; Rogowsky, Calhoun, & Tallal, 2020). Therefore, future counseling researchers may potentially not only

want to test the matching hypothesis (e.g. Beutler, Kimpara, Edwards, & Miller, 2018) but also explore the effect of using a complementary teaching style (i.e. mismatching) (see van Doorn et al., 2012). Alternatively, it is also possible that flexibility in learning abilities helps people function better in today's cross-functional and multidisciplinary workplace (Sharma & Kolb, 2010). Similarly, given that therapists with broader theoretical perspectives evince higher healing involvement (Romano, Orlinsky, Wiseman, & Rønnestad, 2009), therapists with more diverse learning abilities may potentially be more effective. These alternative hypotheses around the possible benefits of flexibility of LS have not yet been empirically examined.

Conclusion

This scoping review is innovative in bridging the fields of counseling and education and examining the effectiveness of applying LS theory to counseling education and clinical practice. The empirical application of LS theory to the broad field of counseling research has produced studies limited in number and quality, and demonstrates diversity in study characteristics and research designs, from large-scale cross-sectional surveys small-scale post-hoc experiments to naturalistic longitudinal analyses. There are some potential research angles that have not yet been explored, however, based on the current (limited) research findings, there is no compelling evidence to suggest that the assessment of preferred LS actually helps to make training or counseling practice more effective. Thus, administering LS tests does not likely help students or clients achieve better learning outcomes. Perhaps future research may demonstrate such linkages, but at present, there is no adequate evidence base to justify incorporating LS assessments into counseling practice or training.

Notes

1. A helpful overarching framework is described in Curry's onion model of cognitive style (1987), also applied to nursing training (Griggs et al., 1994) and medical education (Curry, 2002), that describes personality dimensions, social interaction models, and instructional preference models, as different from the information-processing model that addresses the individual's preferred approach to assimilating information, as operationalized by Kolb's LSs.
2. Most psychotherapies involve a certain element of psycho-education of psychopathology development (Lightburn & Beck Black, 2001), although different treatment modalities might emphasize different LSs. For example, in Dialectical Behavioral Therapy or Cognitive Behavioral Therapy therapists might focus on teaching skills (Riess, 2002), whereas psycho-dynamic therapist might teach relationally by way of corrective emotional experiences or making transference interpretations (e.g. Stern et al., 1998)
3. We originally aimed to focus on the use of LS in mental health training specifically. However, given the very small n , we decided to not only include studies conducted within training settings but also include studies reporting on the use of LS in psychotherapy treatment settings.
4. We originally aimed to narrow our search to Kolb's definition of LS only, but, we soon realized there were very few empirical studies on this conceptualization of LS, and therefore decided to include empirical studies that used different definitions of LS.
5. We decided not to specifically add terms for different mental health professions, such as social work, occupational therapy, and nursing, because these fields were already investigated with regards to their application of the LS literature (e.g. Andreou, Papastavrou, &

Merkouris, 2014) and because we were interested in applications in the field of clinical psychology in particular. This means that we only included studies that included these professions if they used the term “psychology” or “psychotherapy” or “counseling” in their abstract.

Disclosure statement

No potential conflict of interest was reported by the authors.

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All authors contributed to and have approved the final manuscript. KA developed the original systematic search design, inclusion criteria, and quality assessments of methods and measures, wrote the majority of the manuscript and its revisions. KN initiated the topic and conducted the original systematic search and conducted the initial assessment under the supervision of KA. ZC conducted the systematic search update and double-checked inclusion criteria, write-up and references.

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