The article discusses current empirical evidence, also identifying gaps and areas for future research, for the three critical elements of evidence-based practice in psychology (EBPP) (evidence-based practice; client characteristics, preferences, and culture; and clinical expertise) as applied to autism spectrum disorder (ASD). We contrast EBPP to a pure EBP approach, outline issues in specifying criteria and sources for defining EBP, and identify gaps in the evidence base (e.g., treatments for adults with ASD). We review the impact on treatment of specific client characteristics (client age, ASD severity, intellectual and language ability, diagnostic comorbidity, cultural/family factors) and outline critical issues affecting clinical expertise and decision making when choosing and adapting treatments. Implications for policy, training, and research are discussed.

Key words: autism, evidence-based practice, review, treatment. [Clin Psychol Sci Prac 23: 239–255, 2016]
pure evidence-based practice (EBP) approach. We begin by reviewing each of the three elements of EBPP: best available research; individual characteristics, preferences, and culture; and clinical expertise. Best available research refers to scientific results related to intervention strategies, assessment, clinical problems, and patient populations, as well as clinically relevant basic research (APA, 2006). The primary concern is to identify evidence-based practices, that is, interventions, for which there is controlled research demonstrating efficacy. Client characteristics, preferences, and culture refer to the client's specific problems, strengths, personality, sociocultural context, values, beliefs, goals, worldviews, and preferences that may impact the goals and choice of treatment. Clinical expertise refers to competence, attained from education, training, and experience, essential in identifying and integrating research evidence with clinical data in the context of clients' characteristics and allowing the clinician to deliver services with the highest probability of achieving therapy goals (APA Presidential Task Force on Evidence-Based Practice, 2006). Within each element, we discuss specific competencies, such as case formulation, treatment planning, implementation of treatment, monitoring, formation of therapeutic alliances, and understanding of individual, cultural, and contextual influences.

EVIDENCE-BASED PRACTICE

Evidence-based practice has become the de facto and even de jure standard for interventions across a variety of fields (e.g., medicine, nursing, dentistry, psychology) and treated conditions (Baker, McFall, & Shoham, 2008; Chambless & Ollendick, 2001; Nathan & Gorman, 2007), including autism (Mesibov & Shea, 2011; Reichow, Doehring, Cicchetti, & Volkmar, 2011). However, there are also concerns about the EBP movement (Bohart & Tallman, 2010; Chambless & Ollendick, 2001; Miles & Loughlin, 2011; Tanenbaum, 2005), with specific criticisms spanning a range of methodological, conceptual, and practical grounds (e.g., unrepresentative client samples/settings, narrow definitions of effectiveness, limits of manualized treatments; see Chambless & Ollendick, 2001; Laska, Gorman, & Wampold, 2014; Westen, Novotny, & Thompson-Brenner, 2004). Below we highlight concerns relevant to the development and application of EBPs for persons with ASD.

Perhaps the most central concern with EBPs is definitional (Chambless & Ollendick, 2001). Although there is broad consensus about what EBP means conceptually, that is, an intervention supported by research evidence of efficacy, there is disagreement about how to operationalize this definition. In a few areas, there is clarity about what constitutes an evidence-based intervention (i.e., by U.S. law, the Federal Drug Administration determines evidence-based medications). However, in other areas, including EBPs for ASD, there is confusion regarding what EBP means, who decides, using what criteria and from which organization or source (American Psychiatric Association, 2006; Chambless & Ollendick, 2001; Hennessy, Finkbiner, & Hill, 2006; Nathan & Gorman, 2007; Roth & Fonagy, 2005; Society of Clinical Psychology, 2015). Problematically, sources often disagree. As noted in a recent Institute of Medicine report, “Consequently, clinicians, consumers, providers, educators and health care organizations seeking information are given little direction as to which reviews are accurate and which guidelines should be employed” (England, Butler, & Gonzalez, 2015, p. 74).

Part of the problem is that different individuals and groups propose different evidentiary criteria (Mesibov & Shea, 2011; Nathan & Gorman, 2007; Roth & Fonagy, 2005; Tanenbaum, 2005; Thyer & Pignotti, 2011; Westen et al., 2004). Within ASD, the recent review by the National Professional Development Center (Wong et al., 2013, 2015) listed three separate criteria: two or more high-quality experimental/quasi-experimental studies conducted by two or more research groups, five or more high-quality single-case design (HQSCD) studies conducted by at least three different research groups, or one high-quality experimental/quasi-experimental study plus at least three HQSCD studies. In contrast, the National Standards Project (National Autism Center, 2009) classified as evidence-based any treatment with reviewer ratings of three or higher across five weighted domains of methodological quality.

Moreover, within ASD, concern has been expressed about privileging randomized controlled trials (RCTs) when identifying EBPs, with a call to be more
inclusive of quasi-experimental and single-case designs (SCDs; Mesibov & Shea, 2011; Wong et al., 2015). However, the over-reliance on SCDs and the paucity of group designs in ASD are also worth noting, because it is at odds with the literature for most mental health diagnoses (Nathan & Gorman, 2007; Roth & Fonagy, 2005) and with the standards for establishing efficacy for medical devices/drugs, which rely exclusively on RCT designs (FDA). For example, Wong and colleagues’ (2015) review of over 50 intervention practices for children and youth with ASD identified 408 SCD studies, but only 38 RCTs. Given that this review covered the entire ASD literature, the number of RCTs identified is alarmingly low. For comparison, Dieterich, Irving, Park, and Marshall (2010) reviewed a single psychosocial intervention for severe mental illness (intensive case management) and identified 38 RCTs, matching the total for all psychosocial interventions for children and youth with ASD.

The identification of EBPs is also complicated by variability in the criteria for judging effectiveness (e.g., Tanenbaum, 2005; Westen et al., 2004). Specifically, whether an intervention is “effective” may depend on the specific outcome assessed (Chambless & Ollendick, 2001; Westen et al., 2004). Within ASD, concerns have been raised that interventions may be deemed effective based on attainment of short-term, easily measured goals, rather than impact on longer-term, meaningful improvements (McConachie et al., 2015; Mesibov & Shea, 2011). Importantly, in their comprehensive review, Wong et al. (2015) classified treatments as EBPs based on their impact on each of 12 different outcome domains, for example, social, communication, behavior, and cognitive. Whether an intervention was classified as an EBP differed across outcome domains. For example, use of visual supports was considered an EBP for 11 of 12 domains, whereas exercise was classified as an EBP for only four domains. Moreover, the number of available EBPs varied widely across domains. The communication domain had 26 EBPs, whereas the cognitive domain had only nine interventions classified as EBPs.

Two other methodological critiques are perhaps even more relevant. First, most EBP research attempts to discover interventions appropriate for an entire group of individuals sharing a single diagnosis. In contrast, psychological practice focuses on what to do for individual clients, many of whom have comorbid disorders (e.g., anxiety and ASD), and is oversimplified by an approach that relies on menus of acceptable intervention practices for a single diagnosis (American Psychiatric Association, 2006; Miles & Loughlin, 2011; Thyer & Pignotti, 2011). Equally important, the EBP approach emphasizes differences rather than commonalities among treatments, even though, across DSM disorders, common factors likely account for most of the variance underlying treatment success (APA, 2013; Bohart & Tallman, 2010; Kazdin, 2008; Lambert, 2013; Wampold, 2006). As noted in the recent APA position statement on psychotherapy effectiveness, “In contrast to large differences in outcome between those treated with psychotherapy and those not treated, different forms of psychotherapy typically produce relatively similar outcomes” (APA, 2013, p. 103). Similarly, in one of the few studies contrasting well-established interventions for ASD, Boyd et al. (2014) reported no differences in 1-year outcomes for children with ASD in three preschool classroom settings: Learning Experiences Alternative Programs (LEAP; Strain & Bovey, 2011), Treatment and Education of Autistic and related Communication-handicapped Children (TEACCH; Mesibov, Shea, & Schopler, 2004), or high-quality special education. All treatments, including the control condition, were equally successful, and factors common to all three classrooms likely contributed to their success.

In contrast to these small-to-null comparative treatment effects, a voluminous literature documents the large impact of common factors on treatment outcomes, such as the therapist (e.g., therapist sense of well-being), the client (e.g., IQ, level of functioning, self-efficacy), and the relationship (e.g., therapeutic alliance; Bohart & Tallman, 2010; Lambert, 2013). That is, general techniques and factors common across therapies account for most treatment impact, with perhaps only 30% of the variance attributable to specific treatment effects (Lambert, 2013; Laska et al., 2014), suggesting that there may be more value in studying what is common across interventions, such as the search for mechanisms of action (Kazdin, 2008), common factors (Lambert, 2013), and evidence-based therapeutic relationships (Norcross & Wampold, 2011).
For example, the identification of treatment moderators (e.g., sociocultural factors) and mechanisms of action (e.g., attentional bias) has been proposed as critical for advancing intervention research and identifying factors needed to foster personalized interventions (England et al., 2015; National Institute of Mental Health, 2015). Within ASD, Dawson and Osterling’s summary of features of effective programs (Dawson & Osterling, 1997), the National Research Council’s report (Lord & McGee, 2001), and recent calls for research on mechanisms of action in early intervention (Lieberman & Yoder, 2012) and in cognitive behavior therapy for anxiety (Lang, Regester, Lauderdale, Ashbaugh, & Haring, 2010) represent similar initiatives focusing on identifying common treatment principles. Moreover, given that effective interventions may share overlapping strategies, identification of the core components (i.e., intervention elements responsible for the treatment effect) and their impact on various outcomes is key to identifying cross-cutting principles underlying treatment effectiveness (e.g., antecedent-based intervention, extinction, reinforcement, modeling; Kasari & Smith, 2013). For example, Ruble and McGrew (2013, 2015) identified the quality of the individual educational program (IEP) as a moderator of treatment outcome for children with ASD in their consulting intervention and speculate that IEP quality also may underlie success for other school-based interventions. Identification of such principles could assist in understanding how current treatments work, in matching elements to the specific needs of the client, and in helping to adapt and create novel treatments.

A final critical concern is simply the paucity of ASD intervention research. Currently, the evidence base for ASD treatment is both limited and uneven, with knowledge concentrated within certain client subgroups and areas of intervention. Despite the fact that most individuals with ASD will become adults and live a near-normal lifespan, most intervention research has focused on young children and youth with ASD (Mukaetova-Ladinska, Perry, Baron, & Povey, 2012). Bishop-Fitzpatrick, Minshew, and Eack (2013) identified only 13 studies meeting review criteria for adults (18 years and older), whereas Wong et al. (2015) identified 456 studies meeting criteria for children and youth (to age 22). Moreover, even when limited to those under 22, most intervention research has focused on preschoolers and elementary-school-age children (Wong et al., 2015). The older the person with ASD, the less we know about effective interventions (Mukaetova-Ladinska et al., 2012). Similarly, most intervention and basic research has focused on persons with less severe ASD, especially those with near “normal” IQs or some ability to communicate (Tager-Flusberg & Kasari, 2013). For example, in the Bishop-Fitzpatrick et al. (2013) review, mean sample IQs for adults with ASD ranged from 96.7 to 116.3. In contrast, 40% to 70% of those with ASD have an intellectual disability (ID; Fombonne, 2005). Problematically, interventions validated for those with nearly average IQs, for example, cognitive-based treatments, may not generalize to those with ID. Thus, in addition to the methodological challenges outlined earlier, we face equally important challenges in the need for research to fill the enormous gaps in our knowledge concerning EBPs for those with ASD.

**INDIVIDUAL CHARACTERISTICS, VALUES, CULTURE, STRENGTHS, PREFERENCES, AND GOALS**

The EBPP approach is most effective for achieving positive outcomes when research evidence and clinical expertise are combined with an understanding of individual characteristics. Treatment choice is based on a consideration of an individual’s (and/or family’s) values, culture, preferences, religious beliefs, worldview, goals, and strengths combined with the psychologist’s experience and knowledge of best available research (APA Presidential Task Force, 2006). As noted above, across disorders, large-scale comparative studies of psychotherapy outcome typically show that the type of treatment affects outcome less than individual characteristics (Clarkin & Levy, 2004). Similar questionable claims of intervention uniqueness are made for ASD treatment outcomes. For example, several studies have replicated the finding that 50% of children with ASD show a marked treatment response to clinic-based, high-quality early intensive behavioral intervention (Lovaas, 1987; McEachin, Smith, & Lovaas, 1993; Sallows & Graupner, 2005; Smith, Groen, & Wynn, 2004). However, half do not show clinically significant change; moreover, the response rates to community-based behavioral treatments are largely unknown. Because
community-based treatment is often not delivered by experienced research teams, the proportion of children who respond is likely to be lower, again emphasizing the impact of individual factors on outcomes (cf. Smith, Flanagan, Garon, & Bryson, 2015).

One critical task is to identify factors that underlie this wide variability in treatment response. Therapists must use clinical decision making to choose which interventions to apply and to adapt treatment protocols for children who do not respond (Sherer & Schreibman, 2005; Stahmer, Schreibman, & Cunningham, 2011). Although a few factors have been identified that tend to moderate treatment success, such as age, cognitive level, language ability, severity of autism symptoms, and presence of comorbidities (Reichow, Barton, Boyd, & Hume, 2012), very little information on adapting treatment approaches is available to assist clinicians in the choice or adoption of specific protocols for those who do not respond (Vivanti, Dissanayake, Zierhut, & Rogers, 2013) and who are most in need of treatment individualization (Schreibman, Dufek, & Cunningham, 2011). Essentially, nothing is known about how to individualize treatment protocols prospectively to maximize child responsiveness (Stahmer et al., 2011; Trembath & Vivanti, 2014). Research on individualizing treatment protocols is especially important for children and adults with ASD, and for families, clinicians, and educators. These frontline consumers/users have limited time and resources to experiment with treatment protocols to determine what works for whom. As soon as an individual is identified as not responding, the treating clinician must be able to assess and adapt treatment protocols using individual strengths, challenges, and preferences as part of an overall EBPP approach.

Moreover, the little empirical clinical guidance available is limited to a narrow range of specific treatment approaches and has not been replicated (Vivanti et al., 2013). For example, Sherer and Schreibman (2005) created a summary profile of responders to pivotal response training (PRT) and used this profile prospectively to discern responders from nonresponders. However, these findings were not replicated in a study involving a larger, more diverse sample of children with ASD (Fossum, 2014). Although these studies are helpful in beginning to identify children most likely to respond to a particular intervention, the critical question remains: What to do for those who do not respond?

Another challenge is that in contrast to most intervention studies, which focus on one particular therapy, many community service providers do not use single treatment protocols. Instead, they combine or select from a set of interventions (Stahmer, Collins, & Palinkas, 2005), further complicating research on adapted interventions (Stahmer et al., 2011). In a promising approach, Kasari and colleagues have applied an adaptive treatment design to demonstrate an effective combination of communication intervention strategies for the subset of children with ASD who remain minimally verbal at school age (Kasari et al., 2014). It is worth noting that these implementation challenges are present even when considering interventions for young children with ASD, the very group about whom we have the most treatment evidence. Further research on the use of adapted interventions is clearly needed across the lifespan.

The limited research on the interactions between individual characteristics and response to treatment is in part explained by the extreme heterogeneity in behavioral expression of ASD (Vivanti et al., 2013) and the overreliance on assessment of the same few broad outcome factors mentioned earlier. The following sections will review each of the broad domains of treatment predictors and outcome variables (Howlin, Magiati, & Charman, 2009) most commonly examined in ASD research—age, IQ, language, and comorbidities—and review briefly what is known about individualizing treatment protocols based on these features.

### Client Age and Gender

Age as a treatment predictor has been a target of study primarily in early intervention research. Research suggests that the sooner children start comprehensive and specialized treatment for ASD, the greater the opportunity for positive outcomes (Dawson, Ashman, & Carver, 2000). However, the association between age and treatment effectiveness is not a universal finding and, importantly, has not been demonstrated beyond the early years. Moreover, the target of the intervention varies depending on the chronological or developmental age of the client. For young children,
speech-language development is often a treatment target, whereas goals for adolescents and young adults more likely reflect social skill deficits, or behavior problems (Kuravackel & Ruble, 2014) and comorbid mental health problems become salient. For adults, goals are generally expanded to focus on vocational or occupational skills (Howlin & Moss, 2012). Therefore, intervention goals and associated treatments that have been developed for young children (for whom most research has been conducted) may not be appropriate for adolescents, young adults, middle-aged persons, or elderly individuals with ASD.

Moreover, clinical guidance connecting goals to specific intervention approaches across the developmental lifespan and within specific settings is largely absent. For very young children, parent-mediated approaches that can be applied in home and community settings are a rapidly growing area of research (Siller et al., 2014). For school-age individuals, schools play an important role in the selection and implementation of intervention with the individual educational program (Individuals with Disabilities Education Act, 2004), partly because in the United States they represent the only federally mandated and publicly funded services for all children with disabilities regardless of family income and insurance status. As individuals age out of the school system, even less is known about the individualization process. Little information is available about how residential providers, employers, day program workers, etc., individualize interventions and evaluate effectiveness of EBPs within specific contexts. Moreover, these trends in services for different age groups provide little concrete guidance about matching treatment to goals and are largely based on typical practice patterns rather than empirical evidence. Lastly, gender is another individual difference that has received virtually no attention in the ASD treatment literature, despite a growing literature on possible sex differences in symptom presentation (e.g., Zwaigenbaum et al., 2012).

### Autism Severity

Level of autism symptom severity refers to the frequency or intensity of symptoms associated with the diagnosis. To date, most studies of ASD symptom severity have focused on young children. The general (but inconsistent) finding is that less severe symptoms are associated with greater responsiveness in early intervention (Ben-Itzchak & Zachor, 2007). However, again, these data do not guide clinical decisions in whether and how ASD severity should impact treatment type, intensity, and modification, and little to no research has been conducted with older groups. Instead, there seems to be an implicit assumption that an established intervention will be effective for all individuals with ASD. In contrast, indicating the potential importance of symptom severity, the latest revision of the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013) now includes separate ratings for the severity of impairment in social communication and restricted, repetitive behavior domains, with three levels (Level 1 “requiring support” to Level 3 “requiring very substantial support”). Currently, these ratings are meant to serve as an index of the impact of symptoms on daily functioning, not as a guide to response to treatment. An advantage of requiring this information is that it may provide a common metric to inform future research by helping to characterize research participants.

### Intellectual Ability

Another highly studied individual characteristic related to treatment outcome is intellectual ability. Between 40% and 70% of individuals with ASD have intellectual disability (Baio, 2012; Fombonne, 2005). Given the wide range of intellectual abilities in ASD, it is surprising how little research offers intervention strategies adapted to differences in IQ. Summaries of EBPs in ASD are based on mean responses across available studies and samples; other than age (e.g., children, adults), they typically have not accounted for individual differences, including intellectual ability (Trembath & Vivanti, 2014). Compendia of EBPs would be more useful if conclusions about efficacy were based on IQ and other relevant specific client variables. How effective putatively evidence-based strategies such as social stories, video modeling, or computer-aided instruction are for individuals with differing IQ levels is largely unknown. Clear guidelines are needed that describe individual characteristics best suited for a particular EBP as well as how to adapt the practice for
individuals based on IQ. We also recognize that in the United States, assessment of intellectual abilities may be problematic due to overidentification of certain minority groups. However, intellectual disability is part of the DSM and has implications for treatment outcomes in ASD.

语言能力

个体预测治疗效果的因素可能最常在沟通干预中研究。作为一种核心特征的残疾，接收性和表达性语言能力，像IQ，范围广泛地在自闭症谱系中，大约30%的自闭症谱系者从未发展出有用的口语（Wodka, Mathy, & Kalb, 2013）。最近，然而，研究人员已经开始识别特定发育因素，包括治疗前的接收性语言、联合注意、和玩具类型，作为个体预测语言获得的因素（Ganz, Davis, Lund, Goodwyn, & Simpson, 2012; Gordon et al., 2011; Pasco & Tohill, 2011; Paul, Campbell, Gilbert, & Tsiouri, 2013; Yoder & Stone, 2006）。然而，几乎没有指导医生根据语言能力选择或调整干预的资料。因此，虽然因素如IQ和语言是治疗反应和预后的指标，广泛的标准IQ或语言语言反映了多种神经认知过程，它们很难在个体间一致地应用，涉及治疗干预。然而，当为儿童和成人建立行为的干预时（Vivanti et al., 2013）。在这一领域，需要理解和评估更底层的机制，以便理解改善治疗效果的需要（Ruble & McGrew, 2013; Yoder & Stone, 2006）。

医学/心理障碍

最后，值得注意的是，尽管因素如IQ和语言是影响治疗选择和有效性的指标，广泛的标准IQ或语言反映了多种神经认知过程，它们很难在个体间一致地应用，涉及治疗干预。然而，当为儿童和成人建立行为的干预时（Vivanti et al., 2013）。在这一领域，需要理解和评估更底层的机制，以便理解改善治疗效果的需要（Ruble & McGrew, 2013; Yoder & Stone, 2006）。

文化/家庭因素

根据上述客户端因素可影响治疗选择和有效性，EBPP方法也强调需要考虑和调整了文化和家庭因素和偏好。人口统计因素和文化和家庭因素在其他目标人群中可能起作用，但在自闭症干预研究中常常未被提及（Mandell & Novak, 2005）。Mesibov et al. (2004)在《自闭症的文化》中，论证了需要理解内部世界的个人，以及他们共享的思维方式。当

医疗/心理障碍

最后，诊断性障碍，虽然常见于自闭症，可能影响治疗结果，而且是重要的考虑因素。在个体化治疗中。一个估计10%到56%的自闭症谱系者有焦虑或情绪障碍（Frazier, Georgiades, Bishop, & Hardan, 2014; Mattila et al., 2010; Mazefsky, Conner, & Oswald, 2010），且10%有另一种医疗条件，如癫痫、结节性硬化症、快速X或唐氏综合症（Gillberg & Billstedt, 2000; Kim, Szatmari, Bryson, Streiner, & Wilson, 2000）。这些条件可能在不同组合中出现，也可能影响男性和女性的结果（Stacy et al., 2013）。尽管这些研究极其有限，但根据上面提到的障碍，研究结果表明，这些障碍与较差的或不同的治疗反应有关（Matson & Nebel-Schwalm, 2007）。

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working with persons with ASD, clinicians usually are also working with systems and within family contexts that must also be taken into account. Although limited, research is emerging on cultural factors that may impact clinical practice (Bishop, Richler, Cain, Lord, & Floyd, 2007) and the importance of matching the EBP to the context. For example, social skills interventions provided in clinical settings may be less impactful compared to those provided within school settings where an additional peer-mediated instruction can be provided to further enhance social interactions with students with ASD (Wong et al., 2015).

CLINICAL EXPERTISE
Clinical expertise is also a critical component in provision of psychological interventions. Clinical expertise integrates what is known about the client, the setting, client goals, presenting problems, diagnostic complexity, and cultural factors, with the limits (e.g., effectiveness established only in school settings or for verbal clients) and indications (e.g., effective for reducing maladaptive symptoms, not for increasing quality of life) of established EBPs (Wilson, Armoutliev, Yakunina, & Werth, 2009). This integrated perspective allows the clinical expert to craft a treatment plan that sequences, matches, synthesizes, and adapts one or more EBPs to address individual clients’ needs. This complex process encompasses much of the clinical training of mental health professionals, including psychologists. The use of EBPs without clinical expertise, including diagnostic evaluation, psychosocial assessment and culturally sensitive interviewing, goal setting, and clinical decision making, runs the risk of oversimplifying and thereby reducing the therapeutic process to a stick-figure caricature. It is important to emphasize that adding client characteristics and clinical expertise as coequal factors with EBP (yielding EBPP) was in deliberate recognition of the shortcomings of a simple EBP approach. By “simple,” we mean a prescriptive approach in which a manualized EBP is applied inflexibly for all clients with a given diagnosis (Westen et al., 2004), relegating the clinician to a technician role. A technician may be well versed in a particular EBP, yet relatively unskilled—indeed unaware—of the clinical skills and decision-making processes required to intervene with unselected community samples whose complex symptom presentations and personal histories are not represented in clinical trials.

However, the EBPP process is not a smoke screen for uncritical, ad hoc eclecticism. Each of the three components is intended to be based within the best scientific evidence (American Psychiatric Association, 2006). Clinical expertise then integrates the information from the other two elements (i.e., EBP and individual, contextual factors) to select the optimal intervention (Spring, 2007). The complexities of ASD—extraordinary heterogeneity of presentation and associated features or comorbidities for individuals, plus family and contextual factors interacting with these—necessitate multiple EBPs to address facets of the condition across individuals and contexts. The National Standards Report (National Autism Center, 2009, 2015) and the National Professional Development Center on ASD (Wong et al., 2013, 2015) have catalogued EBPs for remediation of a range of clinical problems associated with ASD. Despite this important work consolidating knowledge about matching intervention procedures to skill deficits and behavioral difficulties in ASD, enormous gaps remain.

Many of these broader considerations regarding effective ASD interventions have been identified previously (e.g., Lord et al., 2005). However, researchers have seldom addressed these complexities, and practitioners therefore cannot turn to the literature for specific methods to address the challenges that arise in clinical practice. As noted, Boyd et al. (2014) demonstrated that three preschool-based interventions for ASD produced comparable results, suggesting that common elements influence outcomes more than model-specific aspects. The implication is that results may have less to do with the particular intervention and more to do with whether empirically based intervention components are implemented with high fidelity by well-trained practitioners. Even within the constrained paradigm of the early intensive behavioral intervention (EIBI) model for ASD (Lovaas, 1987), meta-analysis assigns a great deal of variability in outcome to the supervision provided to interventionists (Reichow & Wolery, 2009). Indeed, given the overall low quality of the empirical studies supporting EIBI, most reviewers emphasize the need for clinical decision making regarding its use (e.g., Reichow et al., 2012).
Again, this reinforces the need for expert practitioners with broad-based clinical knowledge and skills in selecting and using EBP for individuals.

Decades of general psychological intervention research underpin this point (Beutler, 2000). Recall that perhaps 30% of psychological treatment effectiveness can be attributed to the specific features of the interventions versus features that are common across interventions, including treatment-supportive characteristics of clients and their families (Lambert, 2013). Given this, the knowledge, skills, and behavior of clinicians, which contribute to the other 70%, must be identified if we are to articulate the ingredients for successful treatment. We have every reason to suppose that the same applies to intervention for individuals with ASD. That is, skills such as listening, comprehensive assessment, case formulation, goal setting, outcome measurement, and the clinical decision making required to match treatments to individual goals and clients’ characteristics and contexts all apply to ASD intervention, just as for any other complex psychological/behavioral presentation. Yet these considerations are routinely ignored or at best downplayed in the field of ASD. This may be especially true in the case of young children with ASD. With the need to provide services for a burgeoning number of diagnosed children, pressures to adopt a one-size-fits-all approach are great. The risk is that a diagnosis of ASD may serve as a proxy for individualized assessment, and a standard program and curriculum might guide treatment, uninformed by clinical decision making. In such cases, a service may nonetheless be hailed as “evidence-based.”

The public—and policy decision makers—often seek simple answers to the complex challenges of ASD intervention. Perhaps the fiction that effective treatment of ASD requires only narrowly trained practitioners to implement specific EBPs has been perpetuated because it serves this need for simplicity. Indeed, public discourse regarding ASD intervention has increasingly emphasized the technical skills required to implement specific procedures (notably those derived from applied behavior analysis [ABA]), rather than broader issues such as integrating these skills with decision-making expertise and other aspects of providers’ clinical competence.

Given these considerations regarding EBPP—that is, the broader framework beyond EBP pertaining to the common features of effective psychosocial interventions, the clinical expertise required to implement effective interventions fully, and the individual and contextual factors that influence responsiveness to interventions—we believe that the implications are wide reaching for the well-being of clients with ASD, as well as for professional psychologists.

If psychologists become only EBP implementers, we assume the role of technicians, rather than of professionals with extensive clinical training and the expertise to individualize treatment for individuals in context, a concern echoing that of Silverman (1996). We have a limited empirical basis for our knowledge of effective treatment of many challenging aspects of ASD, especially among older youth and adults, and among those with the most significant levels of disability (Wong et al., 2015). Given this situation, systems of care must rely heavily on professional expertise and clinical judgment regarding how to modify EBPs to align with individual needs as manifested in varied contexts. On multidisciplinary teams, psychologists often assume clinical leadership roles because of this broad-based expertise. In addition, each member of a treatment team contributes specific expertise; for example, speech-language pathologists have extensive training in the assessment and remediation of the language and communication disorders that constitute a key feature of ASD. The breadth and depth of such specific expert skills are minimized if each team member is an EBP technician.

Many of our interventions for individuals with ASD are mediated by nonclinicians, for example, professionals from other disciplines, family members, or classmates. Use of such interventions can be accommodated within the EBPP framework—psychologists’ clinical expertise is essential for decisions such as under what circumstances to engage others as intervention agents, and what intervention strategies are the best fit for the situation. For example, although peer-mediated intervention is a strategy supported by evidence (Wong et al., 2015), there is presently very little evidence available to guide the selection of either the best candidates or the peer intervention agents (Boudreau, Corkum, Meko, & Smith, 2015).
TRAINING AND POLICY IMPLICATIONS

Implications for clinical training accompany the cultural shift toward EBP in health policy and practice. The ascendance of a simplistic EBP approach brings the risk of compromising the training of clinical and educational psychologists (among others). That is, training may emphasize the technical mastery of EBPs, rather than more comprehensive and integrative clinical skills.

Moreover, the policy implications of how EBPs are construed and their place in the larger context of psychosocial service provision are enormously important, potentially influencing the content and process of training as well as trainees’ future employment opportunities. How do we ensure that legislation is consistent with best practices, that is, with EBPP rather than the mandated use of one or more specified EBPs without consideration of context and clinical expertise? The ASD field provides clear examples of how advocacy can result in legislation or regulations that, although well intended, narrow the opportunity to provide EBPP. The complexity of identifying ASD and of providing intervention that is a good individual and contextual fit typically requires collaboration among professionals with a range of skills. Therefore, it should concern all of those who do provide evidence-based care for individuals with ASD when policymakers or insurers, whether public or private, privilege particular approaches or groups of providers. Until relatively recently, the major focus of advocacy efforts to expand insurance coverage of ASD treatment in the United States was to include interventions such as those based on ABA under health coverage (e.g., Abt Associates, 2008). That is, emphasis is placed on provision of a limited list of EBPs. The text of model legislation drafted by the U.S.-based advocacy organization Autism Speaks (2014) includes the following definition of one class of intervention for ASD:

“Behavioral health treatment” means counseling and treatment programs, including applied behavior analysis, that are . . . provided or supervised by a Board Certified Behavior Analyst [BCBA] or by a licensed psychologist so long as the services performed are commensurate with the psychologist’s university training and supervised experience. (p. 2)

Note that this wording specifically qualifies BCBA providers (whose training is focused on one class of potential EBPs) to deliver “counseling and treatment programs,” while giving only conditional endorsement to licensed psychologists. This policy has the potential to reinforce the common misunderstanding that the BCBA designation certifies competence in providing services sufficient to individuals with ASD, while implicitly devaluing the training of psychologists. Such rigid and prescriptive funder-based practices are thus antithetical to the spirit and intent of EBPP, and run counter to the best interests of both psychological service providers and their clients.

RESEARCH IMPLICATIONS

Research that has generated specific EBPs has been invaluable as a step toward defining some key components of psychosocial treatments for ASD. However, as noted in several places above, significant gaps remain. For example, consistent with standard practice for intervention research for other DSM disorders, additional research is needed using rigorous group designs (RCTs). Group designs are especially well suited for discovering potential mediators (therapist alliance) and moderators (symptom severity, age) of change (Kasari & Smith, 2013). Research also is needed to examine the generalizability of EBPs for client subgroups (e.g., age, comorbid conditions, ASD symptom presentation, verbal versus nonverbal), settings (e.g., schools versus clinics), and type of outcome (e.g., cognitive, academic, social, vocational, quality of life). For example, children and adults who have limited verbal ability and also have intellectual disability are greatly underrepresented in research (e.g., Tager-Flusberg & Kasari, 2013). In addition, we require more research to assist us in identifying comorbid behavioral/emotional disorders in such individuals, who are unable to provide self-report of symptoms (e.g., those related to mood). There also are gaping holes in our understanding of services for adults, such as day and residential services, as well as vocational services. Adult treatment research remains a small fraction of the published literature (Bishop-Fitzpatrick et al., 2013). Perhaps specific funding opportunities might mobilize more research in this area.

Research also is greatly needed to understand and identify critical ingredients and mechanisms of action
of EBPs (Kasari & Smith, 2013; Lieberman & Yoder, 2012). In addition, implementation science research is needed to identify methods to promote the dissemination and diffusion of EBPs (Dingfelder & Mandell, 2011; Ruble & McGrew, 2015), for example, assessment of feasibility and acceptability of EBPs, and creation of treatment manuals and fidelity scales. More research could focus on community-based service outcomes, how to measure these outcomes best, and how clinical decision making is used to select treatment goals and interventions, and to adapt EBPs for particular circumstances.

Much is also yet to be learned about which individuals, in what contexts, respond best to established EBPs, including information regarding the combinations or sequences in which these interventions should be implemented. Emerging work on adaptive treatment strategies (Murphy, 2005) in ASD (e.g., Kasari et al., 2014) provides one avenue toward greater treatment individualization. Although this research represents an important advance, such studies are in their infancy with respect to ASD. Moreover, even with more finely tuned information about individualization of EBP, the need for clinical expertise and for consideration of individual and contextual factors remains, especially beyond childhood. Crucially, we need to know far more about which interventions should be delivered, how, and with what adaptations, and when, as well as which outcomes are most important to measure (e.g., Lord et al., 2005; Reichow et al., 2011). We agree with the critiques raised by Miles and Loughlin (2011), among others, that we should move from diagnosis-centered, prescriptive EBP to evidence-informed, person-centered approaches. One example of this approach is a consultation intervention called the Collaborative Model for Promoting Competence and Success (COMPASS), which is based on an EBPP framework and provides guidance in identifying ecologically valid treatment goals and matching those goals to specific EBPs (Ruble & McGrew, 2015).

Beyond the need for knowledge at the level of individualized clinical decision making, ASD researchers are also increasingly aware of the need for studies that take account of the larger societal context of intervention and what is usually referred to as the research-to-practice gap. For example, several authors have noted the gap between the establishment of EBPs and their uptake into community-based practice (e.g., Greenwood & Abbott, 2001; Ringeisen, Henderson, & Hoagwood, 2003). Similarly, Kasari and Smith (2013) note the lag in research and adoption of EBPs for children with ASD in the school setting and provide several helpful suggestions for improving dissemination. Moreover, when interventions are finally implemented, they often fail to adhere closely to the original research, leading to lower-quality services and poorer client outcomes (Bond, Evans, Salyers, Williams, & Kim, 2000).

Here, the field of ASD has turned to implementation science for guidance, a direction explicitly articulated by Dingfelder and Mandell (2011), who introduced a diffusion of innovation model to guide research. Ruble and McGrew (2015) in their work on COMPASS, for example, describe an implementation strategy for improving the educational outcomes of children with ASD in public schools. Using an implementation framework described by Dunst, Trivette, and Raab (2013), they examine the association between three primary actors: (a) the consultant, who is the enactor of the implementation practice (i.e., COMPASS; Ruble, Dalrymple, & McGrew, 2012); (b) the teacher, who is the enactor of the intervention practice (the EBPs matched to the student’s individual goals); and (c) the child, who represents the practice outcome. They showed that consultant adherence impacted teacher treatment quality and that child outcomes were related to teacher (burnout, adherence) and child (severity) factors, thus providing information helpful both to future implementation and to the application of COMPASS within an EBPP framework.

Also within the purview of implementation science, we recommend more research to address issues with important policy implications, such as the short- and long-term cost-effectiveness of various evidence-based intervention options. These might include comparisons of interventions that fall within the competencies of psychologists and medical interventions such as medication use (which may be more expedient in the short term but possibly more costly). For example, the efficacy of behavioral interventions for sleep problems in individuals with ASD has not been systematically compared with the impact of medications (Malow et al., 2012), which, in addition to being costly, are less
acceptable to parents of children with ASD (Goodday, Corkum, & Smith, 2014).

SUMMARY
Our intention here has been to highlight implications specifically for psychologists who provide clinical services for persons with ASD and their families, as well as for treatment researchers. Other professions may have comparable concerns about current trends toward simplistic views of EBP on the part of administrators and policymakers. Both as psychologists, and together with our colleagues from other disciplines, we must try to ensure that in advocating for empirical approaches to treatment, we avoid reductionism that may ultimately disadvantage individuals with ASD whose complex needs are not likely to be met by simple solutions.

REFERENCES


Kasari, C., & Smith, T. (2013). Interventions in schools for children with autism spectrum disorder: Methods and


Received April 10, 2015; revised November 16, 2015; accepted January 21, 2016.