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Community-Delivered Evidence-Based Practice and Usual Care for Adolescent Attention-Deficit/Hyperactivity Disorder: Examining Mechanistic Outcomes

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Previous research suggests that routine psychosocial care for adolescents with attention-deficit/hyperactivity disorder (ADHD) is an eclectic and individualized mix of diluted evidence-based practices (EBPs) and low-value approaches. This study evaluated the extent to which a community-delivered EBP and usual care (UC) for adolescents with ADHD produce differential changes in theorized behavioral, psychological, and cognitive mechanisms of ADHD. A randomized community-based trial was conducted with double randomization of adolescent and community therapists to EBP delivery supports (Supporting Teens' Autonomy Daily [STAND]) versus UC delivery. Participants were 278 culturally diverse adolescents (ages 11–17) with ADHD and caregivers. Mechanistic outcomes were measured at baseline, post-treatment, and follow-up using parent-rated, observational, and task-based measures. Results using linear mixed models indicated that UC demonstrated superior effects on parent-rated and task-based executive functioning relative to STAND. However, STAND demonstrated superior effects on adolescent motivation and reducing parental intrusiveness relative to UC when it was delivered by licensed therapists. Mechanisms of community-delivered STAND and UC appear to differ. UC potency may occur through improved executive functioning, whereas STAND potency may occur through improved teen motivation and reducing low-value parenting practices. However, when delivered by unlicensed,

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community-based therapists, STAND did not enact proposed mechanisms. Future adaptations of community-delivered EBPs for ADHD should increase supports for unlicensed therapists, who comprise the majority of the community mental health workforce.

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by impairing levels of inattention, hyperactivity, and impulsivity with a pediatric prevalence of 9.4% (Danielson et al., 2018). ADHD is associated with a range of negative adult outcomes (Barkley & Murphy, 2010), making ongoing treatment critical in childhood and adolescence. Cognitive theories indicate that executive functioning (EF) processes, as well as motivational factors (e.g., delay aversion, preference for immediacy, altered reward sensitivity), underlie ADHD's etiology (Castellanos et al., 2006; Sonuga-Barke, 2002). In adolescence, ADHD-related EF and motivation deficits (Colomer et al., 2017; Gut et al., 2012; Luman et al., 2005; Toplak et al., 2005; Zentall & Beike, 2012) link to poor organizational, time management, and planning (OTP) skills, as well as academic problems (Langberg et al., 2013; Sibley et al., 2019). Thus, remediating EF and motivation deficits may be key to improving ADHD-related outcomes.

Stimulant medication is the frontline evidence-based treatment for ADHD (American Academy of Pediatrics, 2019) and directly mitigates ADHD-related neurophysiological deficits (Czerniak et al., 2013)—however, stimulant medications appear to have little impact on ADHD-related EF and motivation deficits (Biederman et al., 2011; Rosenau et al., 2021). Several psychosocial interventions for adolescents with ADHD significantly reduce behaviors associated with EF and motivation dysfunction (Langberg et al., 2012; Sibley et al., 2016b; Sprich et al., 2016) and demonstrate promise of long-term effects (Sibley et al., 2020). These treatments target EF by teaching adolescent OTP skills while targeting motivation by instructing parents to reinforce progress using operant principles (Chan et al., 2016; Sibley et al., 2014).

Though psychosocial treatments for adolescents with ADHD became well established through highly controlled efficacy trials (Chan et al., 2016; Sibley et al., 2014), little is known about the effectiveness of everyday psychosocial treatment for ADHD. Usual care (UC) psychosocial treatment for adolescents with ADHD typically involves a mix of non-evidence-based and evidence-based practices (EBPs), delivered at low intensities by master's-level therapists. While community providers find evidence-based treatments for ADHD to be highly acceptable and engaging to deliver, they often struggle to maintain strong fidelity across the course of treatment and incorporate low-value practices (Sibley et al., 2021a, 2021b). Thus, EBP dilution may undermine effectiveness. For example, in earlier work from the present randomized community-based trial (N = 278), a community-delivered EBP for ADHD (Supporting Teens' Autonomy Daily [STAND]) was compared to UC. Treatment was delivered with suboptimal fidelity, EBP effect sizes were smaller than lab-based trials (Sibley et al., 2021a), and effects failed to separate from UC in both primary (ADHD symptoms and impairments; Sibley et al., 2021c) and secondary analyses (impact on comorbidities and nontargeted ADHD-related outcomes like social skills and sluggish cognitive tempo; Sibley et al., 2023). However, in both primary and secondary analyses STAND demonstrated superiority to UC when therapists were licensed (ADHD symptoms, OTP skills, conduct problems; Sibley et al., 2021c, 2023). In the United States, therapists who have not received a license to practice from their state department of health often comprise most of the community mental health workforce (Schoenwald et al., 2008) because they are lower cost to employ than those who are licensed. We hypothesized that licensed clinicians were more skilled and professionally engaged than their counterparts who had not chosen to obtain a practitioner's license, leading to higher-quality intervention (Daniels, 2002). Thus, it is clear that STAND has some potency in community contexts—at least when therapists are licensed. However, the extent to which STAND improves upon UC in targeting mechanistic outcomes remains unclear. In addition, eclectic and individualized, but low-intensity UC, may offer at least some therapeutic benefit—perhaps through different, yet-to-be-defined, mechanisms than traditional EBPs.

Current Study

The current study examined the impacts of an EBP for adolescents with ADHD (STAND) and UC on well-established, ADHD-related cognitive, psychological, and behavioral processes. Known mechanisms by which psychosocial treatment improves ADHD symptoms are largely behavioral and include parenting behaviors (e.g., disciplinary practices, parent–child relationship quality; Haack et al., 2017; Hinshaw et al., 2000) and youth skills development (Breaux et al., 2019; Hennig et al., 2016; Sibley et al., 2022a). This

study attempts to replicate these existing findings in a community context, while examining novel cognitive (i.e., executive functioning, rewards processing) and psychological (i.e., parent and youth motivational attitudes) processes that are central to prevailing models of ADHD (Sonuga-Barke, 2002).

First, we examined whether an EBP for adolescents with ADHD (STAND) delivered in a community setting was successful in targeting mechanistic outcomes relative to UC. Based on the results of our previously published primary outcome analyses, we hypothesize that STAND would not demonstrate superiority to UC at the main effect level. Second, we assessed whether, as in our primary outcome analyses (Sibley et al., 2021c), there were moderator effects of therapist licensure on each proposed outcome. We hypothesized that adolescents receiving treatment from licensed therapists who were randomized to deliver STAND would demonstrate significantly greater effects on all proposed outcomes relative to adolescents receiving UC (and STAND delivered by an unlicensed therapist randomized to STAND).

Method

All procedures were approved by the Florida International University Institutional Review Board. Parents, therapists, and adolescents signed consent/assent documents prior to participating.

PARTICIPANTS

Adolescents

Adolescents ($N = 278$; ages 11–17) were incoming patients at four community agencies in a large pan-Latinx and pan-Caribbean U.S. city. They were required to meet full *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition (DSM-5) ADHD criteria using a structured diagnostic interview and parent and teacher rating scales. These procedures have been described at length elsewhere (Sibley et al., 2021c). Autism spectrum disorder and intellectual disability (IQ < 70) were exclusionary. Adolescents were randomly assigned to STAND or UC using a stratified randomization procedure within agency. Randomization occurred after agency and study intake and before initiation of treatment at the agency (see Sibley et al., 2021c). Table 1 presents sample demographic characteristics. There were no significant group differences on any variable.

Therapists

Therapists ($N = 82$) were mental health professionals employed at four agencies. Therapists self-identified as 19.8% non-Hispanic White ($n = 16$), 14.8% Black or African American ($n = 12$), 64.2% Hispanic ($n = 53$), and 1.2% other ($n = 1$). They were 86.6% female ($n = 71$), with 61.0% ($n = 50$) offering treatment in both Spanish and English; 86.6% ($n = 71$) held a master's degree (7.3% held a doctorate [$n = 6$] and 6.1% were bachelor's-level interns [$n = 5$]); 22.0% of therapists ($n = 18$) were licensed to practice by the state department of health and 78.0% were not. Unlicensed therapists included bachelor's-level, master's-level, and doctoral-level practitioners. On average, clinicians reported 5.24 years delivering therapy ($SD = 5.00$). STAND ($N = 44$) and UC ($N = 38$) therapists did not differ on any of the background variables noted above including licensure status.

PROCEDURES

Recruitment and Intake

At agency intake, agency staff provided study information to parents of 6th- to 12th-grade students with attention, organization, motivation, or behavior problems. Parents signed a permission-to-contact form and study staff administered an eligibility screen by phone that queried ADHD symptoms, impairment, exclusionary criteria, and treatment priority. If another presenting problem (e.g., anxiety, substance use) took priority over ADHD, the teen was not eligible. Students with at least four inattention (IN) or hyperactivity/impulsivity (H/I) symptoms according to the screen attended a full diagnostic assessment to evaluate inclusion criteria. The study intake included an IQ screener (Wechsler Abbreviated Scale of Intelligence—2nd Edition [WASI-II]; Wechsler, 2011) and parent-administered Diagnostic Interview Schedule for Children (DISC; Shaffer et al., 2000).

Therapist Recruitment

Detailed information about therapist recruitment can be found in Sibley et al. (2021a). All therapists were randomly assigned to STAND or UC at baseline.

Intervention Content

STAND is a manualized engagement-focused psychosocial treatment for adolescent ADHD. STAND consists of 10 weekly 60-minute sessions attended by the adolescent and parent (Sibley, 2016). Skill instruction is blended with motivational interviewing (MI) and guided parent–teen behavioral contracting. Treatment targets family, behavioral, and academic impairment and is modular to promote flexibility and treatment tailoring. In the engagement phase, MI increases awareness of personal values and goals, identifies strengths,

Table 1
Baseline Characteristics of Adolescent Sample

	STAND ($N = 138$)	UC ($N = 140$)
Diagnostic variables		
WASI estimated Full-Scale IQ *M* (*SD*)	94.15 (14.07)	96.81 (13.20)
ADHD presentation		
ADHD–predominantly inattentive (%)	50.0	54.3
ADHD–combined (%)	50.0	45.7
ODD/CD	50.7	47.1
Elevated depressive symptoms	21.0	12.2
Elevated anxiety symptoms	21.0	15.8
Current ADHD medication (%)	31.2	23.6
Demographic variables		
Age *M* (*SD*)	13.97 (1.51)	14.08 (1.50)
Male (%)	70.3	70.7
Race/ethnicity (%)		
White non-Hispanic	5.1	3.6
Black non-Hispanic	16.7	10.0
Hispanic any race	77.5	85.7
Other	0.7	0.7
Single parent (%)	35.5	36.4
Limited parent English proficiency (%)	36.2	46.4
Billing source (%)		
Medicaid	57.0	55.0
State/county subsidy	12.2	14.4
Sliding scale	29.8	28.8
Pro bono	0.0	1.8
Private insurance	0.9	0.0
Parent education level		
High school graduate, GED, or less (%)	23.9	27.3
Part college or specialized training (%)	30.4	30.2
College or university graduate (%)	33.3	33.1
Graduate professional training (%)	12.3	9.4

Note. STAND = supporting teens' autonomy daily; UC = usual care; WASI = Wechsler Abbreviated Scale of Intelligence; ODD/CD = oppositional defiant disorder/conduct disorder; *M* = mean; *SD* = standard deviation; ADHD = attention-deficit/hyperactivity disorder; GED = general equivalency diploma. There were no significant differences in baseline characteristics between STAND and UC or when considering therapist licensure status.

and recognizes how to achieve personal goals to act consistently with values. The skills phase teaches parent behavioral strategies, parent–teen communication, and OTP skills applied to homework, school, and chores. Planning sessions integrate skills into a daily routine, transfer new habits to school settings, and build a final parent–teen contract. MI in the final session promotes maintenance of change.

UC was characterized empirically based on content analysis of 76 clinician work samples (Sibley et al., 2022b). Findings indicated treatment differentiation, including minimal implementation of STAND-related content and significantly lower MI scores than audio samples from the STAND group (Sibley et al., 2022b). Further analysis indicated that individually delivered social skills training was UC's most commonly detected practice element (31.6% of samples). Parent involvement was low (53.9% of sessions had no parental presence) and core elements of EBPs were rarely delivered (e.g., organization skills training: 18.4% of tapes; operant reinforcement: 13.2%); when evidence-based content was introduced, it was implemented at a very low intensity.

Therapist Procedures

Therapy was delivered across 3 years. Duration of treatment varied naturalistically to avoid built-in between-group dose differences. Participating therapists treated an average of 2.74 study cases (range: 0–14). Study interventions were provided by agency employees using typical billing procedures. Therapists randomized to STAND were offered a 3-day training and 30 minutes of weekly supervision while treating study cases. Every 12 months, a 4-hour booster training was provided. STAND therapists were provided with a treatment manual and a family workbook for each case. Therapists in both groups were instructed to utilize

UC procedures for termination, allowing STAND therapists to continue treatment after completing STAND manualized content. As noted in the primary randomized controlled trial (RCT) manuscript (Sibley et al., 2021c), there were no significant differences in STAND and UC in terms of the number of total sessions completed over 12 months (STAND mean = 13.99, *SD* = 13.80; UC mean = 17.38, *SD* = 15.26). UC therapists were instructed to treat study cases using usual procedures in the agency and the treatments they believed would be most effective for the youth. Of note, only 30.6% of the sample were also concurrently obtaining additional therapeutic services (e.g., tutoring). There were no significant differences between STAND and UC on these additional therapeutic services ($p = .13$) nor were there any significant differences between licensed and unlicensed therapists ($p = .81$). Therapists received weekly supervision for study cases from agency supervisors according to typical agency practices. UC therapists were offered STAND training at study conclusion. Fidelity and differentiation data are presented elsewhere (Sibley et al., 2021a).

Data Collection

Participants were permitted to utilize naturalistic stimulant medication during the study; all medications were monitored. Because therapy duration was allowed to vary naturalistically, posttreatment (PT) assessments were scheduled for 16 weeks after a participant's first session at the agency, which provided ample time for families to complete the 10-session STAND protocol with assumed cancellations. On average, PT assessments occurred 5.11 months after baseline (BL; *SD* = 2.26). Follow-up (FU) assessments were attempted at approximately 12 weeks after PT and occurred approximately 4.70 months after PT (*SD* = 2.50). Retention was 99.3% ($n = 276$) at PT and 97.5% ($n = 271$) at FU (data provided by at least one informant). Academic records and teacher ratings were obtained directly from schools. Electronic health records were accessed directly. Parent ratings were available in Spanish or English. Teachers and therapists received $20, and families received $100 for each assessment.

MEASURES

Youth Behavioral Measures

The Behavior Rating Index of Executive Function (BRIEF) is a well-validated measure of EF behaviors for youth ages 5–18 (Gioia et al., 2000; Mahone & Hoffman, 2007). Parents rate youth EFs on a 3-point scale (*never*, *sometimes*, and *often*). Raw score of the emergent metacognition index (initiate + working memory + plan–organize + organization of materials + monitor; 44 items) was used ($\alpha = .94–.96$) with higher scores indicating poorer EF. Research assistants blind to group conducted observations of planner use (or a device) and book bag organization using the Organization Checklist (OC; Evans et al., 2009), which correlates with academic outcomes and are sensitive to change in ADHD treatment (Evans et al., 2009; Sibley et al., 2013). Percentage of classes with recorded homework (or indication of no homework) was calculated for the last 5 school days the adolescent attended school. OC percentage was based on dichotomously scored items (e.g, "Is the book bag free from loose papers?" and "Is there a folder/binder for each core academic class?"). Of note, these assessments occurred throughout the beginning (17%; September–November), middle (36%; December–February), and end (47%; March–May) of the school year. The time of year did not significantly relate to any of these assessment measures across either STAND or UC.

Parent Behavioral Measures

The Parent Academic Management Scale (PAMS) is a psychometrically validated 16-item checklist that measures adaptive and maladaptive parental academic involvement for youth with ADHD (Sibley et al., 2016a). Parents indicated the number of days during the past week (0–5) each item was performed. We separately analyzed two PAMS factors (OTP oversight: eight items; $\alpha = .90–.91$) and contingency management (e.g., use of rewards and consequences; $\alpha = .76–79$). High scores on the OTP oversight factor indicate excessive and intrusive use of parenting strategies associated with low autonomy support (i.e., excessive assistance, reminders, prompting). High scores on the contingency management factor measure parent use of adaptive behavior strategies, such as collaborative expectation setting and providing systematic rewards and consequences to reinforce behavioral expectations.

Dyadic Behavioral Measures

Parents and teens also participated jointly in three video-recorded interactions. First was an analogue homework task in which parents were instructed to "do what you would normally do to make sure your student studies … " Parental involvement and teen goal directedness were coded based on the Early Parenting Coding System (Graziano et al., 2011; Perry et al., 2018; Winslow et al., 1995). Second was an unstructured *Pictionary* play task. Teen positive affect was coded, via a global rating system from prior work (Calkins

et al., 2004; Helm et al., 2018) as an index of teen emotional engagement with the parent. Third was a parent–teen joint problem-solving task in which parents and teens were asked to "think about the last time you argued about something and spend the next 5 minutes trying to work on solving the problem." Three indices of parent–teen communication were coded based on the Parent–Adolescent Interaction Rating Scale (PAIRS; Pelham et al., 2017): teen positive communication, parent–teen balance (i.e., extent to which the parent vs. the teen dominated conversation), and effective resolution of the problem. Codes were expressed on a 5-point scale. Trained research assistants were masked to study group. Intraclass correlation coefficients (ICCs) were .62–.76 (good to excellent agreement).

Youth Cognitive Measures

A well-validated computerized Iowa gambling task (Hungry Donkey Task; Crone & van der Molen, 2004) measured risky decision making (i.e., sensitivity to future negative consequences). Participants were told to assist the hungry donkey to collect as many apples as possible by pressing one of four keys corresponding to four separate doors. Doors A and B were considered high-risk doors given that they resulted in a high immediate reward (e.g., yielding four apples 100% of trials) but a net loss in the long run (0, 8, 10, 12, or 50 apples lost per trial depending on the door). On the other hand, Doors C and D were considered low-risk doors as they resulted in an immediate low reward (e.g., yielding two apples 100% of trials) but an overall gain in the long run (due to yielding lower loss magnitude: 0, 1, 2, 3, or 10 apples lost per trial depending on the door). The cumulative number of apples earned across 100 trials was computed as an index of risky decision making with scores below 0 indicating a disadvantageous performance while scores greater than 0 indicating an advantageous performance (Crone & van der Molen, 2004). Delay discounting was measured using a well-validated computerized Choice-Delay Task (Scheres et al., 2006, 2008) for adolescents with ADHD. Participants were instructed to make repeated choices between a small variable reward (0, 2, 4, 6, 8, or 10 cents) that would be delivered immediately (i.e., after 0 seconds) and a large constant (10 cents) reward that would be delivered after a variable delay of 0, 5, 10, 20, or 30 seconds. After completion of the task (40 trials), participants received the total earnings from the examiner (maximum amount = $4). The total amount of money earned served as an index of delay discounting.

The Color–Word Interference Task (CWIT) and the Tower Task from the Delis–Kaplan Executive Function System (D-KEFS; Delis et al., 2001) measured EF performance. The CWIT is a modified Stroop task that consists of four conditions in which participants are presented with a page containing the words "red," "green," and "blue," written in red, green, or blue ink. The current study examined the third and the fourth conditions. Higher scores in Condition 3 indicated poorer *inhibition* skills and in Condition 4 indicated poorer *cognitive flexibility*. The D-KEFS Tower Test involves nine graded trials from very simple to very difficult. Higher scores indicated better *planning* skills. Teens also completed two subtests of the Automated Working Memory Assessment (AWMA; Alloway, 2007; Alloway et al., 2008), a well-validated computer-based assessment of working memory skills for children and adults ages 4–22. The subtests administered included (a) Word Recall (phonological short-term memory) and (b) Dot Matrix (visuospatial short-term memory). Higher subtest scores indicate better EF abilities.

Parent and Youth Psychological Measures

The change ruler is a self-report measure of motivation (importance, confidence, willingness, interest) using an 11-point Likert scale from 0 (*not at all*) to 10 (*extremely*). The change ruler possesses established psychometric properties with adolescent populations (Aliotta et al., 2004) and is sensitive to change in ADHD treatment (Sibley et al., 2017). Change ruler single items outperform longer measures at predicting behavioral intentions (LaBrie et al., 2005). Perceived importance and confidence items were averaged as an index of extrinsic motivation. Adolescent and parent readiness to change was coded on separate audio recordings using the Motivational Interviewing Skills Code 2.5 (MISC 2.5; Houck et al., 2010). The MISC 2.5 includes a comprehensive method of coding patient verbal behaviors that predict client outcome in MI (Moyers et al., 2009). Parents and teens were asked to speak with an interviewer for 2 minutes using standardized prompts related to anticipated improvements over the next 6 months. Interviewers were trained to query for more information if parents or teens discontinued speaking prior to 2 minutes. Coders parsed speaker utterances according to manualized procedures and coded change talk and sustain talk. Percentage of change talk was calculated. ICCs ranged from .56 to .64 indicating interrater agreement in the fair to good range.

ANALYTIC PLAN

Linear mixed models (LMMs) with random intercepts were conducted in SPSS 25. A false-discovery rate correction was applied within outcome domain for all analyses (Benjamini & Hochberg, 1995). We first conducted intent-to-treat (ITT) analyses ($N = 278$). Separate LMMs were conducted for each outcome and dummy codes were specified for group (UC = 0, STAND = 1). We included three dummy codes with agency 1 (largest) serving as the reference group. We tested various time curves and found linear time to possess the best fit. Time was coded as a continuous, subject-specific measure reflecting months since BL (BL time = 0). Missing data averaged 11.9% at BL, 14.64% at PT, and 18.89% at FU and were determined to be missing completely at random per Little's Missing Completely at Random (MCAR) test ($p = .308$). Mixed models are also robust in handling missing-at-random data with the use of full information robust maximum likelihood estimator (Schafer & Graham, 2002). For each outcome, the following specifications were evaluated. The linear effects of time and Group × Time were the effects of interest to test aim 1 hypotheses.

Level 1: $Yij = \pi 0i + \pi 1(time) + eij$

Level 2: $\pi 0i = \beta 00 + \beta 01(agency\ 2) + \beta 02(agency\ 3) + \beta 03(agency\ 4) + \beta 04(group) + r0i$

$\pi 1 = \beta 10 + \beta 11(group)$

Combined: $Yij = \beta 00 + \beta 01(agency\ 2) + \beta 02(agency\ 3) + \beta 03(agency\ 4) + \beta 04(group) + \beta 10(time) + \beta 11(group*time) + r0i + eij$

We then conducted per protocol (PP) analyses that included only participants who initiated treatment ($n = 225$). This analysis isolates the upper limit on the true effects of STAND in community settings, given that ITT effects may be deflated by randomized participants who never engaged in services. Compared to those who initiated treatment, those who did not ($N = 53$) did not differ on demographic or clinical variables listed in Table 1. All analyses above were repeated and three-way interactions of Licensure × Group × Time indicated whether the group's effect on the mechanism over time varied by licensure. Of note, including medication status or adolescent age as covariates did not impact any of the results and therefore, they were not included in the final growth models.

Results

ITT ANALYSES

Across measures there was only one Time × Group interaction (D-KEFS cognitive flexibility). Teens in the UC group experienced greater improvement in cognitive flexibility (steeper slope) relative to STAND, $b = 0.62$, $SE = 0.22$, $p = .005$, $d = –0.36$, 95% CI [0.19, 1.04]. Effects of time were mixed across outcomes with greater improvements on EF than motivation indices (see Tables 2 and 3).

PP ANALYSES

There were three significant Time × Group interactions (see Figures 1 and 2). UC parents reported greater improvement in teen metacognition relative to STAND, $b = 0.44$, $SE = 0.20$, $p = .023$, $d = –0.37$, 95% CI [–0.06, –.83]. Similarly, teens in the UC group experienced greater improvements in task-based inhibition and cognitive flexibility (steeper slope) relative to teens in STAND, $b = 0.49$, $SE = 0.23$, $p = .035$, $d = –0.30$, 95% CI [–0.03, –.0.94]; $b = 0.56$, $SE = 0.24$, $p = .022$, $d = –0.33$, 95% CI [–0.08, –1.03] Time effects were mixed across measures (see Tables 4 and 5). Of note, there was no significant Time × Group interaction for teen change talk even when only examining adolescents with low BL levels of self-reported motivation (score of 5 or lower on the motivation ruler).

MODERATING EFFECT OF THERAPIST LICENSURE

There were two significant Group × Time × Licensure interactions: teen change talk, $b = 0.04$, $SE = 0.01$, $p = .01$, 95% CI [–0.01, 0.07] and parent OTP oversight, $b = –0.11$, $SE = 0.04$, $p = .01$, 95% CI [–0.19, –.0.03]. STAND (vs. UC; see supplementary Figure 3) led to greater improvements in teen change talk over time when therapists were licensed, but not when they were unlicensed. Standardized difference scores for three-way interactions were $d = .96$ (STAND licensed vs. UC licensed), $d = .61$ (STAND licensed vs. UC unlicensed), and $d = .80$ (STAND licensed vs. STAND unlicensed). STAND (vs. UC; see supplementary Figure 4) also led to greater decreases in OTP oversight over time when therapists were licensed therapists but not when therapists were unlicensed. Standardized difference scores for three-way interactions were $d = .79$ (STAND licensed vs. UC licensed), $d = .48$ (STAND licensed vs. UC unlicensed), and $d = .55$ (STAND licensed vs. STAND unlicensed).

Discussion

Overall, STAND did not outperform UC on any mechanistic outcome. However, consistent with the primary and secondary findings of this study (Sibley et al., 2021b, 2021c), when STAND was

Table 2
Intent-to-Treat (ITT) Analyses: Results From Linear Mixed Models for Teen Motivation and EF Variables

	ITT STAND				ITT UC				ITT time			ITT Group × Time			
	BL mean (*SD*)	PT mean (*SD*)	FU mean (*SD*)	*d*	BL mean (*SD*)	PT mean (*SD*)	FU mean (*SD*)	*d*	B (*SE*)	*p*	95% CI	B (*SE*)	*p*	*d*	95% CI
Teen motivation															
HDT total score (O)	−13.37 (64.08)	−5.17 (69.56)	3.18 (71.46)	.26	−24.20 (66.55)	−11.77 (60.15)	0.89 (68.83)	.38	2.08 (.82)	.012	[0.46, 3.69]	−.71 (1.13)	.53	−.13	−2.92, 1.51
Delay discounting task total score (O)	302.42 (59.41)	302.43 (65.45)	302.83 (61.44)	−.01	308.90 (56.69)	305.59 (63.94)	302.22 (65.38)	.12	−.55 (.56)	.326	[−1.66, 0.55]	.62 (.78)	.43	−.13	−.91, 2.16
Readiness to change (A)	7.09 (1.98)	7.09 (2.05)	7.10 (2.48)	.01	7.00 (1.89)	7.14 (2.03)	7.28 (2.04)	.14	.02 (.02)	.32	[−.02, 0.07]	−.02 (.03)	.48	−.13	−.08, .04
% change talk (O)	.84 (.30)	.82 (.34)	.80 (.35)	.14	.90 (.24)	.86 (.27)	.82 (.34)	.32	−.01 (.00)	.14	−0.01, 0.00]	.00 (.01)	.62	−.13	−.01, .01
Teen EF															
Metacognitive Problems BRIEF (P)	100.94 (16.30)	95.46 (18.07)	89.88 (19.73)	.68	102.79 (16.03)	96.05 (18.11)	89.20 (17.91)	.85	−1.12 (.13)	<.001	−1.37, −.88	.21 (.17)	.22	−.16	−.13, .54
Inhibition raw score: DKEFS (O)	68.10 (17.74)	63.42 (17.72)	58.65 (18.24)	.53	66.88 (21.26)	60.19 (15.34)	53.38 (12.52)	.63	−1.12 (.15)	<.001	−1.41, −..83	.33 (.20)	.096	−.21	−.06, .73
Cognitive Flex. raw score: DKEFS (O)	73.74 (21.40)	69.33 (19.83)	64.83 (17.93)	.42	74.74 (20.31)	66.64 (16.01)	58.38 (14.34)	.81	−1.35 (.16)	<.001	−1.67, −.1.04	.62 (.22)	.005	−.36	.19, 1.04
Planning raw score: DKEFS (O)	15.87 (3.52)	17.12 (3.11)	18.38 (3.10)	.71	16.01 (2.90)	17.40 (2.83)	18.81 (3.01)	.97	.23 (.03)	<.001	.16, .30	−.02 (.05)	.61	−.09	−.11, .07
Word Recall raw score: AWMA (O)	22.74 (6.47)	23.65 (5.58)	24.57 (6.58)	.28	23.50 (5.09)	24.42 (5.17)	25.36 (4.97)	.37	.15 (.05)	.001	.06, .25	.00 (.07)	.96	.01	−.13, .13
Dot Matrix raw score: AWMA (O)	25.53 (5.21)	25.94 (5.34)	26.36 (5.52)	.16	25.76 (5.58)	26.63 (5.44)	27.51 (5.83)	.31	.15 (.06)	.017	.03, .26	−.08 (.08)	.35	−.17	−.24, .09

Note. EF = executive function; STAND = supporting teens' autonomy daily; BL = baseline; *SD* = standard deviation; PT = posttreatment; FU = follow-up; UC = usual care; *SE* = standard error; HDT = Hungry Donkey Task; O = observed/assessment; A = adolescent report; BRIEF = Behavior Rating Inventory of Executive Function; P = parent report; DKEFS = Delis–Kaplan Executive Function System; AWMA = Automated Working Memory Assessment. Means are marginal estimates controlling for agency; *d* within groups is the difference between BL and FU divided by BL-pooled *SD* with positive values indicating improvement. Positive *d* values for Group × Time effect indicates that STAND had greater improvement from BL to FU relative to UC. Bolded *p* values indicate significant values that survived Benjamini–Hochberg adjustment per domain.

Table 3
Intent-to-Treat (ITT) Analyses: Results From Linear Mixed Models for Teen Organization, Parent Motivation, Parent Involvement, Communication

	ITT STAND				ITT UC				ITT time			ITT Group × Time			
	BL mean (*SD*)	PT mean (*SD*)	FU Mean (*SD*)	*d*	BL mean (*SD*)	PT mean (*SD*)	FU mean (*SD*)	*d*	B (*SE*)	*p*	95% CI	B (*SE*)	*P*	*d*	95% CI
Teen organization															
Planner use (O)	.06 (.18)	.03 (.09)	.01 (.09)	−.32	.04 (.15)	.03 (.03)	.021 (.17)	−.15	.00 (.00)	.22	.00, .00	.00 (.00)	.17	−.21	−.01, .00
Organization Checklist (O)	.42 (.27)	.45 (.32)	.47 (.28)	.19	.40 (.27)	.44 (.30)	.48 (.27)	.30	.01 (.00)	.04	.00, .01	.00 (.00)	.60	−.10	−.01, .01
Parent motivation															
Readiness to change (P)	7.72 (2.21)	7.21 (2.34)	6.70 (2.22)	−.46	7.92 (1.93)	7.24 (2.43)	6.55 (2.74)	−.71	−.11 (.02)	<.001	−.16, −..07	.03 (.03)	.36	.17	−.03, .09
% change talk (O)	.76 (.38)	.76 (.34)	.76 (.40)	−.01	.75 (.36)	.74 (.39)	.72 (.38)	−.08	.00 (.01)	.64	−.01, .01	.00 (.01)	.76	.07	−.01, .02
Parent academic involvement															
Contingency management	1.78 (1.27)	1.74 (1.32)	1.70 (1.30)	−.07	1.63 (1.31)	1.66 (1.30)	1.69 (1.47)	.04	.00 (.01)	.67	−.02, .03	−.01 (.02)	.45	−.10	−.04, .02
OTP oversight	2.05 (1.37)	1.93 (1.39)	1.80 (1.26)	−.19	1.93 (1.48)	1.87 (1.44)	1.81 (1.51)	−.08	−.01 (.01)	.39	−.03, .01	−.01 (.02)	.52	−.09	−.04, .02
Parent–teen communication															
Parental involvement (O)	2.43 (1.22)	2.37 (1.28)	2.32 (1.19)	−.09	2.49 (1.10)	2.39 (1.14)	2.30 (1.16)	−.17	−.02 (.01)	.28	−.04, .01	.01 (.02)	.76	−.06	−.03, .05
Teen goal directness (O)	2.23 (1.17)	2.29 (1.13)	2.36 (1.11)	.11	2.46 (1.02)	2.33 (1.14)	2.20 (1.08)	−.26	−.02 (.01)	.11	−.05, .00	.03 (.02)	.086	.35	.00, .07
Teen positive affect (O)	1.75 (1.14)	1.61 (1.16)	1.48 (1.09)	−.24	2.04 (1.09)	1.74 (1.03)	1.44 (.95)	−.55	−.05 (.01)	<.001	−.08, −..02	.03 (.02)	.14	.30	−.01, .06
Teen positive communication (O)	1.41 (1.15)	1.42 (1.02)	1.42 (1.17)	.01	1.52 (1.17)	1.44 (1.05)	1.36 (1.03)	−.14	−.01 (.01)	.34	−.04, .01	.01 (.02)	.45	.15	−.02, .05
Parent–teen resolution (O)	1.68 (1.41)	1.65 (1.33)	1.62 (1.27)	−.04	1.83 (1.29)	1.74 (1.31)	1.65 (1.27)	−.14	−.01 (.02)	.35	−.05, .01	.01 (.02)	.65	.09	−.03, .05
Parent–teen balance (O)	.63 (.89)	.57 (.72)	.51 (.87)	−.13	.65 (.76)	.64 (.85)	.64 (.77)	−.01	.00 (.01)	.95	−.02, .01	−.01 (.01)	.52	−.13	−.04, .02

Note. STAND = supporting teens' autonomy daily; BL = baseline; *SD* = standard deviation; PT = posttreatment; FU = follow-up; UC = usual care; *SE* = standard error; O = observed/assessment; P = parent report; OTP = organization, time management, and planning. Means are marginal estimates controlling for agency. *d* within groups is the difference between BL and FU divided by BL-pooled *SD* with positive values indicating improvement. Positive *d* values for Group × Time effect indicates that STAND had greater improvement from BL to FU relative to UC. Bolded *p* values indicate significant values that survived Benjamini-Hochberg adjustment per domain.

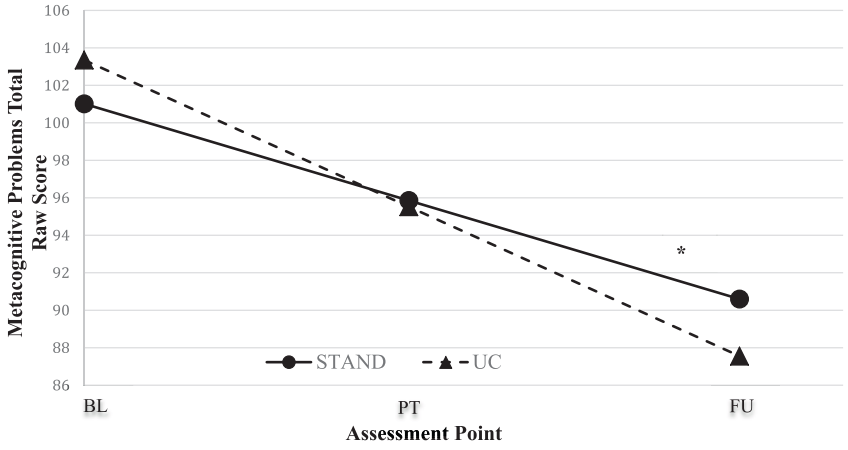

FIGURE 1 BRIEF metacognitive problems via parent report. *Note*. BRIEF = Behavior Rating Index of Executive Function; STAND = supporting teens' autonomy daily; UC = usual care; BL = baseline; PT = posttreatment; FU = 1-year follow-up. Lower raw scores indicate better executive functioning as reported by parents. *$p < .05$ for Time × Group interaction.

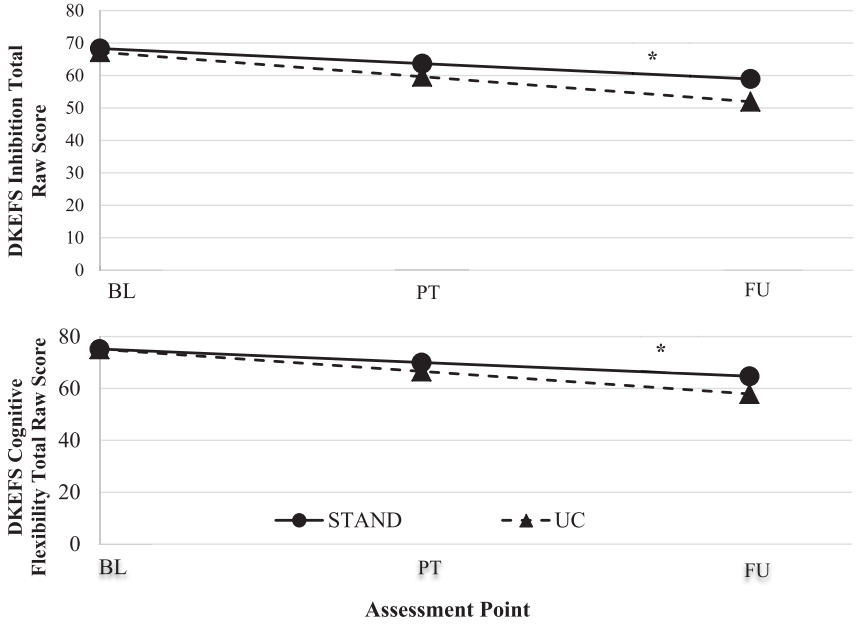

FIGURE 2 DKEFS inhibition and cognitive flexibility via observed assessment. *Note*. D-KEFS = Delis–Kaplan Executive Function System; STAND = supporting teens' autonomy daily; UC = usual care; BL = baseline; PT = posttreatment; FU = 1-year follow-up. Lower raw scores indicate better executive functioning. *$p < .05$ for Time × Group interaction.

delivered by licensed therapists, effects were demonstrated for teen readiness to change and parental OTP oversight. Thus, it appears that community-based dilution of ADHD EBPs appears to reduce impact on mechanistic outcomes. Additionally, we continue to reveal that the efficacy of community-based EBPs for adolescents with ADHD appears contingent on *who* implements treatment. Finally, our exploratory aim revealed that, relative to STAND, UC demonstrated superior effects on several EF indices. We discuss these findings below.

In this study, a licensed therapist delivering an EBP created the largest effects on mechanistic outcomes. A range of factors may explain why licensed STAND therapists elicited greater teen readiness to change than UC therapists and unlicensed STAND therapists. For example, they may implement MI more effectively, promote more effective incentive delivery by parents, or be more skilled at problem-solving barriers. Licensed therapists delivering STAND also demonstrated the greatest success reducing intrusive parenting behaviors. Unlike in UC, parents

Table 4
Per Protocol (PP) Analyses: Results From Linear Mixed Models for Teen Motivation and EF Variables

	ITT STAND ($n = 114$)				ITT UC ($n = 111$)				ITT time			ITT Group × Time			
	BL mean (*SD*)	PT mean (*SD*)	FU mean (*SD*)	*d*	BL mean (*SD*)	PT mean (*SD*)	FU mean (*SD*)	*d*	B (*SE*)	*p*	95% CI	B (*SE*)	*p*	*d*	95% CI
Teen motivation															
HDT total score (O)	−10.50 (64.98)	−5.86 (60.64)	−1.14 (67.87)	.14	−21.95 (65.56)	−16.03 (69.36)	−9.99 (71.23)	.18	.99 (.95)	.30	−.88, 2.86	−.22 (1.29)	.87	−.04	−2.74, 2.31
Delay discounting task total score (O)	300.89 (58.80)	300.65 (63.95)	300.40 (62.16)	−.01	309.02 (57.93)	304.45 (64.14)	299.79 (66.64)	−.16	−.76 (.64)	.24	−2.03, .50	.72 (.88)	.41	.15	−1.00, 2.47
Readiness to change (A)	7.11 (2.05)	7.22 (1.95)	7.33 (2.36)	.11	6.86 (1.94)	7.16 (2.00)	7.47 (2.06)	.32	.05 (.03)	.046	.00, .10	−.03 (.03)	.34	−.20	−.10, .03
% change talk (O)	.84 (.31)	.82 (.32)	.80 (.35)	−.12	.90 (.26)	.87 (.27)	.85 (.31)	−.20	.00 (.00)	.39	−.01, .01	.00 (.01)	.85	.05	−.01, .01
Teen EF															
Metacognitive Problems BRIEF (P)	101.01 (15.75)	95.85 (18.30)	90.60 (19.70)	.66	103.35 (13.04)	95.52 (16.58)	87.55 (16.40)	1.21	−1.31 (.14)	<.001	−1.59, −.1.02	.44 (.20)	.023	−.37	.06, .83
Inhibition raw score: DKEFS (O)	68.32 (16.32)	63.68 (18.25)	58.94 (18.23)	.57	67.20 (22.54)	59.63 (15.61)	51.93 (12.48)	.68	−1.26 (.17)	<.001	−1.60, −..93	.49 (.23)	.035	−.30	.03, .94
Cognitive Flex. raw score: DKEFS (O)	75.21 (20.01)	70.02 (19.52)	64.72 (17.76)	.52	75.12 (21.21)	66.59 (16.42)	57.89 (14.70)	.81	−1.43 (.18)	<.001	−1.78, −.1.07	.56 (.24)	.022	−.33	.08, 1.03
Planning raw score: DKEFS (O)	15.83 (3.52)	17.07 (3.10)	18.33 (3.08)	.71	16.07 (2.65)	17.67 (2.79)	19.30 (2.96)	1.22	.27 (.04)	<.001	.19, .34	−.06 (.05)	.23	−.24	−.16, .04
Word Recall score: AWMA (O)	22.55 (6.40)	23.59 (5.34)	24.64 (4.95)	.33	23.59 (5.33)	24.57 (5.46)	25.58 (5.16)	.37	.17 (.06)	.004	.05, .28	.01 (.08)	.92	−.02	−.14, .16
Dot Matrix score: AWMA (O)	25.76 (5.33)	26.14 (5.22)	26.53 (5.61)	.14	25.81 (5.93)	26.75 (5.61)	27.71 (5.89)	.32	.16 (.07)	.027	.02, .30	−.09 (.10)	.33	−.20	−.28, .09

Note. EF = executive function; ITT = intent-to-treat; STAND = supporting teens' autonomy daily; UC = usual care; BL = baseline; *SD* = standard deviation; PT = posttreatment; FU = follow-up; *SE* = standard error; HDT = Hungry Donkey Task; O = observed/assessment; A = adolescent report; BRIEF = Behavior Rating Inventory of Executive Function; P = parent report; DKEFS = -Delis–Kaplan Executive Function System; AWMA = Automated Working Memory Assessment. Means are marginal estimates controlling for agency. *d* within groups is the difference between BL and FU divided by BL-pooled *SD* with positive values indicating improvement. Positive *d* values for Group × Time effect indicates that STAND had greater improvement from BL to FU relative to UC. Bolded *p* values indicate significant values that survived Benjamini–Hochberg adjustment per domain.

Table 5
Per Protocol (PP) Analyses: Results From Linear Mixed Models for Teen Organization, Parent Motivation, Parent Involvement, Communication

	ITT STAND ($n = 114$)				ITT UC ($n = 111$)				ITT time			ITT group × time			
	BL mean (*SD*)	PT mean (*SD*)	FU mean (*SD*)	*d*	BL mean (*SD*)	PT mean (*SD*)	FU mean (*SD*)	*d*	B (*SE*)	*p*	95% CI	B (*SE*)	*p*	*d*	95% CI
Teen organization															
Planner use (O)	.06 (.18)	.03 (.10)	.01 (.10)	−.30	.04 (.15)	.03 (.03)	.02 (.18)	−.14	.00 (.00)	.34	−.01, .00	.00 (.00)	.25	−.20	−.01, .00
Organization Checklist (O)	.42 (.28)	.46 (.32)	.49 (.27)	.25	.41 (.27)	.45 (.30)	.48 (.26)	.23	.01 (.00)	.17	.00, .01	.00 (.00)	.88	.03	−.01, .01
Parent motivation															
Readiness to change (P)	7.66 (2.28)	7.28 (2.19)	6.89 (2.16)	−.33	7.73 (1.96)	7.12 (2.25)	6.49 (2.61)	−.63	−.10 (.03)	<.001	−.15, −..05	.04	.27	.22	−.03, .11
% change talk (O)	.76 (.39)	.76 (.33)	.76 (.40)	−.01	.75 (.36)	.73 (.40)	.72 (.39)	−.09	.00 (.01)	.67	−.01, .01	.00 (.01)	.73	.09	−.01, .02
Parent academic involvement															
Contingency management	1.77 (1.29)	1.79 (1.28)	1.81 (1.32)	.03	1.62 (1.30)	1.60 (1.25)	1.59 (1.39)	−.02	.00 (.01)	.84	−.03, .02	.01 (.02)	.74	.06	−.03, .04
OTP oversight	2.05 (1.41)	1.94 (1.36)	1.82 (1.30)	−.16	1.89 (1.48)	1.81 (1.37)	1.72 (1.41)	−.12	−.01 (.01)	.29	−.04, .01	.00 (.02)	.81	−.04	−.04, .03
Parent–teen communication															
Parental involvement (O)	2.42 (1.24)	2.36 (1.29)	2.31 (1.20)	−.08	2.53 (1.08)	2.44 (1.09)	2.35 (1.15)	−.16	−.01 (.02)	.39	−.05, .02	.01 (.02)	.80	.06	−.04, .05
Teen goal directness (O)	2.24 (1.12)	2.30 (1.15)	2.35 (1.12)	.10	2.50 (1.02)	2.34 (1.14)	2.17 (1.11)	−.32	−.03 (.02)	.085	−.06, .00	.04 (.02)	.09	.40	−.01, .08
Teen positive affect (O)	1.79 (1.12)	1.60 (1.16)	1.40 (1.11)	−.34	2.05 (1.05)	1.76 (.96)	1.47 (.92)	−.55	−.05 (.02)	.002	−.08, −..02	.02 (.02)	.46	.17	−.03, .06
Teen positive communication (O)	1.38 (1.11)	1.39 (1.00)	1.40 (1.17)	.02	1.56 (1.16)	1.45 (1.02)	1.35 (1.01)	−.18	−.02 (.02)	.28	−.05, .01	.02 (.02)	.38	.20	−.02, .06
Parent–teen resolution (O)	1.64 (1.37)	1.65 (1.32)	1.65 (1.35)	−.01	1.91 (1.27)	1.77 (1.25)	1.64 (1.30)	−.21	−.02 (.02)	.23	−.06, .01	.02 (.02)	.36	.21	−.03, .07
Parent–teen balance (O)	.65 (.89)	.58 (.73)	.51 (.89)	−.15	.62 (.79)	.65 (.85)	.67 (.76)	.07	.00 (.01)	.69	−.02, .03	−.02 (.02)	.32	.23	−.05, .02

Note. STAND = supporting teens' autonomy daily; UC = usual care; BL = baseline; *SD* = standard deviation; PT = posttreatment; FU = follow-up; *SE* = standard error; O = observed/assessment; P = parent report; OTP = organization, time management, and planning; A = adolescent report; BRIEF = Behavior Rating Inventory of Executive Function; DKEFS = Delis–Kaplan Executive Function System; AWMA = Automated Working Memory Assessment. Means are marginal estimates controlling for agency. *d* within groups is the difference between BL and FU divided by BL-pooled *SD* with positive values indicating improvement. Positive *d* values for Group × Time effect indicates that STAND had greater improvement from BL to FU relative to UC. Bolded *p* values indicate significant values that survived Benjamini–Hochberg adjustment per domain.

in STAND are trained to practice strategies that promote adolescent autonomy (e.g., reducing assistance, prompting, reminding). When delivering STAND, perhaps licensed therapists are more skilled at supporting parents through tapering age-inappropriate parental involvement. It may also be the case that licensed therapists are more professionally engaged, relative to unlicensed therapists, which may impact the quality of implementation. A recent STAND paper showed how lower content fidelity related to poorer treatment outcomes within the academic impairment domain (Sibley et al., 2021a), yet such content fidelity and MI quality did not differ among licensed and unlicensed therapists. More work is clearly needed in measuring quality of treatment implementation and unpacking why unlicensed individuals have less success implementing STAND. This is a particularly important area for future research as we have recently found via an Innovation Tournament with agency stakeholders that a great majority of the community mental health workforce is unlicensed (and not just because of recent graduation).

Based on these findings, we conclude that teen motivation and reducing parental intrusiveness are two targets of ADHD intervention that may be contextually relevant to community settings. These mechanisms may signal a strategic direction for continued adaptation of community-based EBPs for ADHD, customizing to the needs of stakeholders (e.g., focusing on adolescent motivation and reducing low-value parenting practices in community contexts). This finding also highlights the importance of considering practitioner characteristics when assigning adolescent ADHD cases in community settings. For severe ADHD cases, licensed therapists may be best equipped to impact patient outcomes. Increasing support for unlicensed therapists should also be a strategic direction for implementation of ADHD EBPs in routine care.

It is important to note that we found that UC experienced greater gains in behavioral and cognitive EF indices relative STAND. It is possible that UC therapists' freedom to simultaneously treat comorbidities, such as anxiety or depression, could improve EFs, which are also impaired in internalizing comorbidities (Mullin et al., 2020). Some speculate that iatrogenic effects are possible when treating adolescents with ADHD (Barkley, 2018); therefore, it cannot be ruled out that participating in behavior therapy somehow taxes cognition—just school burnout has been shown to decrease cognitive task performance (May et al., 2015). However, this hypothesis is not fully supported because, consistent with previous work, adolescent EF improved over time in both groups (Ferguson et al., 2021). Additionally, the UC condition entailed more individual sessions with only the adolescent versus STAND, which had a greater number of sessions with both the adolescent and parent. Thus, it is possible that some of the treatment strategies employed by UC therapists may have included cognitive-behavioral therapy (CBT) strategies (e.g., cognitive restructuring) that may have unexpectedly led to greater improvements in adolescents' cognitive flexibility performance. However, this is speculative as a recent paper (Sibley et al., 2021a) shows that UC therapists engage in a variety of treatment components in session (not just CBT strategies). Thus, more work is needed to replicate our finding to better understand the superior improvements in EF demonstrated in UC.

Many tested mechanistic outcomes showed equivalency between groups. Unfortunately, it is not clear whether both arms (or neither) enacted therapeutic impact on nonsignificant mechanistic outcomes. Main effects of time indicate that most outcomes did not demonstrate significant change during treatment. Areas of sample-level decompensation highlight future treatment priorities. For example, the worsening of teen positive affect highlights the importance of ADHD-related emotion dysfunction. Emotion regulation is receiving more attention as a possible mechanism of ADHD-related impairment (Graziano & Garcia, 2016) and focus of adolescent ADHD treatment (Breaux & Langberg, 2020). Furthermore, parent motivation waned over time across the sample. This may highlight the need for parent-directed sessions targeting parental engagement. Given UC's potency, greater individualization of ADHD EBPs may also be a key future direction.

Without a no-treatment control ADHD group, it remains plausible that time effects (e.g., EF domain) are a result of confounds such as adolescent brain maturity, regression to the mean, effects of repeat test administration, or placebo effects. This trial was not powered to conduct tests of moderated mediation—therefore, we could not evaluate complex models where mediators varied as a function of moderators (i.e., licensure status). We tested a limited set of cognitive and psychological mechanistic outcomes based on prevailing ADHD theories. However, in doing so we may have oversimplified some constructs. For example, work on ADHD and motivation suggests that more nuanced measures of motivation subdimensions might yield a clearer picture of the impact of treatment on motivation (Morsink et al.,

2022). Some measures had acceptable, rather than strong, psychometric properties that could increase measurement error. Additionally, the total maximum earning from our delay discounting task ($4) may have been too low to motivate adolescents, although past work suggests that the link between delay discounting and ADHD symptomology is detected more when using real rewards (even if small) relative to larger hypothetical rewards (Scheres et al., 2008). Future work using a delay discounting task may want to consider examining larger real rewards and have adolescents rate immediately after the extent to which they were motivated by the reward amount. Therapist participation was voluntary, and we may have oversampled therapists with openness to EBPs. We also had a limited number of therapists with lower levels of education (e.g., bachelor's degree), which prevented us from investigating whether it is licensure that matters when providing STAND or level of education/training. Of note, the main outcome paper on STAND found that the licensure effects were not related to therapists' years of experience. Thus, it remains to be seen what unique aspects of being a licensed therapist contribute to a greater success in the implementation of STAND.

The findings of this study suggest that maximizing the impact of ADHD treatment in community-based settings may involve delivery by a licensed workforce, focus on reducing negative parenting behaviors, and on teen readiness to change. Given that teens' lack of belief that no change is needed and intrusive parenting are top barriers to successful engagement in adolescent ADHD treatment (Bussing et al., 2011; Sibley et al., 2022a), these are ecologically valid treatment targets. Additional work is needed to better understand both the content and potency of community-based UC for adolescents with ADHD. Future work should continue to test a broader range of EBPs for ADHD in community-based settings where effects differ from lab-based trials. Examining the impact on mechanistic outcomes may hold the key to long-lasting treatment gains and personalized treatment efforts, and may vary as a function of treatment protocol, context, and practitioner characteristics.

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