

BRIEF REPORT

Questioning the Distinction Between Active Elements and Mechanisms:
Evidence From a Reanalysis in Cognitive Behavioral
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Objective: A new theoretical measurement framework for assessing active elements in cognitive behavioral therapies (CBT) emphasizes distinguishing various aspects of therapeutic components, and differentiating processes occurring within and between sessions. In this article, we apply the framework to data analyzed prior to its introduction. **Method:** In Study 1, a panel of CBT experts evaluated items from the Cognitive Change scales (immediate and sustained) to determine whether they assess CBT skills (active elements) or cognitive change (mechanisms). In Study 2, we applied the framework to data from 125 CBT clients undergoing treatment for depression. Using disaggregated within- and between-patient components, we tested mediation models using framework-informed scores. **Results:** In Study 1, experts achieved high interrater reliability and identified skill and cognitive change items using the framework. In Study 2, findings revealed that cognitive change mediated the relationship between skill use and symptom improvement. Results were similar using different subscales, consistent with the subscales being driven by a single underlying factor. **Conclusions:** Our results suggest that the pattern of findings was similar whether a distinction between skills and cognitive change was made or not. Considering previous factor analytic results and the present findings, we call into question whether the distinction between active elements and mechanisms is as essential or important as the framework suggests.

What is the public health significance of this article?

This study challenges the separation of cognitive behavioral therapy skills and cognitive change, revealing that neither cognitive behavioral therapy professionals nor clients clearly distinguish these constructs. We encourage future research on measurement that is both informed by careful thinking and empirical support to advance our understanding of how cognitive behavioral therapy achieves its effects.

Keywords: cognitive behavioral therapies, measurement, skills, cognitive change, theory

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The data reported in this article have also been previously published and were collected as part of a larger data collection. Findings from the data collection have been reported in 17 separate manuscripts (all published). MS 1, MS 2, MS 5, MS 6, MS 9, and MS 12 focus on cognitive change. Specifically, MS 1 focuses on cognitive change and depression symptoms. MS 2 focuses on cognitive methods and cognitive change. MS 5 focuses on maladaptive personality traits, interpersonal problems, social skills, cognitive change, and depression symptoms. MS 6 focuses on affect and cognitive change. MS 9 focuses on maladaptive personality characteristics, interpersonal problems, social skills, cognitive methods, and cognitive change. MS 12 focuses on Socratic questioning, cognitive change, and depression symptoms. MS 3 focuses on cognitive behavioral therapies skills, depression symptoms, and anxiety symptoms. MS 4 focuses on cognitive behavioral therapies skills, alliance, depression symptoms, and dropout. MS 7 focuses on alliance and depression

symptoms. MS 8 focuses on interpersonal bias. MS 10 focuses on observer rater characteristics. MS 11 focuses on occupational outcomes. MS 13 focuses on disproportionality of depression symptoms. MS 14 focuses on alliance and dropout. MS 15 focuses on race, cognitive methods, behavioral methods, alliance, and depression symptoms. MS 16 focuses on alliance and depression symptoms. MS 17 focuses on patient response profiles, cognitive methods, behavioral methods, and depression symptoms. The current article is composed of two studies; the first study uses new unpublished data while the second study is a re-examination of MS 1 described above.

Iony D. Ezawa played an equal role in conceptualization, formal analysis, writing—original draft, and writing—review and editing. Daniel R. Strunk played an equal role in conceptualization, formal analysis, writing—original draft, and writing—review and editing.

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In having a conversation with a longtime friend, a psychotherapy client noticed the friend seemed a bit distant. The client thought “Maybe she doesn’t like me anymore.” In the next moment, the client thinks, “Doesn’t she? I don’t know.” How would we understand the client’s coping experience from a cognitive behavioral framework? Is this an example of the application of cognitive behavioral skills? Did the client experience cognitive change? Was it all part of one process? Such issues are key aspects of a recently proposed theoretical measurement framework for assessing the active elements of cognitive behavioral therapies (CBTs).

The new framework advanced by [Cohen et al. \(2023\)](#) emphasizes the importance of distinguishing active elements and mechanisms. Active elements are defined as skills intended to cause therapeutic change. These active elements are further split into a therapist’s delivery of a skill, a client’s receipt of a skill in a session, and a client’s application of a skill outside of session. Mechanisms are defined as the effects of active elements, the variables in “the causal pathway that sits between the therapy activity (active element) and treatment response (outcome)” ([Cohen et al., 2023](#), p. 4). For CBT, among the most hypothesized active elements are CBT skills and a key putative mechanism is cognitive change. While frameworks can be useful in refining conceptual distinctions, aspects that require empirical validation need to be tested. The framework reflects one perspective within a longer standing discussion about psychotherapy research methods, related to “splitting” into narrower or “lumping” into broader factors ([Doss, 2004](#)). With this in mind, we take the framework as a starting point for discussion.

Psychotherapy researchers likely operate from different frameworks, some of which may be implicit. One key difference lies in the tendency to “split” or “lump” constructs across measures. For example, much of the work on possible mechanisms of CBT has focused on assessing the degree to which clients endorse specific negative cognitive content (e.g., the Dysfunctional Attitudes Scale). Recent measures of CBT skills or cognitive change (where the content is not specified) typically lump together experiences involving different cognitive content (e.g., concerns about social approval, concerns related to perfectionism; see [Kirchner et al., 2024](#)).

The [Cohen et al. \(2023\)](#) framework emphasizes certain distinctions as requiring splitting. They argue that researchers need to “maintain the boundary” between therapeutic procedures and treatment mechanisms (p. 3). Although we agree with the importance of differentiating therapist and client contributions, their suggestion goes beyond this. In making their point, they highlight the Cognitive Change–Immediate scale as an example of a measure that suffers from this problem.

We introduced the Cognitive Change–Immediate and Cognitive Change–Sustained scales as tools for studying cognitive change and CBT skills within and between sessions ([Schmidt et al., 2019](#)). The immediate scale is a five-item scale that includes items that [Cohen et al. \(2023\)](#) described as assessing client technique use (e.g., “I took note of what I was thinking and worked to develop a more balanced view”) and cognitive change that might be an effect of using those techniques (“I noticed myself thinking less negatively”). [Cohen et al.](#) describes the former item as an example of “receipt” of an active element and the latter as an example of a “mechanism.” Receipt of an active element involves coming to understand a concept as well as practicing using a strategy, but they clarify that if practice occurs in session it is part of receipt only (see [Table 1](#) in [Cohen et al.](#)). When practicing occurs between sessions, it reflects application.

Table 1

Panel Ratings of Assessment of Active Element and Treatment Mechanism by CC-S Item

AE	M	CC-S item
5.40 (0.63)	2.40 (2.06)	2. I caught myself thinking negatively, recognized the negative bias and re-evaluated the situation.
5.27 (0.96)	2.07 (1.91)	6. When I have felt down, I engaged in activities that were enjoyable or gave me a sense of accomplishment (to try to help my mood).
5.27 (1.03)	2.27 (2.02)	9. Rather than letting a challenge overwhelm me, I imagined how to break the challenge down, developed a plan, and worked on it step-by-step.
5.13 (0.92)	2.47 (2.00)	5. When I found myself upset about something, I took note of what I was thinking and worked to develop a more balanced view.
5.00 (1.07)	2.20 (2.11)	3. When my negative thoughts and emotions really bothered me, I had a specific action plan of things I could do to cope.
4.93 (1.03)	2.27 (2.05)	8. When I got upset, I took time to step back from a situation and consider that my negative thoughts might be inaccurate.
1.87 (1.96)	5.13 (1.81)	4. I came to recognize that a negative belief I have long held might not be true.
1.33 (1.88)	5.00 (1.77)	7. I have noticed that when something bad happens, my initial interpretation is not as negative as it used to be.
1.80 (1.82)	4.93 (1.75)	1. I noticed myself thinking less negatively.

Note. This panel was composed of 15 therapists with experience in cognitive behavioral therapy. Mean item scores reported outside of parentheses, SDs reported in parentheses. Ratings of assessment of active element and mechanism differed for each item with all $ps \leq .002$ (below the Bonferroni correction threshold of $p < .006$). AE = active element; M = mechanism; CC-S = Cognitive Change–Sustained scale.

Each scale was written with the intention of having items that captured the use of CBT skills and others for the experience of cognitive change. However, we were initially uncertain if clients would distinguish these ideas through distinguishable factors. The distinction between the use of skills and the experience of cognitive change can be subtle. When we conducted an exploratory factor analysis, results strongly suggested a one-factor solution for each scale ([Schmidt et al., 2019](#)). Nonetheless, it is possible that items that load on the same factor nonetheless are differentially related to other measures.

In this article, we empirically evaluate the measurement framework proposed by [Cohen et al. \(2023\)](#), particularly its distinction between CBT skills (active element) and cognitive change (mechanism of change). In Study 1, our objective was to use a panel of those with a background in CBT to apply the framework to assess items of the cognitive change scales, differentiating those that assess CBT skills and cognitive change. In Study 2, our objective was to test whether separating CBT skills and cognitive change (as informed by ratings in Study 1), meaningfully enhanced the explanatory value of mediation models presented in [Schmidt et al. \(2019\)](#).

Study 1

Method

Participants and Procedure

We recruited 15 individuals experienced with CBT (three bachelors, six masters, and six doctoral level). All identified CBT or cognitive therapy as their primary theoretical orientation, and on average, had provided 1,194 hr of face-to-face CBT ($SD = 1,551$; range 13–5,000). All had read a CBT manual, 11 received a year of supervised CBT training, and 12 had published a scientific article on CBT. As part of an online survey, each participant was asked to read Cohen et al. (2023) and directed to focus on the distinction between definitions of active elements and mechanisms provided in the article. Participants then rated the extent to which each of the items on an existing measure of cognitive change and CBT skill use (see Cognitive Change–Sustained scale below) measured an active element and a treatment mechanism on 0 (*not at all*) to 6 (*extensively*) point Likert scale. In addition, respondents were asked “Based on the definitions, to what extent would you regard CBT skills as a potential mechanism of CBT?” and were able to respond using a scale ranging from 0 (*not at all*) to 6 (*extensively*). Participant responses were interpreted as indicators of how clearly the framework was communicated rather than as a formal test of comprehension. This study was approved by the University of Southern California’s Institutional Review Board.

Measures

Cognitive Change–Sustained Scale. The Cognitive Change–Sustained Scale (CC-S; Schmidt et al., 2019) is a nine-item self-report measure designed to be administered immediately prior to each therapy session to capture a patient’s experience of cognitive change and use of skills in the period since the last session. Participants in this study were asked to assess the nine CC-S items. The CC-S demonstrated excellent internal consistency ($\alpha = .95$) and an exploratory factor analysis supported a one-factor solution, with strong item loadings. Additional evidence provided support for validity with related measures of CBT skills and beliefs (see Schmidt et al., 2019).

Analytic Strategy

We calculated intraclass correlation coefficients (ICC) to determine the reliability of the raters’ item judgments. We examined ratings of the degree to which items assessed an active element and a mechanism, and we calculated the reliability of each of these two judgment types. Using the averages of raters’ judgments per item, we conducted *t* tests to compare the active element rating and the mechanism scores for each CC-S item. This information determined whether a CC-S item was deemed to reflect an active element or mechanism.

Transparency and Openness

Study 1 was not preregistered. Due to some risk of re-identification, data are not posted publicly but are available upon request pending approval.

Results

The ICC (corrected for 15 raters) for judgments of whether each individual item assessed CBT skills (an active element) was .96. The ICC for judgments of whether each item assessed cognitive change (a mechanism) was .87, indicating excellent interrater reliability. As shown in Table 1, for all items, there was a significant difference between the rating assessing CBT skills (an active element) and cognitive change (mechanism). For six items, the mean for CBTs skills was greater. For three items, the mean for cognitive change was greater. When asked to rate the degree to which they regarded CBT skills as a mechanism of CBT, raters’ responses suggested moderate endorsement ($M = 3.20$, $SD = 2.24$), with only about a quarter (4 of 15) indicating “not at all”—suggesting a clear majority disagreed with this aspect of the framework.

Study 2

Method

Participants and Procedure

Patients were 125 adults who participated in CBT for depression. For study details, including sample characteristics and inclusion/exclusion criteria, see Schmidt et al. (2019). CBT was provided by five advanced graduate students who received extensive training in CBT and ongoing weekly supervision. Therapists delivered CBT following procedures outlined in Beck et al. (1979). Throughout treatment, participants completed the Beck Depression Inventory-II and CC-S at the start of each session, and the Cognitive Change–Immediate scale (CC-I; see measure description below) at the end of each session. This study was approved by The Ohio State University’s Institutional Review Board.

Measures

Depressive Symptoms. The Beck Depression Inventory-II (BDI-II; Beck et al., 1996) is a 21-item self-report measure of depression symptom severity.

CC-S. The nine-item CC-S (Schmidt et al., 2019) assesses sustained cognitive change (i.e., cognitive change or skill use since the last session). Informed by ratings from Study 1, six items were used to assess a skills subscale (“CC-S active element”). Three items were used to assess a Cognitive Change subscale (“CC-S mechanism”). See the Appendix for the items.

CC-I. The CC-I (Schmidt et al., 2019) is a five-item self-report scale designed to be administered immediately after each session to capture a patient’s experience of cognitive change and skill use during the session that was just completed. These five items overlap with items from the CC-S, excluding only the four items that assess experiences that are specific to out-of-session contexts. Because of use of the same items across measures, respondents’ judgements of the CC-S items were also taken to apply to the CC-I items. Based on ratings obtained in Study 1, three items formed a skill subscale (“CC-I active element”) and two items formed a Cognitive Change subscale (“CC-I mechanism”). See the Appendix for the items used for each subscale. Similar to the CC-S, the CC-I has demonstrated excellent internal consistency and evidence of convergent validity with theoretically relevant measures (see Schmidt et al., 2019 for details).

Analytic Strategy

To examine the effect of active elements received in session on subsequent mechanism change and symptom outcomes, we examined a multilevel model with sustained cognitive change (mechanism) as a mediator of the relationship between immediate skill use (active element) and next-session depression symptoms across all sessions (M number of sessions per patient = 15.9, $SD = 5.1$, range = 1–28). For this model, we first disaggregated the within- and between-patient components of our predictor and mediator variables. We then tested a within-patient mediation model where CC-I active element scores were the independent variable, next-session BDI-II scores were the dependent variable, and CC-S mechanism scores were the potential mediator across all sessions. We also controlled for current BDI-II scores in the mediation model.

Transparency and Openness

We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the present study. We used SAS Proc Mixed and the IndTest.sas SAS macro (Bauer et al., 2006). The sample size was the same as reported in Schmidt et al. (2019). One participant who discontinued prior to Session 1 was not included in analyses. There were no experimental manipulations. Measures reported are limited to those used in the prior article. Because the data are not deidentified, the data are not available without obtaining approval from our institutional review board. The analyses presented were not preregistered. Example code for the study analyses is available upon request.

Treatment Manual Availability

Therapists delivered CBT following the treatment procedures described in Beck et al. (1979), a widely available treatment manual.

Results

Table 2 provides means and standard deviations for variables assessing CBT skills and cognitive change across early sessions. We calculated ICCs to estimate the proportion of total variation in the sustained variables that was accounted for by between-patient variability; remaining variation could be attributed to within-patient variation or error. For the CC-I subscale, 60% of the variance in skills (active element) and 51% of the variance in cognitive change (mechanism) were between-patient variation. For the CC-S subscale, 62% of the variance in skills (active element) and 57% of the

variance in cognitive change (mechanism) were between-patient variation. This is similar to the ICCs previously reported for the full CC-S and CC-I measures (CC-I: 60%; CC-S: 64%).

Correlations of the skill and cognitive change subscales parsed into within and between patient scores are provided in Table 3. If Cohen et al.'s distinction between skills and cognitive change is meaningful, we would expect measures of the same construct across scales (immediate or sustained) to be more correlated than correlations of different constructs assessed across scales. Conversely, if the distinction is less meaningful, correlations between different constructs would be similar to those between the same constructs. For the within-patient correlations, correlations of the same construct (viz., $r = .23$ for skills, $r = .25$ for cognitive change) were similar to those of different constructs across scales ($r = .19$ immediate skills with sustained cognitive change; $r = .24$ immediate cognitive change with sustained skills). This pattern of similar correlations was also observed for between-patient scores.

We tested the within-patient component of sustained cognitive change (CC-S mechanism) as a potential mediator of the relation between the within-patient component of immediate skills (CC-I active element) and next-session BDI-II score while controlling for current BDI-II scores. If the distinction between skills and cognitive change is meaningful, we would expect this mediation model to be unique, supporting cognitive change as a distinct mechanism. As shown in Figure 1, there was evidence for the mediating effect of cognitive change in this model (indirect effect: $b = -0.20$, $SE = 0.03$, $p < .001$, 95% CI $[-0.26, -0.13]$; direct effect: $b = -0.08$, $SE = 0.04$, $p < .001$, 95% CI $[-0.16, -0.003]$; total effect: $b = -0.28$, $SE = 0.06$, $p < .001$, 95% CI $[-0.39, -0.17]$; a arm = 0.24, $p < .001$, b arm = -0.88 , $p < .001$). However, as detailed in the Appendix, similar evidence for a significant indirect effect was also obtained when testing (a) sustained skills as a mediator of the relation of immediate skills on symptoms; (b) sustained cognitive change as a mediator of the relation of immediate cognitive change on symptoms; and (c) sustained skills as a mediator of the relation of immediate cognitive change on symptoms. Thus, similar results were obtained for all four variations testing skills and cognitive change in the independent variable and mediator positions in these models, suggesting the distinction between these constructs may not be strongly reflected in client reports.

Discussion

We applied the Cohen et al.'s (2023) framework to our previous analysis of sustained cognitive change as a mediator of the effect of immediate cognitive change on session-to-session symptom change (Schmidt et al., 2019). Per the framework, our previous assessment of

Table 2

Descriptive Statistics: Means and Standard Deviations of Patients' Raw Cognitive Behavioral Skills and Cognitive Change Scores at Each Session

Subscale	Session				
	1	2	3	4	5
CC-I-active element	2.90 (1.31)	3.52 (1.17)	3.19 (1.40)	3.24 (1.34)	3.41 (1.30)
CC-I-mechanism	2.42 (1.21)	2.95 (1.27)	2.79 (1.30)	2.97 (1.39)	3.07 (1.40)
CC-S-active element	1.86 (1.00)	2.29 (1.02)	2.49 (1.12)	2.60 (1.12)	2.76 (1.17)
CC-S-mechanism	1.50 (0.97)	1.96 (1.11)	2.26 (1.23)	2.44 (1.27)	2.49 (1.26)

Note. The sample was composed of 125 patients who received a course of cognitive behavioral therapy for depression. Means of average item scores are reported outside of parentheses, SD s reported in parentheses. CC-S = Cognitive Change–Sustained scale; CC-I = Cognitive Change–Immediate scale.

Table 3

Relationships Among Within-Patient (Below Diagonal) and Between-Patient (Above Diagonal) CC-I and CC-S Variables at Session 1

Subscale	1	2	3	4
1. CC-I-active element	—	.89***	.69***	.69***
2. CC-I-mechanism	.66***	—	.66***	.76***
3. CC-S-active element	.23*	.24**	—	.89***
4. CC-S-mechanism	.19*	.25**	.63***	—

Note. CC-I = Cognitive Change–Immediate scale. CC-S = Cognitive Change–Sustained scale.

* $p < .05$. ** $p < .01$. *** $p < .001$.

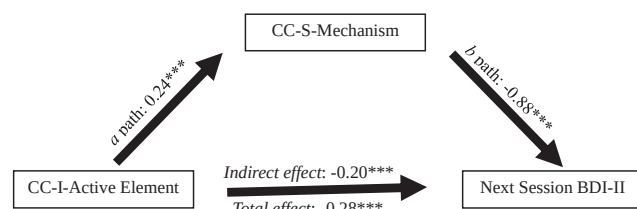
immediate cognitive change represented some combination of active elements and the mechanism of cognitive change and these constructs need to be distinguished. In Study 1, a panel with CBT experience was able to reliably rate the degree to which items assessed active elements (i.e., CBT skills) and mechanisms of change (i.e., cognitive change). In Study 2, separating the items that assess cognitive change or skills, the framework led us to expect specific support for the mediation model supporting cognitive change as a distinct mechanism. Instead, whether we tested sustained skills mediating the effect of immediate skills, sustained skills mediating the effect of immediate cognitive change or sustained cognitive change mediating the effect of immediate cognitive change, the results were all remarkably similar. Thus, the available evidence is consistent with clients' responses to items representing a single factor that combines CBT skills and cognitive change. Interestingly, raters from Study 1 also expressed moderate disagreement with the framework's assertion that CBT skills cannot in principle be considered a potential mechanism.

It may be difficult for assessments to elicit the distinction between active elements and mechanisms. CBT involves iterative learning—clients try, practice, and refine strategies both in and out of session. Prior work informs each step, and skill use is frequently revisited and reinforced. Moments of cognitive change likely happen at multiple points, likely on different occasions for different clients, amidst the use of skills across the course of therapy. Active elements and mechanisms may simply be so interrelated that they are difficult to distinguish.

As research on how CBT achieves its effects continues, it is important that researchers continue to discuss promising measurement approaches and what distinctions are important to make. Given

Figure 1

Cognitive Change Mediating the Relationship Between Cognitive Skill Use and Session-to-Session Symptom Change



Note. CC-I = Cognitive Change–Immediate scale; CC-S = Cognitive Change–Sustained scale; BDI-II = Beck Depression Inventory-II.

our results, we are concerned that requiring researchers to distinguish between active elements and mechanisms may amount to giving them a difficult task that may thwart progress they might otherwise make. We welcome measure development that might make new distinctions to better understand the overall process by which psychotherapy achieves its effects.

It is important to note some limitations. First, our analysis focused on measures given at each session over the course of CBT. It is possible that different factors would emerge when measures are given more frequently. Second, our use of multilevel modeling, while appropriate for nested data, does not capture more complex temporal dynamics. Future studies may benefit from applying methods such as dynamic structural equation modeling to better understand change processes in CBT. Third, the cognitive change measures were designed to assess overall cognitive change without focusing on specific belief content. Future research could benefit from developing measures to capture both overall change and the belief content involved. Future studies could also examine predictors of sustained cognitive change while controlling for in-session change, which would help clarify whether these constructs are empirically distinct and differentially influenced by therapeutic processes.

In conclusion, despite including items that separately assess cognitive change and CBT skills, responses on the Cognitive Change scales (immediate and sustained versions) have been accounted for by single factor solutions. We suspect that the use of CBT skills and cognitive change are so intricately intertwined that clients do not readily distinguish them. Despite the framework proposed by Cohen et al. (2023) calling for differentiating CBT skills and cognitive change, we failed to find evidence to support the discriminant validity of separate assessments of these constructs. We suggest that future research prioritize measurement that is informed by theory and data, with researchers each pursuing the possibilities they find most promising for advancing our understanding of how CBT achieves its effects.

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(Appendix follows)

Appendix

Scale Items and Additional Model Results

Cognitive Change–Immediate Scale

Skills (Active Element)

2. I caught myself thinking negatively, recognized the negative bias, and re-evaluated the situation.
4. I took note of what I was thinking and worked to develop a more balanced view.
5. I considered that my negative thoughts might be inaccurate.

Cognitive Change (Mechanism)

1. I noticed myself thinking less negatively.
3. I came to recognize that a negative belief I have long held might not be true.

Cognitive Change–Sustained Scale

Skills (Active Element)

2. I caught myself thinking negatively, recognized the negative bias, and re-evaluated the situation.
3. When my negative thoughts and emotions really bothered me, I had a specific action plan of things I could do to cope.
5. When I found myself upset about something, I took note of what I was thinking and worked to develop a more balanced view.
6. When I have felt down, I engaged in activities that were enjoyable or gave me a sense of accomplishment (to try to help my mood).
8. When I got upset, I took time to step back from a situation and consider that my negative thoughts might be inaccurate.
9. Rather than letting a challenge overwhelm me, I imagined how to break the challenge down, developed a plan, and worked on it step-by-step.

Cognitive Change (Mechanism)

1. I noticed myself thinking less negatively.
4. I came to recognize that a negative belief I have long held might not be true.

7. I have noticed that when something bad happens, my initial interpretation isn't as negative as it used to be.

Additional Models

Model 1: Within-patient sustained skills (CC-S active element) as a mediator on the relationship between within-patient immediate skills (CC-I active element) and next-session depression symptoms (with current symptoms covaried)

Effect	Estimate	SE	<i>t</i>	<i>p</i>	95% CI
<i>a</i>	0.35	0.05	6.93	<.0001	[0.25, 0.45]
<i>b</i>	−0.50	0.04	−12.91	<.0001	[−0.58, −0.42]
<i>c'</i>	−0.12	0.04	−3.05	.003	[−0.20, −0.04]
<i>c</i>	−0.30	0.06	−5.17	<.0001	[−0.41, −0.19]
Indirect	−0.17	0.04	−4.96	<.0001	[−0.24, −0.11]

Note. CI = confidence interval; SE = standard error.

Model 2: Within-patient sustained cognitive change (CC-S mechanism) as a mediator on the relationship between within-patient immediate cognitive change (CC-I mechanism) and next-session depression symptoms (with current symptoms covaried)

Effect	Estimate	SE	<i>t</i>	<i>p</i>	95% CI
<i>a</i>	0.38	0.04	9.13	<.0001	[0.30, 0.47]
<i>b</i>	−0.90	0.06	−15.04	<.0001	[−1.02, −0.78]
<i>c</i>	−0.08	0.06	−1.33	.18	[−0.20, 0.04]
<i>c</i>	−0.40	0.08	−5.13	<.0001	[−0.56, −0.26]
Indirect	−0.32	0.05	−6.57	<.0001	[−0.42, −0.23]

Note. CI = confidence interval; SE = standard error.

Model 3: Within-patient sustained skills (CC-S active element) as a mediator on the relationship between within-patient immediate cognitive change (CC-I mechanism) and next-session depression symptoms (with current symptoms covaried)

Effect	Estimate	SE	<i>t</i>	<i>p</i>	95% CI
<i>a</i>	0.54	0.07	5.79	<.0001	[0.40, 0.68]
<i>b</i>	−0.50	0.04	−12.81	<.0001	[−0.58, −0.43]
<i>c</i>	−0.12	0.06	−2.17	.03	[−0.23, 0.01]
<i>c</i>	−0.38	0.08	−4.73	<.0001	[−0.53, −0.22]
Indirect	−0.25	0.05	−5.12	<.0001	[−0.35, −0.16]

Note. Estimates in all models are standardized. CI = confidence interval; SE = standard error.

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