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BRIEF REPORT

Tracking individualized stuck points in cognitive processing therapy: The amount of change matters

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Abstract

Cognitive processing therapy (CPT) targets maladaptive beliefs called "stuck points," which are typically assessed using standardized measures (e.g., the Posttraumatic Cognitions Inventory [PTCI]). This study examined whether changes in person-specific individualized stuck points (ISPs) were associated with reductions in self-reported and clinician-rated posttraumatic stress disorder (PTSD) symptoms and whether ISPs predicted PTSD severity beyond general stuck points (GSPs) measured using the PTCI. Adults ($N = 57$) with PTSD received 1-week massed virtual CPT via one of two randomized controlled trials. ISPs were tracked, and ISP belief strengths were rated after every other session and at 1- and 3-month follow-ups. Linear mixed-effects models examined associations between ISP changes and self-reported (PTSD Checklist for *DSM-5* [PCL-5]) and clinician-rated PTSD (Clinician-Administered PTSD Scale for *DSM-5* [CAPS-5]) symptom reductions, adjusting for baseline depression, gender, age, and treatment condition. Participants showed large reductions in PTSD symptoms from baseline to 1-month follow-up, $M_{\text{PCL-5 reduction}} = 29.4$, $d = 2.02$; $M_{\text{CAPS-5 reduction}} = 10.49$, $d = 0.72$. Average ISP belief strength decreased by 50.2% during treatment and up to 1-month follow-up, $d = 2.75$. Higher numbers of ISPs also predicted reduced PCL-5 scores, $p = .021$, $R^2 = .02$. However, when controlling for PTCI score, ISPs no longer significantly predicted PTSD symptom change, $ps = .352–.534$, whereas PTCI scores remained significant predictors, $p < .001$. ISP reductions were associated with PTSD symptom improvements but did not predict outcomes beyond PTCI-assessed GSPs. Tracking ISPs may still be valuable for tailoring therapy and enhancing patient engagement.

Cognition change is one of the most hypothesized mechanisms for posttraumatic stress disorder (PTSD) symptom improvement (Brown et al., 2019). Clinicians can facilitate cognition change through Socratic dialogue by helping individuals explore their beliefs and then evaluate and potentially change them considering existing evidence. Worksheets that guide patients to evaluate their thoughts and the connected evidence also can be used to facilitate cognition change (Resick et al., 2024). Research has demonstrated that effective cognition change produces

more balanced thinking, which, in turn, is associated with improved symptoms and functioning (Ezawa & Hollon, 2023).

One well-established primarily cognitive intervention for the treatment of posttraumatic stress disorder (PTSD) that centers around cognition change is cognitive processing therapy (CPT; Resick et al., 2024). In CPT, patients learn to identify problematic beliefs, termed "stuck points," that drive their distress and negatively impact their ability to function. Through dialogue between a clinician and patient, as well as the use of structured worksheets, patients are taught the necessary skills to identify stuck points and develop alternative ways of thinking about themselves, others, and the world. Through in-session and out-of-session practice of these skills, patients are able to reduce their level of belief in their stuck points (Farmer et al., 2017; Resick et al., 2024; Woolley et al., 2024).

Belief change in trauma-focused cognitive behavioral treatments, such as CPT, is commonly assessed via established measures like the Posttraumatic Cognitions Inventory (PTCI; Foa et al., 1999). Measures like the PTCI list various general stuck points (GSPs) that are commonly held by trauma survivors (e.g., "people can't be trusted"). Respondents are then asked to rate the extent to which they agree with these beliefs. Through effective Socratic dialogue and other interventions, patients often report reduced beliefs in GSPs over the course of treatment (Diehle et al., 2014; Szoke et al., 2024). GSP assessments like the PTCI provide a standardized measure by which researchers can compare across large patient samples. However, given the generic nature of beliefs listed on these measures, individual nuances in patients' stuck points are not captured. Individuals undergoing CPT are encouraged to log their individualized stuck points (ISPs) so they can be addressed in treatment (Resick et al., 2024). Although patients are asked to log stuck points, changes in their level of belief in each ISP are commonly only examined during treatment activities (e.g., worksheet completion), not systematically over the course of treatment. As such, it is unclear to what extent the logged stuck point beliefs may be changing over the course of treatment. It has also yet to be systematically determined whether the number of logged stuck points matters for treatment outcomes in CPT or whether it is sufficient to see reductions in a few well-defined stuck points (i.e., those that may be core to an individual's traumatic experiences) over the course of treatment.

To better understand the role of ISPs in the context of CPT, this study evaluated whether changes in ISPs were associated with PTSD symptom reduction and whether they predicted changes in self-reported and clinician-rated PTSD severity from pretreatment to 1-month and 3-months posttreatment, controlling for baseline demographic characteristics and depression symptoms. A second goal of this study was to evaluate the ability of ISPs to predict PTSD symptom severity when accounting for GSPs captured via the established PTCI to discern the utility of combining both stuck point rating methods. Tracking individuals' stuck point belief strengths may help patients feel that assessment is tailored to them, show patients that treatment is working for them based on their own beliefs changing, or help clinicians more easily identify personalized treatment targets.

METHOD

Participants and procedure

The sample consisted of 57 individuals who met the criteria for PTSD and received 1-week massed virtual CPT through one of two randomized controlled trials (RCTs; Clinical Trial Identifiers NCT05265039 and NCT05534126). Data from both trials were combined to obtain a sufficient sample size for the planned analyses. The first trial compared 1-week virtual massed CPT to 1-week virtual relaxation training; participants who received relaxation training were excluded from the current analysis. The second trial compared 1-week virtual massed CPT in combination with stellate ganglion block injections versus 1-week virtual massed CPT in combination with placebo injections; we controlled for assignment to stellate ganglion block versus placebo in the present analyses. Most participants in the total sample identified as male (73.7%) and White (64.9%). Complete sample descriptive characteristics are provided in Table 1.

Study procedures were approved by the Rush University Medical Center Institutional Review Board. Interested individuals for both RCTs underwent similar screening and baseline assessments, including clinician ratings of PTSD severity and potential comorbid mental health conditions. To be eligible for inclusion, individuals needed to be older than 18 years and on stable medication for at least 3 months. Individuals were excluded if they were currently in or had completed a first-line intervention for PTSD in the past 3 months, had ongoing legal actions related to the index traumatic event, reported suicidal ideation with intent and a plan, had unmanaged psychosis or mania, or engaged in substance use for which hospitalization would be likely if discontinued. For the trial involving stellate ganglion block versus placebo injections, individuals were also excluded if they had previously received a stellate ganglion block or had contraindications for the procedure, such as being allergic to the medications used or having an active infection. To be included in the present analyses, individuals had to have attended at least one CPT session.

TABLE 1 Sample characteristics

Characteristic	*M*		*SD*
Age	37.58		11.19
		n	%
Gender			
Male		42	73.7
Female		10	17.6
Transgender man		1	1.7
Transgender woman		3	5.3
Chose not to answer		1	1.7
Race			
Asian		6	10.5
Black or African American		9	15.8
White		37	64.9
Other		2	3.5
Chose not to answer		3	5.3
Ethnicity			
Hispanic		5	8.8
Non-Hispanic		51	89.5
Chose not to answer		1	1.7
Educational attainment			
Some high school, no diploma		1	1.7
Some college, no degree		11	19.3
Trade/technical/vocational school		4	7.0
Associate degree		3	5.3
Bachelor's degree		17	29.8
Master's and general postgraduate degree		18	31.6
Doctorate/professional degree		3	5.3
Marital status			
Single		30	52.6
Married or domestic partnership		17	29.8
Divorced		7	12.3
Engaged		1	1.7
Separated		1	1.7
Other		1	1.7
Veteran Status			
Veteran		5	8.8
Nonveteran		52	91.2

The delivery of 1-week massed virtual CPT (Held et al., 2022) was identical across both trials. Participants received 10 sessions of CPT delivered twice per day. Sessions were spaced at least 1 hr apart to allow time for homework assignments. Given the reduction in the total number of sessions compared to the standard CPT protocols (Resick et al., 2024), themed sessions on topics such as safety, trust, power and control, esteem, and intimacy were structured such that the clinician and participant collaboratively decided on the two most relevant themes to address in Sessions 8 and 9; the remaining themes were assigned as homework (see Held et al., 2022, for information about 1-week massed CPT). All sessions were delivered virtually and recorded for supervision and fidelity assessment.

Measures

Stuck points

Throughout CPT, whenever a participant identified a stuck point, clinicians documented it on an Excel sheet as part of the trials. Stuck points were continuously added but never removed, resulting in a growing list (see Supplementary Figure S1 for an example). After each even-numbered session (e.g., Session 2, Session 4) and at the 1-, and 3-month posttreatment assessments, clinicians asked participants to rate how much they believed each stuck point on a scale ranging from 0% (*do not believe at all*) to 100% (*believe completely*). This process took less than 5 min to complete. For this study, we assessed both the total number of stuck points and the average belief strength on the day they were assessed, with total belief strength calculated by averaging the belief strength across all stuck points on a particular day.

Demographic characteristics

Study participants self-reported various demographic characteristics, including gender, race, ethnicity, education, and marital status during their intake assessments.

Negative posttrauma beliefs

The PTCI (Foa et al., 1999) is a 33-item self-report measure of a range of negative posttrauma beliefs about oneself, negative beliefs about the world, and self-blame. Respondents rate the extent to which they endorse each item on a 7-point scale ranging from 1 (*totally disagree*) to 7 (*totally agree*), with total possible scores ranging from 33 to 231. Higher PTCI scores indicate more belief in negative cognitions. The PTCI was administered at baseline, 1-, and 3-month follow-up. In this sample, Cronbach's alpha ranged from .96 to .99.

Self-reported PTSD symptoms

The PTSD Checklist for *DSM-5* (PCL-5; Weathers, Litz, et al., 2013) is a 20-item self-report assessment of PTSD symptoms, as outlined in the *Diagnostic and Statisti-*

cal Manual of Mental Disorders (5th ed.; *DSM-5*; American Psychiatric Association, 2013), that has demonstrated sound psychometric properties (Bovin et al., 2016). Respondents rate symptom severity on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*), with scores ranging from 0 to 80 and higher scores indicating higher levels of PTSD symptom severity. At baseline, 1-month, and 3-month follow-ups, participants rated their past-month symptoms. During treatment, they rated the symptoms experienced over the past day, and at the 1-week follow-up, they rated symptoms experienced over the past week. In this sample, Cronbach's alpha ranged from .93 to .97.

Clinician-rated PTSD symptoms

The Clinician-Administered PTSD Scale for *DSM-5* (CAPS-5; Weathers, Blake, et al., 2013) is a validated structured clinical interview used to assess the presence and severity of PTSD symptoms according to *DSM-5* criteria (Weathers et al., 2018). The CAPS-5 consists of 30 items that evaluate the 20 *DSM-5* PTSD symptoms across the four symptom clusters (intrusions, avoidance, negative alterations in cognition and mood, and alterations in arousal and reactivity). Symptom severity is rated on a 5-point scale ranging from 0 (*absent*) to 4 (*extreme/incapacitating*), with a total severity score range of 0–80 and higher scores indicating more severe symptoms. In this study, the CAPS-5 was used to assess past-month PTSD symptoms at baseline, 1-month follow-up, and 3-month follow-up. Cronbach's alpha ranged from .83 to .91 across assessment points.

Depressive symptoms

The Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001) is a validated, nine-item self-report instrument used to assess the severity of depressive symptoms. Each item corresponds to one of the nine diagnostic criteria for major depressive disorder and is rated on a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*nearly every day*), with a range of 0–27. Higher scores indicate higher levels of depressive symptom severity. In this study, participants completed the PHQ-9 at baseline, reporting on symptoms experienced over the past 2 weeks. Cronbach's alpha for the PHQ-9 was .83.

Data analysis

PTSD symptom severity (assessed every session), the number of ISPs (provided every other session), and the average percentage for ISP belief strength (rated every other session) were examined descriptively for each day during treatment. Effect sizes for change from baseline to 1- and 3-month follow-ups were calculated using a variant of Cohen's d for repeated measures (Gibbons et al., 1993). Separate linear mixed-effects models (LMMs) were used to model longitudinal changes using baseline and 1- and 3-month follow-up PTSD severity measurements, which assessed the associations between PTSD severity and both the number of stuck points and change in stuck point belief strength (i.e., percentage change). LMMs are particularly appropriate for longitudinal analyses due to their ability to utilize all available measurements despite some missingness over time, as well as their accommodation of various variance and covariance structures. Initial models adjusted for baseline depressive symptom severity, gender, and age. Another model added time-varying PTCI score to assess the ability of ISPs to predict PTSD severity beyond what this standardized GSP metric accounts for. This model also adjusted for gender, age, whether the participant had received an active stellate ganglion block, and baseline depression score. In line with prior research, post hoc models examined assimilated (i.e., maladaptive beliefs in which the individual internalizes blame or distorts the meaning of the trauma to fit preexisting schemas) and overaccommodated (i.e., rigid, overgeneralized beliefs that reflect an exaggerated attempt to integrate the trauma, often resulting in inaccurate conclusions about the self, others, or the world) stuck points separately in the same manner to assess the effect of changes in either type of stuck point on outcomes (Farmer et al., 2017). Linear and quadratic time effects were also included in the models. Effect size for ISPs and GSPs fixed effects were assessed using Edwards et al.'s (2008) variant of R^2 values for fixed effects in LMMs. This partial R^2 metric examines the strength of the associations between predictors and multivariate repeated outcomes when adjusting for the other predictors. Analyses were conducted in R (Version 4.4.1).

RESULTS

On average, participants in both trials reported large (M = 29.40 points, SD = 14.38) PTSD symptom reductions between baseline and 1-month follow-up on the PCL-5, 1-month: d = 2.02, 3-month: d = 1.64, as well as a 10.49-point (SD = 11.10) change in CAPS-5 score, 1-month: d = 0.72, 3-month: d = 0.85. The average stuck point belief reduction was large (49.1%, SD = 23.5%) during this time as well, 1-month: d = 2.62, 3-month: d = 2.35. By the end of treatment (i.e., Day 5), participants had identified and rated an average of 18.89 (SD = 7.40) stuck points, with an average of 2.13 (SD = 2.06) new stuck points added to the tracking

TABLE 2 Linear mixed-effect model predicting PTSD Checklist for *DSM-5* (PCL-5) and Clinician-Administered PTSD Scale for *DSM-5* (CAPS-5) scores

	PCL-5			CAPS-5		
Variable	***B***	**95% CI**	***p***	***B***	**95% CI**	***p***
Time	−0.33	[−0.52, −0.13]	.001	−0.42	[−0.51, −0.30]	< .001
Time^2	.002	[0.001, 0.005]	.006	.003	[0.002, 0.004]	< .001
Number of stuck points	0.01	[−0.24, 0.25]	.987	−0.04	[−0.28, 0.20]	.732
Average stuck point belief percentage	0.21	[0.15, 0.27]	< .001	0.11	[0.01, 0.20]	.028
Gender	−0.06	[−2.20, 2.09]	.958	0.38	[−1.83, 2.55]	.746
Age	−0.13	[−0.35, 0.08]	.231	−0.09	[−0.30, 0.11]	.375
PHQ-9	1.40	[0.98, 1.82]	< .001	0.66	[0.23, 1.10]	.003
Active stellate ganglion block injection	0.15	[−5.48, 5.78]	.959	10.12	[4.54, 15.71]	< .001

Note. Reference categories were males without active injections. PTSD = posttraumatic stress disorder; *DSM-5 = Diagnostic and Statistical Manual of Mental Disorders* (5th ed.); CI = confidence interval; PHQ-9 = Patient Health Questionnaire.

log each day during the program. On average, participants rated 18.84 (SD = 8.15) stuck points at 1-month follow-up and 18.80 (SD = 8.40) at 3-month follow-up. Reductions in the number of stuck points are due to changes in sample size across time points.

Initial LMMs indicated that reductions in stuck point belief strength ere significantly associated with reductions in PCL-5 across follow-up time points, R^2 = .16, p < .001. When stuck point percentage effects were partitioned into within- and between-participant effects, both remained significant predictors of PCL-5, ps < .001, indicating that within-participant reductions in stuck point belief strength were associated with PCL-5 score reductions from baseline to follow-up time points. Higher baseline depressive symptom severity was also associated with higher overall PCL-5 scores, though no other predictors were significant (see Table 2). Number of stuck points was not a significant predictor of reduced PCL-5 change over time, p = .987. Similarly, stuck point belief strength, R^2 = .06, p = .004, but not number of stuck points, p = .792, was associated with CAPS-5 severity scores across baseline and follow-up measurements. Age and gender were not associated with PTSD outcomes, but higher baseline depressive symptom severity was associated with higher overall PTSD symptom severity (see Table 2).

Post hoc examinations of assimilated and overaccommodated stuck points separately indicated that, similar to overall stuck points, neither number of assimilated (M = 31.39, SD = 29.78) nor overaccommodated stuck points (M = 38.24, SD = 27.06) was significantly associated with PCL-5, assimilated: p = .869, overaccommodated: p = .794, or CAPS-5 scores, assimilated: p = .359, overaccommodated: p = .492, across assessments. However, belief in both overaccommodated stuck points, B = 0.19, p < .001, and assimilated stuck points, B = 0.11, p < .001, was associated with PCL-5 across treatment and follow-up time points. When examining CAPS-5 scores, belief in overaccommodated, B = 0.10, p = .018, but not assimilated stuck points, p = .998, was associated with PTSD severity over time.

The inclusion of the PTCI as a time-varying covariate in follow-up LMM analysis indicated that both stuck point belief strength, p = .534, and number of stuck points, p = .352, were no longer significant, though PTCI was significantly associated with PCL-5 over time, B = 0.20, p < .001, R^2 = .30. This was also true when predicting CAPS-5 scores, with neither belief strength, p = .554, nor number of stuck points, p = .332, remaining significant after adjustment for PTCI score, though PTCI was a significant predictor of CAPS-5 score, B = 0.16, p < .001, R^2 = . 39. Thus, neither ISP belief strength nor number of ISPs accounted for a significant amount of variability in PTCI outcomes over time beyond GSP, as assessed using the PTCI. The lack of significant associations also held true when examining assimilated and overaccommodated stuck point types after adjusting for PTCI score in models predicting PCL-5, (ps = .550–.773), and CAPS-5 scores, ps = .218–.317.

DISCUSSION

This study examined whether participants' ISPs, tracked at the end of every other session, changed over the course of 1-week virtual massed CPT. We also investigated whether changes in ISP belief strength predicted PTSD symptom reduction at 1- and 3-months posttreatment. Finally, we tested whether changes in ISP beliefs accounted for additional variance beyond the PTCI, which was used to assess GSPs. Participants reported reductions of approximately 50.6% in their average stuck point belief strength throughout treatment and up to 1-month follow-up. This was expected based on the extensive literature on the effectiveness of Socratic dialogue, evaluations of GSPs using

measures like the PTCI, and the large PTSD symptom reductions in this study.

Changes in ISPs predicted PTSD symptom change. For each 20% average reduction in stuck point belief strength, participants reported a 5-point reduction on the PCL-5 when adjusting for age, gender, and baseline depressive symptom severity. Generally similar findings, though smaller in magnitude, were observed for changes in ISPs and clinician-rated PTSD severity. These findings align with the premise of CPT (Resick et al., 2024) and cognitive theory (Ehlers & Clark, 2000), which postulate that reductions in maladaptive beliefs produce symptom improvements. The findings also correspond with prior research demonstrating that reductions in trauma-focused beliefs are associated with decreases in PTSD symptoms (Brown et al., 2019). As such, tracking and updating ISPs during the last 5 min of every session could be a useful way to clinically assess patient progress and help predict overall treatment outcomes. When examining changes in assimilated and overaccommodated beliefs, only the latter was significantly associated with both outcomes. Changes in assimilated beliefs were only significantly related to self-reported PTSD symptom severity, which may be attributed to participants experiencing less distress (i.e., self-reported) even when their PTSD symptoms remained present (i.e., clinician-assessed symptom severity and functional impairment).

Total number of ISPs, even when broken into assimilated and overaccommodated stuck points, did not significantly predict self-reported or clinician-rated PTSD symptom severity. These findings are contrary to the notion that a higher number of negative beliefs could indicate a poorer prognosis. Therefore, clinicians should not perceive a high number of stuck points to be a negative predictor of treatment outcomes. Instead, having a higher number of stuck points provides the clinician and patient with a broader range of treatment targets and the opportunity to explore a number of different stuck points. Additional stuck points that cannot be addressed within the CPT timeframe should still be collected, as patients can always work on additional stuck points using homework assignments between sessions and after treatment completion. As we did not evaluate the quality of stuck points, we are unable to speak to the role stuck point quality plays. Given that the number of stuck points only accounted for 2% of the variance in self-reported PTSD symptom change over the course of treatment, it seems relatively safe to assume that the quality of the identified stuck points and the order in which they are addressed (i.e., assimilated before overaccommodated stuck points) are more important than the quantity (Farmer et al., 2017).

Notably, we found that ISP reductions, even when broken into assimilated and overaccommodated beliefs, no longer significantly predicted self-reported or clinician-rated PTSD symptom change when the PTCI was included in the model. Associations between ISP agreement and PTCI were quite large, with correlations between them reaching .77, $p < .001$, at follow-up. Though ISPs represent the stuck points explored during treatment, measures like the PTCI generally capture a much broader range of trauma-related cognitions. Clinicians do not expect to address every problematic belief during treatment; therefore, a GSP measure might better capture the beliefs left unexplored in treatment and, therefore, explain a greater amount of variance in PTSD outcomes. The results support that existing measures like the PTCI adequately assess the degree of unhelpful trauma-related cognitions. However, clinicians who do not employ standardized GSP measures can easily assess the strength of patients' specific stuck points in treatment to personalize assessment and make predictions about treatment outcomes based on those ratings.

The study had several limitations. The relatively small sample size may limit the generalizability of the findings. Moreover, the sample for this study was combined from two different randomized trials, one of which also involved a medical procedure. Although we controlled for the receipt of the medical procedure in the analyses, we cannot rule out the possibility that it impacted the delivery of CPT. Future studies should aim to replicate these findings in larger samples. Next, a majority of the sample identified as male and White, potentially limiting the applicability of the results to more diverse populations. It will, therefore, be important to test the same research questions in different populations. Finally, given that CPT was delivered twice per day, additional research is needed to determine whether the findings obtained here can be applied to more traditional (i.e., weekly) CPT delivery formats.

In conclusion, tracking and repeatedly rating ISPs can be a valuable clinical practice that can be used to predict treatment outcomes and may also enhance therapeutic engagement. In our experience, tracking ISPs encourages conversations with patients about specific beliefs that have changed or remained unchanged, as well as possible reasons for these change patterns. Clinicians who track ISP belief strength systematically are also able to quickly gauge possible treatment targets for homework assignments and in-session practice, focusing on ISPs with the highest belief strength. Given that this practice required less than 5 min per session yet provided substantial clinical and research data, we encourage clinicians to track ISPs toward the end of each session. Although ISP tracking did not add

anything to the ability to predict PTSD symptom severity when established measures like the PTCI were available, ISP tracking may allow for a reduction in the use of other measures, thereby decreasing assessment burden without compromising the quality of care or limiting research abilities. Future research should more closely examine whether the type of stuck points that were tracked and may have reduced— rather than simply tracking the total number and average belief strength changes—can further help improve PTSD treatment predictions.

OPEN PRACTICES STATEMENT

This study used data from two different ongoing preregistered clinical trials. Information about the trials can be found at on ClinicalTrials.gov under NCT05265039 and NCT05534126. Neither the data nor the materials have been made available on a permanent third-party archive; requests for the data or materials can be sent via email to the corresponding author at Philip_Held@rush.edu.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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