

Intentional External Scaffolding and Friction as a Novel Non-Pharmacological Behavioral Framework for Executive Dysfunction and Metabolic Health in Late-Diagnosed Neurodivergent Adults

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Method Article

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Additional Declarations: Competing interest reported. Dylan Kratochvil is the founder of Strength Protocol LLC and holds proprietary rights to the methodology described. No external funding was received for this work.

Abstract

Background

Adults with attention-deficit/hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) develop obesity and metabolic dysfunction at higher rates than the general population. It has been frequently observed that high-functioning neurodivergent adults have been subconsciously implementing external scaffolding as a coping mechanism. Even though evidence supports environmental modification and structured behavioral interventions for ADHD, there has yet to be a formalized program implementing intentional external scaffolding as a clinical intervention for metabolic management for this population.

Objective

This paper describes Intentional External Scaffolding and Intentional External Friction as novel, complementary behavioral intervention constructs designed to address the executive function gap in adults with obesity and co-occurring neurodivergence. This paper discusses the theoretical rationale for using intentional external scaffolding and friction as an intervention for obesity among neurodivergent individuals.

Methods

The framework was developed through a systematic process aligned with the United States Preventive Services Task Force guidelines for intensive behavioral weight management [26]. The development included personal experimentation, evidence synthesis, and clinical translation by a late-diagnosed ADHD clinician (age 33). The $n = 1$ development path is documented as a case study in accordance with SCRIBE 2016 reporting guidelines [25]. The University of Pennsylvania's Resiliency Program served as the framework for developing the modules utilized in the program. The Grief, Relief, and Belief Cycle [18] and the Bransgrove & Karakas (2025) identity framework were incorporated into the curriculum to be utilized as a post-diagnostic identity recovery.

Results

The Strength Protocol Program is a 17-chapter, 13-visit biweekly telehealth program consisting of three phases: Stabilization (Visits 1–4), Metabolic and CNS Rebuilding (Visits 5–8), and Integration (Visits 9–13). The core intervention components include structured resistance training for central nervous system regulation, high-protein nutrition, friction mapping, environment design, accountability engineering, and progressive identity reconstruction. The planned outcome includes tracking each of the included interventions to assess the effect of the interventions.

Conclusions

Intentional External Scaffolding and Intentional External Friction represent a novel contribution to the behavioral translation literature, formalizing what has been observed as an unconscious compensatory strategy among the ADHD and ASD populations into a deliberate clinical intervention. Data collection is planned from program inception to support future efficacy studies and peer-reviewed publication. This paper presents a theoretical framework and clinical protocol; no efficacy data are reported.

1. INTRODUCTION

Adults with attention-deficit/hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) undergo significantly elevated rates of obesity compared to neurotypical populations. The mechanisms causing this are well documented: dopamine dysregulation contributes to impaired executive function which cascades into many stacking symptoms leading to metabolic imbalance for example inadequate meal planning, impulse control, and exercise adherence; dopamine dysregulation drives compensatory food-seeking behavior; decision fatigue depletes the cognitive resources required for consistent health behaviors; and the metabolic cost of sustained social masking accelerates burnout and undermines lifestyle interventions [3, 21].

In traditional behavioral weight management programs, it is assumed that all patients have intact executive function. With the ability to preserve consistency through motivation alone, for adults with executive dysfunction, this amounts to a fundamental flaw: the intervention requires the very cognitive capacities that the population lacks.

Because of this assumption, there is a predictable pattern of program failure when adults with ADHD attempt these fitness programs. Initial dopamine-driven motivation declines as novelty fades and executive demands increase[28]. Each unsuccessful attempt reinforces internalized narratives of laziness, lack of discipline, and personal deficiency, thereby misattributing a neurobiological deficit to a character flaw [7].

Environmental modification and external structure have long been recognized as effective approaches for ADHD. Organizational skills training produces medium effect sizes compared to controls among pediatric populations [16]. Point-of-performance interventions — structural supports at the moment of behavioral execution — are a keystone of evidence-based ADHD management [4]. However, no existing program has formalized these principles into a named clinical intervention specifically designed for metabolic management in neurodivergent adults. The lack of any current research into this topic is what led to the development of the Strength Protocol Program.

This paper describes two novel, complementary behavioral intervention constructs: Intentional External Scaffolding and Intentional External Friction. It also details the Strength Protocol Program, a 6-month, biweekly, intensive behavioral weight management program developed based on these constructs for

adults with obesity and executive dysfunction associated with ADHD, ASD, and other neurodivergent conditions.

2. FRAMEWORK DESCRIPTION

2.1 Defining the Constructs

In contrast to compensatory scaffolding, which high-functioning neurodivergent adults develop unconsciously over time, intentional External Scaffolding refers to the deliberate, proactive construction of external structural routines, environmental cues, and behavioral systems intended to replace reliance on internal executive function. Intentional External Scaffolding in the Strength Protocol Program is engineered as a clinical intervention.

Intentional External Friction is deliberately engineering external obstacles to disrupt maladaptive behavioral loops before they begin. Instead of relying on inhibitory control, which is specifically impaired in ADHD, Intentional External Friction positions the intervention at the environmental level, making maladaptive behaviors more difficult to perform instead of requiring the individual to resist them.

Current non-pharmacological methods for treating ADHD include CBT, which teaches patients to restructure their thinking. Organizational skills training gives them the tools to manage tasks. Environmental modification adjusts their physical spaces [5, 16, 17]. These interventions have yet to be formalized into a named intervention for intensive behavioral weight management. Intentional External Scaffolding and Intentional External Friction were initially developed for that specific purpose for the ADHD and ASD population. The environment is engineered before the failure point.

2.2 Program Architecture

The Strength Protocol Program is a 17-chapter, 13-visit biweekly telehealth program structured in three phases:

Phase 1: Stabilization (Visits 1–4, Weeks 1–8), which establishes baseline behavioral architecture. There are four topics in this phase that address the CNS reset protocol (structured resistance training), Nutrition Simplified (the 30–30 Rule: 30–40g protein within 30 minutes of waking), The Presence Protocol (structured engagement systems), and Identity Recovery (initial psychoeducation on post-diagnostic adjustment). Clinical tools introduced include TDEE tracking, friction mapping worksheets, and the Non-Negotiables System. The goal of phase one is to get a baseline and start the disruption of the previous ADHD and autism masking identities.

Phase 2: Metabolic and CNS Rebuilding (Visits 5–8, Weeks 9–16) adds greater complexity to the intervention. Topics address ADHD Brain and Fitness, Sleep Optimization, the Dopamine Connection Motivation Cycle, Systems Over Motivation, Environment Design, Non-Negotiables, Accountability Engineering, and Burnout Architecture. Identity reconstruction prompts are mapped to the negotiation phase of the Bransgrove & Karakas (2025) framework. The goal of this phase is to deepen the

intervention complexity by building on the behavioral foundation established in Phase 1, targeting the neurobiological and metabolic mechanisms that drive executive dysfunction and metabolic health.

Phase 3: Integration (Visits 9–13, Weeks 17–26) is where the behavioral systems and identity consolidate. The topics in the phase address Dopamine Finishers, The 5 PM Wall, Tracking and Troubleshooting, Emergency Protocols, and the Integration Plan. Identity reconstruction prompts are mapped to the integration phase of the Bransgrove & Karakas framework and the Feeling Gratitude phase of the Grief, Relief, and Belief Cycle [18]. The goal of this phase is to solidify the new identity by unmasking and engineering intentional external scaffolding and friction to the point where they are almost unobservable in day-to-day life, and removing tasks that deplete executive function.

2.3 Specific Intervention Components

Included in this program are several formalized interventions designed to help improve executive function deficits. The interventions include either Intentional External Scaffolding or Friction, or both:

The CNS Reset Protocol utilizes structured heavy resistance training performed before noon and preferably by 5am; the reason behind a goal of 5 am is to help regulate the circadian rhythm. It targets catecholaminergic upregulation and BDNF-mediated prefrontal neuroplasticity. Weight training is a closed-skill, high-feedback exercise is selected primarily because it provides predictable, internally-paced, high-demand motor patterns that maximally engage the prefrontal-striatal dopaminergic circuits that are deficient in ADHD [12, 27].

The 30–30 Rule recommends consuming 30g or more of protein within 30 minutes of waking or after training. The primary clinical rationale is blood sugar stabilization and satiety, which reduces impulsive food-seeking behavior and supports consistent energy throughout the morning. While dietary tyrosine is a precursor to catecholamine synthesis [10], the specific claim that this timing meaningfully upregulates dopamine/norepinephrine in ADHD brains is mechanistically plausible but not yet validated in clinical trials. The intervention is retained for its demonstrated effects on metabolic stability and decision fatigue reduction.

Friction Mapping utilizes a structured worksheet in that patients use to identify maladaptive behaviors (left column) and desired behaviors (right column), then engineer increased friction for the former and decreased friction for the latter. Examples include phone lockbox protocols, countertop anchor systems, and the Clear Bin Protocol for visible protein snacks.

Environment Design: Systematic redesign of physical spaces through the utilization of intentional external scaffolding and intentional external friction to reduce executive demand. The Bunker concept, which involves a dedicated training space with zero setup, visible equipment, and sensory optimization, is formalized as a clinical intervention.

Accountability Engineering is implemented through the application of structured external accountability systems and progress reports sent to referring providers at weeks 8, 16, and 26.

The program integrates the Grief, Relief, and Belief Cycle and the Bransgrove & Karakas (2025) identity framework on a chapter-by-chapter basis, help participants map post-diagnostic emotional adjustment to specific program phases [6, 18].

3. MECHANISTIC RATIONALE

3.1 Atomoxetine Neuroadaptive Trajectory

My framework of Intentional External Scaffolding and Intentional External Friction was developed during a time when I was in a window of convergence in which, I a late-diagnosed ADHD adult (age 33), had simultaneously started atomoxetine (initiated December 19, 2025) and began participating in structured heavy resistance training (initiated January 26, 2026). Research shows that atomoxetine produces progressive neuroadaptive effects that continue to increase through 26 weeks, with two response clusters exhibiting gradually increasing trajectories that had not plateaued by 24 weeks [7, 29].

Participants may be concurrently receiving pharmacotherapy managed by their prescribing provider, the framework was developed during a period of concurrent atomoxetine use, which is documented here for transparency, not as a program component.

3.2 CNS Loading and Prefrontal Engagement

Compound resistance training was selected as the primary movement intervention because of its structural properties as an exercise modality, not because of any single neurotrophic mechanism. Physical exercise produces the highest average effect size of any non-pharmacological intervention category for executive function in ADHD, and closed-skill exercise specifically has been shown to produce the largest improvement in ADHD core symptoms ($SMD = -0.83$), whereas open-skill exercise did not reach significance [12]. Closed-skill modalities such as heavy compound lifting are predictable, internally-paced, and high-feedback: they impose high-demand, repeatable motor sequencing that engages the prefrontal-striatal circuitry that is deficient in ADHD, with minimal decision load and immediate performance feedback.

It should be noted that chronic elevation of resting brain-derived neurotrophic factor (BDNF) has been demonstrated primarily with aerobic modalities; resistance training reliably produces acute BDNF elevation but has not consistently shown sustained increases in resting concentrations [9]. This does not undermine the selection of resistance training, because the rationale here does not rest on chronic BDNF elevation. Resistance training was chosen for its closed-skill, high-feedback, internally-paced properties and its engagement of prefrontal-striatal circuitry [12], with any acute, exercise-induced neuroplastic effects treated as complementary rather than foundational [27].

Framed this way, the mechanistic overlap with atomoxetine is described at the level of convergent prefrontal engagement and catecholaminergic modulation rather than a shared chronic-BDNF pathway. Both approaches are proposed to support prefrontal function through partially overlapping

catecholaminergic and prefrontal-activation effects, but by distinct routes — pharmacologic in the case of atomoxetine, and behavioral/exercise-induced in the case of the CNS Reset Protocol.

Consistent with a dose-dependent relationship between exercise and executive function, a dose-response meta-analysis identified optimal long-term weekly exercise doses for specific executive function domains: 1100 METs for cognitive flexibility, 1300 METs for working memory, and 2500 METs for inhibitory control [22]. These targets inform training-volume progression across the program phases.

3.3 Working Memory as the Central Deficit

One of the most commonly documented deficits of ADHD is the working memory deficit. A head-to-head randomized trial demonstrated that atomoxetine significantly improved spatial working memory, spatial short-term memory, sustained attention, and spatial planning at 8–10 weeks, with significantly greater efficacy than methylphenidate in spatial planning specifically [20]. The BRIEF-A confirmed significant improvement in the Working Memory, Plan/Organize, Inhibit, and Task Monitor subscales under atomoxetine [1]. NIRS imaging demonstrated that atomoxetine enabled patients to activate the right DLPFC during executive function tasks—a region that had not been properly activated before treatment [24].

3.4 The Unmasking Variable

Masking is associated with significant mental health burden and executive function demands. Research indicates that camouflaging is correlated with executive function, though the causal direction—whether camouflaging depletes executive bandwidth or whether those with executive difficulties feel greater pressure to camouflage—is not yet empirically established [13, 23]. The theoretical construct that progressive unmasking frees cognitive bandwidth for executive tasks is clinically plausible and consistent with patient reports, but should be considered a hypothesis for future validation.

4. N = 1 CASE STUDY

In accordance with the SCRIBE 2016 reporting guidelines, this case study documents the evolution trajectory [25].

4.1 Participant

A 33-year-old male Family Nurse Practitioner (MSN, NP-C) with 4 years of geriatrics experience managing a 76-bed long-term care facility, prior psychiatric RN experience (Avera Behavioral Health Geriatric Unit), Army National Guard service with training in the University of Pennsylvania's Master Resilience Program, and a minor in psychology (motivational theory and evolutionary psychology). Diagnosed with ADHD (inattentive type) at age 33 after more than 10 years of unsuccessful weight loss programs and abandoned fitness routines. Family history significant for four generations of suspected or confirmed neurodivergence (son, self, mother formally diagnosed ADHD, maternal grandfather

suspected). Three-generation family history of Alzheimer's disease (great-grandmother, both maternal grandparents).

4.2 Intervention Timeline

In June 2025, I had the belief that I either had ADHD, ASD, or both, and began personal experimentation with evidence-based non-pharmacological interventions and documenting what was effective at managing my symptoms and what was not beneficial. In September 2025, I was formally diagnosed with ADHD inattentive type. On December 19, 2025, I began initial pharmacological treatment with atomoxetine. I began Structured heavy CNS loading with a focus on deadlifts and other compound lifts to initiate the "CNS reset" on January 26, 2026. May–June 2026, I developed and revised the full 17-chapter clinical curriculum, student guides, workbooks, and *The Rebuild: A Journal For The Ones Who Weren't Supposed to Figure it out*. It was during this time that I realized I was implementing Intentional External Scaffolding and Intentional External Friction and formally integrated the terms into my guides and workbooks as well as aligned my results with the post-diagnostic identity reconstruction module developed and mapped to evidence-based frameworks where appropriate. I then launched Strength Protocol LLC June 1, 2026.

4.3 Observed Outcomes (Self-Report)

While I lost minimal weight, starting at 228 pounds I had significant changes in body composition. It is worth noting I have not utilized a DEXA scan and have only had access to Bioelectrical Impedance Analysis (BIA) with 8 sensors. BIA has known accuracy limitations, particularly in individuals with high muscle mass, and may overestimate muscle mass by approximately 2% in muscular individuals. The body composition changes reported here should be interpreted as directional trends rather than precise measurements. DEXA validation is planned for future participants. Since January 26, 2026 by BIA, I have gained 15 pounds of muscle while losing 20 pounds of fat, my visceral fat reduced from 15 to 10, waist circumference reduced from 41 to 37 inches. This is the lowest body fat and highest muscle mass that I have had since college. Cognitive: Resolution of chronic headaches, elimination of processing lag for spoken information, subjective experience of "the world going quiet," return of humor and social engagement, enhanced puzzle-solving ability. I have observed increases in executive function and cognitive ability evidenced by the completion of a 17-chapter clinical curriculum, 17 student guides, 17 workbook sections, a book manuscript, provider outreach infrastructure, and private practice launch within approximately 60 days. I was able to maintain my systematic interventions through a nine-day family vacation without requiring a "restart" upon return. My Intentional External Scaffolding and Intentional External Friction withstood the real stress of a family vacation. The intentional scaffolding was held without failing. Throughout this process, I have noticed experienced progressive unmasking with the return of my authentic personality traits, stimulating behaviors, and emotional engagement, and an alternation between the negotiation and integration phases of the Bransgrove & Karakas framework. Baseline BRIEF-A and CAT-Q scores were not obtained but are planned for future participants. The framework developer also serves as the $n = 1$ participant, introducing inherent bias. No control group is included, and the framework has not yet been tested with external patients. The data hypothesis, while

mechanistically plausible and supported by independent evidence for each component, has not been formally studied as a synergistic interaction. These limitations are acknowledged and will be addressed through the planned prospective data collection protocol.

5. PLANNED OUTCOME MEASURES AND FUTURE RESEARCH DIRECTIONS

This manuscript reports a single-subject ($n = 1$) Phase I framework development and case report; no data from other participants are included, and no prospective enrollment has occurred. The measures described below outline the intended evaluation plan for future study and are presented to demonstrate feasibility and intent, not as an active protocol.

Any future collection of participant data will be undertaken only after Institutional Review Board (IRB) review and approval, with documented informed consent and a data-privacy plan in place. Because the framework combines existing evidence-based practices into a structured, trackable intervention, a future protocol is anticipated to be well suited to expedited or minimal-risk review; however, no participant data will be collected until such approval is obtained.

Contingent on IRB approval, a future single-arm feasibility evaluation is envisioned in which outcome measures would be assessed at baseline and at the completion of each program phase (approximately visits 8, 16, and 26) with a 6-month post-graduation follow-up. Proposed measures include:

- Validated instruments (to be administered by the referring psychologist or psychiatrist, not by the Strength Protocol program): the CAT-Q, BRIEF-A, and WHOQOL-BREF.
- Body composition and anthropometrics: lean mass, visceral fat, waist circumference, and body weight, ideally with DEXA validation where available.
- Behavioral and engagement metrics: weekly presence ratings, adherence and visit-completion rates, and community-engagement frequency.
- Qualitative measures: identity-reconstruction reflections, masking inventories, and system stress-test logs, including self-identified phase within the Grief, Relief, and Belief Cycle.

Should feasibility be demonstrated, subsequent work could progress toward a prospective cohort study (target enrollment approximately 30 participants) and, ultimately, a randomized controlled trial.

Consistent with the ORBIT model, the present work represents Phase I (Define/Refine); the studies outlined here would constitute the Phase II (feasibility/pilot) stage and would each require their own ethics approval before initiation.

6. DISCUSSION

6.1 Novel Contribution

I am proposing that Intentional External Scaffolding and Intentional External Friction constitute a novel contribution to the behavioral translation literature. Although environmental modification, organizational skills training, and point-of-performance interventions are each well-established in the ADHD literature; there is no existing framework that has formalized these approaches into named, complementary constructs implemented as a unified, proactive clinical intervention for metabolic management in neurodivergent adults. The distinction between unconscious compensatory scaffolding, which high-functioning adults develop autonomously, and Intentional External Scaffolding, a deliberate and engineered clinical intervention, is the central theoretical contribution of this work.

6.2 Collaborative Care Model

I am developing the Strength Protocol Program as a non-pharmacological, non-diagnostic adjunct to existing psychiatric and psychological care. My program does not manage medications or provide psychiatric diagnoses. This follows a collaborative care model where the Strength Protocol Program provides intensive behavioral weight management through Intentional External Scaffolding and Intentional External Friction, while the referring psychologist provides identity and emotional processing, environmental engineering, and metabolic intervention. Evidence supports collaborative care interventions, which have been shown to nearly double treatment initiation rates when compared to the standard referral (99.4% vs. 54.2%). It has also been observed to increase treatment completion rates by six times (76.6% vs. 11.6%) [14]. It is important to acknowledge the limitations of this study Kolko et al., 2014, as it was done on a pediatric population. However, the core principle — that collaborative care models improve treatment initiation and completion — has been consistently supported across populations and is not inherently age-dependent. The COMPAS trial demonstrated that combined multimodal treatment produced the largest improvements in ADHD symptoms, with effects maintained at 1.5-year follow-up [15].

6.3 Gamification and Community Engagement

My program utilizes a tiered community platform (currently Skool, with planned migration to a proprietary Canvas Medical-based system) with progressive content unlocking, community challenges, and weekly group resiliency sessions that will provide training on the modules of the University of Pennsylvania's Resilience Program. Gamification is the application of game mechanics and design elements to non-game contexts to increase engagement, motivation, and participation. It produces a small-to-medium effect on physical activity behavior change (Hedges' $g = 0.42$) across RCTs, with effects persisting at follow-up [19]. People with ADHD and autism absolutely do want and benefit from community and social support — the misconception is that they don't want connection, when the reality is they struggle with the mechanics of accessing it. Social support and shaping knowledge show the strongest associations with sustained engagement in digital health interventions [11]. A dose-response relationship between engagement frequency and clinical outcomes has been confirmed in longitudinal analyses [2].

6.4 Limitations

This paper presents a framework at the earliest phase of behavioral translation research (Phase I: Define/Refine per the ORBIT model) [8]. The $n = 1$ case study, although documented and aligned with SCRIBE 2016 guidelines, does not provide efficacy evidence. The framework developer also serves as the $n = 1$ participant, introducing inherent bias. No control group is included, and the framework has not yet been tested with external patients. The data hypothesis, while mechanistically plausible and supported by independent evidence for each component, has not been formally studied as a synergistic interaction. These limitations are acknowledged and will be addressed through the planned prospective data collection protocol.

6.5 Future Directions

My immediate next steps include collecting prospective data from the first patient cohort and using the outcome measures described above, with a target goal of 30 patients. I then plan on using the data collected from my practice to explore the overlap between the Strength Protocol Program interventions and benefits, if any, on long-term cognitive health outcomes, given the elevated dementia risk in ADHD populations. This manuscript represents the initial preprint publication of the framework, with a formal peer-reviewed submission planned following prospective data collection.

Declarations

Ethics approval:

Not applicable.

CONFLICTS OF INTEREST

The author, Dylan Kratochvil, is the founder and sole proprietor of Strength Protocol LLC, which delivers the intervention described in this manuscript. The author holds proprietary rights to the Strength Protocol methodology, including Intentional External Scaffolding and Intentional External Friction.

Competing Interests

Dylan Kratochvil is the founder of Strength Protocol LLC and holds proprietary rights to the methodology described. No external funding was received for this work.

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Author Contribution

Dylan Kratochvil conceived the Intentional External Scaffolding and Intentional External Friction constructs, designed the Strength Protocol Program framework, conducted the systematic literature review and evidence synthesis, developed the 17-chapter clinical curriculum and intervention components, performed and documented the n=1 case study in accordance with SCRIBE 2016 guidelines, and wrote the entire manuscript. D.K. reviewed and approved the final manuscript.

Data availability statement:

All data generated or analyzed during this study are included in this published article.

Consent to participate: Not applicable.

Consent to publish: Not applicable.

Clinical trial number: Not applicable.

Competing interests: The author declares the following competing interests: Dylan Kratochvil is the founder of Strength Protocol LLC and holds proprietary rights to the methodology described. No external funding was received for this work.

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