SHOW NOTES

The Missing Manual for Constraint Design

The Missing Manual for Constraint Design

Episode 3 | Season 3 | *Coaching Research To Results Podcast*

EPISODE AT A GLANCE

Paper	Adding texture to the art of constraints-led coaching: A request for more research-informed guidelines
Author	Kennedy, A., & O'Brien, K. A
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THE THREE STICKY IDEAS

These are the labels to remember from this episode. They are designed to stick with you long after the research fades.

The Missing Manual.

The constraints-led approach asks coaches to become 'ecological designers' who shape task, environmental, and individual constraints rather than dictate movement solutions. But the current guidance stops at 'manipulate, watch, reflect, adjust': it names the goal without offering a practical process for choosing which constraints to use and why.

Noise or Signal?

Under the constraints-led approach, athlete errors are treated as productive rather than something to correct immediately, and coaches are encouraged to hold back and let self-organisation happen. The research does not yet explain how to tell whether an error is normal variation that will resolve on its own, or a sign that the constraint design needs to change, or that the athlete needs guidance.

Bad Habit in a Good Disguise.

Because self-organisation can strengthen unhelpful movement patterns just as easily as good ones, some 'undesired skills' emerge that look adaptive in the moment but cause problems over time, such as turnovers or lost possession. Telling a still-developing solution apart from a harmful habit requires sport-specific judgement, and the research does not yet offer coaches a framework for making that call or which constraints might help unwind it.

TWO ACTIONS FOR TOMORROW

Take one or more of these actions into your next coaching session.

To build your constraint menu

Spend fifteen minutes building a Constraint Menu: a personal, sport-specific inventory of task, environmental, and individual constraints organised by the outcomes each tends to produce. Having this searchable list ready means a coach can reach for a relevant constraint in the moment rather than guessing, and can track what has been tried and what worked.

To run a constraint audit on one session

After a session, spend five minutes running a Constraint Audit: note which constraints were used, any moment a verbal intervention felt necessary, and what one constraint you would change next time. This habit builds a personal evidence base and is exactly the kind of applied documentation the paper argues the field needs more of.

RESEARCH REFERENCE

Primary Source: Kennedy, A., & O'Brien, K. A. (2024). Adding texture to the art of constraints-led coaching: A request for more research-informed guidelines. Sports Coaching Review.

Counterpoint Sources:

Ferguson, C., Carson, H. J., & Collins, D. (2023). Skill execution errors: An "it depends" perspective on their role, type and use when coaching for player development in sport. Sports Coaching Review, 1-18. doi:10.1080/21640629.2023.2263268

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- Full episode library: thecoachdeveloper.com
- Show notes: thecoachdeveloper.com/coaching-research-to-results-podcast-notes
- Subscribe and leave a review on Apple Podcasts, Spotify, or your preferred platform

Share this episode with one coach this week, since that's how research actually travels.

SHOW NOTES

FULL EPISODE TRANSCRIPT

The following is the complete script for this episode of *Coaching Research To Results*.

Cold Open

Here's a question I want you to think about for a minute. Have you ever read about constraints-led coaching, or been on a course about it, or heard a keynote about it...and walked away thinking: okay, that all makes perfect sense. And then you stood on the training pitch and thought: “so... what exactly do I do?”

You changed the field size. You added a rule. You took a player out. And you watched what happened. And sometimes it was brilliant. And sometimes it wasn't. And you weren't entirely sure why, in either case.

If that sounds familiar, YOU are not the problem. Today's research has something important to say about that uncertainty...and it might make you feel considerably better about the fact that you've been improvising.

Intro and Show ID

The Paper

The paper is called, "Adding Texture to the Art of Constraints-Led Coaching: A Request for More Research-Informed Guidelines," published in Sports Coaching Review in August 2024. The lead author is Andrew Kennedy from the School of Human Movement and Nutrition Sciences at the University of Queensland, and his co-author is Katherine O'Brien from Queensland University of Technology. Both are researchers who work at the intersection of ecological dynamics, skill acquisition, and sports coaching.

This paper grew directly out of a gap they kept seeing in the constraints-led literature: coaches are told that the approach works, and broadly it does, but the research has been slow to answer the specific applied questions that coaches face every single day on the training ground. Kennedy and O'Brien sat down to name those questions out loud, and to ask the research community to start answering them.

Big Idea #1

The big idea could be called "The Missing Manual."

Here's the situation. The constraints-led approach - the idea that coaches should shape the training environment rather than dictate movement solutions - is genuinely compelling, and the research base behind it is growing. Coaches are supposed to become what the literature calls "ecological designers": people who adjust task constraints, environmental constraints, and individual constraints to allow athletes to find their own best movement solutions.

The three constraint categories, by the way, are worth naming clearly because they're the tools you're working with. Task constraints are the rules, the scoring system, the equipment, the size of the space, the number of opponents, the time pressure. Environmental constraints are things like the surface, the weather, the crowd noise, the physical layout of the training facility.

Individual constraints are the athlete's physical characteristics, fitness and fatigue levels, emotional state, prior experience, and skill level. All three interact constantly.

Now, Kennedy and O'Brien's argument is this: the theory is excellent, but the practical guidance hasn't kept pace. The current advice for coaches amounts to, “manipulate constraints, watch what happens, reflect, adjust”. Which is fine as a starting point. But it's NOT a manual...it's more like telling someone to "just cook something" and then expecting a gourmet meal.

The constraints-led approach tells you what to cook but doesn't give you the recipe.

So, here's the question for your own coaching: when you design a session using modified games or constraint adjustments, how confident are you that you know why you're choosing those specific constraints? And if it's not working, do you know what to change?

Ideas #2 and #3

Call this one "Noise or Signal?"

Every athlete makes errors. A swimmer who keeps dropping their elbow in the catch phase. A football player who always looks down when receiving the ball. A basketball player who tends to jump before looking to pass. Under traditional coaching, these errors are things to correct directly: you see it, you name it, you fix it.

Under the constraints-led approach, errors are reframed as productive instabilities: the athlete is working out the movement problem, and errors are part of that process. The coach is encouraged to hold back and let the athlete self-organise. And there is real wisdom in that. Over-coaching errors can make athletes dependent, anxious, and mechanical.

But here's what Kennedy and O'Brien point out: the CLA literature is very quiet about what happens when the error doesn't resolve itself. When is an error just natural variation that will settle down on its own, and when is it a sign that the constraint design isn't working, or that the athlete genuinely needs some form of guidance? Right now, coaches are left to figure that out alone. The research hasn't given them a decision framework.

Think about a field hockey example: a player who dribbles with their head down and can't see their teammates or the space around them. Should the coach wait? Should they redesign the task so the player is forced to look up? Should they say something? The CLA doesn't give you a clear answer. That's the gap.

Call this one "Bad Habit in a Good Disguise."

Related to errors but distinct from them: sometimes athletes develop movement patterns that look like adaptation but are quietly causing problems. The constraints-led framework calls these "undesired skills" and it acknowledges they exist. But again, it's not very clear about what to do with these errors.

The reason that this matters is that once a movement habit forms, it is very difficult to change. And the process of self-organisation that the CLA relies on can strengthen bad habits just as easily as good ones. The athlete is self-organising: they're just organising themselves in the wrong direction.

The basketball example from the paper is a good one. A player who jumps first and then looks to pass is making a movement decision that sometimes works -- they might complete the pass successfully. So, by the framework's logic, this could be interpreted as a functionally adaptive response to defensive pressure. But more often it leads to turnovers, and the longer it's left, the more deeply grooved it becomes.

Here's what's genuinely tricky about this. To tell the difference between "the athlete is still finding their solution" and "this is becoming a harmful habit," a coach needs knowledge of the sport, the athlete's developmental stage, and the specific performance context. The CLA research doesn't yet offer guidance on how to make that call or, critically, a list of constraint manipulations that might specifically help unwind it.

The constraints-led approach says trust the process. But what do you do when the process is producing the wrong answer?

The Counterpoint

Now, let's bring in some contrasting evidence.

The critique in today's paper could leave you thinking that the constraints-led approach doesn't offer coaches any practical tools at all, and that's not quite fair. Renshaw, Davids, Newcombe, and Roberts -- whose 2019 book is essentially the practitioner bible for the CLA -- developed the GROW model: a structured reflection process that asks coaches to identify their Goals, the Reality of the athlete's current level, the Options available in terms of constraints to manipulate, and the Way Forward. It's a genuinely useful framework.

So the counterpoint is this: the tools exist. The GROW model works. Representative learning design works. The question Kennedy and O'Brien are raising isn't that nothing is available -- it's that what's available doesn't go far enough for the specific, messy, real-time decisions coaches have to make.

The Anecdote

Recently, I was working with a coach who was relatively new to the constraints-led approach. He came to me frustrated about what he perceived to be ineffective use of it. He had been to a CLA workshop, and then read a bunch of resources, and genuinely wanted to implement it in his practices. But when he sat down to plan his next session, he had a list of things he could “theoretically” constrain and no way to know which constraints to choose.

He related, "I know the theory. But, I don't know how it translates to the session plan."

I helped him build up a menu of constraints, that is, a personal inventory of task, environmental, and personal constraint options, organised by the outcomes each constraint was likely to produce.

Then we did a brief analysis of his last game and identified two main areas to work on in the next practice. Based on the outcomes we wanted to chase, we went back to the Constraint Menu and selected two constraints to help direct the design of the game. In this case, we changed the physical environment by shrinking the size of the playing area to force more pressure on the attacking team and we slightly changed the task by forcing attackers to score from a particular area; this forced the attackers to work out a new way to get into that area before being able to score.

By all reports, the practice went well. It was just connecting the step between knowing the outcome and choosing the right constraint to chase the outcome that the coach was looking for.

Two Actions

Action one is to build your Constraint Menu. The paper's core argument is that coaches currently have to guess which constraints to use. Here's an action that begins to change that.

Before your next session, take fifteen minutes and write out a constraint menu -- not for the specific session, but for your sport in general. Organise it under the three headings from the framework: Task constraints, Environmental constraints, Individual constraints.

I've provided a list of constraint examples, in the show notes that you can adapt to your sport and context.

Your goal is not to use all of these today. Your goal is to have a searchable list you can go to when you notice something in a session and want a constraint to shape it. Once the list exists, you can start tagging which constraints you've actually tried, and what happened. Over time, that becomes your personal evidence base.

Action two is to run a Constraint Audit on one session. At the end of the session, take five minutes to write down answers to three questions: One -- what constraints did I use today, categorised as task, environmental, or personal? Two -- was there a moment where I felt the need to intervene verbally because the constraint wasn't producing what I wanted? And three -- if I could change one constraint for next session, which one would it be and why?

This is about building the reflective habit of noticing what you're actually doing when you're designing constraint environments. The paper's argument is that coaches need more applied guidance and part of building that guidance is coaches like you documenting your own applied practice.

Close

So let's bring it back together.

Kennedy and O'Brien aren't asking you to abandon the constraints-led approach. They love it. But they're naming three real problems that the research hasn't fully solved: coaches need better guidance on reading errors, on recognising harmful habits before they become permanent, and on selecting constraints intelligently rather than guessing.

The big idea today was "The Missing Manual." The constraints-led approach is a genuinely powerful framework. But right now, it asks coaches to improvise in situations where a bit more structure would go a long way.

Here's the sharpest thing I want you to take away: the environment is the teacher -- but someone still has to design the classroom. And designing it well is a skill that needs its own manual. That manual is still being written. Today's paper is one of the voices asking for it to be finished.

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