CogniFind Rock Paper Scissors: A Research Rationale for Educators

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I. Introduction: Purpose and Scope

A game of Rock Paper Scissors looks, on its surface, like ten minutes of harmless fun before a transition or after a long stretch of seatwork. That surface reading is not wrong, but it undersells the thinking behind it. This paper exists to make that underselling unnecessary, by walking through four design choices built into the CogniFind version of the game and connecting each one to a body of developmental research describing the kinds of experiences associated with related cognitive and social processes in childhood.

Two boundaries matter before anything else. First, CogniFind activities are built for cognitive-skill engagement rather than content-standards alignment, and this paper does not claim the game teaches mathematics, reading, or science content, because it doesn't. Second, and just as important, this paper does not claim that playing this game develops, builds, or teaches any of the cognitive or social capacities it discusses. The research cited here describes processes that emerge and change over the course of childhood, and describes types of experience that researchers have associated with those processes. It does not claim that a single game, or any specific amount of play, causes a change in a child's underlying capacities. What follows is a more modest and, we think, more defensible case: that four specific features of this game were designed with an eye toward research on these developmental processes, and that a teacher running the game with that research in mind may be better equipped to understand what a child is doing and why it might matter, without any promise being made about outcomes.

II. Design Choice: The Hidden Count and the Structured Wait

Ask any teacher what the hardest part of early childhood is to manage, and impulse is usually somewhere on the list. Children reach before they think, answer before they're called on, and move before the signal says go. The count in CogniFind Rock Paper Scissors, three, two, one, SHOOT, is built around this tendency, and it is worth understanding in light of the research on how this kind of self-regulation develops, without treating the game itself as a training device.

Diamond (2013) describes executive functions as the mental processes that make possible the deliberate pause before acting, including inhibition, broadly defined as the capacity to resist temptation and hold off on an impulsive response, alongside working memory and cognitive flexibility. The structure of the count resembles this kind of moment: the child's hand is free to move during the three beats, but the throw itself waits for the signal. Nothing in the rules physically prevents early movement, so any discipline in the waiting comes from the child rather

than the mechanics of the game. We would characterize the count as an opportunity that resembles the kind of moment this research describes, rather than as evidence that the game itself builds this capacity.

Diamond's review also notes that this capacity develops gradually and unevenly across early childhood, which is relevant to how a teacher might think about a five-year-old who throws early compared with a nine-year-old who doesn't. The count likely represents a different kind of ask for those two children, even though the game looks identical for both, and this developmental variability is part of why CogniFind positions the game across the full Pre-K through grade five span rather than assuming a single age is the right fit. Lee and Carlson's (2015) work on preschoolers adds a related observation: it examines this kind of self-regulation not as an abstract lab measure but as something that shows up inside an actual decision a child has to make, which is a useful frame for thinking about what a child may be doing at the moment the count reaches SHOOT, though again, the study does not speak to what any particular game accomplishes.

Power and Chapieski's (1986) home-based study of eighteen toddlers offers a further, complementary way of thinking about this capacity. The study operationally described self-regulation of this kind as the nonmanipulation of an object once a caregiver had designated it off-limits, and found that mothers placed demands on their infants for this kind of restraint beginning in the second year of life, with these demands typically enforced promptly and consistently. This paper does not extend the study's findings about discipline style into any claim about classroom practice, and the study says nothing about games of any kind. What it does offer is a useful way of framing self-regulation generally: not as a fixed trait a child either has or lacks, but as something situational, tied to a specific external cue in a specific moment. That framing is a reasonable lens through which a teacher might view this game, without implying that the game is doing the same thing the study measured.

III. Design Choice: A Truly Chance-Determined Outcome

The single most important design decision in this game happens before the child even reaches the front of the room. The board locks in its own throw the instant the facilitator presses Begin, before the child has thrown anything at all. Neither side can see or react to the other. This detail matters because it is what allows the game to be framed, honestly, as one where nothing the child does can be judged as wrong.

Understanding why that framing can be offered honestly requires looking at how children's thinking about chance changes over time. Pawsey, Bauman, Ozlu, Denison, and Friedman (2025) studied how children aged four to seven think about the difference between skill-based and chance-based activities, examining whether children treated a person's past success as predictive of that person's future success. They found that from around age five, children increasingly treated past success as more predictive of future success for skill-based activities than for chance-based ones, suggesting a developing understanding that a chance outcome does not reliably indicate anything about what will happen next.

This finding is worth sitting with rather than smoothing over, because it cuts two directions. It suggests that many children are capable of grasping the idea that a chance outcome doesn't reflect on them, and grasping it earlier than adults might assume. It also suggests that a child at

the younger end of the Pre-K band may not yet hold this understanding as firmly as an older child will. For that younger child, a facilitator's spoken reassurance, "you couldn't have known what the board would pick," may be doing meaningful work by supplying, in words, a piece of reasoning the child may not yet reliably supply on their own. We frame this as a possibility supported by the research rather than a guaranteed effect of saying the line.

The emotional dimension of this is informed by Weiner's (1985) work on attribution. Weiner identified several explanations people commonly offer for success or failure, including ability, effort, task difficulty, and luck, and described how the explanation a person settles on for an outcome relates to the emotion that tends to follow. An outcome attributed to luck is associated with a different, generally lighter, emotional response than one attributed to a lack of ability. This offers a plausible account of why the game's structure may function as a lower-stakes way to encounter losing: because the board's throw is genuinely unknowable and unaffected by anything the child does, an ability-based explanation for a loss is harder to reach for. We describe this as a reasonable inference from the research, not as a demonstrated outcome of this specific game.

IV. Design Choice: Whole-Class Shared Focus

Only one child plays at a time, and that structural choice is often the first thing a visiting administrator questions: why not pair students up so everyone gets more turns? The reasoning behind it relates to a different kind of shared experience than individual repetition would provide.

Tomasello (1995) describes joint attention, the shared focus of two or more people on the same external object or event, as a process associated with early social and language development. A relevant distinction in this research is between attention that is merely parallel, where people happen to be looking at the same thing, and attention that is genuinely joint, where the shared focus is coordinated and mutually understood. The class calling out the count together with the board, watching the same throw land, and reacting together to the reveal resembles the latter more than the former. We offer this as a design rationale grounded in that distinction, not as a claim that the format produces joint attention in a measurable sense every time the game is played.

This is also part of the reasoning behind the child facing away from the board. A child watching the screen directly could react to the board's throw rather than commit independently to their own, which would undercut the fairness rationale described in Section III. Facing the class instead keeps the child's attention directed toward the classmates calling the count, which is the orientation the joint-attention framing above depends on.

V. Design Choice: The Optional Prediction Beat

Steps eight and nine are the one part of this game a teacher can skip without changing anything else, and that optionality is intentional. The prediction beat, in which classmates silently guess what a child will throw next based on the history strip of that child's past throws, touches on

something more involved than anything discussed so far: reasoning about what another person is likely to do based on an observed pattern of their behavior.

Wellman and Liu (2004) studied how children's understanding of other people's mental states, including desires, beliefs, and knowledge, develops in a consistent sequence across early childhood, such that a child who succeeds on a later task in this sequence has almost always already succeeded on earlier ones. This body of research describes, broadly, how children come to reason about what is happening in someone else's mind and to use that reasoning to anticipate behavior. We would describe the prediction beat as touching on this general area of development, rather than as an application or test of it. Wellman and Liu's tasks involve desires, beliefs, and knowledge in structured scenarios; guessing a classmate's next throw from a pattern of rock, paper, and scissors is a more informal and different kind of task that this specific research did not examine. The connection offered here is to the broader developmental territory this research maps, not a claim that this task has been studied or validated in the same way.

VI. Bringing It Together: What the Research Does and Doesn't Support

It is worth closing with the same care this paper opened with. The research cited here describes developmental processes, self-regulation and waiting for a signal, children's evolving understanding of chance and its emotional consequences, joint attention, and reasoning about others' likely behavior, that are relevant to the four design choices described above. None of the cited sources studied this specific game, and none should be read as evidence that the game produces, builds, or teaches any of these capacities. What they offer is a way of understanding why each design choice was made with these developmental processes in mind, which we believe is more useful, and more honest, than a claim of effectiveness would be. A teacher running this game with a four-year-old and a teacher running it with a fourth grader are likely encountering meaningfully different developmental moments, even though the game itself looks the same for both, and the research above is offered as a way to notice that difference rather than to make any promise about what the game will do for either child.

VII. References

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