

Episode 25: Now That's Deep!

Show Notes

We examine the concept of levels of processing in this episode, that if you process an experience more deeply, you will remember it better. This comes into play in many aspects of gaming, for both players and designers.

Game References

Fog of Love, What Remains of Edith Finch, When I Dream

Research References

Craik, F. I., & Lockhart, R. S. (1972). Levels of processing: A framework for memory research. *Journal of verbal learning and verbal behavior*, 11(6), 671-684.

Transcript

Hello! This is Episode 25 of the Cognitive Gamer podcast. I am your host, Dr. Stephen Blessing, a professor of psychology at the University of Tampa. I use games to both explain and explore concepts in psychology, particularly cognitive psychology. In this episode we're going to discuss a powerful, yet straight-forward concept, something referred to as levels of processing. The original research on this was done by two researchers, Fergus Craik and Robert Lockhart back in 1972. You have probably noticed that sometimes you remember every aspect of a game and have no trouble recalling the rules or what transpired during a game. But, there are other times when you have struggled to recall what happened during the last play of a game. Why is it that sometimes things stick so easily in your mind, but sometimes things empty from your memory like a sieve?

There are multiple issues at play in these situations, but the one I would like to highlight now is levels of processing. Simply put, the more deeply you process something, the more likely you are to remember it. If you engage in an event like a game in a very superficial manner, you're not going to remember what happened nearly as much as if you engage in the event more fully. The classic demonstration of this, and one that I do in my classes often to great success, is to do a simple memory experiment. I read off the same list of 16 words to everyone, but I give some students one set of instructions and another group a different set of instructions before I read the list. I might tell the left half of the class that as I read the list, I want them to keep a running count of all the e's that are contained in the word list I am about to read. The right half of the class gets told to think about which of the items on the word list, they are all nouns, would be useful to have if you were stranded on a desert island. And that's it. Half the students are keeping a running tally of e's, so they can tell me how many total e's are within the words, and the other half are thinking about usefulness of each word so they can tell me what item they would like if stuck by themselves on an island. But again, everyone hears the same list of words. Once I've read the list, I then tell them I'm not really interested in how many e's or which item is most

useful, but how many words they remember total from the list. I then have them write down as many words as they can remember.

Which group do you think remembers the most words? They all heard the same words, and interacted with them in some form or another. It turns out that I get pretty similar results every time I do the demo. The group considering which item would be most useful on a desert island remembers about 2 more words than the group counting vowels. The vowel group usually remembers between 5 and 6 words, the desert island group between 7 and 8 words. Why the difference, do you think, and how might this impact game playing?

Simply put, the desert island group processed the words more meaningfully than the counting vowel group. In counting vowels, you are just interacting with the word in a more superficial, syntactical level. You just need to think about letter strings. But, with thinking about which of these words might be most useful on a desert island, you are interacting with the word in a meaningful, semantic way. You need to recall the actual definition of the word and think about it in context of being stranded. And, that makes all the difference. Even though they are the same words, the two groups will remember them differently because one group interacts with them in a deeper, more meaningful way. That's what levels of processing is all about. I think of it more as a continuum than as discrete levels, with anytime you process information more deeply, it will be remembered more. That was at the heart of what I was talking about back in Episode 10, when I was talking about the power of narrative. People remember stories because they are meaningful pieces of information, and you are able to process them and make many connections to the information as you store it in your long-term memory. For those in the desert island group, a similar thing happens, because they have to think about the meaning of each word. That allows them to create more connections and when I surprise them about needing to remember all the words, they are better off doing the task.

This notion of levels of processing is important in a variety of game playing situations, from learning the rules to setting up the game, to actually playing the game. My wife and I recently played *Fog of Love*, by Jacob Jaskov. I had heard about the cool way it comes, with the tutorial cards and the already made up decks. You just need to set it up according to the back page of the instruction manual, and then start reading the first tutorial card. It then steps you through the rest. Prior to being able to play it for the first time, I flipped through the rule book, wanting to get a jump on things. I imagine I could have learned it that way, but I'm reasonably convinced we learned the game faster using these bite-sized chunks of instructions that were presented when we needed them on the tutorial cards, which made them more meaningful. The next time my wife and I play, many of those instructional items will still be easily accessible in our memory, making our second setup and play of the game much easier than had we had to have slogged through the less meaningful instruction manual.

A relatively simple game that I really enjoy, both on a personal level but also from a cognitive psych point of view, is *When I Dream* by Chris Darsaklis. A round of *When I Dream* consists of one player, called the dreamer, closing their eyes. The other players then go through a set of words, giving a series of player generated clues for each word until the dreamer makes a guess, at which point play moves on to the next word. The other players have each been assigned a role prior to the start of the round, with some players being fairies, who want the dreamer to guess the

word correctly, and some players being boogeymen, who do not want the dreamer to guess the word. Other players are also sandmen, who will sometimes want to give good clues, but will sometimes want to give bad clues. The dreamer doesn't really know who's giving good clues and bad clues, but may figure it out as each player takes turns giving them a clue. Once the dreamer thinks they know the current word, they can guess, and the dreamer wants to get as many words as they can. That part of the game is cool enough, but then there's another little bit at the end, where the dreamer tries to remember the words they have guessed throughout the round. I always think of the counting vowel/desert island experiment during this part of the game. People with good memories can do quite well at this part, if they took a bit of effort at meaningfully encoding all of their guess, making levels of processing work for them. A lot of players though find this hard, because they haven't processed these words so deeply. They guessed the word, but then move on to the next one. Here the words are encoded in a shallow way, and not remembered at the end, just like those students who I told to count e's in the desert island experiment.

Levels of processing can be a useful thing to consider, for both game designers and players, as they approach a game. In general, people want to remember as much stuff as they can, and anything that a game designer can do to help players learn and play a game will be a great benefit. Make the rules and each part of the game meaningful, like the tutorial system of *Fog of Love* does, so that players do not forget those sorts of things. And for players, whenever you want to remember something, a rule or a gameplay element like a word in *When I Dream*, make it meaningful.

Levels of processing has been critiqued because ultimately it falls back on tautological reasoning: items that are processed in a more meaningful way are remembered better. But, how do we know what constitutes more meaningful processing? Well, we know that because when you engage in that processing the items are remembered better. That type of circular reasoning doesn't really help in scientific discourse. But, I think in a practical sense, it's pretty helpful. I believe we all, both you all as game players and me as a cognitive psychologist, have a gut level appreciation for what more meaningful processing means. Thinking about what items are useful on a desert island requires deeper interaction and retrieval of the actual meaning of the word than simply counting vowels. Or, in a role-playing game, having if the game master interacts with the players as they are describing a new location, having the players come up with some of the description or just having a bit of back and forth, that narrative is going to be better remembered than if the game master merely tells the players what they see.

As already indicated, we can see this practical application in a variety of different ways. One prominent way they show up, not only in game playing but in everyday life, is with all the mnemonic devices that people use to remember lists of words and information in general. All mnemonic devices work by making the to-be-remembered items more meaningful. To make another reference to Episode 10 when I talked about narrative, I mentioned the story method of remembering. Many people probably use this method without fully realizing what they are doing. As the name implies, to use this method you simply create a story out of the items that you want to remember. This automatically makes the information more memorable, because you have created something that already is imbued with meaning, a story. I see people do this spontaneously when trying to recall all the words at the end of a round of *When I Dream*,

because they actually did create a little dream, a story, about all the words they called out as guesses. It's a very effective strategy due to levels of processing.

Another common mnemonic device that also follows levels of processing is the link method. As the name suggests, to remember items on a list, you need to link them together. Perhaps visualize them together, or create some sort of association between the items. That is going to require you to access the meaning of the words to be linked or chained together, thereby making them more memorable. There are a variety of other mnemonic devices, and perhaps I will do a whole podcast just on them at some point, but they all have at their core the same thing that the idea of levels of processing promotes, that to make an item memorable, you need to create as many links and associations in memory as possible. To do that, you need to think about the semantic meaning of the to-be-remembered items, and many mnemonics also have a visual component to aid in the creation of those links.

All games have at least some memory component. At the very least, you have to remember the rules, and the more meaningfully those can be processed, the better off players will be. Most games also rely on memory to some extent as well during play, anytime you need to remember the state of the game from turn to turn. And again, the more meaningfully that state information can be processed, the better players will remember the game. That has implications for designers, game masters in a role-playing game, and players of any type of game. If you need to remember something from Time A to Time B, process the information meaningfully.

As a final example, I recently played through the game *What Remains of Edith Finch* by Giant Sparrow Games. I enjoyed it very much, particularly the tale and game play element that went along with Lewis Finch and his job at the fish cannery. It's a powerful game, and a very remarkable game. Part of the reason it's memorable is levels of processing. You are thinking about all of this information concerning the Finch family in a very meaningful, semantically-driven manner. And, not only are you thinking about it, you are also doing actions related to the story, which of course requires even more processing. Even though it's been a couple of months now, I can still remember my play experience quite vividly. I encourage you all to try out this game, *What Remains of Edith Finch*.

I have you have enjoyed and have gotten something out of this discussion of levels of processing. As I said at the beginning, it's a straight-forward idea, but has some very practical applications as you think about both playing and designing games. And, all type of games, including board, video, role playing, and card games. If you want your game to be memorable, make it meaningful.

As always, I welcome any comments or questions you may have, so please email me, steve@cognitivegamer.com and also visit my website, cognitivegamer.com. Also, you can like me on Facebook, Cognitive Gamer, or follow me on Twitter, [@cognitive_gamer](https://twitter.com/cognitive_gamer). Until next time, remember to think about what you play, and have fun doing it.