(15 pts 30-45 minutes) Now propose, briefly, three ways to redesign one aspect of the game Concentration so that it is easier (but still fun) to play, for people of a younger age or with cognitive impairments. Use ideas from class around cognitive psychology, ambient awareness, tangible interfaces, and so on to justify your design ideas. Sketch if it's useful. Note that this question is not about making Zdaily's version more usable, so you shouldn't feel constrained by the problems you found. Surfing for other versions of Concentration on the web might be useful for inspiration.

1. If an incorrect pair of blocks is chosen, those blocks should visibly glow for a several turns. The glow will start off bright and then dim every turn that they are not clicked. This design provides novice users with more awareness about their previous actions without compromising the spirit of the game. Clues to previous turns will remind novice users of the context of their actions. This helps easily distracted children with recovering from a loss of activation if interrupted. Contrast between glowing and completely inactive blocks will also encourage users to explore other blocks and not accidentally leave any stone unturned.

2. Instead of arranging the blocks in a square grid, arrange them in a meaningful pattern with graphical elements that act as subtle hints to matches. The blocks could, for example, outline a cartoon figure when completely matched. Right now, the square layout only serves to add another cognitive load to users who must strain to remember where they last clicked. Arranging the blocks into a pattern puts more information into the environment for the user to access. The varying locations of blocks prevents description errors caused by uniformity and makes errors caused by misclicking less harmful. For children, an arrangement that builds into something would enhance gameplay by adding another incentive to completing the game.

3. Add sounds that hint at where the user should click. Like a metal detector, the mouse pointer beeps faster if hovering near a correct match. These sounds would give the user ambient awareness about the location of their target and decrease the cognitive load of the game. The user would still have the challenge of making a guess, but within a more restricted area of play. The sound guidance would give users another channel of feedback in a more continuous manner. This would be especially helpful to children who may be too timid to execute a click without extra assurance about their choice.

Nice.
(12 pts 30 minutes) Read Don Norman's critique of gestural interfaces at:
http://www.jnd.org/dn.mss/gestural Interfaces a Step Backwards in Usability 6.html
Choose three of Nielsen's principles for heuristic evaluation (from the lecture slides) and, for each, briefly explain why it would be either much more or much less likely to catch interface problems in gestural interfaces than in WIMP interfaces. Think about the differences between gestural and WIMP interfaces.

1. Simple and Natural - This is the use of metaphors, meaningful graphic design, and logical ordering to guide the use of the system. Interface elements should demonstrate their interactivity and reflect the users expectations. This heuristic would be less likely to catch problems in a gestural interface because universal expectations for such interfaces have yet to develop, and the input technique itself makes distinguishing natural from unnatural less clear. As Norman mentions, different gestural interface developers use their own proprietary designs. Unlike WIMP, broad guidelines for what to expect on a gestural interface do not exist. Furthermore, because gestural interfaces inherently involve more metaphoric interactions, the categories of natural and unnatural are more arbitrary. A developer may deem any number of multitouch zoom gestures to be natural. However, each of these "natural" gestures would be equally unsuitable if used without consistency or feedback.

2. Be consistent - This involves maintaining the same user expectation and experiences in the system's environment. If a user learns something in one part of the design, it should be applicable across the entire design. This heuristic would be more important for a gestural interface. Citing both Apple and Google, Norman highlights inconsistency as a major problem in current gestural interfaces. Unlike a mouse pointer, gestures opens up a much wider variety of interactive options. Given the ability to make almost any human action an input, a developer must be much more careful in managing expectations and making sure that the usage process is predictable.

3. Provide feedback - This means that the design should always inform the user about what the system is doing and how it is processing inputs. This heuristic is more important in a gestural interface. Unlike WIMP, a touchscreen does not inherently have any way to provide physical feedback. Norman discusses a case where a lack of touch feedback may cause a user to exit out of an application. This is less likely to happen on a physical keyboard where each key press is noisy and haptic. Designers must be more careful to satisfy this heuristic when the physicality of the interface is removed. Having multiple methods of input through gestures also means that each gesture must clearly demonstrate a unique feedback.