

[Note: This is a correction to an editorial error in the next-to-last paragraph in the online article, and appears with our apology to the author.]

Integrating Fluency and Accuracy with Logic Puzzles

by *Linda Ciano*

Logic puzzles are a powerful tool for sparking authentic communication and improving both fluency and accuracy in spoken English. The type of logic puzzle is one familiar to children the world over, in which variables are coordinated across multiple categories based on information found in sentence-based clues. For example, a puzzle might present three people, three houses, and three pets. Players match the person with the house that he or she lives in and the pet that he or she owns. Clues indicate false relationships (“The owner of the parrot is not a woman”) as well as true relationships (“The dog lives in the blue house”), and by proceeding systematically through the clues and using a process of logical deduction, the player eventually determines all the true relationships, thereby solving the puzzle.

To use a logic puzzle for fluency and accuracy practice, students are assigned a deceptively simple-sounding task: first solve a logic puzzle and then explain the solution step by step. The challenge is that students are being asked to complete a cognitively complex task—expressing the correct information about the content of the puzzle—while maintaining accurate grammar and fluent delivery throughout.

According to the Cognition Hypothesis (Robinson, 2003), increasing the cognitive demands of a task results in greater accuracy and complexity of L2 production as well as greater incorporation and long-term retention of forms made salient in the input. With their high level of cognitive demand, logic puzzles provide a rich environment for such practice.

Once a puzzle has been tailored to the target grammar and vocabulary needs of a class, however, there are only so many ways of expressing the true and false relationships between the variables. Students therefore repeat and reuse the target grammatical structures as they explain the logic puzzle step by step. This provides them with ample opportunities to practice these target structures within the meaningful, challenging context of the logic puzzle, helping them to develop automaticity of use by establishing and strengthening links in long-term memory (Ortega, 2009).

In addition to being exceptionally well suited to developing fluency and accuracy, logic puzzles are noteworthy for their accessibility, adaptability, and challenging nature.

The “trick” of a logic puzzle comes not from the use of particularly complex grammatical structures or sophisticated vocabulary, but from the information included in—and omitted from—the puzzle’s clues. The puzzles themselves can actually be expressed in relatively simple language, making them accessible to students of all proficiency levels, even beginners.

Logic puzzles are also easy to adapt in a variety of ways, from the grammar structures and vocabulary items targeted in the written clues (which will help dictate the grammar and vocabulary that students use when speaking about the puzzle) to the level of logical difficulty of the puzzles. For this reason, a teacher can select a relatively small number of logic puzzles, each of which can then be adapted in multiple ways to suit a wide range of classes in terms of desired language focus as well as students’ level of critical-thinking skills and puzzle-solving ability.

Finally, logic puzzles are challenging, not only because of the concentration required in solving the puzzle, but also in terms of discussing the puzzle and its solution afterward. This makes logic puzzles particularly well suited for use in heterogeneous classrooms, notably those in which some students speak fluently but with poor accuracy while others speak accurately but with poor fluency. Working to solve and explain a logic puzzle helps level the playing field

between these two very different groups of students. Fluent/inaccurate students are forced to slow down when speaking in order to maintain grammatical and factual accuracy, while accurate/nonfluent speakers begin to develop greater speaking speed and ease through the repetition of similar grammar structures within the confines of the puzzle.

To facilitate a logic-puzzle activity in the classroom, first introduce the concept of logic puzzles—you may find that many students are already familiar with them—and hand out a puzzle that includes the setup or background information plus the list of clues. Then, distribute a solving grid. The grid gives students an easy way to organize and visualize the information they uncover during the solving process, with Xs representing false relationships and Os representing true relationships. Refer students to a good tutorial on using grids to solve logic puzzles if necessary (Puzzle Baron, n.d.) and assign students to solve the puzzle for homework.

In the next class session, group students so those who successfully solved the puzzle are working with those who did not. This leads to dynamic, authentic communication as students attempt to explain and understand the logical steps to follow in order to reach the solution. This is also an opportunity for students to practice the language they will use when explaining the solution step by step to the teacher.

Finally, students take turns telling the teacher how to fill in the grid, explaining their rationale in the process: “The owner of the parrot isn’t a woman, so Susan can’t own the parrot. Put an X at the intersection of ‘Susan’ and ‘parrot.’ ”

Additional layers of challenge can be added by expanding the activity to include peer monitoring and error correction; the systematic incorporation of language function practice into discussions, explanations, and/or peer monitoring sessions; or grammar self-correction, in which students record themselves speaking, transcribe and correct grammar errors in the recordings, and then submit the corrected transcripts for feedback from the instructor (Ciano, 2016).

Get started developing your own logic puzzles for classroom use by visiting www.logic-puzzles.org or by googling “logic puzzles.”

References

- Ciano, L. (2016). Integrating fluency and accuracy with logic puzzles [PowerPoint slides]. Retrieved from <https://www.youtube.com/watch?v=-whjv3Lgvls>
- Ortega, L. (2009). *Understanding second language acquisition*. London, UK, and New York, NY: Routledge.
- Puzzle Baron (n.d.). How to solve a logic puzzle. Retrieved from <http://logic-puzzles.org/how-to-solve-a-logic-puzzle.php>
- Robinson, P. (2003). The Cognition Hypothesis, task design and adult task-based language learning. *Second Language Studies*, 21(2). Retrieved from https://www.researchgate.net/profile/Peter_Robinson13/publication/228554259_The_Cognition_Hypothesis_task_design_and_adult_task-based_language_learning/links/00b495257a87342d40000000.pdf

Linda Ciano (M.A.) is a clinical assistant professor at the American Language Institute, School of Professional Studies, New York University. <linda.ciano@nyu.edu>