

C. Listening test responses

Upon finishing the listening tests, subjects were asked given the following instructions:

Thank you for your participation in this experiment. Before finishing, please take a few moments to write down any thoughts or reactions you have to the exercises you have just done. We are interested in hearing what you thought about the auralisations and whether there were any strategies you employed to help you identify the constructs.

Their responses were as follows:

- 1 “The examples seemed quite simple in programming terms, yet long-winded in music terms. After a couple of hours, the music does [become] quite painful; couple this with the usual programming headaches, well.. ”
- 2 “Distinct instruments such as flute helped. Listened for major and minor tones to distinguish between **REPEAT** and **WHILE**.”
- 3 “Associations with particular instruments. Differences between **IF..THEN** and **IF..THEN..ELSE** were not as obvious as they could be. Some examples were very long although the answer was obvious quickly.”
- 4 “The exercises were repeated too many times and in some cases needlessly too long, to get the point of the experiment across. The overall aspect of the idea was carried out well and differentiating between selection and iterations was easy, although differentiating between **IF. . . THEN** and **IF. . . ELSE** was quite difficult. There was no such problem with **WHILE** and **REPEAT** loops however. Different instruments helped distinguish between different constructs.”
- 5 “After listening to the sound for a while they become easier to identify. Some constructs sound too alike though and are difficult to tell the difference between (although more practise may rectify this).”
- 6 “I found the different instruments were the key to identifying the constructs. The polyphony was also helpful.”
- 7 “I thought some of the tests were too long and the introduction seemed too long as well. The loops, especially nested, were easier to spot and so anything that wasn't I assumed to be a selection.”

- 8 “Some became long and tedious. Easy to tell nested structures because starting tunes for constructs were easy to hear. The pitch changes in `FOR...TO` and `FOR...DOWNTO` structures were easily identifiable.”
- 9 “`WHILE` loop -> strings. Different construct indicators useful.”
- 10 “There was a lot to take in at first but once a few examples were heard it made sense. My strategy was to work my way down the tree, e.g. ticked either selection or iteration very quickly then on the subsequent plays tried to home in on the answer. Longer loops were easier to recognise.”
- 11 “The tunes weren’t different enough. Most being variations on runs within a scale making it difficult to distinguish. It would have been better to have the tunes varying in tempo as well as melody. By making each significantly different in terms of voice, tempo and tune it would have been easier. Use of rhythm on the selection/iteration made it easy to spot, this could have been used further down the tree.”
- 12 “Many iterations go on for too long, three plays of which just becomes tedious. I used the tree structures to help decide what was being played, by making a decision at each branch I could find the answer.”
- 13 “`REPEAT` and `WHILE` too similar. `ELSE` statements hard to spot.”
- 14 “The long tasks went on for a little too long.”
- 15 NO RESPONSE
- 16 “`FOR` loops were easy.”
- 17 “The idea was good but some of the sounds were very similar. A better idea may be to play the sounds one after the other at the beginning ie `FOR...TO` (`FOR` sound), `FOR...DOWNTO` (`FOR...DOWNTO` sound). Not looking with loops just the start and finish of the loop. Also, when showing the slides at the start is it possible to have a moving bar over the text as the sound is played, this would make it easier to understand.”
- 18 “Practise helps a lot. Different instruments helped me remember. I can’t imagine how it could help me program.”
- 19 “Difficult to pick up structure of the music, but once you have learnt the basic blocks it becomes quite easy to pick out the structure of the program. V. good!”
- 20 “When similar tunes were used for similar constructs it was very difficult to distinguish between them. Different instrument types e.g. string, wind, drums were easy to distinguish.”

- 21 “Found it quite difficult as I didn’t really pick up the sounds at the beginning. Started getting the hang of it towards the end.”
- 22 “Not quite sure how I did that, but the tunes became quite familiar towards the end.”