

# Testing the role of involuntary musical imagery in novel music learning

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## Background

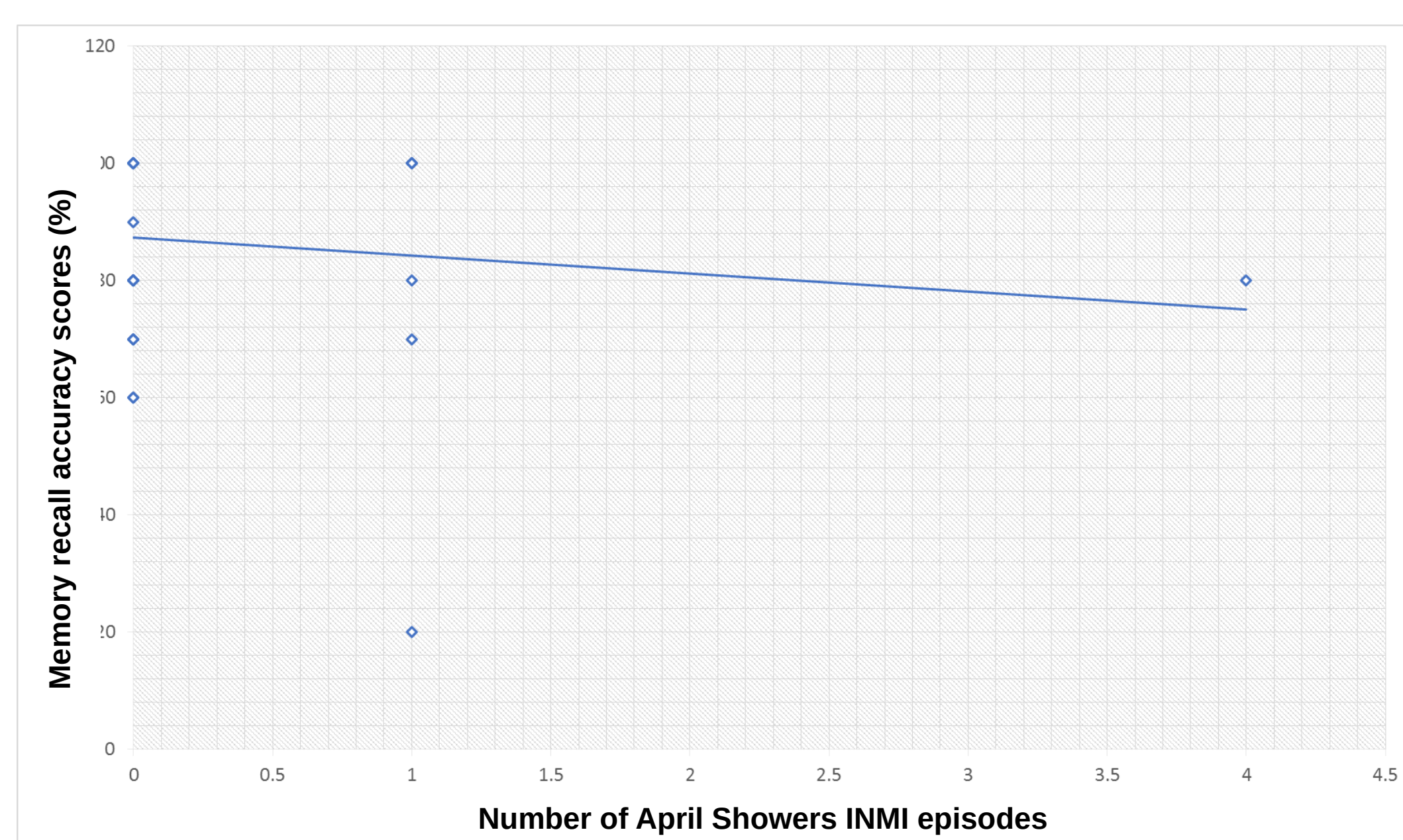
- Involuntary musical imagery involves a piece of music appearing in the mind involuntarily, without any conscious effort, repeating at least once on a loop.
- Knowledge around this phenomena is growing, with researchers looking at whether melodic features and song popularity can predict the occurrence of involuntary musical imagery episodes and techniques to reduce this experience (Jakubowski et al., 2017; Beaman et al., 2010).
- Among these findings, there have been possible associations established between involuntary musical imagery and whether it can serve as a functional purpose in daily life (Jakubowski et al. 2015).
- Liikanen (2012) proposed the idea of involuntary musical imagery aiding in memory consolidation.
- The possibility of involuntary musical imagery assisting in memory consolidation for musical tunes has not yet been investigated, thus providing a motive for the present study.
- Researchers were also interested in whether certain variables (musical training, active musical engagement, the number and the length of involuntary musical imagery episodes) and the type of learning method used could affect memory accuracy recall.

### Why could involuntary musical imagery affect memory consolidation for musical tunes?

1. Rehearsal is an important technique contributing towards storing information in memory.
2. The more information is rehearsed, the more likely it is to be stored.
3. A main aspect of involuntary musical imagery is that the music fragments involved are repeated. This can act as a form of rehearsal of musical information.

## Results

### A scatterplot to show the relationship between the number of April Showers involuntary musical imagery episodes and memory recall accuracy scores



- No significant correlation found between the number of April Showers involuntary musical imagery episodes reported and the memory recall accuracy scores for April Showers,  $p = .758$ . (**Hypothesis one**).
- The overall multiple regression analysis of the effect of predictor variables on memory recall accuracy scores did not produce significant results,  $F(4, 39) = 2.30$ ,  $p = .08$ . However, individually the length of INMI ( $\beta = -.95$ ,  $p = .05$ ) and musical training ( $\beta = .08$ ,  $p = .02$ ) significantly predicted variability in memory recall accuracy scores.
- The effect of the type of learning method (active vs passive) used for April Showers did not significantly affect the memory accuracy recall scores,  $\chi^2(1) = .11$ ,  $p = .74$ . (**Hypothesis two**).

## Aim

To test whether involuntary musical imagery can affect the ability to recall novel musical tunes accurately.

## Hypotheses

1. The total number of April Showers (novel piece) involuntary musical imagery episodes reported will affect the memory recall accuracy for the musical piece.
2. The type of method used to learn April Showers will affect the memory accuracy for the musical piece.

## Method

- **Design:** Between groups design.
- **Participants:** 36 participants (19 male), age ranging from 18 - 48 years old ( $M = 25.19$ ,  $SD = 5.56$ ).
- **Stimuli:** Original April Showers piece, in addition to five alternative versions.
- **Overall procedure:** Learning phase, involuntary musical imagery diary and surprise test phase.

### Stage one: Learning phase

- Participants learnt April Showers actively (singing) or passively (listening), then completed the Gold-MSI and the IMIS.
- Next, success in learning April Showers was tested using a two-alternative forced choice (2AFC) memory task (which included exposure to alternative versions of the musical piece).
- After, participants listened to April Showers 10 times, whilst rating the piece on 10 different items.

### Stage two: Involuntary musical imagery diary

- For three days, the participants recorded all of their involuntary musical imagery episodes (each page in the diary represented one involuntary musical imagery episode).

### Stage three: Surprise test phase

- The participants memory for April Showers was tested using a surprise 2AFC test.

## Conclusion

- This was an exploratory study investigating whether involuntary musical imagery could have a potential role in daily life that is associated with learning new musical pieces.
- The results did not support the hypotheses; the number of reported April Showers involuntary musical imagery episodes and the type of learning method (active vs passive) did not affect the memory accuracy recall for April Showers.
- However, the length of involuntary musical imagery episodes and musical training ability significantly predicted variability in memory accuracy recall scores.
- The results are not able to demonstrate another potential function of involuntary musical imagery in daily life, but it does show that musical memories can be influenced by internal and external variables.

## References

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