The title

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The authors made the following contributions. Atsuko Tominaga: Conceptualization, Writing - Original Draft Preparation, Writing - Review & Editing; Günther Knoblich: Writing - Review & Editing, Supervision; Natalie Sebanz: Writing - Review & Editing, Supervision.

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Abstract

One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline.

Two to three sentences of **more detailed background**, comprehensible to scientists in related disciplines.

One sentence clearly stating the **general problem** being addressed by this particular study.

One sentence summarizing the main result (with the words "**here we show**" or their equivalent).

Two or three sentences explaining what the **main result** reveals in direct comparison to what was thought to be the case previously, or how the main result adds to previous knowledge.

One or two sentences to put the results into a more **general context**.

Two or three sentences to provide a **broader perspective**, readily comprehensible to a scientist in any discipline.

Keywords: keywords

Word count: X

The title

Introduction

Methods

Participants

20 participants were recruited who already had a degree (above bachelor or equivalent) in piano performance/teaching or were studying advanced piano performance at a music school. Most participants were right-handed (left: 2, ambidextrous: 2). The mean age of the participants was 28.25 ($SD = 10.95$). They had 21.55 years of practice on average ($SD = 11.59$). 17 participants had teaching experience in piano ($M = 7$ years, $SD = 6.68$). All participants were recruited through an online participant platform (SONA system, https://www.sona-systems.com). The study (No. 2020_05) was approved by the Psychological Research Ethics Board (PREBO) CEU PU in Austria.

Apparatus and stimuli

The experiment was programmed in Max/MSP (8.1.11; https://cycling74.com/products/max) on a Mac Book Pro with Mac OS X Catalina 10.15.7. A weighted Yamaha MIDI digital piano was used to record participants' performance. All auditory feedback was given to participants through headphones (Audio-Technica ATH-M50X). Sheet music was displayed on a computer monitor in front of the participants.

Clementi's Sonatina Op.36 (No.3) in C major was selected as a stimulus because it contains our targeted expressions (i.e., articulation and dynamics) because it is relatively simple in terms of motor skills. The first 12 measures of the original piece were used and modified so that the piece had an almost equal number of data points for each dependent variable. The modified piece consisted of a 12-measure isochronous melody notated in 4/4 meter to be played with the right hand only. Original sheet music was used for the purpose of practice (*Fig A*). Two expressive notations were added to the original sheet music for the

experiment (*Fig B*). These excerpts were confirmed to be musically natural by a doctoral student in piano performance at Liszt Ferenc Academy of Music in Hungary. The fingering was also assigned and confirmed by the same doctoral student.

Procedure

Prior to the experiment, participants were required to memorise the piece so that they had enough time to practise and performed it without pitch errors while implementing notated expressions in the experiment.

Data analysis

In each performance (trial), the pitch, onset and offset time of each note, and key velocity profiles were obtained from MIDI data using Max/MSP patchers. We quantified performances in terms of tempo,

Results

Discussion