

Supplementary Material

Below are listed the formulations of the hierarchical models that were tested in Experiments 1 and 2 in order to assess effect sizes.

Experiment 1

Model 1 (including head motion)

- (1) $Pupil\ size \sim Technical\ difficulty\ ratings$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$
- (2) $Pupil\ size \sim Technical\ difficulty\ ratings + Cloud\ diameter$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$
- (3) $Pupil\ size \sim Technical\ difficulty\ ratings + Cloud\ diameter + Harmonic\ complexity\ ratings$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$
- (4) $Pupil\ size \sim Technical\ difficulty\ ratings + Cloud\ diameter + Harmonic\ complexity\ ratings$
 $+ Expressive\ difficulty\ ratings$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$

Model 2 (including arm motion)

- (1) $Pupil\ size \sim Technical\ difficulty\ ratings$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$
- (2) $Pupil\ size \sim Technical\ difficulty\ ratings + Harmonic\ complexity\ ratings$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$
- (3) $Pupil\ size \sim Technical\ difficulty\ ratings + Harmonic\ complexity\ ratings + Cloud\ diameter$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$
- (4) $Pupil\ size \sim Technical\ difficulty\ ratings + Harmonic\ complexity\ ratings + Cloud\ diameter$
 $+ Quantity\ of\ Arm\ motion$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$

Experiment 2

Model 1 (including head motion)

- (1) $Pupil\ size \sim Harmonic\ complexity\ ratings$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$
- (2) $Pupil\ size \sim Harmonic\ complexity\ ratings + Expressive\ difficulty\ ratings$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$
- (3) $Pupil\ size \sim Harmonic\ complexity\ ratings + Expressive\ difficulty\ ratings$
 $+ Technical\ difficulty\ ratings$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$
- (4) $Pupil\ size \sim Harmonic\ complexity\ ratings + Expressive\ difficulty\ ratings$
 $+ Technical\ difficulty\ ratings + Quantity\ of\ Head\ Motion$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$

Model 2 (including arm motion)

- (1) $Pupil\ size \sim Harmonic\ complexity\ ratings$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$
- (2) $Pupil\ size \sim Harmonic\ complexity\ ratings + Expressive\ difficulty\ ratings$
 $+ (1-piece) + (1-ID) + ar1(bars + 0-piece:ID)$

- (3) *Pupil size* $\sim$ *Harmonic complexity ratings* + *Expressive difficulty ratings*
+ *Technical difficulty ratings*
+ (1—piece) + (1—ID) + ar1(bars + 0—piece:ID)
- (4) *Pupil size* $\sim$ *Harmonic complexity ratings* + *Expressive difficulty ratings*
+ *Technical difficulty ratings* + *Quantity of Arm Motion*
+ (1—piece) + (1—ID) + ar1(bars + 0—piece:ID)