Drop the beat & miss T2: How various dimensions of music influence attentional failures

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Emotional distractors and the attentional blink

- It is well established that emotional distractors enhance attentional control in demanding tasks such as the attentional blink paradigm. (Olivers & Neiuwenhuis, 2005)
- When inducing moods using music, the interaction of emotional valence and level of arousal have unique effects on second target accuracy detection. (Jefferies, Smilek, Eich, & Enns, 2008)
- However, it is unclear how these dimensions, along with rhythmicity specifically influence attention.
- The current study aims to disentangle how emotional valence, arousal, and rhythmicity affect the attentional blink.

Music Conditions

Rhythmicity	Arousal	
	Arousal	No Arousal
Rhythmic	Positive Valence	Positive Valence
	Negative Valence	Negative Valence
Not Rhythmic	Positive Valence	Positive Valence
	Negative Valence	Negative Valence

Rhythmicity	Arousal	
	Arousal	No Arousal
Rhythmic	Southern Rock Piano	Upright hip hop bass
	Edgy Synth 01	Deep Electric Piano 05
Not Rhythmic	Allegro III	Corral Nocturne
	Chamber Symphony	Adagio for Strings

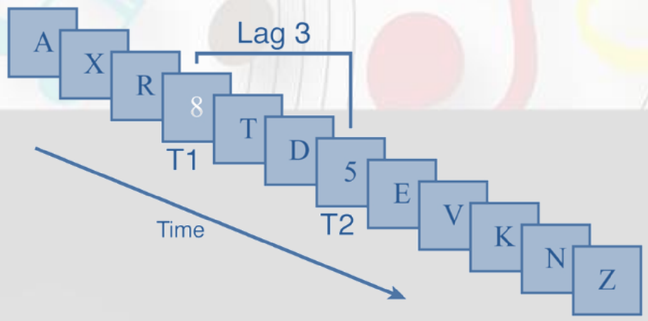
Methods

Design

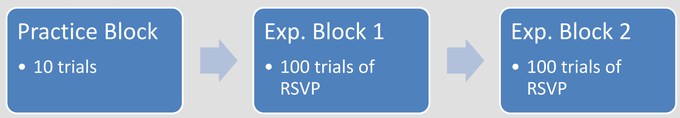
We used a 2 x 2 x 2 x 2 mixed design. Musical valence, rhythmicity, and arousal were the primary between-subjects factors. The presentation of music (music or not) was a within-subjects factor. Also manipulated within-subjects was the lag between T1 and T2. N= 193

Attentional Blink Task

The attentional blink task is a rapid serial visual presentation (RSVP) task. Trials began with a centered fixation cross. Participants then viewed a stream of letters and were told to identify the two numbers that appeared (T1 and T2). Each letter or number appeared for 75ms with a 15ms pause before the next item. The lag between T1 and T2 varied between 1-5 items. There were a total of 22 letters used (excluded l, o, q and z) and numbers used were 1-9.

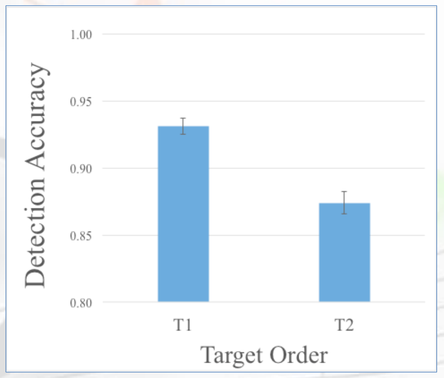


Procedure



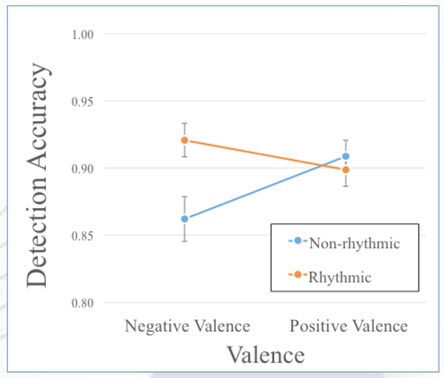
Results

Replicating the Attentional Blink



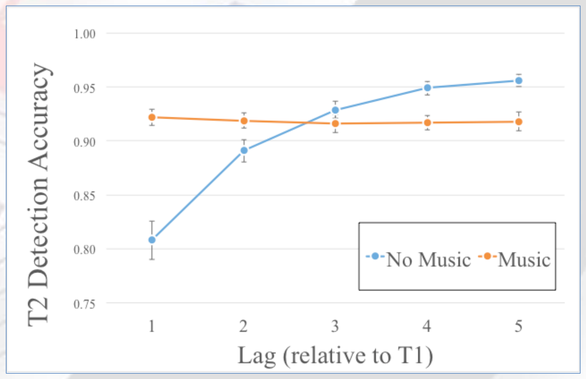
Main effect of Target Number
F(1,129)= 74.438, p<.001
η_p^2=.366

Valence and Rhythmicity



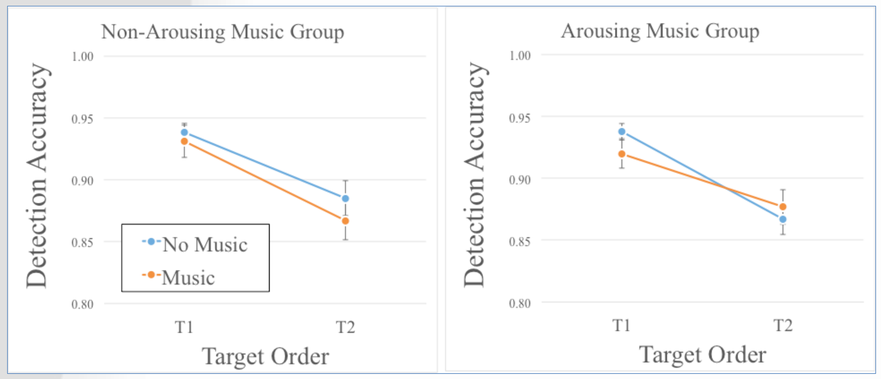
Interaction between Valence and Rhythmicity
F(1,129) = 4.205, p=<.05
η_p^2=.032

T2 detection with music



- Main effect of lag *F(4,127) = 16.382, p<.001* η_p^2=.340
- Marginal effect of music *F(1,148) = 4.827,*
- *p=.076* η_p^2=.024
- Interaction between Lag and Music *F(4,127) =16.702, p<.001* η_p^2=.345

Arousal and Music



Marginal interaction with Music, Arousal, and Target
F(1,129) = 3.206, *p*=.076, η_p^2=.024

Conclusions

- Although the attentional blink occurred in both music and non-music conditions, the size of the effect was ameliorated by listening to music. Also, in the music conditions, performance was relatively unaffected by lag.
- We found evidence that emotional valence and rhythmicity interact to affect overall target detection, but not the size of the attentional blink, per se.
- However, arousing music may decrease the size of the attentional blink (from 7% to 4%, relative to non-arousing music which increased the blink from 5% to 6%), suggesting that arousing music is more beneficial at reducing attentional failures.