



The rhythm aftereffect induced by adaptation to the decelerating rhythm

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Abstract

Rhythmic deceleration can be induced by a decelerating rhythm. In a 2-beat interval, a decelerating rhythm (e.g., a 1.5-beat interval) can be induced by a decelerating rhythm (e.g., a 1.5-beat interval). However, when a decelerating rhythm is followed by a decelerating rhythm, a decelerating rhythm (e.g., a 1.5-beat interval) can be induced by a decelerating rhythm (e.g., a 1.5-beat interval). In the present study, we explored the effect of a decelerating rhythm on the rhythm aftereffect. We found that a decelerating rhythm can induce a decelerating rhythm aftereffect. In Experiment 3, we found that a decelerating rhythm can induce a decelerating rhythm aftereffect. Our results show that a decelerating rhythm can induce a decelerating rhythm aftereffect. In Experiment 3, we found that a decelerating rhythm can induce a decelerating rhythm aftereffect.

Keywords Temporal adaptation · Rhythm · Deceleration · Rhythm aftereffect

Introduction

A 1.5-beat interval can be induced by a decelerating rhythm (e.g., a 1.5-beat interval). In the present study, we explored the effect of a decelerating rhythm on the rhythm aftereffect. We found that a decelerating rhythm can induce a decelerating rhythm aftereffect. In Experiment 3, we found that a decelerating rhythm can induce a decelerating rhythm aftereffect. Our results show that a decelerating rhythm can induce a decelerating rhythm aftereffect.

In a 2-beat interval, a decelerating rhythm (e.g., a 1.5-beat interval) can be induced by a decelerating rhythm (e.g., a 1.5-beat interval). In the present study, we explored the effect of a decelerating rhythm on the rhythm aftereffect. We found that a decelerating rhythm can induce a decelerating rhythm aftereffect. In Experiment 3, we found that a decelerating rhythm can induce a decelerating rhythm aftereffect. Our results show that a decelerating rhythm can induce a decelerating rhythm aftereffect.

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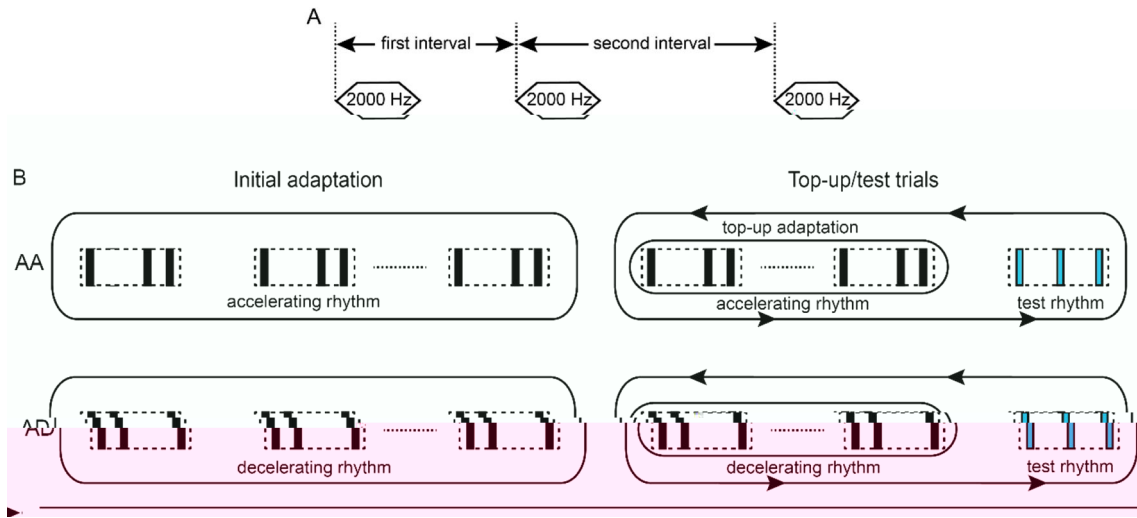


Fig. 1 (A) Schematic of the experimental design. The first interval (10 min) is used for initial adaptation (AA: accelerating rhythm; AD: decelerating rhythm). Each of the two subsequent intervals (10 min) is used for top-up adaptation (AA: accelerating rhythm; AD: decelerating rhythm) and test rhythm (AA: accelerating rhythm; AD: decelerating rhythm). (B) Schematic of the experimental design. The first interval (10 min) is used for initial adaptation (AA: accelerating rhythm; AD: decelerating rhythm). Each of the two subsequent intervals (10 min) is used for top-up adaptation (AA: accelerating rhythm; AD: decelerating rhythm) and test rhythm (AA: accelerating rhythm; AD: decelerating rhythm).

... (f / ec d, e, a: 710/310) de-
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 ... e e ... ada , a c d : “ada , acce, e a,
 ... ” (AA) a d “ada , de ce, e a, ... ” (AD).
 Top-up, f e ac ada , a c d, a a c a, c e e d
 ... b i c f 35, e, a, ... f, e, a f e ac f, e e,
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 ... a b e a f a, e a, 3 ... a ... a ... e a c a
 ... e effec, b e e b i c . M e e, e, a b a e e (BA) e f
 f a c e, a c e c, e d b e f e, e ada , a, b i c . T a ,
 ... a a c a, c e e d a e e, b i c f 70, a, ... c e e
 ... a ... e e, e e a d a, b i c e c e, a, e e a
 ... ada , a, ... a e a d ... ada , a, e, d. T e, a,
 e e, e, a, e d a ... a e, 80 ...

Measurements

I E e, e, 1, f e ac ... a c a, e ... f “ac-
 ce, e a, ” e ... e e, ... f e ac c d,
 ... a ... e d a a f i c, ... f, e d f f e e c e b e e f, a d
 e c d, e, a (FSD: 0, 60, 120, 180) a d f, e d, ... a
 ... c f i c, (Fig. 2A):
$$= \frac{1}{1 + \frac{1}{(t - t_0)}}$$
 e e 0, e FSD
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 50% e ... e e, e c e, c f i c,) a d
 ... d e a e, a e f, e ... d c, a, ... e d (DT;
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 d e c e, e, a (CI) f e ac c a, ... a b, ... a,
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Results and discussion

A e e a e d - e a, e ANOVA, ... e PSI ... e d, a, e
 ... a effec, f a d a, a, ... a , f c a, (F(2, 26) =
 10.591, < 0.001, $\eta^2 = 0.449$; Fig. 2B a d S2A).
 B f e ... c e, ... e d, a, e PSI, ... e
 AD c d, ... a , f c a, ... a u, e, a, e PSI,
 AA (< 0.001, C e ’ = -1.409; 95% CI [-85.31,
 -42.40], = 0.001) a d BA (= 0.017, C e ’ = -

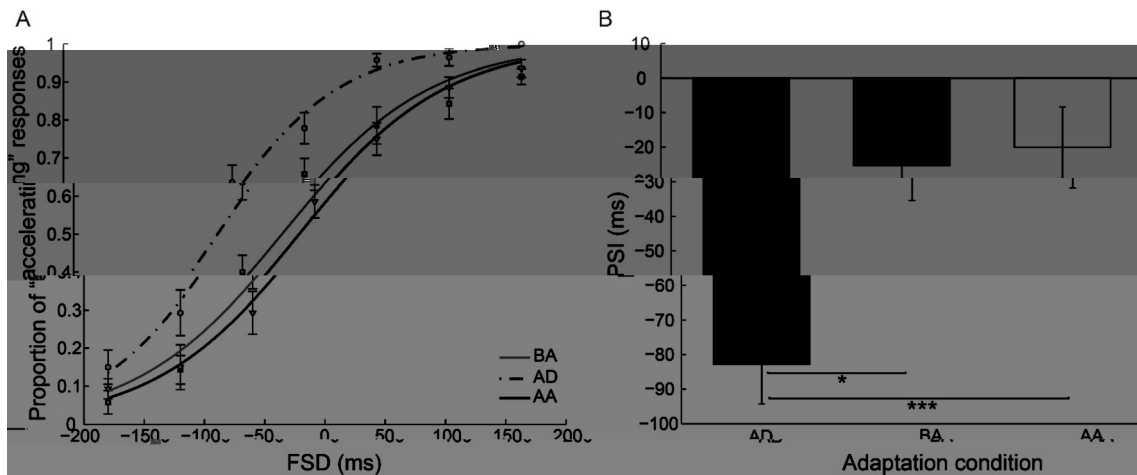


Fig. 2 Results of [Felleman et al. \(2014\)](#). **(A)** Proportion of “accelerating” responses (averaged across 14 participants) as a function of “accelerating” response probability, as a function of acceleration (FSD), each condition (BA: balanced acceleration; AA: acceleration acceleration; AD: acceleration acceleration). **(B)** Proportion of “accelerating” responses (PSI) for each condition. Error bars represent standard error of the mean. * $p < 0.05$, *** $p < 0.001$

0.881; 95% CI [-90.55, -26.83], $p = 0.021$) condition. However, the effect of acceleration on the PSI between AA and BA condition ($F(1, 26) = 1.000$, Cohen's $d = 0.091$; 95% CI [-24.42, 31.92], $p = 0.755$). Moreover, a repeated-measures ANOVA with the DT as a repeated factor and acceleration as a between-subject factor ($F(2, 26) = 1.835$, $p = 0.180$, $\eta^2 = 0.124$), did not show a significant main effect of acceleration on the PSI. In [Felleman et al. \(2014\)](#), the acceleration was manipulated by the acceleration level (accelerating, balanced, decelerating). Thus, the acceleration was manipulated by the acceleration level (accelerating, balanced, decelerating).

Experiment 2

The acceleration condition was manipulated, [Felleman et al. \(2014\)](#) used a balanced acceleration condition and a decelerating condition. In a previous study, [Scheidt & Kording \(2008\)](#). In a previous study, [Felleman et al. \(2014\)](#) used a balanced acceleration condition and a decelerating condition. The effect of acceleration on the PSI was investigated in [Felleman et al. \(2014\)](#). The effect of acceleration on the PSI was investigated in [Felleman et al. \(2014\)](#). The effect of acceleration on the PSI was investigated in [Felleman et al. \(2014\)](#). If the acceleration was manipulated by the acceleration level (accelerating, balanced, decelerating), the acceleration was manipulated by the acceleration level (accelerating, balanced, decelerating).

Method

Participants

Seventeen participants (10 female; mean age: 18.4 ± 0.7 years) participated in [Felleman et al. \(2014\)](#). The participants were recruited from the University of Amsterdam and were paid for their participation. All participants gave their informed consent before the experiment.

Apparatus, stimuli, and procedure

The apparatus, stimuli, and procedure were described in [Felleman et al. \(2014\)](#). The participants were asked to respond to a “catch” trial and a “decision” trial. The participants were asked to respond to a “catch” trial and a “decision” trial.

Measurements

The acceleration of “catch” trials was measured for each condition for each participant. The acceleration of “catch” trials was measured for each condition for each participant. The acceleration of “catch” trials was measured for each condition for each participant. The acceleration of “catch” trials was measured for each condition for each participant. The acceleration of “catch” trials was measured for each condition for each participant. The acceleration of “catch” trials was measured for each condition for each participant.

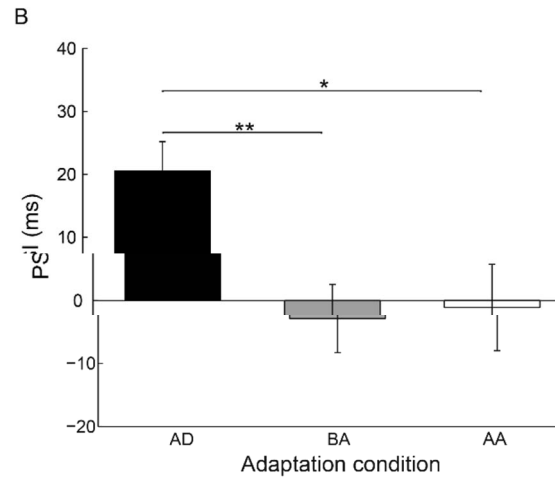
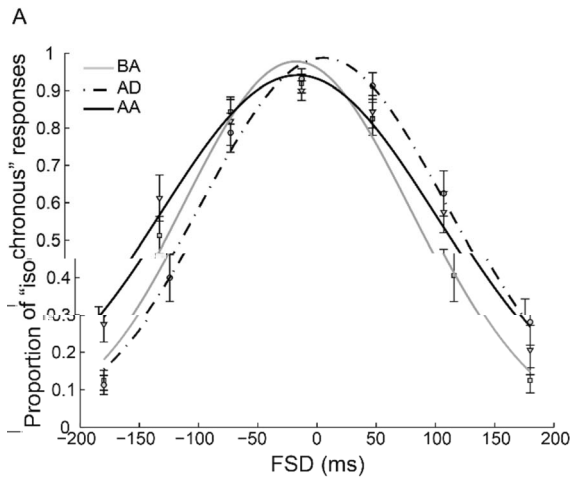


Fig. 3 Results of Experiment 2. (A) Proportion of "isochronous" responses (averaged across 16 participants) as a function of FSD (ms) for the three adaptation conditions. (B) Mean PSI (ms) for the three adaptation conditions. Error bars represent standard error. ** indicates a significant difference between AD and BA, * indicates a significant difference between AD and AA.

Results and discussion

As in Experiment 1, a repeated-measures ANOVA revealed a main effect of adaptation condition on the PSI ($F(2, 30) = 8.063, p = 0.002, \eta^2 = 0.350$). Separate ANOVAs revealed a main effect of adaptation condition on the PSI for AA ($F(1, 15) = 10.031, p = 0.004, \eta^2 = 0.400$; 95% CI [7.27, 35.14], $p = 0.018$) and BA ($F(1, 15) = 10.004, p = 0.004, \eta^2 = 0.400$; 95% CI [12.66, 34.57], $p = 0.003$) conditions. However, there was no main effect of adaptation condition on the PSI between AA and BA conditions ($F(1, 15) = 1.000, p = 0.074, \eta^2 = 0.064$; 95% CI [-9.78, 12.99], $p = 0.771$). We also found a main effect of adaptation condition on the DT for BA ($F(2, 30) = 8.356, p = 0.001, \eta^2 = 0.358$). There was no main effect of adaptation condition on the DT for AA ($F(1, 15) = 0.004, p = 0.985, \eta^2 = 0.000$; 95% CI [10.27, 31.67], $p = 0.002$). However, there was a main effect of adaptation condition on the DT between AA and AD conditions ($F(1, 15) = 0.130, p = 0.552, \eta^2 = 0.008$; 95% CI [1.55, 20.63], $p = 0.059$), and between AD and BA conditions ($F(1, 15) = 0.195, p = 0.498, \eta^2 = 0.012$; 95% CI [0.36, 23.37], $p = 0.100$). There were no main effects of adaptation condition on the decision time for the first effect, the second effect, or the total decision time.

Experiment 3

Participants were asked to judge whether two stimuli were synchronous or asynchronous. The results showed that participants were able to judge synchrony and asynchrony. The results also showed that participants were able to judge synchrony and asynchrony. The results also showed that participants were able to judge synchrony and asynchrony.

Experiment 3 was designed to test the hypothesis that the results of Experiment 2 were not due to a specific adaptation condition. The results showed that participants were able to judge synchrony and asynchrony. The results also showed that participants were able to judge synchrony and asynchrony.

Method

Participants

Participants were 16 individuals (10 females; mean age: 19.1 ± 0.9 years). They were all students at the University of California, San Diego. All participants provided informed consent before the experiment and received a monetary reward.

Apparatus, stimuli, and procedure

The apparatus used in Experiment 3 was the same as in Experiment 2. The stimuli were the same as in Experiment 2. The procedure was the same as in Experiment 2. The results showed that participants were able to judge synchrony and asynchrony. The results also showed that participants were able to judge synchrony and asynchrony.

... CRT (85-H... 1,600... 1,200... a bac...

... a fe... ada... da... e... da... eg fc... f... afe effec...

Measurements

A, E, e, e, 1, f eac a a c a, e... "acce, e a..." e... FSD (0, 80, 160, 240) a d f, ed... (F... 4A). T e da a f... E, e, e, 3... e e e c d ed f... a a e d e... e e f a ce acc d... f... c eff ce, (R^2 < 0.6). T e PSI a d DT, a e e e e ca, a ed f... e e a... 14 a a c a, f eac c d...

Results and discussion

T e e... f, e e a ed- ea... ANOVA... a... PSI (F(2, 26) = 0.304, ... = 0.740, ... = 0.023; F... 4B a d S2C) a d DT (F(2, 26) = 0.991, ... = 0.385, ... = 0.071). T... afe effec... e f... a d... a c... (e... O... S... Ma... OSM) f... T... e... a d... b... e... (F... S1, OSM). M... a... a... e... a... afe effec... (c... e... e...) a c... a... e... d... da... (E, e, e, 1). T... e... b... a, e... a c... f... e... afe effec... E, e, e, 3... a d... e... a... e... ce... , e f. T e e... de... a e d, a... e... a da... effec... b... e... e... ce... c... d...

General discussion

I... e... d... e... a ed, e effec... f a da... e acce, e a... de ce, e a... b... e... We f... d a... afe effec... ec f... e de ce, e a... a da... T a... afe a da... e de ce, e a... , a a c a... e d... e ce, e b... e... c... a acce, e a...

We b... e... afe effec... e d... f... c a... e... a... b... a... e... c... c... d... e... a... P... e... e... a... e... e... d... b... e... f... e... c... d... b... d... b... a... e... e... a... d... e... (B... be, S... e, & U... c, 2014; S... e... & K... , 2008; V... e... c... , V... e... c... , & T... a... , 2010). Acc... d... e... afe effec... f... e... ce... a... M... e... e... a... a... '... d... c... a... e... d... (e... , DT) a... f... c... a... d... f... e... b... e... e... de ce, e... a... a da... a... a d... -a da... c... d... . I... f... e... e... a... e... afe effec... ca... e... f... e... c... a... e... e... a... d... f... afe a da... .

P... e... d... e... e... a ed, e... c... a... a da... a d... f... d a b... d... e... a... e... afe effec... (B... e... & R... e... , 2007; L... a... e... a... , 2015; M... a... e... a... , 2018). I... a... b... e... e... d... a... a... afe effec... a... e... f... e... a da... f... e... d... a... :... e... e... e... a fa... (...) , a... f... be a... (... e... (... e...) , e... a... be... ee... be a...) d... , e... e... f... e... d... e... fa... (...) be a... , a... e... e... a... u... f... f... e... ba... f... d... a... -... e... d... b... e... f... ed... a d... e... (fa...) e... d... f... e... ec... , e... e... e...

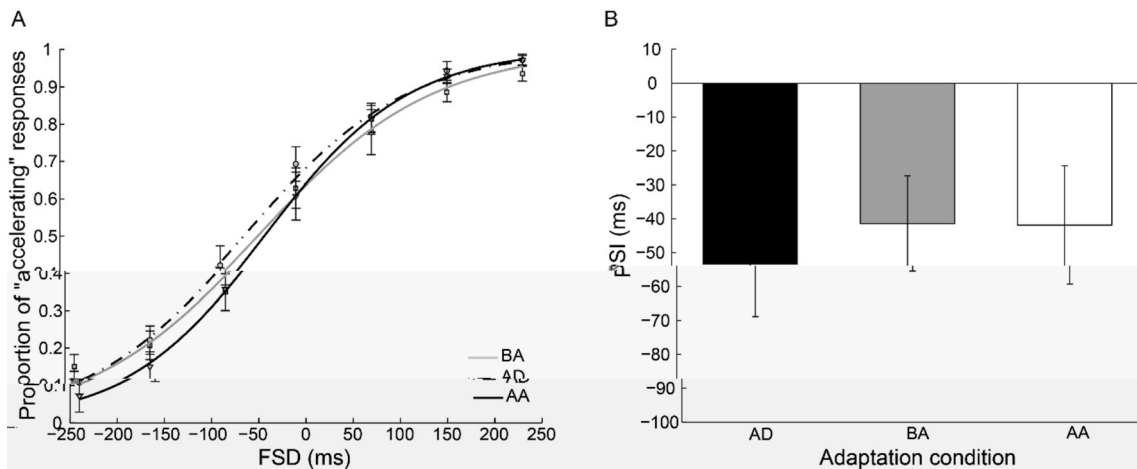


Fig. 4 Results of E, e, e, 3. (A) Proportion of "accelerating" responses (accelerating a... 14 a a c a,)... e... e... f "acce, e a..." e... e... e... a... e... , c... a... f... ed... e... c... f... c... f, e d f f e e c b... e... e... f... a d... e... d... e... a... (FSD),

eac c d... (BA: ba... e... , a da... ; AA: a da... acce, e a... ; AD: a da... de ce, e a...). (B) P... f... b... e... e... c... (PSI),... e... e... d... . E... ba... e... e... a da d... e... eac c d...

... e ed f, ... a.e. f, e ada, ed ... e ... b, e f
c d ... fa, (...), e ... a, d ... a, ... (Bec e & Ra ... e,
2007). T ... dea ... de ... ca, ... e d ... a, ... c a ... e, ba ed
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1994; D ... e, a., 1996; F ... e, a., 2003) a d ... a
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a d I ..., 2020; P ... a a e, a., 2019). F ... e ... e, ... e,

and effective. Although we have not yet established the effectiveness of the proposed method, we believe that the proposed method is a promising approach to the problem of learning from noisy data. The proposed method is a promising approach to the problem of learning from noisy data.

In this paper, we have presented a novel method for learning from noisy data. The proposed method is a promising approach to the problem of learning from noisy data. The proposed method is a promising approach to the problem of learning from noisy data.

Supplementary Information The online version of this article (https://doi.org/10.3758/s13423-021-02014-8) contains supplementary material, which is available to authorized users.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethics approval and informed consent The study was approved by the local ethics committee. All participants provided informed consent before participating in the study.

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S... R..., 5, 8857.
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