

The relationships of theory of intelligence and musicality with concurrent musical activities and training, academic and social self-concept as well as non-verbal intelligence and overall academic performance

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Overview.



Characteristics of implicit theories.

(Aeppli et al., 2016; Biddle et al., 2003; Dweck et al., 1995; Dweck & Leggett, 1988)

“Implicit theories are schematic knowledge structures that include specific beliefs regarding the inherent stability of an attribute, as well as a set of general principles concerning the conditions likely to promote personal change or stability” (Ross, 1989, p.342).

- They can change during a long period.
- They set up a framework for the interpretation and reaction to one's own and other's behavior.
- Implicit theories can be distinguished between an incremental and a entity theory of human traits.
- People have different theories of different attributes.

Implicit theories are comprehensively examined.

(Dweck et al., 1995; Biddle et al., 2003, Henderson & Dweck, 1990)

- Implicit theories are independent of age, intelligence and gender.
- Implicit theories foster helpless versus mastery-oriented responses to personal setbacks.
- Association with internal and external attribution of success and failure.
- They are associated with objective factors like academic achievement.

But there are less studies about theory of musicality.

(Müllensiefen et al., 2015)

Investigating the importance of self-theories of intelligence and musicality for students' academic and musical achievement

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The results of the study conducted by Müllensiefen et al. (2015) show, that *theory of musicality* and *theory of intelligence* correlate high with each other. Also *theory of musicality and intelligence* are related with the personality dimension *conscientiousness* and the factor *overall academic achievement*.

Overview.



The aims of the present study.

The principle aims of the present study are...

- ...to analyze the relationships between various constructs related to musical development from three independent waves of data collection (Years: 2015, 2016, 2017).
- ... to determine to what degree the level of *concurrent musical activity* has a direct influence on *overall academic achievement* and to what degree this is mediated by *theory of musicality*.

Based on previous literature (Dweck, 2000; Müllensiefen et al., 2015) we assume...

1. ...that *theory of intelligence* (TOI) and *theory of musicality* (TOM) correlate substantially.
2. ...that TOI and TOM are independent of *non-verbal intelligence*.
3. ...that TOI and TOM are related with *overall academic achievement* and *social and academic self-concept*.
4. ...that TOI and TOM correlate with *musical training* (Gold-MSI) and *concurrent musical activity* (CCM).
5. ...that TOM acts as an mediator between CCM and *overall academic achievement*.

Overview.



The sample consists of students from three secondary schools in Southeast England.

Table 1

Characters of three different samples across the three measurement points.

	Year 2015	Year 2016	Year 2017
Total	308 students	425 students	573 students
Gender	100.0 % female	83.5 % female	65.4 % female
		13.6 % male	32.5 % male
		0.7 % rather not say	2.1 % rather not say
		2.2 % missing values	
Age (SD)	14.27 (1.73)	13.94 (1.78)	13.76 (1.51)

Across the three years the questionnaire consists of various measuring instruments.

**Cognitive
Test**

Matrix reasoning IQ Test (Chan & Kosinski, 2015)

**Musical
activities**

Musical Training (Müllensiefen, Gingras, Musil & Stewart, 2014), **Concurrent Musical Activity** (Müllensiefen et al., 2015)

Attitudes

Social and Academic Self-Concept (Bracken, 1992), **Theory of Intelligence** (Dweck, Chiu & Hong, 1995), **Theory of Musicality** (Müllensiefen, Harrison, Caprini & Fancourt, 2015)

**Academic
performance**

General School Grades

Development of the theory of musicality questionnaire.

Year 2015

Entity (3 items)

Year 2016 & 2017

Entity

Stable (3 items)

Gift (3 items)

Incremental

Learning (3 items)

Improvement (3 items)

TOI and TOM show substantially correlations.

Table 3

Correlations (Pearson) between theory of intelligence (TOI) and theory of musicality (TOM) across the years 2015 and 2017

	TOM entity 2015	TOM entity 2017	TOM incremental 2017
TOI entity 2015, 2017	.525**	.433**	-.198**

Note: ** $p \leq .01$

TOI and TOM are independent of *non-verbal intelligence*.

Table 4

Correlations (Pearson) between non-verbal intelligence and TOM and TOI across the years 2015, 2016 und 2017

	TOM entity 2015	TOM entity 2016	TOM incremental 2016	TOM entity 2017	TOM incremental 2017	TOI entity 2015	TOI entity 2017
Non-verbal Intelligence 2015, 2016, 2017	-	-	-	-.132**	.155**	-	-.116**

Note: ** $p \leq .01$

TOI and TOM correlate with overall academic achievement and academic and social self-concept.

Table 5

Correlations (Pearson) between overall academic achievement and academic and social self-concept with TOM and TOI across the years 2015, 2016 und 2017

	TOM entity 2015	TOM entity 2016	TOM incremental 2016	TOM entity 2017	TOM incremental 2017	TOI entity 2015	TOI entity 2017
Academic achievement 2015, 2016, 2017	-.266**	-	-	-.108*	.120**	-.233**	-.173**

Note: * $p \leq .05$, ** $p \leq .01$

TOI and TOM correlate with overall academic achievement and academic and social self-concept.

Table 5

Correlations (Pearson) between overall academic achievement and academic and social self-concept with TOM and TOI across the years 2015, 2016 und 2017

	TOM entity 2015	TOM entity 2016	TOM incremental 2016	TOM entity 2017	TOM incremental 2017	TOI entity 2015	TOI entity 2017
Academic achievement 2015, 2016, 2017	-.266**	-	-	-.108*	.120**	-.233**	-.173**
Academic self-concept 2015, 2016, 2017	-	-.158**	.246**	-.141**	.087*	-	-.267**
Social self-concept 2015, 2016, 2017	-.161**	-.109*	.097*	-.121**	.138**	-.147*	-.163**

Note: * $p \leq .05$, ** $p \leq .01$

TOI and TOM correlate with musical training (Gold-MSI) and concurrent musical activity.

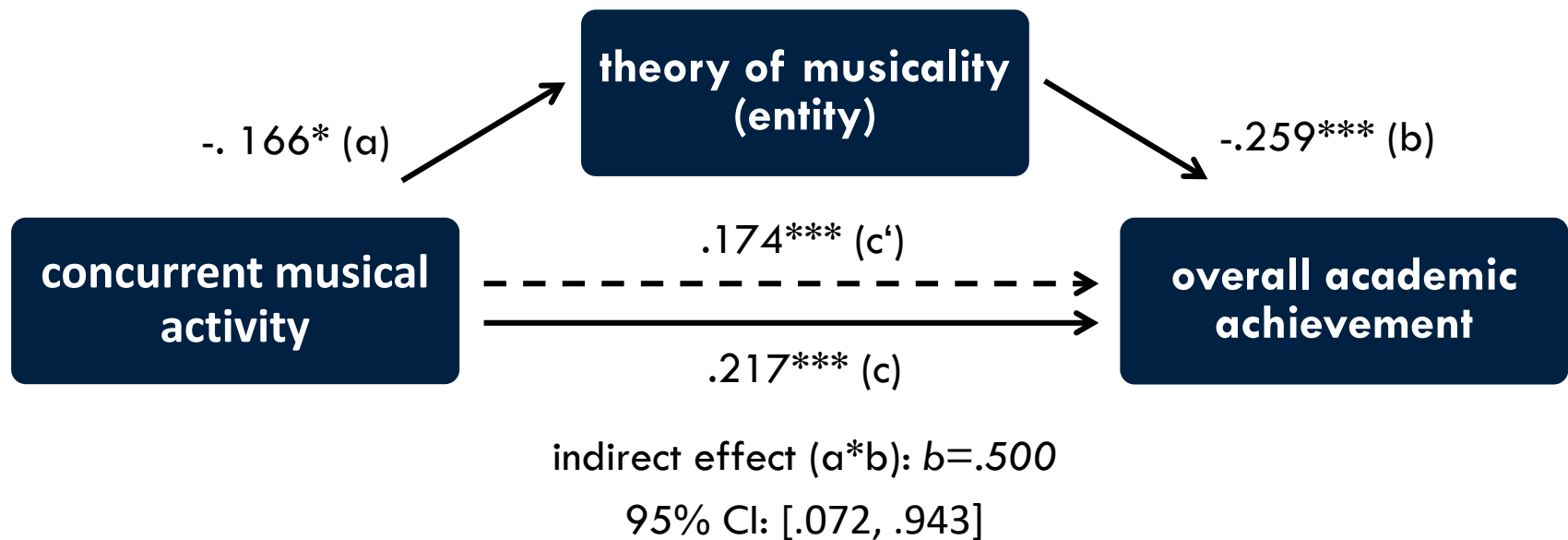
Table 6

Correlations (Pearson) between musical training (Gold-MSI) and concurrent musical activity with TOM and TOI across the years 2015, 2016 und 2017

	TOM entity 2015	TOM entity 2016	TOM incremental 2016	TOM entity 2017	TOM incremental 2017	TOI entity 2015	TOI entity 2017
Musical training (Gold-MSI) 2015, 2016, 2017	-	-.278**	.109*	-.139**	.128**	-	-
Concurrent musical activity 2015, 2016, 2017	-.163**	-.274**	.107*	-.088*	-	-.169**	-

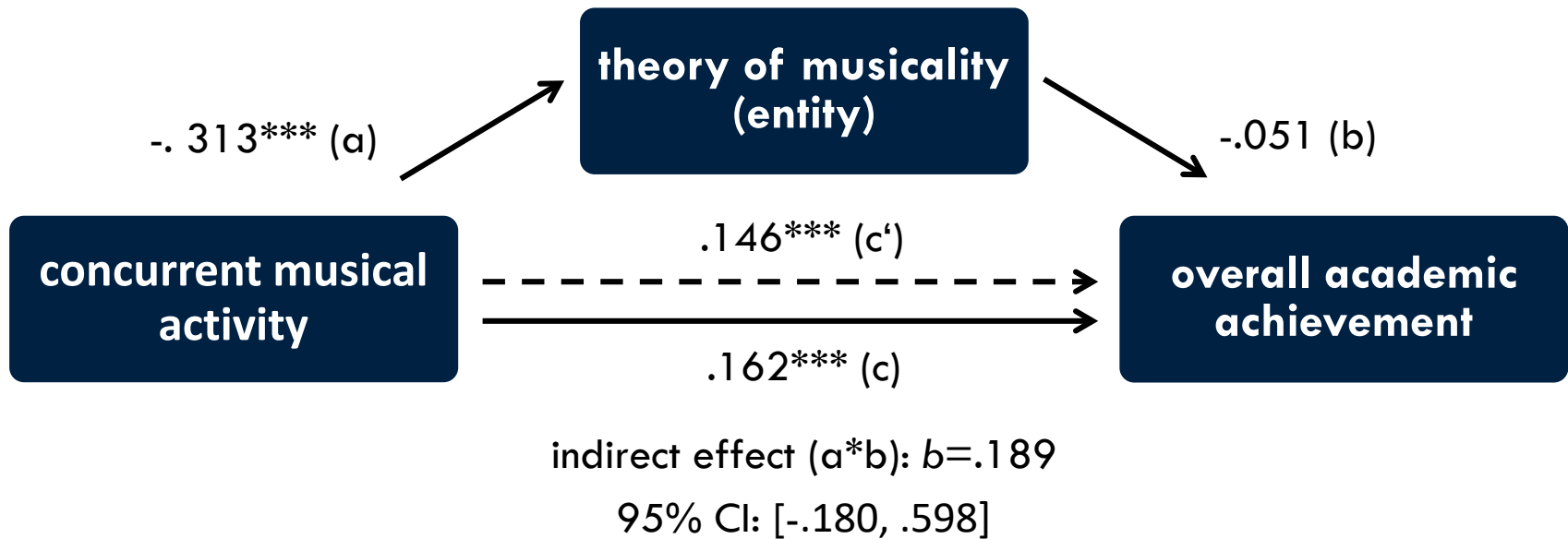
Note: * $p \leq .05$, ** $p \leq .01$

Theory of musicality as a mediator between concurrent musical activity and overall academic achievement (Year: 2015).



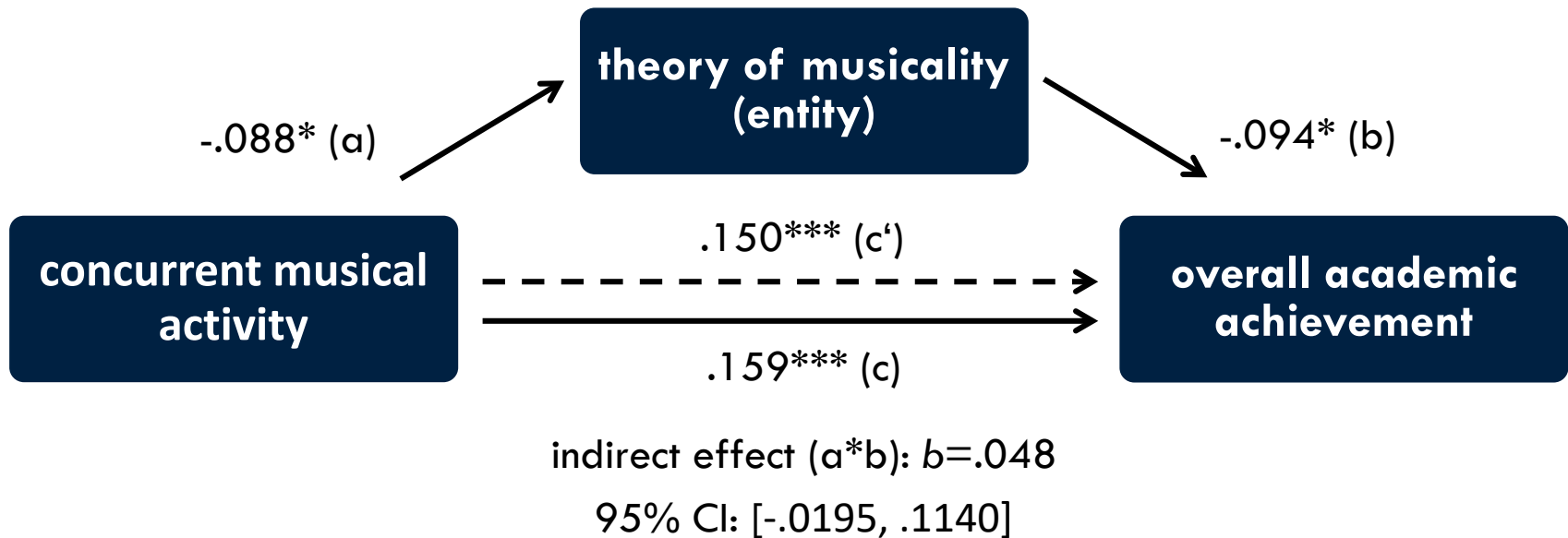
Note: * $p \leq .05$, *** $p \leq .001$

Theory of musicality as a mediator between concurrent musical activity and overall academic achievement (Year: 2016).



Note: *** $p \leq .001$

Theory of musicality as a mediator between concurrent musical activity and overall academic achievement (Year: 2017).



Note: * $p \leq .05$, *** $p \leq .001$

Overview.



Conclusion.

- *theory of intelligence and theory of musicality are related*
- *they correlate with academic and social self-concept and overall academic achievement*
- *incremental theory of musicality correlates positive with musical activity*
- *theory of musicality acts as a mediator between concurrent musical activity and overall academic achievement (indirect effect in 2015)*

Limitation of the present study.

- Usages of different measuring instruments (TOM 2015 and 2016/2017).
- The sample of the present study is not representative in age, gender and type of school.
- Only longitudinal models of musical development will be able to provide evidences for causal relationships (Brüderl, 2010).

Discussion.

- No theory (incremental or entity) is the “correct” one to have, each has costs and benefits (Dweck et al. 1995).
- But: The results show that an incremental theory of musicality could be an important factor in the musical development during adolescence.

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