

# Early Adolescent Music Preferences and Minor Delinquency

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## KEY WORDS

youth, adolescence, music, risk factors, juvenile delinquency

## ABBREVIATIONS

MMT—Music Marker Theory

R&B—rhythm and blues

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**WHAT'S KNOWN ON THIS SUBJECT:** Adolescent music preferences have been linked to problem behavior in cross-sectional studies. Particularly, preferences for loud, rebellious, and so-called "deviant" music predict externalizing problem behavior, such as minor delinquency and substance abuse.



**WHAT THIS STUDY ADDS:** There is a theoretical rationale for associations between music preferences and minor delinquency. Preferences for rock, African American music, and electronic dance music indicate later minor delinquency. Music preferences are better markers of later delinquency compared with early adolescent delinquency.

## abstract

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**OBJECTIVES:** To test Music Marker Theory (MMT) positing that early adolescents' preferences for nonmainstream types of popular music indicate concurrent and later minor delinquency.

**METHODS:** MMT was tested in a 4-year longitudinal study ( $n = 309$ ).

**RESULTS:** The results showed that early fans of different types of rock (eg, rock, heavy metal, gothic, punk), African American music (rhythm and blues, hip-hop), and electronic dance music (trance, techno/hardhouse) showed elevated minor delinquency concurrently and longitudinally. Preferring conventional pop (chart pop) or highbrow music (classic music, jazz), in contrast, was not related to or was negatively related to minor delinquency.

**CONCLUSIONS:** Early music preferences emerged as more powerful indicators of later delinquency rather than early delinquency, indicating that music choice is a strong marker of later problem behavior. The mechanisms through which music preferences are linked to minor delinquency are discussed within the framework of MMT. *Pediatrics* 2013;131:1–10

During the 1980s and 1990s, the loudest and most rebellious forms of rock (eg, heavy metal, gothic), African American music (hip-hop, particularly gangstarap), and electronic dance music (house, techno, hardhouse) were labeled by adults as “problem” music and perceived as promoting violence, substance use, promiscuous sex, blasphemy, and depression.<sup>1,2</sup> Although public claims that engaging with “deviant” media will inevitably lead to problem behavior are wildly exaggerated,<sup>3</sup> social scientific research has uncovered associations between media use, particularly music listening and music video watching, and a range of externalizing problem behaviors, including minor delinquency.<sup>4–6</sup> Until now, the music–problem behavior link has never been studied from a developmental perspective spanning adolescence.

For an estimated 80% to 90% of adolescents aged 12 to 18 years, music is an important medium that enhances their mood, helps them cope with problems, and helps them develop social identity.<sup>7</sup> Adolescents in the United States listen to music between 2 and 3 hours daily on average.<sup>8</sup> Adolescents listen to the music of their choice often privately through personal audio in their leisure time that is largely unmonitored by parents.<sup>3</sup> In Europe and North America, adolescents listen mainly to 4 or 5 different music styles: conventional, mainstream pop music (eg, chart pop); intense and rebellious rock (eg, rock, heavy metal, emo, gothic, punk); rhythmic and soulful African American or African Caribbean music (eg, blues, soul, hip-hop, rhythm and blues [R&B], reggae); highly energetic dance music (eg, house, trance, techno, hardhouse); and complex highbrow music (eg, classical music, jazz, singer-songwriter).<sup>9–12</sup> To a large extent, preferences for music genres are already in place by early adolescence and remain highly stable across adolescence.<sup>5,13</sup>

Adolescence is a period for testing and internalizing culturally defined norms and values. During adolescence, young people develop a more autonomous position in relation to their parents<sup>14,15</sup> and become more dependent on friends and peers in cliques and crowds.<sup>16</sup> Because of decreased parental monitoring and parent-child communication<sup>17,18</sup> and strengthened peer contacts and influences,<sup>19</sup> adolescent minor delinquency (eg, shoplifting, vandalism, fighting, graffiti spraying) increases strongly, peaks sharply at about the age of 17, and drops precipitously in young adulthood.<sup>20,21</sup>

A small body of research has investigated the role of music in the development of externalizing behaviors and has proposed different mechanisms through which they are linked. Some researchers argue that exposure to violent lyrics or music videos can have a direct effect on externalizing behaviors. For example, in a series of classic experiments, Hansen and Hansen<sup>22</sup> showed that the exposure to violent music makes sexist and antisocial behavior more acceptable, at least in the short run. Anderson et al<sup>23</sup> reported that such exposure fosters hostility and aggressive thoughts and feelings. Recently, Lennings and Warburton<sup>24</sup> found that violent music lyrics rather than violent visual media are more likely to elicit violence.

Other investigators, such as Jeffrey Arnett<sup>25</sup> and Keith Roe,<sup>26</sup> stressed the role of selection, suggesting that adolescents consume the type of media that fits their personality and social context, that is, those who are at odds with their parents and teachers and are inclined to sensation seeking, disinhibition, and substance use, gravitate toward media reflecting these particular characteristics. Both Arnett<sup>25</sup> and Roe<sup>26</sup> stressed that adolescents characterized by disinhibition, sensation seeking, and risky behaviors are more

often alienated from school, receive lower grades, and are more likely to drop out, and, as a result, tend to have strained relations with parents, teachers, and other authority figures. Estranged from major social institutions, they seek the company of their peers and try to compensate for their failure in school with status and respect among these peers. Their deviant media consumption adds to their social status.

Additionally, other research has shown that adolescents actively seek peers with similar music tastes to form friendships; therefore, music is a defining factor in adolescent crowd formation.<sup>27</sup> For all adolescents, not only those at odds with parents and teachers, selecting deviant crowds through music increases the odds of “contagion” by others’ externalizing behaviors.<sup>19</sup>

A number of correlational studies have shown that adolescents who prefer loud, nonmainstream, or even deviant types of music engage in more risky and deviant behaviors compared with their musically conventional peers. More specifically, from the 1980s onward, young people preferring rock genres, such as heavy metal, gothic, and punk, consistently showed more risky behaviors, such as drunk driving, speeding, alcohol and drug use, and minor delinquencies in Canadian, Dutch, US, and Swedish studies.<sup>5,28–30</sup> In Canadian and Dutch studies, different types of hip-hop fans were more likely to be involved in gangs, minor delinquency, and alcohol and drug use.<sup>5,30,31</sup> In a rare 2-year longitudinal investigation, Selfhout and colleagues<sup>32</sup> reported that both heavy metal and hip-hop fans reported more externalizing problems. Heavy types of rock and African American music have not been the only types of music associated with problem behavior. In the late 1980s, electronic dance music emerged, and fans of genres, such as house,

trance, or techno, were more likely to use alcohol and (hard) drugs and engage in risk behavior in the United Kingdom, Canada, and the Netherlands.<sup>30,33,34</sup>

Not all music indicates problems, however. In Canadian, Dutch, and Swedish studies, fans of conventional chart pop music or highbrow music, such as classical music and jazz, showed fewer externalizing problems.<sup>5,29,30</sup>

Although the mapping of the effects of music on different outcomes is valuable, previous studies have an important limitation. Adolescence is a period of life during which social relations, media use, and problem behaviors are in flux. Investigations of potential effects of music should account for these changes and investigate the music-behavior link from a developmental perspective.

To address this issue, we propose the Music Marker Theory (MMT), which synthesizes theoretical and empirical elements reviewed previously. MMT assumes that

1. In early adolescence, youths, confined to the parental house, school, and direct neighborhood, have relatively little room to move, hence to break rules.
2. In the privacy of their own room or through personal audio, they can listen to the music of their choice and develop a “mainstream” or more “deviant” taste in music.
3. When getting older, the balance between adult-monitored activities and unsupervised time with peers shifts to the latter, resulting in more norm-breaking behavior, peaking at age 17.
4. Adolescents with an early and strong taste for deviant, nonmainstream music will see stronger similarities with peers listening to similar nonmainstream music compared with youths less inclined

to listen to energetic, noisy, and rebellious music.

5. The concentration of youths listening to nonmainstream music in peer crowds leads to contagion, that is, across adolescence young people belonging to nonmainstream groups imitate and stimulate each other's norm-breaking behaviors more than do youths in mainstream crowds.
6. In addition, systematic exposure to deviant media may directly influence or exacerbate norm-breaking behaviors among youth listening to nonmainstream music.
7. Although the exact balance between the consequences of selection of friends through music preferences and potential influence of direct media exposure on problem behaviors has not yet been established, it is safe to propose that: Early adolescent music preferences predict later norm-breaking behavior.

Previous theorizing on the link between music preferences and problem behavior has assumed that music taste would reflect a problematic social position (eg, lack of school commitment and academic achievements).<sup>25,26</sup> MMT assumes that music preferences precede norm-breaking behavior (ie, even before adolescent norm-breaking behaviors have developed in full, music preferences function as markers of these later behaviors).

All of the first 6 core assumptions of MMT are based on the results from previous studies on adolescent peer group selection, peer influence in the context of peer crowds, and media exposure influences; however, the last, most central inference on the link between early music preferences and later problem behavior has not been researched across adolescence. Hence, the current study aimed to test whether early adolescent preferences for loud, energetic, nonmainstream music, such

as heavy metal, hip-hop, and techno/hardhouse, are concurrently and longitudinally associated with minor delinquency. In a 4-year longitudinal study, initial and developing preferences for 11 well-known music genres were modeled in relation to minor delinquency.

## METHOD

### Participants

The current sample was drawn from a longitudinal study on the relationships of adolescents with parents and peers, the Conflict and Management of Relationships study (2001–2005), in which 309 2-parent families participated.<sup>17</sup> The participating adolescents, 149 boys and 160 girls, came from various high schools in municipalities located in an urban area in the Netherlands. At the baseline of the current study, adolescents were in their first year of high school and had a modal age of 12 (mean = 12.2; SD = 0.51).

### Questionnaires

Music is an evolving cultural field; therefore, the Music Preferences Questionnaire<sup>7,12,35</sup> is updated every 2 years; however, in the course of the Conflict and Management of Relationships study, the same measures were used across the study. The respondents were asked to rate 11 well-known and popular types of music on 5-point Likert scales (ranging from 1 = dislike very much to 5 = like very much). The respondents also had the opportunity to indicate that they were unfamiliar with specific types of music (6 = don't know this genre). On average, 1.1% to 15.2% of the adolescents reported they were unfamiliar with the different genres across the 4 waves of the study. Over time, a decreasing number of the adolescents reported not knowing the genres in the questionnaire (average missing values for the 4 subsequent measurement waves were 13.5%, 2.7%,

2.7%, and 0.8%). These responses were treated as missing and imputed (relative mean substitution).<sup>36</sup>

Adolescent delinquency was assessed with a self-report questionnaire comprising 14 items measuring minor delinquency.<sup>38</sup> Respondents indicated on a 4-point scale (1 = never, 2 = once, 3 = 2 or 3 times, and 4 = 4 times or more) how many times they had committed minor offenses, such as shoplifting, petty theft, and vandalism in the previous year. Reliabilities of this scale were between  $\alpha = 0.82$  and  $\alpha = 0.92$ . Previous analyses conducted in a Dutch sample of low-risk adolescents have shown that this scale is adequately unidimensional.<sup>37</sup>

In the literature, both personality factors and strained adolescent school relations have been proposed to be important driving factors in the development of problem behavior; thus, this study considered these factors. Covariates in the analyses were academic achievements (ie, educational level) and school commitment (using Utrecht Management of Identity Commitments Scale [UMICS]<sup>38</sup>). Additionally, personality was corrected for by identifying 3 of Block and Block's<sup>39</sup> personality types (ie, resilients, overcontrollers, and undercontrollers). For this purpose, we applied cluster analysis to classify the ratings on Goldberg's<sup>40</sup> Big Five questionnaire (for procedure see Akse et al<sup>41</sup>). Both undercontrolling personality characteristics<sup>41,42</sup> and lack of school commitment<sup>43</sup> have been shown to be predictive of delinquency and, hence, function as highly relevant confounders in the analyses.

### Strategy of Analyses

To examine the development of musical preferences among adolescents, 4 repeated measurements of musical preferences were taken (at ages 12, 14, 15, and 16). First, latent growth curve models were conducted separately for

all genres in Mplus.<sup>44</sup> In this type of analysis, the development of music preferences is expressed by 2 or more latent factors, namely an intercept (ie, mean initial level of music preferences) and 1 or more slope factors. A linear slope indicates linear rate of change of music preferences, an additional quadratic slope indicates curvilinear change. The models describing linear and quadratic changes can be compared to obtain the best-fitting model (for an introduction into this technique, see Duncan et al<sup>45</sup>). Gender differences in the development of musical preferences were tested by constraining the intercept and slope factors to be equal for boys and girls. A significant worsening of the fit statistic (a higher  $\chi^2$  value) after introducing this constraint indicates differences either in mean initial levels (ie, intercept) or in developmental change (ie, slope factors) between boys and girls.

Second, we tested whether the initial mean level and the development of 11 musical preferences related to delinquency at age 12 and at age 16. This model is displayed in Fig 1. In our model, we included repeated measures for the music preference, the estimated latent growth factors of the music preference, and observed scores of delinquency at ages 12 and 16 separately for each music genre. We examined associations between the latent growth factors of the music preference at age 12 and age 16 delinquency while controlling for temporal stability of delinquency between ages 12 and 16. Because the distribution of delinquency was positively skewed ( $\text{skewness}_{\text{Age } 12} = 5.24$ ;  $\text{skewness}_{\text{Age } 16} = 3.40$ ), the normality assumption was violated. Therefore, robust Maximum Likelihood estimation was used in the analyses.<sup>46</sup> Given that our preliminary analyses revealed no systematic gender differences in the

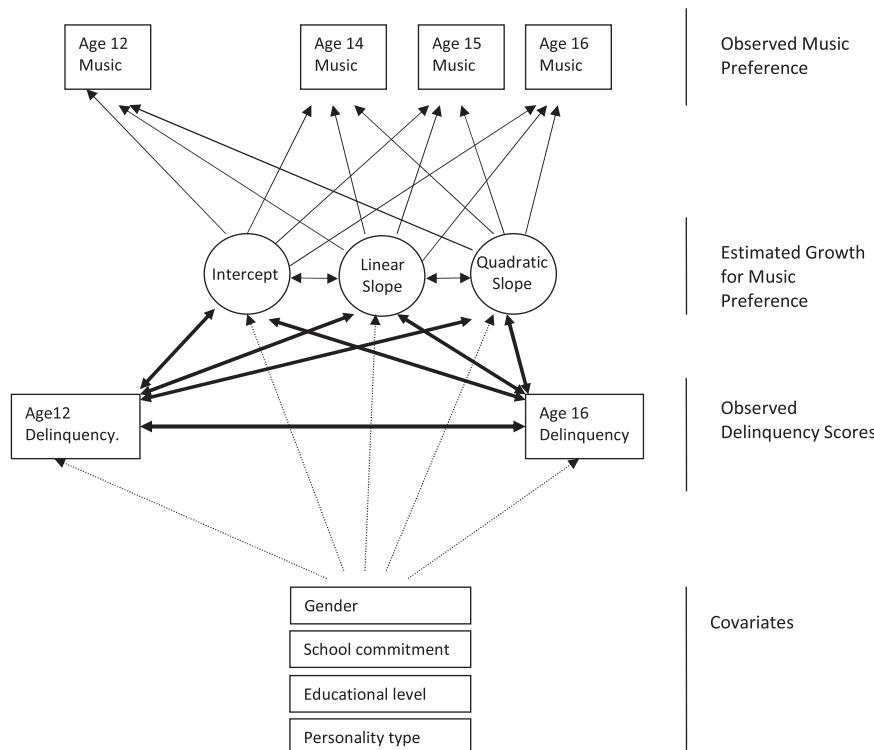
association between music and delinquency, we analyzed boys and girls together. Mean gender differences in delinquency and in the growth curve of music genre preferences were corrected by regressing these variables on adolescent gender. Likewise, to correct for school commitment, educational level, and adolescent personality type, growth factors of music preferences and observed scores of delinquency were regressed on these covariates.

Overall, 13.6% of the cases for delinquency at age 12 were missing. For all other variables, the percentage of missing responses was below 5.2%; 75.4% of the respondents had no missing values across 4 measurements. Moreover, the pattern of missing data was completely random; therefore, we included respondents with missing cases in our model estimations using Full Information Maximum Likelihood.

## RESULTS

### Mean Level Development of Musical Preferences

Based on the observed values in Table 1, Table 2 shows the estimated values for the intercept and slopes of the growth function. For each music preference, we tested whether it developed in a linear or nonlinear fashion. Nonlinear models, with added quadratic slope factors in addition to intercepts and linear slope factors, had superior fit compared with linear models (all  $\Delta\chi^2 > 10.18$ ,  $\text{df} = 4$ , all  $P < .03$ ). Figure 2 displays these estimated mean developmental changes of music preferences. The average preference for chart pop and trance declined linearly across adolescence, as indicated by a negative significant linear slope and no quadratic slope. In contrast, a significant increase in the preference for classical music, jazz, and techno/hardhouse music was found in middle to late adolescence, but not in early to middle adolescence (indicated by significant positive quadratic

**FIGURE 1**

Structural equation model to test associations between growth factors that indicate initial levels and change in music style preferences and age 12/age 16 delinquency, while controlling for adolescent gender, school commitment, educational level, and adolescent personality type.

growth). Preferences for R&B, hip-hop, rock, metal, gothic, and punk music did not change significantly (ie, absence of significant linear and quadratic growth).

#### Gender Differences in Development of Music Genre Preferences

On average, girls reported a higher initial preference for chart pop, R&B, and jazz compared with boys. Boys,

compared with girls, reported a higher preference for hip-hop, metal, gothic, punk, and trance. No significant gender differences were found in the initial preference for rock, techno/hardhouse, and classical music. Significant gender differences in the development of music preferences were found only for gothic music and rock. On average, boys reported a significant decrease in their

preference for rock and gothic music, whereas girls showed no significant change in their preference.

#### Music Genre Preference and Associations With Minor Delinquency

As an initial test of MMT, we examined bivariate correlations between music preferences and delinquency. Table 3 shows that 12-year-old adolescents with relatively strong preferences for hip-hop, metal, gothic, punk, trance, or techno/hardhouse scored relatively high on delinquency at age 12 ( $r$  between 0.13 and 0.25), as well as on delinquency at age 16 ( $r$  over this 4-year interval ranged from 0.16 to 0.31). Adolescents liking rock music at age 12 also scored higher on delinquency at age 16 ( $r=0.21$ ). Strikingly, correlations between age 12 music preferences and age 16 delinquency over a 4-year interval were equally strong or stronger compared with concurrent associations

**TABLE 1** Descriptive Statistics of the Variables Under Study

Variable	Age 12		Age 14		Age 15		Age 16	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Chart pop	4.12	0.96	3.93	1.13	3.74	1.14	3.68	1.15
R&B	3.51	1.20	3.42	1.26	3.45	1.27	3.27	1.29
Hip-hop	3.27	1.26	3.38	1.35	3.33	1.37	3.26	1.37
Rock	2.85	1.16	2.85	1.41	2.80	1.41	2.85	1.49
Metal	2.25	1.28	2.19	1.37	2.11	1.40	2.06	1.36
Gothic	2.05	0.99	1.93	1.17	1.78	1.12	1.68	1.00
Punk	1.90	1.05	2.08	1.27	2.00	1.30	2.05	1.33
Trance	3.31	1.26	2.94	1.40	2.80	1.34	2.77	1.30
Techno/Hardhouse	1.68	0.88	1.70	1.03	1.83	1.20	1.98	1.26
Classic	2.06	1.07	2.06	1.01	2.22	1.08	2.38	1.12
Jazz	2.65	1.15	2.34	1.12	2.49	1.18	2.54	1.18
Delinquency	1.14	0.33	—	—	—	—	1.12	0.27

—, not included in the study.

**TABLE 2** Development of Musical Preferences

Music Style	Mean Growth Factors		
	Intercept	Linear Slope	Quadratic Slope
Chart pop	4.12 <sup>a</sup>	-0.12*	0.00
R&B	3.50 <sup>a</sup>	0.03	-0.02
Hip-hop	3.27 <sup>b</sup>	0.10	-0.03
Rock	2.86	-0.04 <sup>a</sup>	0.01 <sup>a</sup>
Metal	2.26 <sup>b</sup>	-0.04	0.00
Gothic	2.06 <sup>b</sup>	-0.06 <sup>a</sup>	-0.01 <sup>b</sup>
Punk	1.90 <sup>b</sup>	0.09	-0.01
Trance	3.31 <sup>b</sup>	-0.25**	0.03
Techno/Hardhouse	1.68	-0.04	0.03*
Classic	2.06	-0.06	0.04**
Jazz	2.65 <sup>a</sup>	-0.22**	0.05**

Development of music style preference is expressed in 3 growth factors: Intercept (ie, mean initial level), Linear Slope (ie, linear increase or decrease), and Quadratic Slope (ie, curvature). All 9 models had adequate model fit:  $\chi^2 (2) < 4.83$ ; Comparative Fit Index  $> 0.99$ ; Tucker-Lewis Index  $> 0.97$ ; Root Mean Square Error of Approximation  $< 0.07$ .

a Girls score significantly higher than boys on this growth factor.

b Boys score significantly higher than girls on this growth factor. These developmental changes are graphically displayed in Fig 1.

\*  $P < .05$ .

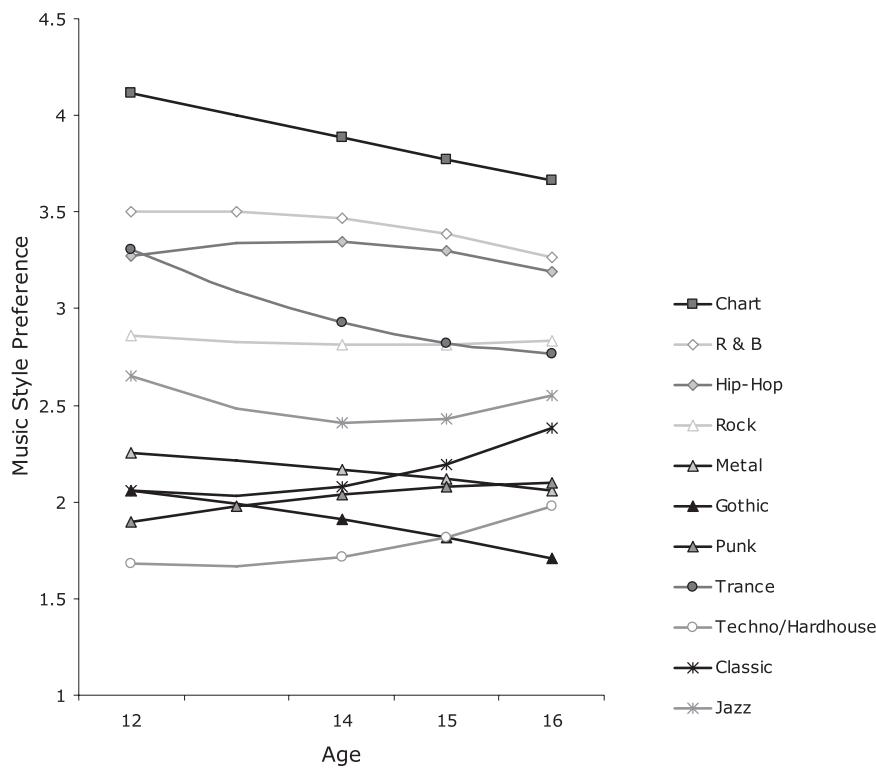
\*\*  $P < .001$ .

between these music preferences at age 12 and delinquency at age 12 ( $r$  between 0.12 and 0.25), and age 16 and delinquency at age 16 ( $r$  between -0.05 and 0.26), and compared with 4-year stability of delinquency ( $r = 0.17$ ).

Although some music preferences were positively associated with delinquency, liking jazz at age 12 correlated negatively with delinquency ( $r = -0.12$ ), but did not relate to age 16 delinquency. Overall, earlier delinquency did not in-

dicate later music preferences; that is, levels of delinquency at age 12 did not correlate with music genre preferences at age 16, with the exception of preference for classical music at age 16 ( $r = -0.17$ ). The overall pattern of correlations thus supports MMT: early music choice indicates later problem behavior and not the other way around.

In a more stringent test of MMT, we examined whether early preferences for loud, rebellious music, but not increasing tendencies to listen to these types of music, would be associated with higher levels of delinquency. That is, we tested whether an individual's level of delinquency at age 12 and age 16 would be associated with initial levels (reflected in intercept) but not with mean-level change (reflected in linear and quadratic slope) of music preferences. In this model, we also corrected for gender differences, potential confounding variables, including educational levels and school commitment,

**FIGURE 2**

Estimated mean development of 11 music style preferences between ages 12 and 16 for the whole sample of adolescents.

**TABLE 3** Bivariate Correlations Between Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Chart pop		0.55**	0.47**	-0.28**	-0.54**	-0.29**	-0.34**	0.23**	0.06	-0.13*	0.01	-0.05	-0.11
2. R&B	0.44**		0.67**	-0.26**	-0.39**	-0.21**	-0.27**	0.15*	0.01	-0.13*	0.24**	-0.05	0.00
3. Hip-hop	0.28**	0.55**		-0.29**	-0.34**	-0.27**	-0.15*	0.31**	0.27**	-0.24**	0.14*	0.03	0.15*
4. Rock	0.00	0.21**	0.21**		0.61**	0.43**	0.42**	-0.18**	-0.07	0.33**	0.20**	0.00	-0.05
5. Metal	0.00	0.23**	0.42**	0.59**		0.60**	0.64**	-0.12*	0.12*	0.22**	0.10	0.06	0.16**
6. Gothic	-0.01	0.23**	0.26**	0.56**	0.69**		0.48**	-0.16**	0.05	0.18**	0.10	0.01	0.06
7. Punk	-0.04	0.09	0.25**	0.52**	0.68**	0.70**		0.09	0.32**	0.13*	0.05	0.06	0.14*
8. Trance	0.21**	0.38**	0.31**	0.14*	0.34**	0.25**	0.24**		0.52**	-0.16**	-0.02	0.08	0.20**
9. Techno/Hardhouse	0.17**	0.19**	0.26**	0.34**	0.44**	0.33**	0.50**	0.33**		-0.15**	-0.09	0.10	0.26**
10. Classic	-0.17**	-0.19**	-0.22**	0.01	-0.12*	-0.09	-0.05	-0.26**	-0.12*	0.40**	-0.17**	-0.17**	
11. Jazz	0.10	0.13*	0.11	0.18**	0.10	0.16**	0.14*	0.00	0.14*	0.32**	-0.10	0.03	
12. Delinquency age 12	-0.03	0.01	0.16*	0.12	0.25**	0.19**	0.16**	0.19**	0.13*	-0.11	-0.12*	0.17**	
13. Delinquency age 16	-0.07	0.09	0.16**	0.21**	0.29**	0.31**	0.27**	0.18**	0.20**	-0.04	-0.06	0.17**	

Below the diagonal, are presented the correlations between age 12 music preferences and delinquency at ages 12 and 16. Above the diagonal, are presented the correlations between age 16 music preferences and delinquency at ages 12 and 16. Correlations with age 14 and age 15 music preferences can be obtained from the first author on request.

\*  $P < .05$ .

\*\*  $P < .01$ .

and adolescent personality type. The results of these final structural equation models are displayed in Table 4. (The results of models in which these covariates were omitted showed identical results and can be obtained from the authors.)

Consistent with correlational analysis, and in support of MMT, the initial mean levels of music genre preferences clearly related to the mean levels of age 12 and age 16 delinquency in the structural equation model. More specifically, the results indicated positive associations of initial preference for hip-hop, metal, gothic, and trance with age 12 and age 16 delinquencies. Preferences for R&B, rock, punk, and techno were not associated with age 12 delinquency, but they indicated higher levels of age 16 delinquency. Again, mean initial levels of music preferences were equally strong or more strongly associated with age 16 delinquency rather than with age 12 delinquency. Interestingly, and further supporting MMT, the associations between music preference at age 12 and age 16 delinquency ranged from 0.20 to 0.46, indicating stronger relations than the bivariate association (ie, 4-year stability) between age 12 delinquency and age 16 delinquency ( $\beta = 0.04, P >$

.05). This suggests that music preference is a better predictor of later delinquency than early delinquency.

Initial preference for jazz or chart pop did not predict engagement in delinquency concurrently (age 12) or prospectively (age 16), and preferences for classical music related negatively to delinquency at age 12.

Consistent with MMT, developmental changes in music genre preferences did not relate to delinquency at age 16, except for a weak but significant link (-0.20) between smaller linear increases in R&B preferences and lower levels of delinquency at age 16. Thus, individuals showing stronger increases in loud, rebellious music were not more delinquent at age 16, as indicated by the nonsignificant associations between music-slope coefficients and age 16 delinquency in Table 4. Finally, associations were found between lower school commitment and higher levels of delinquency at age 16. Resilient adolescents tended to show lower levels of delinquency at age 12 compared with other personality types. Boys, compared with girls, scored higher on delinquency at both ages and had stronger preferences for louder music (not shown in Table 4). It is important to note that even when considering the potential con-

founders, associations between music preferences and minor delinquency remained.

## DISCUSSION

This study is the first to provide evidence that an early preference for different types of noisy, rebellious, nonmainstream music genres is a strong predictor of concurrent and later minor delinquency. Early preferences are more important predictors of later delinquency compared with developing preferences for deviant music (ie, increases in liking of nonmainstream music across adolescence did not indicate more delinquency at age 16). Specifically, adolescents with a strong early preference for music types that have been labeled as deviant (hip-hop, heavy metal, gothic, punk, and techno/hardhouse) were more engaged in minor delinquency in late adolescence. Moreover, preferences for music types that have been labeled as mainstream (R&B, rock, and trance), also predicted deviant behavior. Two highly intriguing results emerged. Longitudinal associations between music preferences at age 12 and minor delinquencies at age 16 were generally stronger compared with concurrent associations between music

**TABLE 4** Associations Between Development of Music Style Preferences and Adolescent Delinquency at Age 12 and Age 16

Model	Correlations Between Music and Delinquency		
	Growth Factors	Age 12 Delinquency	Age 16 Delinquency
Chart	Intercept	-0.01	-0.03
	Linear Slope	-0.13**	-0.09
	Quadratic Slope	0.16**	0.08
R&B	Intercept	0.09	0.21*
	Linear Slope	-0.04	-0.20*
	Quadratic Slope	0.01	0.18
Hip-hop	Intercept	0.21**	0.20*
	Linear Slope	-0.10	0.03
	Quadratic Slope	0.06	-0.01
Rock	Intercept	0.23	0.37**
	Linear Slope	0.08	-0.09
	Quadratic Slope	-0.15	-0.03
Metal	Intercept	0.35**	0.36***
	Linear Slope	-0.06	-0.15
	Quadratic Slope	-0.04	0.13
Gothic	Intercept	0.31*	0.46***
	Linear Slope	-0.10	-0.21
	Quadratic Slope	0.03	0.19
Punk	Intercept	0.22	0.37**
	Linear Slope	0.16	0.01
	Quadratic Slope	-0.20*	-0.04
Trance	Intercept	0.25***	0.21**
	Linear Slope	-0.11*	-0.10
	Quadratic Slope	0.06	0.10
Techno/Hardhouse	Intercept	0.14	0.29**
	Linear Slope	0.09	-0.12
	Quadratic Slope	-0.11	0.16
Classic	Intercept	-0.11*	-0.01
	Linear Slope	-0.02	-0.26
	Quadratic Slope	-0.02	0.15
Jazz	Intercept	-0.15	-0.00
	Linear Slope	0.12	-0.02
	Quadratic Slope	-0.09	0.07

Development of music style preference is expressed in 3 growth factors: Intercept (ie, mean initial level), Linear Slope (ie, linear increase or decrease), or Quadratic Slope (ie, curvature). A separate growth model per music genre was estimated. Values in the table are standardized  $\beta$ s, while controlling for adolescent gender, school commitment, educational level, and adolescent personality type. All models had adequate model fit:  $\chi^2(9) \leq 15.96$ ; CFI  $\geq 0.98$ ; TLI  $\geq 0.91$ ; RMSEA  $\leq 0.05$ . The association between age 12 and age 16 delinquency in these models was  $\beta = 0.04$ ,  $P > .05$ .

\*  $P < .05$ .

\*\*  $P < .01$ .

\*\*\*  $P < .001$ .

and minor delinquencies at both age 12 and age 16. Next, the predictive value of initial music genre preferences in later minor delinquency was stronger compared with the predictive value of delinquency at age 12 in similar behavior at age 16; hence, early adolescent music preferences emerged as highly sensitive indicators of later problem behavior. Therefore, the results confirmed 1 crucial element of MMT, which proposes that early music preferences mark later problem behavior.

Previous research has established a link between media preferences and externalizing behaviors. In the seminal work of Keith Roe<sup>26</sup> and Jeffrey Arnett,<sup>25</sup> media delinquency reflects actual alienation from social institutions, such as family and school, and heavy reliance on deviant peers as company. In addition, experimental work has shown that exposure to deviant media can affect deviant behaviors. MMT is built on these assumptions and more precisely pins down the temporal link

between music taste and problem behavior. It furthermore provides a description of a progression in which early adolescents with a propensity to listen to loud, nonmainstream music congregate with peers with a similar taste. Music is the medium that separates mainstream youth from young people who may more easily adopt norm-breaking behaviors. In peer groups characterized by their deviant music taste, norm-breaking youth may “infect” their friends with their behaviors. Individually heavy exposure to deviant media and deviant models may affect delinquent behavior directly. Future research should investigate in detail the exact set of mechanisms through which music preferences influence problem behavior and establish their relative strength.

Adolescent minor delinquency has been characterized as an attempt to explore personal and social norms and rules, and for most young people, this problem behavior is limited to adolescence.<sup>20</sup> Future investigations should also discriminate between different youths. First, research should consider those who express their liking of deviant media as part of a longer chain of problem behaviors that persist throughout individuals’ lifetimes. These include, for example, exhibiting oppositional or defiant behavior in childhood, listening to “problem” music in early adolescence, or engaging in minor delinquency in middle and late adolescence that extends into persistent adult problem behavior. Second, research needs to consider other young people for whom listening to music, which is often annoying to grown-ups, is energizing, comforting or simply fun, and functions similarly as adolescent-limited problem behavior; that is, as a test of personal and social limits.

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