BOURDIEU IN THE NETWORK: THE INFLUENCE OF HIGH AND POPULAR CULTURE ON NETWORK FORMATION IN SECONDARY SCHOOL

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Abstract: In this paper we test the notion fundamental to Bourdieu's theories on distinction that people use cultural preferences to identify similar others to establish social ties with, and to avoid people with dissimilar tastes. We study social network formation among adolescents using a set of data on 1409 secondary school students (age 14-17) in the Netherlands (Ganzeboom et al. 2005-2006). In this data set students named their best friends in their classroom and were also asked to report on their cultural preferences, highbrow and popular, both their own and those of their parents. The results indicate that students are more likely to choose each other as friends when they have similar tastes in culture. Both highbrow and popular culture turn out to affect the formation of ties among adolescents and the two are about equally important. The effect of similarity in cultural taste is partly due to similarity in parents' education and parents' cultural participation, but adolescents' own similarity in highbrow and popular culture lead to friendship formation as well. A remarkable finding is that on top of adolescents' own cultural tastes, similarity in parents' education and culture increase the likelihood of social ties among adolescents.

I. Introduction

Much of Bourdieu's (1984) work is implicitly based on the idea that lifestyles and distinction determine the formation of social networks. People use cultural preferences to present themselves in social life and to evaluate others. Moreover, people avoid contact with persons who have different cultural tastes and they are attracted to persons with whom they share cultural preferences and practices. In the literature on social network formation this principle is known as homophily (McPherson et al. 2001). Although these social mechanisms in Bourdieu's work have long been acknowledged as important parts of his sociological theory (e. g. DiMaggio 1987; Lamont and Lareau 1988), only a few studies have examined these explicitly (Lizardo 2006; Otte 2004: chap. 9).

While there are many empirical studies on the formation and composition of social networks, only few of these have considered the lifestyle dimensions that are central in Bourdieu's work: how members of different layers of society relate to 'legitimate' or 'highbrow' culture, in particular the world of visual art, classical music, theater and *belletrie*. The typical study that analyzes social network composition in a general population (e. g. Laumann 1966; Marsden 1987) considers the more basic stratification positions of network members, such as occupation and education, and not the lifestyles that represent such positions in everyday interaction. Lifestyle studies of social networks are confined to networks of adolescents. However, these latter studies are typi-

cally occupied with dimensions of 'popular' or 'lowbrow' youth culture. For example, such studies examine the homogeneity of student networks in terms of taste in pop music, taste in clothing, and language usage (e. g. Vermeij 2006). The implicit assumption in this line of work is that the elements of highbrow culture which are at the heart of Bourdieu's work, are not so relevant at an early age. Although this seems plausible at face value, it is in fact at odds with educational research that shows that students' cultural capital (in terms of high culture) is an important factor for academic success in school (e. g. Aschaffenburg and Maas 1997; De Graaf 1986; De Graaf et al. 2000; DiMaggio 1982) – a finding which also spins off from Bourdieu's work (Bourdieu and Passeron 2000).

In this paper we seek to test directly the ideas of Bourdieu that high social status groups tend to form friendship interaction networks using highbrow cultural taste as a selection mechanism. We examine social networks among secondary school students in the age range between 14 and 17. This is an interesting period because in advanced modern societies in this stage of the life cycle, peer-groups have become an important reference group, independent of the parents, and the process of attaining one's (own) future social status takes crucial turns. According to Bourdieu it is through highbrow culture that higher social status groups select each other for social network formation, while youth culture researchers typically would maintain that popular culture is the prime factor in the formation of such social networks.

We try to combine these two lines of research by examining the role of both highbrow and popular culture in the networks of adolescents. Our first question is whether both highbrow culture and popular culture affect the formation of ties among young adults. How much taste similarity arises in the networks of young adults? Our second question is which of the two types of lifestyles is more important in network formation. Are differences with respect to popular culture a more important dividing line in young adults' networks, or are differences with respect to high culture more important? Thirdly, we are interested in the degree to which highbrow and popular culture mediate between parental status positions and offspring's social network formation and thus contribute to social reproduction. We want to learn to what extent highbrow and popular culture function as a way to reproduce social inequalities with respect to social background, which is the case when lifestyles operate as a mediator to bring together students of similar social backgrounds.

To answer these questions, we use a unique set of data collected in 2005 in secondary schools in the Netherlands (Ganzeboom et al. 2005-2006). These data were collected in classrooms and asked students to report on a wide range of lifestyle issues. These include participation in popular culture (e. g., attending pop concerts, cinema, dj-/vj-events, *genres* in popular music) and participation in highbrow culture (e. g., visiting museums, attending classical concerts, going to the theatre, liking and knowledge of paintings). Moreover, students were asked to report on the cultural practices of their parents so that we can also examine lifestyle socialization and more securely conclude about the causal direction in the culture-network association. Networks may not only be homogeneous with respect to young adults' own cultural lifestyle, they may also be homogeneous with respect to their parents' lifestyle, even after controlling the offspring's own lifestyle position.

II. Theory and hypotheses

1. Homophily theory: similarity and attraction

Research on homophily in social networks has elaborately shown that people who associate with one another, tend to be similar with respect to ethnicity, age, gender, education, social status and also on more derivative characteristics like behavior, values, and attitudes (for an overview: McPherson et al. 2001). While partly this similarity is the result of the organization of people into neighborhoods, schools, organizations, that create opportunities for establishing homophilic ties, it is also true that given the opportunity structure, more similar people tend to stay connected in social life. Moreover, the similarity of the peer group seems to be at least as much the result of selection processes as of mutual influences of peer group members (Kandel 1978). Hence, an important causal flow is from similarity to friendship.

There are several reasons why we generally like people who are similar to us (Berscheid and Reis 1998). First, people who are similar to us tend to confirm our own views and attitudes and this is presumably a rewarding experience. Second, with people who are similar to us, it is easier to engage in joint activities. Since joint activities are typically the basis for any friendship, similarity is of great practical importance. Third, we tend to believe that people who resemble us will like us more and this will also lead to a tendency to select similar others.

Homophily theory does not provide information on the relative importance of different dimensions of similarity. Many aspects of similarity seem important, although those that are more relevant for joint behavior will generally be more relevant than those which are not relevant for joint behavior (Davis and Rusbult 2001). Sociological research on lifestyles can also add more differentiation in this respect. Bourdieu and scholars who continued his line of research provide theoretical ideas on the importance of highbrow cultural taste in social network formation. Another stream of research comes from youth research and points to a similar role of popular culture.

2. High-culture

We consider the lifestyle model of Bourdieu (1984) as a specification of the homophily argument, because it states clearly which dimension of similarity is most important. Bourdieu bases his view on Weber's perspective that social networks typically occur within social status groups whose members share prestige, honour, status symbols and lifestyles. Following authors who have reformulated and extended Bourdieu's views (Bryson 1996; DiMaggio 1987; Lamont and Lareau 1988), it can be argued that particularly a highbrow cultural taste is important in social network formation. A taste for highbrow culture can only be acquired during the long and continuous socialization period in the parental home, in which high social status parents transmit their preferences and practices to their offspring. Highbrow culture taste is therefore also the most salient indicator that one originates from a high status family.

Due to its visibility in social life and its strong correlation with social status position (Bourdieu 1984), highbrow cultural taste would allow members of higher status

groups to identify similar and dissimilar others and to establish social ties with members of the same status groups and to keep away from contacts with other status groups. Bourdieu's status similarity arguments are asymmetric, because he reasons mainly in terms of the (strategic) behavior of the higher status groups (Mark 2003). Expressions of highbrow cultural taste therefore would mediate between social status and the emergence of a social tie and become a mechanism of social reproduction. The underlying assumption that the preferences for and competences with respect to high culture are primarily established in the parental family (and not in education) can be regarded as a well-established fact of culture consumption research. For example, Nagel and Ganzeboom (2002) show a much greater similarity between siblings than between students of the same level of education throughout the life course. However, expressions of highbrow culture can – to a certain extent – also be used to manipulate one's social status, and thus offer the opportunity for lower status groups to find access to higher status groups, a process that was baptized by DiMaggio as 'cultural mobility' (1982).

One of the first occasions where culture would produce social reproduction, is in education. Teachers, being themselves core members of the cultural elite, recognize offspring of higher social status families by their familiarity with the norms and practices at school and the ease with which they conform to the school culture, which to a large extent resembles their parental home environment. There is indeed strong empirical evidence that secondary school students who are active in highbrow culture receive higher grades than others, independent of their academic ability (DiMaggio 1982).

Bourdieu has mainly elaborated this cultural reproduction hypothesis for education. On the role of high culture in social networks, especially peer groups, Bourdieu has not formulated clear expectations. However, other authors have (re)formulated and elaborated Bourdieu's ideas explicitly. DiMaggio (1987: 447) considers *genres* in art as the result of "boundary-defining activities" of social status groups. DiMaggio assumes that culture is often used in conversation in which people seek to identify common group membership and shared interests. A highbrow cultural taste serves to identify and seek entrance into the higher social status groups, and thus to enhance the opportunities of good education and prestigious jobs. Highbrow culture would be the most effective status marker of all other status-identifying characteristics, because it identifies high social status across age groups, regions, and gender (DiMaggio 1987: 443). Lamont and Lareau (1988) also argue that higher social status groups recognize each other by their taste for highbrow culture and that these taste expressions are used as a way to include and exclude potential new members of their status group. Lamont et al. (1996) find that a high culture lifestyle affects the tendency to draw cultural boundaries. Similarly, Bryson (1996: 886) states that elite groups regulate the access to resources by limited access to their social networks (social exclusion) which is governed by processes of symbolic exclusion, by which cultural tastes are defined as "more or less acceptable in various situations". In sum, many scholars in the past have used Bourdieu's work to formulate the hypothesis that high culture is also relevant for network formation.

3. Popular culture

Bourdieu was clear about the role of highbrow culture, which he considered as characteristic for the higher social status groups. In his view, popular culture was characteristic of lower social status groups and would express a 'vulgar' taste. From this perspective, the effect of popular culture on interaction is primarily negative. It serves to exclude people from networks that are socially rewarding, and, although popular culture may enhance social ties, these social networks do not lead to social and economic benefits.

Youth culture researchers typically formulate it the other way around. Researchers like De Waal (1989) maintain that adolescents *generally* object to highbrow culture. In her research, she detected two different reasons why highbrow culture was rejected. Students of lower social status rejected highbrow culture because they thought it was not 'for our kind of people', whilst high status students rejected it, because it was 'for old people', and they would have, later, plenty of time to be culturally active. De Waal's work is in line with an extensive literature on culture and network formation that focuses mainly on popular culture (Hakanen and Wells 1990; Knobloch et al. 2000; Van Wel 1993; Vermeij 2006; Zillman and Bhatia 1989).

Other scholars have suggested that highbrow and lowbrow culture could play different roles in social network formation. For example, it has been argued that expressions of taste for lowbrow culture have a bridging function and enable social cohesion between different status groups (DiMaggio 1987, 2004; Erickson 1996; Lizardo 2006). This bridging function is related to the fact that higher status groups have broader taste patterns. Higher status groups would not solely display a highbrow taste, but also popular taste, as expressed in the omnivore thesis (Peterson 1992). This broader taste repertoire could both be the cause and the outcome of the larger and more heterogeneous networks of higher social status groups (DiMaggio 2004; Peterson 1992). Recently, Lizardo (2006) has added that highbrow and lowbrow culture have different roles in communication, leading to social closure or to bridging. Making the connection with network theory, he argues that highbrow culture would lead to the formation of strong ties. Popular culture, suited to have small talk with all people, would lead to weak ties, which are more likely to connect different social circles (Granovetter 1973).

Still other research suggests that not all popular culture is equally (dis)liked among higher and lower status groups, suggesting that there is social differentiation within youth culture as well (Lizardo and Skiles 2008). Whereas in high culture all genres more or less reflect high social status group membership (among adolescents), popular culture more clearly separates quite unrelated or even opposed genres (Hakanen and Wells 1990; Ter Bogt et al. 2003). Other studies reject the ideas of 'omnivorism' or cultural tolerance as well (Bryson 1996). Although Bryson finds that the number of musical genres that is disliked is lower among highly educated, indicating their higher tolerance, she also finds that genres that are associated with lower status groups are disliked the most by the higher educated (e. g., rap, heavy metal). Similar conclusions come from Warde et al. (2008) who find that heavy metal, and other tastes frequently found in lower status groups, are considered as 'vulgar'. To the extent that popular culture is correlated with social class, social reproduction may operate through popular culture as well.

It is these issues that our research addresses. Is it true that high culture affects social network formation over and above the effects of popular culture? And which of the two is more important? And what role do the two dimensions of culture play in reproducing social status?

III. Data, method, and measurement

1. Data and method

The data are from the project Youth and Culture, a series of related cross-sectional and panel data collected among adolescents and young adults from the Netherlands on cultural participation (Ganzeboom and Nagel 1998-2002). We use the data of a cohort of 1544 adolescents who took part in a classroom survey in the fall of 2005 (Ganzeboom et al. 2005-2006). The data collection took place at 69 secondary schools in 14 towns varying in size and dispersed over the country. The schools cover all five levels of secondary education in the Netherlands. All schools have taken part in previous data collections of the Youth and Culture project, except for seven schools that had been closed down. These were replaced by comparable ones. However, the students in the data were interviewed for the first time for the current project.

Within the schools, three classes of third, fourth, and fifth grade students (age 14-17) were selected. To select classes, among all (13) combinations of level*grade, three combinations were randomly selected at each school (to warrant some within-school differences), and, next, one class out of each of these combinations was randomly selected. At schools with only one level of education two classes were drawn with a different grade. This design resulted in a total selected sample of 190 classes of which 148 classes (78 percent) in 60 schools (87 percent) took part in the project. In these classes, all students were asked to fill out a questionnaire with a randomized split-ballot design. In the split-ballot design, half of the students in the classes received the questionnaire on cultural participation and social networks. The data used in this paper refer to 1544 students of whom 1409 were selected for analysis (see further below for selections applied). The non-response at the individual level cannot be determined as the number of students within classes was not known in advance. However, because of the classroom interviews, it can be assumed that selective non-response is virtually absent.

The networks were measured by asking the students to name three others in the class with whom they "interacted the most". We will refer to these persons as 'friends', although this word was not part of the original question. As school classes are closed populations, this allows us to study complete networks rather than ego-centered networks. We will use the methods originally suggested and used by Hallinan in her work on cross-race friendships in American schools (e. g., Hallinan and Teixeira 1987; Hallinan and Williams 1989). In this method, a data matrix is constructed with all possible dyads in the classroom as units. For all units, variables are constructed that characterize both dyad members and the degree of similarity between them. These similarities are subsequently used to analyze whether or not a tie is reported. The number of cases to be analyzed is obviously greatly inflated and the observations are not independent anymore. Hallinan, who wrote her papers in the mid-1980s, used sampling

and weighting to correct for this. We are able to use multilevel MCMC estimation to take into account the specific clustering of the cross-classified dyads (Snijders and Bosker 1999), a method that is also used by Crosnoe et al. (2008). The models are estimated with MlWin 2.20 (Rasbash et al. 2010).

For the analyses we selected all classes in which at least 50 percent of the students had nominated one or more fellow-students as friends. After this selection this leaves us with 1409 students in 132 classes. Remember that (a randomly chosen) half of the students in a class had to fill out the culture questionnaire. Hence, we only consider possible friendships in half of the class and we only consider nominations of friends when these friends were also in the half of the class that filled out the questionnaire on culture consumption. Students could of course also nominate friends who were not in that half, but these are not considered here. Given the random nature of the split-ballot design, this only affects the mean number of friends and not the effects on friendship formation. Of the 1409 students, 48 percent named one to three friends in the classroom for whom information on their cultural taste was available. Among the 1409 students, 54 percent was nominated by the others. The total number of possible dyads is 14 872, of which 1502 (10.1 percent) were reported as actual ties.

Table 1: Students' education, ethnicity and gender

Level of secondary education[a]	
Lower vocational (vmbo-b)	12.6
Junior general (vmbo-t / mavo)	18.2
Senior general (havo)	35.2
Pre-university (vwo)	27.1
Gymnasium	6.8
Non-western origin	20.4
Girl	52.4

Data source: Ganzeboom et al. (2005-2006) (N = 1409).

[a] The abbreviations refer to the Dutch name of the school type.

Table 1 presents the distribution of the students over the five educational levels. In the majority of the classes students follow the same level of education – 12 classes (9 percent) combine two contiguous levels of education – and are therefore identical to their classmates with respect to their level of education. In the analyses, similarity in education is therefore not included as a predictor. The same holds for similarities in other class-related characteristics (such as grade or teacher characteristics): they are automatically held constant.

Table 1 also shows that slightly more than half of the sample consists of girls and that 20.4 percent of the students is of non-western origin (the student or his/her father or mother was born in a non-western country). In the analyses we will use similarity in gender and ethnicity as control variables. In earlier research it has often been found that gender and ethnicity are important causes of friendship formation (Baerveldt et al. 2004; Kalmijn 2002; Lewis et al. 2008; Vermeij 2006), and since these are also known to be determinants of cultural taste, it is important to control both gender and ethnic similarity in our models.

2. Measurement

Dependent variable: the presence of a tie. The dependent variable is whether or not a tie exists between two students in the same class. We consider a tie to exist when one student named another as a friend or when both named each other as friends. As our main interest is not in the main effects of nominating or being nominated, we chose to treat one-sided and reciprocal connections the same. Note that we invited all students to nominate three "friends" (and many did so) and that therefore the number of ties per person is fixed in practice.

Independent variables: Similarities in status and cultural taste. Similarities in social status and cultural taste will be the independent variables. They were constructed by relating both the student's *(ego)* and their friend's *(alter)* characteristics. As missing values for either ego or alter lead to missing values in the similarity measure, it is highly important to keep missing values at a minimum. Therefore, missing values were imputed, by a method that is known as 'hot deck nearest neighbor imputation' (Little and Rubin 1987). For this method, each item was regressed on a number of relevant independent variables, thereby saving the predicted scores. Next, the data were sorted by the predicted values and the observed score of the 'nearest neighbor' (in the row above the respondent) or the next nearest neighbor was taken to fill up the missing value of the respondent. This method has the advantage of preserving random variation in the data over other single imputation approaches. In the remainder of this section we first discuss how the measures of social status and cultural taste of the students have been constructed, and, next, we explain how the similarity measures are established.

For most concepts, multiple items were combined into scales. Scales were constructed by first standardizing the variables using fractional rank scores and then taking the mean of the individually ranked items. The mean was subsequently ranked again into a range of 0-1.

Parents' education and cultural participation. Both parents' education and their high culture participation were included as indicators of social status (see Table 2). Students were asked to report their parents' educational level on a nine points scale, ranging from no education to university. Students also provided the information on their parents' cultural participation and their reading behavior. Father's and mother's cultural participation comes from the item "Did your father / mother in the past twelve months visit [...]?", which was asked for seven highbrow culture events on a three-point scale, for father and mother separately (see Table 2). Parents' reading was tapped by the items: "How often do you think your father / mother reads books?" and "How long ago you think your father/mother read a book?", measured at a four-points scale, again for father and mother separately. A fifth item asked about the number of books at home, in seven categories, ranging from "none" to "more than 500". Factor analysis revealed that these items can be represented well by one underlying latent construct. The Cronbach's alpha coefficient is also quite high (0.88).

Table 2: Parents' social status

Parents' education	**% Father**	**% Mother**
Higher education (higher professional / university)	34.8	26.1
Parents' cultural particpation	**% Attendance father**	**% Attendance mother**
Theatre	34.8	44.2
Cabaret	21.5	22.2
Classical concert	14.8	15.5
Dance	15.2	23.1
Art museum	30.3	32.3
Culture-historic museum	33.5	32.5
Castle, church, monument	53.2	54.8
Read books rather or very often	31.5	56.5
Read a book less than 3 months ago	55.2	75.4
More than 500 books at home	12.8	

Data source: Ganzeboom et al. (2005-2006) (N = 1409).

Students' high and popular cultural participation. Two sets of items were used to measure students' participation in high and popular cultural activities. The first set of items was adopted from the surveys of the Dutch Social and Cultural Planning Office [SCP] (SCP 1999). This question inquired whether the student had attended nine cultural events in the past twelve months, and, if so, how often he or she usually does this: "less than once a year", "once a year", "two or three times a year", "four to eleven times a year", or "at least once a month". A second set of items asked when was the last time the student attended one or more out of eleven cultural events (mostly corresponding to those of item set 1).

Highbrow culture participation is represented by attendance at theatre, classical concert, ballet, and museum *(Table 3a).* Popular culture is represented by going to the cinema, pop concert, cabaret, musical, and dance *(Table 3b).* Although factor analysis suggested that a single latent factor would give a fair representation of the data as well, we chose, in line with our research question and theory, to differentiate between two underlying dimensions. A two-factor solution distinguished, as expected, between the highbrow and the popular culture items, with a correlation between the two constructed indices of 0.41. Apparently, high and popular culture participation are not isolated behaviors among adolescents. Both scales also lead to satisfactory reliabilities, Cronbach's alpha's being respectively 0.77 and 0.72.

Students' reading. Reading is treated as a separate indicator of a highbrow culture taste *(Table 3a),* in part because reading is more closely related to school matters and to academic success (De Graaf et al. 2000). Two items tapped the students' reading frequency. First, they had to estimate how many books they had read in the past 12 months: "none", "1 or 2", "3 to 6", "7 to 11", "1 or 2 every month", "more than 2 books per month". Next, they assessed how often they read in general: "almost every day", "a few times a week", "a few times a month", "less than once per month", "almost never". After reverse recoding of the second item, the two correlate with r = 0.71, which corresponds to a reliability of 0.83.

Table 3a: Students' taste in highbrow culture

High culture taste		
High culture participation	**% Attendance at least yearly**	**% Last visit < 1 year ago**
Theatre	29.6	46.1
Classical concert	5.8	6.5
Ballet	6.1	
Museum	50.7	
Castle, church, monument		64.3
Culture-historic museum		36.6
Art museum		40.2
Reading		**% Readers**
Reads at least one book per month		15.0
Reads at least monthly		68.5
Attitude towards culture		**% Agree**
Reading makes you think		80.8
Classical music is for both young and old people		57.8
Theater is for other people than me (–)		43.3
I admire classical musicians		41.0
A museum is something for the elderly (–)		27.7
Boys who appreciate classical music are softies (–)		23.6
I feel at home with art lovers		21.1
Arts is for snobs (–)		20.7
Reading a book is for the elderly (–)		11.8
I would be ashamed to tell my friends about my visit to a theater (–)		7.7
Taste in paintings		**% Likes**
Vermeer		55.5
Dou		52.4
Van Gogh		49.3
Israels		45.0
Mondriaan		22.0
Lucebert		16.8
Appel		14.8
De Kooning		14.3
Taste for classical music		**% Likes**
Mozart		22.5
Beethoven		20.5

Students' attitude towards high culture. An additional measure of students´ taste for high culture was created out of ten items which were aimed to tap appreciation or esteem versus embarrassment or resistance towards high culture *(Table 3a).* These items have been used in other issues of the Youth and Culture project, and have proven to be reliable indicators of the attitude towards high culture. Cronbach's alpha is 0.79.

Students' appreciation of visual art. Another indicator of high culture taste comes from students' ratings of eight Dutch paintings, printed in color in the questionnaire *(Table 3a).* For each painting students had to express their like or dislike on a four-points scale. Although some differentiation seems to occur between figurative and abstract

Table 3b: Students' taste in popular culture

Popular culture taste		
Popular culture participation	**% Attendance at least yearly**	**% Last visit < 1 year ago**
Cinema	91.8	94.5
Pop concert	36.9	30.3
Cabaret	16.8	22.6
DJ/VJ event	38.9	
Youth manifestation	17.8	
Musical		34.1
Dance performance		28.8
Dance / house party		43.2
Taste for rock music		**% Likes**
U2		67.3
Coldplay		65.0
Keane		62.8
Rolling Stones		42.8
Taste for R&B/rap music		**% Likes**
Destiny's child		75.6
Usher		72.2
Snoop Dogg		69.7
Ali B. [Dutch rap]		66.0
Taste for Dutch folk music		**% Likes**
Frans Bauer		24.4
René Froger		12.0
Taste for female singers		**% Likes**
Joss Stone		67.2
Britney Spears		50.9
Céline Dion		47.6

Data source: Ganzeboom et al. (2005-2006)

paintings, we treat the ratings of the paintings as a one-dimensional measure of the appreciation of high culture. This is confirmed by the Cronbach's alpha of 0.74.

Student's music taste. To measure their taste in music, students were presented with a list of 22 artists and pop groups. The advantage of a list of artists and pop groups, and not *genres*, is that no confusion arises on the content or meaning of different genres. The genres are still revealed by factor analyzing the ratings of the artists and pop groups. The artists and pop groups were chosen as stimuli because they were expected to cover the main genres of pop music, to be known by the large majority of this student population, and thus to cover the main taste variations among adolescents in the Netherlands. We are aware, however, that this method does not give a full picture of all subgenres in popular music in the Netherlands. Definitely, certain subgenres are missed, especially the smaller and more specialist ones. However, as these subgenres have only small number of fans, these are highly unlikely to meet within school classes. The omission of small subgenres is therefore unlikely to affect our results. The fact that our study is restricted to social networks within classes, is an issue that will be discussed at the end of this paper though.

Confronted with the list of artists and pop groups the students had to express their liking and disliking for each of these on a four-points scale ("very bad", "not much", "ok", "very good") and could also fill in that they did not know the artist or pop group. Not all the artists and pop groups appeared to be generally known among the students. Five of them had considerably more missing values than others (Frank Sinatra, Belle Perez [Flemish singer], Earth, Wind and Fire, Armin van Buuren [Dutch DJ], Norah Jones) and were therefore excluded from the analyses. The remaining list was known by at least 85 percent.

On the ratings on the remaining artists a factor analysis was performed, which led to a well interpretable solution in five genres. Two artists – Within Temptation and DJ Tiesto [Dutch DJ] – did not belong clearly to one genre and were left out. The others were classified in classical music *(Table 3a)* and four popular music genres: r&b/rap, rock, Dutch folk (comparable to the German *Schlager*), and female singers (see *Table 3b*). Five scales were constructed, one for each genre. *Table 3* presents percentages of students who liked ("ok" or "very much") the presented artists.

Overall scale of students' taste. Out of the indicators of highbrow taste (high culture participation, reading, attitude towards high culture, appreciation of visual art, liking classical music) we constructed one overall measure of the student's high culture taste. We did so because the separate indicators were highly correlated with a mean correlation of 0.36, suggesting that they have to be considered as different measures of the same cultural taste construct. Indeed, the Cronbach's alpha of the combined high culture scale is 0.74, indicating a rather homogeneous scale. The different indicators of popular culture (popular culture participation, liking rock, r&b/rap, Dutch folk music, female singers) are only moderately related; their mean correlation is only 0.13. Hence, unlike the indicators of highbrow culture, the indicators of popular culture cannot be considered as expression of a single underlying construct. They are therefore treated as separate dimensions of popular culture.

Similarity scores. All status and cultural taste characteristics discussed above have a range between 0 and 1. This way, the effect expresses directly the difference between the lowest and the highest score. Similarity scores were computed by taking the absolute difference between ego's and alters' score, and subtracting that from 1. This way, students in a dyad who differ extremely from one another have a score of 0 and students who are exactly alike have a score of 1.

IV. Results

1. Determinants of highbrow and popular culture

Before turning to the analyses of similarity, we explore in *Table 4* how high and popular culture tastes are determined by parents' social status, students' education, and by gender and ethnicity.

Table 4 makes clear that taste in culture is highly structured by gender, ethnicity, parents' social status and cultural participation and educational level. The main deter-

Table 4: Determinants of highbrow and popular taste

	Intercept	Girl	Ethnicity	Parents' Education	Parents' Culture	Educ: Lower voc.	Educ: Junior general	Educ: Senior general	Educ: Pre-University	Educ: Gymnasium	% Var .expl. (individ. level)
High culture	**–0.102** *0.023*	**0.162** *0.013*	**0.106** *0.018*	0.039 *0.026*	**0.326** *0.026*	0	0.037 *0.030*	**0.104** *0.028*	**0.156** *0.029*	**0.234** *0.041*	0.31
Popular culture participation	**–0.107** *0.026*	**0.055** *0.015*	**0.046** *0.020*	–0.024 *0.030*	**0.306** *0.030*	0	0.033 *0.033*	0.021 *0.031*	0.006 *0.033*	**–0.072** *0.046*	0.09
R&B/rap	**0.036** *0.023*	**0.104** *0.015*	**0.203** *0.019*	–0.037 *0.029*	0.004 *0.030*	0	–0.004 *0.030*	–0.038 *0.028*	–0.049 *0.029*	**–0.115** *0.041*	0.14
Rock	**–0.102** *0.023*	–0.005 *0.014*	**–0.172** *0.019*	–0.012 *0.028*	**0.176** *0.029*	0	**0.069** *0.030*	**0.097** *0.028*	**0.147** *0.029*	**0.204** *0.041*	0.19
Dutch folk	**0.052** *0.025*	0.015 *0.015*	**–0.039** *0.020*	–0.053 *0.030*	**–0.060** *0.031*	0	–0.001 *0.031*	**–0.082** *0.029*	**–0.065** *0.031*	**–0.087** *0.043*	0.03
Female singers	**–0.004** *0.022*	**0.235** *0.014*	**0.083** *0.018*	**–0.081** *0.028*	0.037 *0.029*	0	0.028 *0.027*	–0.012 *0.025*	0.011 *0.027*	–0.004 *0.038*	0.19

Data source: Ganzeboom et al. (2005-2006) (N classes = 132, N = 1409).

MlWin IGLS estimates: unstandardized multilevel regression coefficients; in bold: $p < 0.05$, in italics: standard errors.

minant of a high culture taste is parents' cultural participation. The strong intergenerational transmission of high culture confirms the results of previous studies on the relation between parents' and children's high culture participation (Nagel and Ganzeboom 2002; Van Wel et al. 2006). Aside from parents' cultural participation, parents' education has no direct effect on students' culture: the entire effect of social background is mediated by parents' cultural participation. The taste for high culture is also positively affected by the student's own level of education. The influence of the educational level here is weaker than elsewhere, probably because a strong measure of parents' cultural participation is controlled, which is not always the case in other research (Chan and Goldthorpe 2007). It may also be due to the fact that the effects of education seem to arise somewhat later in the life course (Nagel 2010; Nagel and Ganzeboom 2002).

Students' popular cultural participation also increases when the parents are actively involved in high culture. This reflects that higher status groups participate more in all forms of culture than lower status groups do. However, the relationship with the student's own level of education is reversed, with the highest level students (gymnasium) participating less in popular culture. This result was also found in other Youth and Culture data (Damen et al. 2010).

When looking at popular music, a clear differentiation occurs depending on the genre. Rock music is preferred by students whose parents are culturally active and by those who are at higher levels of secondary school. By contrast, Dutch folk is liked by students of lower social status: both the relation with parents' cultural participation and educational level is negative. A preference for R&B/rap is more often found at lower levels of education, but has no relation with parental background. Finally, female singers are valued by students of lower educated parents, but no effects of parents' cultural participation and students' own social status are found.

Gender and ethnicity structure taste as well. Girls participate more in and think more positively of high culture than boys. The stronger valuation of high culture by girls is in line with other studies on cultural participation (Bihagen and Katz-Gerro 2000; DiMaggio and Mukhtar 2004). Girls also participate (a little bit) more in popular culture. In popular music they like female singers (far) better than boys do, and also R&B/rap is valued more by girls. There is also a small positive effect of ethnicity: after controlling for parents' education and cultural participation, students of non-western origin value high culture somewhat more than others and they also participate more in popular culture. Besides that, there is a clear genre effect: students of non-western origin like R&B/rap and female singers more than others and they dislike Dutch folk and rock music.

2. Similarity and the presence of a tie

Table 5 presents the effects of similarity on the presence of a tie, uncontrolled for similarities with respect to other characteristics. The results indicate that similarity in all characteristics enhances the probability of a tie being formed. Note that due to the rescaling of variables to a 0/1 domain, all effects can directly be compared to one another. Among the lifestyle characteristics, the effect of high culture is weaker than that

Table 5: The presence of a tie: bivariate effects of similarity in gender, ethnicity, status and cultural taste

	constant		similarity	
Similarity gender	**–2.460**	*0.049*	**1.771**	*0.075*
Similarity ethnicity	**–2.192**	*0.040*	**0.431**	*0.076*
Similarity parents' education	**–2.186**	*0.037*	**0.534**	*0.129*
Similarity parents' cultural participation	**–2.189**	*0.041*	**0.533**	*0.133*
Similarity high culture taste	**–2.197**	*0.037*	**0.912**	*0.134*
Similarity popular culture participation	**–2.185**	*0.040*	**0.420**	*0.128*
Similarity r&b/rap	**–2.218**	*0.041*	**1.395**	*0.128*
Similarity rock	**–2.187**	*0.038*	**0.525**	*0.130*
Similarity Dutch folk	**–2.186**	*0.039*	**0.420**	*0.121*
Similarity female singers	**–2.225**	*0.042*	**1.594**	*0.133*

Data source: Ganzeboom et al. (2005-2006) (N classes = 132; N students = 1409; N dyads = 14872).

MlWin MCMC estimates cross-classified model: unstandardized logistic regression coefficients; in bold: $p < 0.05$; in italics: standard errors.

of female singers and R&B, but it is clearly stronger than similarity in the other forms of popular culture. Hence, high culture seems as important as popular culture. Of the demographic and status background characteristics, gender seems to be the most important factor for establishing friendships. Parents' education and cultural participation are about equally relevant.

Up to here, similarity effects were estimated without taking into account similarities with respect to other characteristics. As a student's taste is highly structured by gender, ethnicity and parents' social status, it is not clear whether similarities in cultural taste are just the reflections of these other similarities or whether on top of that, a student's own taste affects social network formation. Therefore, in *Table 6* we first estimate the effects of similarity in gender, ethnicity, parents' social status, and parents' cultural participation (the causally prior variables, Model 1), and, next, we include student's own taste to the model.

Table 6 shows that similarities in gender, ethnicity, parents' education and parents' cultural participation enhance friendship formation, even when taking into account similarities in cultural taste (Model 2). Students of similar family background, as indicated by parents' educational level, tend to choose each other as friends. On top of that, parents' high cultural participation does affect friendship formation. Hence, students whose parents prefer high culture are more likely to choose each other, even when taking into account their own preferences and behaviors. Note that none of the social background effects weakens much in the multivariate model. Most of the effects are close to the uncontrolled associations in *Table 5.*

After controlling for similarity in demographic and status background characteristics, there are still significant effects of similarity in students' own cultural taste. Students who share taste in popular culture or taste in highbrow culture are more likely to choose each other as friends. However, we also see that these effects have weakened considerably between *Table 5* and *Table 6.* Hence, a considerable part of the effect of cultural similarity on network formation is in fact spurious and due to similarity in status background. Of course, significant and substantial effects remain. Interesting too

Table 6: The presence of a tie: effects of similarity in highbrow and popular culture controlled for the other characteristics

	Model 1		Model 2	
Constant	**–2.480**	*0.142*	**–2.545**	*0.053*
Similarity gender	**1.772**	*0.074*	**1.702**	*0.072*
Similarity ethnicity	**0.406**	*0.080*	**0.333**	*0.081*
Similarity parents' education	**0.323**	*0.138*	**0.321**	*0.141*
Similarity parents' cultural participation	**0.498**	*0.142*	**0.418**	*0.142*
Similarity high culture taste			**0.388**	*0.148*
Similarity popular culture participation			**0.337**	*0.131*
Similarity r&b/rap			**1.059**	*0.142*
Similarity rock			**0.401**	*0.137*
Similarity Dutch folk			**0.303**	*0.129*
Similarity female singers			**0.927**	*0.141*
variance class	0.157	*0.043*	0.174	*0.043*
variance ego	0.004	*0.002*	0.001	*0.001*
variance alter	0.003	*0.002*	0.003	*0.002*

Data source: Ganzeboom et al. (2005-2006) (N classes = 132; N students = 1409; N dyads = 14872).

MlWin MCMC estimates cross-classified model: unstandardized logistic regression coefficients; in bold: $p < 0.05$; in italics: standard errors.

is the strong effect of high culture. High cultural taste at the level of the student contributes as much to network formation as high cultural taste at the level of the parents. Moreover, similarity in highbrow culture has an equally strong effect as similarity in popular culture.

As found in previous research, a major source for social network formation is similarity in gender: boys choose boys and girls choose girls to spend their time in school with (Baerveldt et al. 2004; Kalmijn 2002; Lewis et al. 2008; Vermeij 2006). The effect is large and is hardly mediated by similarity in cultural taste: The difference between *Table 5* and *Table 6* (Model 2) is not worth mentioning. Another confirmation of previous findings in the literature is the effect of (non)similarity in ethnicity (Baerveldt et al. 2004; Lewis et al. 2008; Vermeij 2006). In this study it is found that students of western origin more often become friends with each other, just as students of non-western origin. It must be noted though that the last group is composed of students of varying origins. The effect of ethnic similarity does decline when taking into account tastes in popular music. Additional analyses suggest that this is particularly due to shared (dis)taste for rock and r&b/rap.

V. Conclusions and discussion

Like other studies, we find that students are more likely to choose each other as friends when they are more similar in terms of their cultural tastes. This finding is fully in line with the homophily paradigm which has argued that similarity in attitudes and activity preferences fosters attraction in interpersonal relationships (Byrne 1971; Kalmijn 1998; McPherson et al. 2001). Moreover, any of the measures that we look at are probably more influential in networks than attitudes because they have direct be-

havioral implications. Students go to concerts, they go to movies, they listen to music on their iPod, and they wear t-shirts of their favorite singers and musicians. While attitudes are more difficult to observe or can be hidden by a person who has them, the cultural indicators that we use can be observed easily and can therefore function directly as an element in the interpersonal selection process. Moreover, several of our measures are related to the formation of what is called subcultures (e. g., rock, rap) and these constitute obviously a case of social selection and influence.

Although our findings are not new in this respect, we do bring a new element into the literature. We have not only considered indicators of popular culture, but also indicators of high culture. Research on adolescents typically focuses on elements of popular culture, such as music, clothing, and sports (Knobloch et al. 2000; Roe 1992; Ter Bogt et al. 2003; Vermeij 2006). Although such studies often include a token indicator of 'elite' culture as well, this research is conceived from the perspective of youth culture; the underlying reasoning is that elements of popular culture are the things that students care about in their daily life, and that, consequently, these would also be a basis for selecting friends. Our findings, however, show that elements of high culture are also relevant in the selection process. For example, students are more likely to choose each other as friends when they share an interest in classical music and when they read literature. In fact, students' high culture taste is equally important as students' popular cultural taste.

Our own interest in measuring these items is derived from the stratification perspective and in particular from the work of Bourdieu on social and educational reproduction. His view is an extension of Weber's insight that social status groups, bound together by common status symbols and lifestyles, are the foundation of social networks in society. Bourdieu and his followers (DiMaggio 1987; Lamont and Lareau 1988) argue that (highbrow) cultural taste would play a key role herein. By displaying their cultural taste, social status groups communicate their social position to others, and, conversely, these taste expressions enable others to read each other's social status position. On the basis of that, social status groups decide whom to let in to their social circles and whom to leave out. Highbrow culture taste would be the most salient indicator of a high social status and would therefore in particular be an effective means in the process of including and excluding other persons in the social network.

Bourdieu himself did not analyze (youth) networks nor did he provide theoretical arguments specifically focused on children or young adults. Empirically, however, we found clear evidence that these Bourdieu-type indicators are relevant for student networks as well, and not just for adult networks as others have shown (Lizardo 2006). The question then is why students would use such indicators of high culture in selecting friends? After all, high culture appears to be something for older persons, youth culture is typically popular culture (De Waal 1989; Ter Bogt et al. 2003; Van Wel 1993; Ganzeboom 1989). Students wear T-shirts of Madonna, not of Mozart. One counter argument is that schools tend to promote high culture appreciation in their curriculum and that this creates an awareness of and familiarity with high culture which students subsequently may use in their interactions with others. Another argument is that some students do spend time in high cultural productive activities, such as playing a musical instrument or acting. Even if such activities are not part of students' day-to-day life, selection on these traits may be quite strong, leading to signifi-

cant overall effects in the analyses. Third, interest in high culture can also be regarded as a negative selection criterion. Since many students do not have an interest in high culture and since high culture is so strongly associated with the world of adults, it can be regarded as a sign of being different or perhaps, being marginal to the group. If this is true, those who do not like high culture would avoid those who do, and the ones who do like high culture are stuck with each other.

The second new element in our study lies in the effects of *parental* characteristics on friendship selection in school. We found that students are more likely to choose each other as friends when they are more alike with respect to parental education and parental participation in high culture. The effect of parental education operates partly through the parents' cultural participation, which dominates when these two traits are analyzed simultaneously, but resemblance in parents' education affects social network formation directly as well. Both forms of parental homophily partly operate indirectly via the student's own activities. Hence, parental status homophily is partly a byproduct of selection on the basis of student characteristics which are correlated with parental status. For example, students who like rock music are more likely to become friends, and, because students who like rock music tend to have highly educated parents, the two rock music friends will both have highly educated parents.

More important, however, is that there is also a *net* effect of parental status on friendship selection. In other words, even when taking into account similarity with respect to students' own characteristics, a direct effect of parental status similarity remains. The effect is significant statistically and meaningful theoretically and is comparable in magnitude to several similarity effects of students' own taste. Why would students select each other on the basis of who their parents are? Before we answer this question, we must still address the possibility that the finding is spurious. After all, there can be unmeasured traits of students that are correlated with parental status and which can produce a spurious association between friends' parents' status characteristics. One candidate could be cognitive ability. If smart students choose each other as friends, this can produce homophily with respect to parental status because students' cognitive abilities are correlated with parental status (Veenstra and Kuyper 2004). While this is a possibility, we note that we already take into account students' own level of education and students' own participation in high culture. Since both these traits are correlated with cognitive abilities (Ganzeboom 1982), this takes away part of our concerns here. Future analyses may further explore this issue but we note that it will be difficult to find other omitted traits that are causally prior to parental status characteristics.

The effects of parents' characteristics are rather remarkable if one takes into account the homogeneity of schools and school classes. Schools and school classes are to a large extent homogeneous, at least with respect to level of secondary education, but also to related characteristics, such as parents' education and lifestyles (Kalmijn and Batenburg 1986). Moreover, parents have selected the school for their children and in this way possibly have created a homogeneous pool of potential friends. This could be a way by which parents' may steer the social networks of their children: by presenting them with a specific pool of friends from which their children can choose. This is in line with a structural explanation in the network literature which argues that people are involved in functional settings which are socially segregated and which uninten-

tionally provide restricted meeting (and mating) opportunities (Feld 1981; Marsden 1990). Examples are voluntary associations, sport clubs, and neighborhoods, but also the schools parents choose for their children. The homogeneity of schools and classes may explain status homogeneity of networks in general, but it does not explain our effect of parental status similarity on friendship choices *within schools*. On the contrary, our finding is surprising because the choices of the students are – by design – restricted to school classes and hence, not only the friends will be similar in terms of parental status, the potential friends will also be similar. One would therefore expect effects of background similarity to be small.

How then, can we interpret the strong effect of parental status on friendship selection? We offer two possible mechanisms. First, we suggest a network argument to understand this form of selection. Students select each other as friends, but parents may also assist in the selection process or do the selection process themselves. Parents often know with whom their children interact and they may also know who the parents are of their children's interaction partners. Coleman (1988) has called this network structure 'intergenerational closure' and several studies have shown that in particular high-quality schools in cohesive neighborhoods are characterized by high degrees of such intergenerational closure (Morgan and Sørensen 1999). Because parents have a tendency to select their own friends and acquaintances on the basis of status characteristics, they may encourage their children to interact with other children of high status backgrounds. Although this influence may become less important during secondary school, it can still play a role for the ages that we look at.

A second possible mechanism is that students select directly on parental characteristics. Although it is sometimes believed that status considerations are something of the adult world, classic stratification studies have long argued that children and adolescents also are status-conscious (e. g. Hollingshead 1949; Simmons and Rosenberg 1971; Willis 1977) and some of these arguments may still apply in the present context. First, children are very well aware of their own status characteristics. Research shows that 14-16 year olds often give correct information on the status characteristics of their parents (Lien et al. 2001). Second, children can observe status characteristics in others. For instance, they observe in which neighborhood and which house their friends live, they hear how they talk, whether they use a dialect or accent or not, and they see the clothing they wear. Since all these traits are related to parental status, it is plausible that students are at least aware of such differences. Third, parents can socialize their children in a status-conscious way. In talking about their own network, for example, parents may unconsciously transmit the idea to their children that status is an important matter in interaction. For all those reasons, the son of a working class father may not feel at home at his upper class friends' house, even if these upper class parents welcome him in their home.

We end our contribution with a few methodological remarks. Our evidence is based on a large number of school classes and a large number of students and independent measures of cultural taste. Previous evidence on cultural influences on network selection was either based on experimental designs (Knobloch et al. 2000; Zillman and Bhatia 1989) or on survey research that trusted on ego's reports on friends' cultural taste (Van Wel 1993). While our data are in this sense stronger than previous research, we note that our design is also limited by its cross-sectional nature. For that

reason, we were unable to separate out the mechanisms of selection and influence. Students can select each other on the basis of taste, but they certainly will influence each other's taste as well. The theoretical mechanisms for why similarity is important in a friendship are not per se different, however, for the selection and influence processes. Moreover, there are few population based data sets in which networks are followed over time. Exceptions are the classic study by Kandel (1978) and recent studies by Reifman et al. (2008), Mercken et al. (2010), De Klepper et al. (2010), and Steglich et al. (2006), but only the last one focuses on *cultural* indicators.

Another disadvantage of our study is that the network is limited to friends in school classes. Other studies have shown that secondary school students' networks contain many friends who are not in the same class and friends who are not in the same school (Kiesner et al. 2004). These are important segments of the personal network, and moreover, persons who have such out-of-school friends may not be a random subset of all persons. In what direction this will affect our estimates of similarity is not immediately clear, however.

Third, we do not have complete classes in our sample but only half of the class. This means that part of the friendships was not represented in our alter data and hence was missing from the analyses. Although these cases are missing-completely-at-random, the loss of these ties does result in a reduction of the statistical power to detect effects.

Finally, we have relied on student reports about the characteristics of parents. This is a common approach, but it is also possible that student reports are biased toward their own characteristics. For this reason, we think that our finding of direct selection on parental characteristics needs replication with independent parental data. In the Ganzeboom et al. 2005-2006 data set, this information is included, but due to the high numbers of parents who did not respond, the information is incomplete and requires a separate more complex form of analysis.

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