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The Effect of Network Centrality on the Gender Socialization Process within Highschool Classrooms

Bachelor Thesis Sociology

Abstract. The purpose of this study is to investigate how the classroom gender norms affect the gender norms of individual students. In addition, this study aims to discover which students are more susceptible to be influenced by the classroom gender norms, by looking at the position of the individual in the classroom network. More specifically, this study will look at in-degree centrality as a possible factor that make students more susceptible to conform to the classroom gender norms. The theoretical framework suggests that gender norms in the classroom influence the gender norms of the individual student. Furthermore, the effect of in-degree centrality on this relation can be theorized as positive as well as negative. The study uses CILS4EU data conducted in the 3rd grade of secondary schools in the Netherlands. The sample consistent of 2377 adolescents aged between 13 and 17. Using SPSS and UCINET, analyses were executed to research the expected relations. The results show that individual students adapt their own gender norms to the classroom gender norms. The results did not support the expectations that in-degree centrality affects this relation.

Key words: network centrality • in-degree centrality • peer influence • norm conformity

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Introduction

The process of gender socialization occurs within a web of interpersonal relations. Peer groups are an important factor in this development, especially during adolescence, a stage characterized by increased peer influence (Handel, 1988). To gain more insight into the influence of peer groups on individual gender norms, this study will look at network characteristics in order to explain the difference between classmates in susceptibility to influence.

In early adolescence, children move away from mostly family environments and interactions to a larger environment of school and friends (Witt, 2000). Prior research has shown that the adolescent transition period includes an increase in youths' time spent with peers as compared with parents, making peer influence a strong factor since social interactions with persons of the same age is a highly significant socialization factor (Larson, Richards, Moneta, Holmbeck & Duckett, 1996; Handel, 1988). Along with the expansion of the environment comes the ability to form a general sense of self and to relate to others. In this process, adolescents develop beliefs about the expectations and roles which are associated with a particular gender group and a self-identity as a member of one of these groups. The process through which adolescents learn gender-appropriate behaviour is known as gender socialization (Kretchmar, 2011). According to Maccoby (1988), gender role development generally takes place in social interactions among peers. Receiving feedback from peers, positive and negative, gives individuals an understanding of appropriate behaviour (Witt, 2000). This process of peer influence can take place in small groups, but also within larger peer groups. Peer groups can be influential since individuals that identify with a certain group conform to norms established in that group. Conformity to peers is of frequent occurrence and the willingness to conform to peers increases from childhood through adolescence (Brown, Clasen & Eicher, 1986). As adolescents form a self-identity and are able to compare their norms to others, adolescents use peer groups as social reference groups. Earlier research demonstrates that people will adjust their judgements if told that they differ from the majority of the group (Moore, 1921; McKeachie, 1954). For example, Marple (1933) shows that more than half of the respondents in his research change their attitude toward the majority attitude. In comparison, in the control group who wasn't told the majority attitude, only 15% changed their attitudes.

This study aims to research the susceptibility of students to conform to the gender norms of the group in the classroom context. Schools and classrooms provide a social context in which adolescents interact with their peers, create social networks, and are exposed to social norms. Since adolescents seek to expand their networks beyond the family, this non-

institutional role of the school is a relevant factor in the opportunity to meet peers (Crosnoe, 2011). When students go to secondary education institutions, adolescents are confronted with a larger and more heterogeneous population of students. Moreover, adolescents spent a great part of their life at school, in the classroom. In short, school and the classrooms are an important site for social relations and learning gender-appropriate behaviour and norms.

A key network characteristic of the individual that is associated with influence and conformity is network centrality. Network centrality is defined as a central or middle position within a network. In network analysis, centrality identifies important nodes, or actors, within a network. The term 'important' can have different meanings. It can be interpreted in relation to the flow of information in the network or in the involvement in the cohesiveness of the network (Borgatti, 2005). In this study, network centrality will be researched in relation to the susceptibility of influence in a social network.

Previous research shows expectations on the effect of network centrality in the influence process. The study of Crosnoe and Needham (2004) and Lansford and colleagues (2009) show that the network centrality affects the susceptibility of adolescents for peer group influence. Crosnoe and Needham (2004) researched influence within larger peer networks in the school context. Results show that adolescents with a more central position within the peer network conformed to the drinking behaviour of peers. Similar research, but with different results is the study of Lansford and colleagues (2009). They examined the relation between the adolescent central position within the peer group and the similarity between the problem behaviours of their group leaders and the problem behaviours of the individual. The results show that girls who had a less central position in their group were more similar to their group leader on indirect aggression. Therefore stating that the less central, or more peripheral, position of an individual is in the network, the more they will conform to the leader's behaviour. This study aims to clarify ambiguities around the effect of network centrality on susceptibility to peer influence.

This study will add to existing research on peer effect and interpersonal influence in networks in various ways. First, this study aims to be innovative by examining data in which individuals are embedded in classroom networks that are larger than small peer groups or cliques. Second, as mentioned before, this study focuses to unravel the scientific disagreement about the central position being more or less susceptible to group influence. Third, this study investigates new areas by looking at gender socialization of peers in the context of the classroom.

Research on gender socialization by peer groups is relevant since certain gender norms can have negative consequences. According to various studies (e.g., Blazina, 1997; Fagot,

Rodgers & Leinbach, 2000; O'Neil, Good & Holmes, 1995), these negative consequences can be anxiety, depression, stress, substance use, poor attachment with parents and homophobia (Blazina & Watkins, 2000; Good & Mintz, 1990; Sharpe & Heppner, 1991; Stark, 1991). Moreover, closely tied to traditional gender norms are the roots of sexual prejudice and discrimination (Herek, 2000; Parott, 2009). This study can contribute to society by exploring characteristics that make adolescents more susceptible to gender socialization by peers that can have negative outcomes. When susceptible adolescents are in the picture, a policy can be targeted to prevent negative outcomes. Moreover, classroom networks can be adjusted if, for example, more connectiveness between students provides a favourable outcome.

In sum, this study will look at degree centrality as a network characteristic in the classroom that has the potential to affect the gender socialization process of classmates on the individual student. The following research question is proposed:

How does network centrality of the individual affect the way the individuals' gender norms are influenced by the average gender norms of the class?

After providing a theoretical framework that reflects on the research question, this study will discuss how the hypotheses will be tested. Then, the results will be shown and interpreted. Finally, the corresponding conclusion and discussion points will be illustrated.

Theoretical framework

In the first part of the theoretical framework, I will work towards a hypothesis that describes the relation between the average gender norms of the classroom and the gender norms of the individual student. The first hypothesis will be derived by the means of the social learning theory, the self-categorization theory, and the reference group theory.

The relation between the average classroom gender norms and individual gender norms

First, the processes of gender socialization will be explained. A theory that explains gender socialization is the social learning theory constructed by Bandura (1977). This theory defines learning in terms of stimulus and response. According to this theory, gender-appropriate and inappropriate behaviour is reinforced, both positively and negatively. For example, a young boy who plays with dolls will be negatively evaluated by his social environment. In contrast, a girl who plays with dolls will be positively evaluated and therefore will repeat this behaviour in the future. In this way, boys and girls learn which behaviours are appropriate and expected of them. Boys learn that playing with dolls is inappropriate and girls learn that playing with dolls is appropriate, and consistent with being female. Another aspect of the social learning

theory is that children learn by observing and learning the behaviour of others. Thus, through imitating a child learns what behaviour is appropriate for their gender (Kretchmar, 2011).

Adolescents learn to identify themselves as a member of either the male or female group. Identification with a social group is accompanied by the confirmation of the social norms of that group. For example, men with higher identification with being a man have a higher pain tolerance than men with lower identification, because the group norm of men is that they are masculine, hence have a higher pain tolerance (Pool, Schwegler, Theodore & Fuchs, 2007). This mechanism is also known as the self-categorization theory (Turner, Hogg, Oakes, Reicher & Wetherell, 1987). This theory explains how individuals adopt the norms of a certain group. This process takes place in three stages: “individuals define themselves as members of a distinct social category, they form or learn the stereotypical norms of that category, ... they assign these norms to themselves ... and thus their behaviour becomes normative” (Turner et. al., 1987; p. 72-73). Thus, influence within groups is exercised to the extent that individuals categorize themselves as group members and perceive themselves in terms of the shared stereotype that defines the ingroup (Turner, 1982). When someone encounters a difference between themselves and a fellow group member they will experience uncertainty. This uncertainty can be solved by either recategorizing the people that have perceived differences; or, become more similar to the other. In short, the self-categorization theory says that the more someone identifies as a member of the group, the more someone adopts the group norms, beliefs, and values (Livingstone, Haslam, Postmes & Jetten, 2011). Adolescents form a self-identity as a member of one of the gender groups, thus they adopt the norms that are applicable within these groups. Since adolescents are a vulnerable group, in the process of creating gender norms, the self-categorization theory can be applied to adolescents (Kretchmar, 2011). Hence, adolescents who identify with one of the gender groups will adopt the norms that are assigned to these groups. Therefore, it can be concluded that adolescents’ gender norms are influenced by peer groups.

The gender groups discussed earlier can be seen as reference groups. Individuals look at a reference group to obtain the right information on how to act. Reference groups define what is right and what is wrong. According to the reference-group theory, multiple reference groups can be taken into account in the course of selecting behaviour or in making a judgement about an issue (Kemper, 1968). Reference groups can be a group or a person. As long as the individual takes the group into account in the process of choice-making, the group can be seen as a reference group. Normative reference groups provide the individual with norms and values of the specific group and expects the individual to comply with these norms and values. Thus, the main purpose of normative reference groups is to direct the individual into conformity with the

cultural patterns by encouraging them to play certain roles. Such a group can be family, religious community, nation, and classroom. Normative groups play a significant part in the socialization process of adolescents. Moreover, normative groups set boundaries for conformity deviation (Kemper, 1968). A gender group within the classroom can be a reference group for students. Thus, according to the reference group theory, adolescents will conform to gender norms existing in the classroom.

Previous research provides evidence for the argument that students will conform to the average classroom gender norms. The study of McKeachie (1954) did research on individual conformity to attitudes of classroom groups. The study, conducted among students at the University of Michigan, shows that individuals shift their attitudes in order to maintain a similar relationship to the group norm. Moreover, recent research shows similar results of individuals that conform to group norms (Hornsey, Majkut, Terry & Mckimmie, 2003; Lee, 2006; Livingstone et. al., 2011; Prapavessis & Carron, 1997; Postmes, Spears & Lea, 2000). Such as the study of Livingstone and colleagues (2011). They used the social identity and self-stereotyping theories to hypothesize that in-group identification will lead to in-group norm conformity of the individual. The results show that in-group identification mediates the conformity of in-group norms by new members of a group.

Based on the social learning theory, the self-categorization theory, and the reference group theory it is reasoned that adolescents' gender norms are influenced by the classroom norms. Therefore, the following hypotheses can be derived:

H1: The gender norms of the student will be influenced by the average gender norms of the peers in the classroom.

By drawing the relation between the average gender norms of the peers in the classroom and the student gender norms, a network perspective suggests how network characteristics of the classroom network may influence the classroom-student relation. Expectations of classroom network characteristics are detailed below.

Effect of network centrality on conformity to classroom gender norms.

In this study, network centrality will be defined as *degree centrality*. Degree centrality is the number of ties a node has in a network. The more direct ties to the node, the higher the degree of centrality (Freeman, 1978). In the context of adolescents' peer networks, degree centrality is defined as the number of friends, or links, an adolescent has within a social network (Mardsen & Friedkin, 1994). In a directed network, degree centrality can be measured for *in-degree* and *out-degree*. In-degree centrality represents the ties as perceived by the nominating actors

(Uddin, Hossain & Wigand, 2014). In-degree centrality is relevant for this study since it tells us the position of the individual in the network, perceived by others in the network. When only looking at non-directional ties, an erroneous centrality will be calculated since an isolated individual can nominate many others. This study will look at in-degree centrality to evaluate the position in the network as a possible factor to make a student more or less susceptible to the average gender norms in the classroom. Figure 1 shows a visualization of the network of students in class 1 of the data. In this classroom, the yellow node, student 30010106, received six ties or nominations from other students in the network. Thus, this student has an in-degree centrality of six. The red node, student 30010116, has received two ties or nominations, thus has an in-degree centrality of two. In this case, the yellow student has a higher in-degree centrality than the red student.

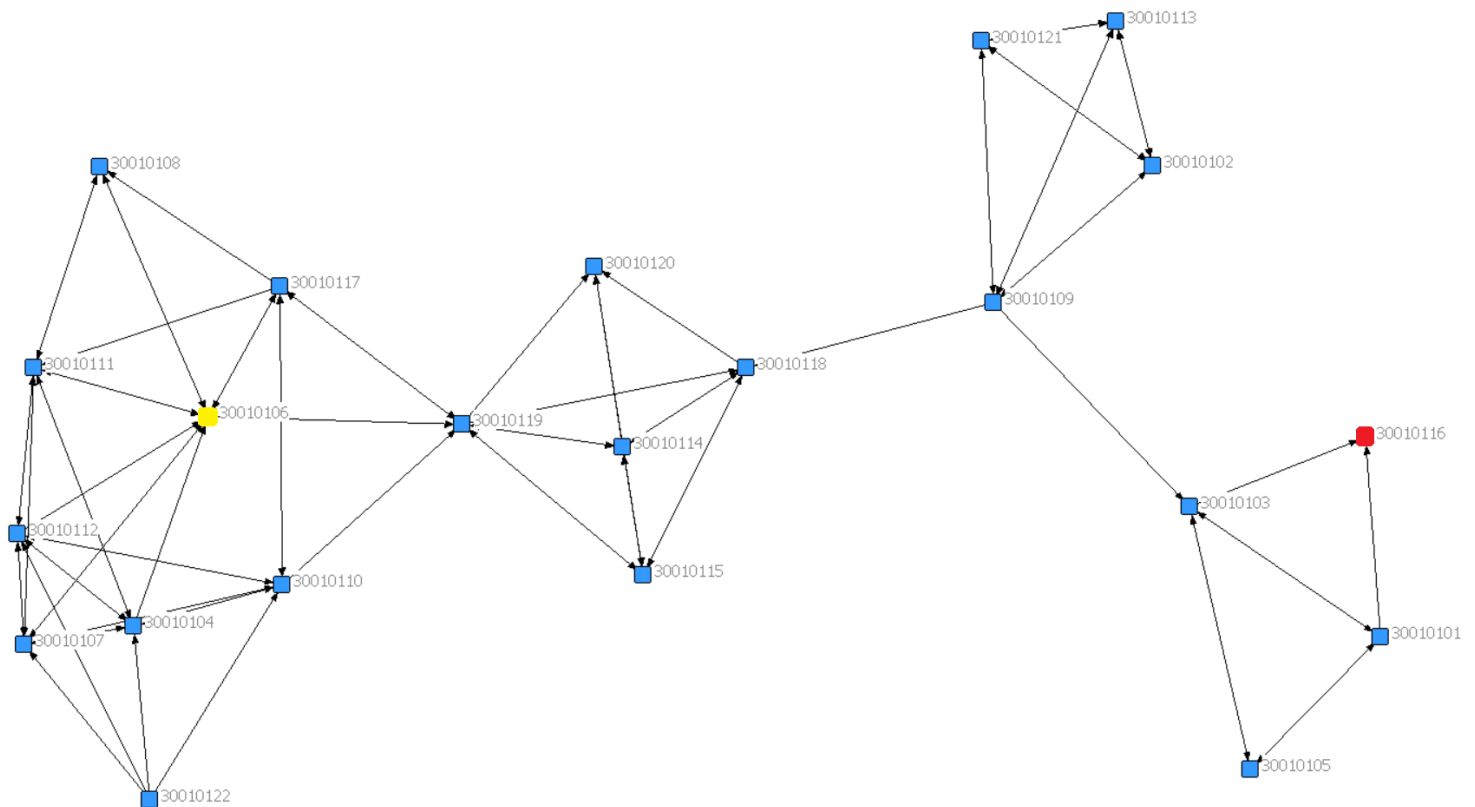


Figure 1: Visualized network of class 1. (Visualized by UCINET NetDraw)

It is expected that the position of an individual within a network affects how influential the network's behaviour is on adolescent behaviour. Adolescents in more central positions are expected to behave more similar to the other network peers than adolescents located in more peripheral positions (Giordano, 1983). As stated before, centrality is defined as a position in which the individual has ties to most others in the network. The more ties, the more central the

position (Freeman, 1978). Thus, a more central position implies a higher involvement with others in the network. The more involvement, the more exposure to communication and interaction with others (Haynie, 2001). Hence, it is expected that adolescents who have a more central position have a higher exposure to the network norms. This argument will be the keynote in the next part of the theoretic framework.

Social contagion is the idea that a norm or behaviour is adopted by an individual when a threshold is reached. The threshold is a certain amount of others that the individual is connected to that already possess the norm of behaviour. 'Complex contagions' are contagions that require social support or reinforcement by multiple contacts (Centola & Macy, 2007). "A contagion is complex if its transmission requires an individual to have contact with two or more sources of activation" (Centola & Macy, 2007; p.707). By drawing linkages between the complex contagion theory and the exposure argument as mentioned above, the influence of in-degree centrality on the classroom-student association becomes clear. A more central position is associated with more involvement of other actors in the network, hence more exposure. According to the complex contagion theory, multiple sources of exposure are necessary to be normatively influenced. When a student is more exposed to other students in the classroom it is more likely that this student will adapt more to the average gender norms of the class. Thus, I argue that students who have a more central position in the classroom are more susceptible to adopt the average gender norms of the classroom.

Students who are more involved and have frequent contact with others in the network are monitored by others in the network to keep them act according to the norms of the group (Kemper, 1968). As stated before, students with a high central position are more exposed to peers than students with a peripheral position. When an individual shows inappropriate behaviour to their peers, the peers will negatively reinforce this (Bandura, 1977). When an individual receives negative evaluation, he or she will learn that this behaviour is considered inappropriate and therefore will not act like that again. Moreover, adolescents will imitate behaviour from peers that are considered appropriate (Kretchmar, 2011). A student that has a more central position in the network is more exposed to peers that will reinforce appropriate behaviour and will negatively evaluate inappropriate behaviour. Moreover, students with a more central position have more contact with others and will have more opportunities to imitate appropriate behaviour. Thus, students with a more central position are more susceptible to be influenced by the average gender norms of the classroom.

The study of Crosnoe and Needham (2004) shows that adolescents who have friends who drank an above-average amount of alcohol, drank more alcohol themselves. This

association applied to central and non-central actors. However, the increase of alcohol use was much higher for adolescents with a more central position in the network than those with a more peripheral position. Thus, I argue that adolescents with a more central position in a network are more likely to conform to the group norms. Hypothesis 2 therefore reads:

H2: Students with high in-degree centrality are more likely to adapt to the average gender norms of the classroom.

In contrast to the proposed hypothesis, which shines a light on individuals with a high in-degree centrality, the next part will focus on the individuals with a low in-degree centrality or peripheral position of the network. The next part will hypothesize why students in such a position are more likely to be influenced by the average classroom gender norms.

The key argument in the next part is focused on normative social influence. Normative social influence involves a change in behaviour that is perceived necessary in order to fit in a group (DeWall & Bushman, 2011). Normative social influence consists of two mechanisms: the need to belong and the conformity to group norms. Those will be explained in the next part.

First, the need to belong is the need to form and maintain interpersonal relationships and is considered a fundamental human motivation. Moreover, one of the most powerful and influential human drives is the need to sustain a minimum amount of social connections (Baumeister, 2012). The lack of the feeling of belonging constitutes deprivation and causes illnesses. This theory hypothesizes that people are motivated to form and maintain social connections. Maslow (1968) ranked “love and belongingness needs” over esteem and self-actualization in the motivational hierarchy. In short, people have the need to be loved and socially accepted (Baumeister & Leary, 1995). In addition to the need for belonging is the need to belong to a group. According to Newman and colleagues (2007), the desire to belong to a group can influence adolescents, even before they are a member of the group. Moreover, adolescents change their behaviour to gain peer acceptance. Hence, the peer group connectedness does not need to be reciprocated to influence the individual. Thus, students who do not belong to classroom in-group or who have not many connections have an unfulfilled desire to belong and are seeking for peer acceptance.

As stated before, this study will use student nominations to measure network centrality. Coie and colleagues (1982), did the same to measure sociometric status. They asked children to nominate others that they liked most. They argued that peer acceptance can be connected to this measurement by defining peer acceptance as the number of nominations the child received. The more nominations, the more ‘liked’ and thus accepted by peers. This study will also use

nominations that indicate a positive relation between the individual and the receiver. Concluding from this study, students who received fewer nominations are considered less accepted by peers. As stated in the previous paragraph, people have a strong desire to have multiple relationships and to belong to a group. Therefore, I argue that students with a more peripheral position in the classroom network will have a strong drive to belong to the group, and thus are more susceptible to be influenced by the average gender norms of the classroom.

The next part will explain why adolescents change their norms in order to make more social connections, get accepted, and feel belonged. Adolescents are likely to be underdeveloped in interpersonal and communicative skills. Therefore, adolescents make connections and form groups based on shared attributes and interests. When a student outside of the group wants to be accepted by the group, he or she has to reduce the likelihood of peer conflict or other potential threats to the group's integrity. Thus, by adapting to the group norms the individual is more likely to be accepted (Hallinan, 1980). Additionally, the similarity-attraction theory (Byrne, 1971) states that similarity in attitudes, interests, and values increases trustworthiness and predictability. This makes communication in an interpersonal relationship easier: there is more sense of understanding and belongingness which makes the relationship more rewarding. Thus, people with shared characteristics are more likely to make a connection and create a friendship (Veenstra & Dijkstra, 2011). Therefore, students with a desire to belong are prone to adapt to the average norms of the group he or she wants to belong to. In other words, students with a low in-degree centrality are expected to have a desire to belong and will conform to group norms in order to be accepted.

Prior research shows that the need to be accepted is a factor that makes people conform to group norms (Chang, 2004; McKeachie, 1954; Kelley & Shapiro, 1954; O'Brien & Bierman, 1988). Chang (2004) did research on the role of classroom norms in relation to children's behaviour and peer acceptance. The results show that the social context with contextual norms affects behaviours by reinforcing social acceptance. In this study, they used the classroom as a social context. Thus, the results show that classroom norms strengthen the association between behaviour and peer acceptance. In other words, when a certain behaviour is a norm in the class, students who show that certain behaviour are accepted. This study is similar to the study of Hymel (1986) which shows that an individual's effort to be liked by the group causes the individual to attain social conformity. Thus, adolescents conform to group norms in order to be consistent with the group majority and be accepted.

In conclusion, people have a natural desire to belong to a group and have connections. Acceptance is needed to fulfil the need to belong. The similarity will lead to a positive

relationship and thus, acceptance. Therefore, students whose need to belong is not fulfilled will conform to the group norms of the classroom. Thus, students with a more peripheral position, who are less accepted by peers, will have a strong desire to fit in and are more susceptible to conform to the average gender norms of the classroom. I propose the following hypothesis:

H3: Students with low in-degree centrality are more likely to adapt to the average gender norms of the classroom.

Data and Methods

Data and sample

This study will use data from the “Children of Immigrants Longitudinal Survey in Four European Countries”, or in short: CILS4EU. Subsidised by the NORFACE (New Opportunities for Research Funding Agency Co-operation in Europe) programme, this survey was set up to study the integration of immigrant and non-immigrant children in four European countries. These countries include Germany, the Netherlands, Sweden, and the United Kingdom. Because of access limitations, this study will use data collected in 2010/2011 (wave 1) from the Netherlands. The target population in the Netherlands exists of adolescents in the 3rd grade of secondary school. These students were aged between 13 and 17 (CILS4EU, 2016).

CILS4EU used a stratified three-stage sample design. The first stage consisted of the sampling of schools. Small schools and schools for students with learning disabilities were excluded. After the exclusion of these schools, schools were sampled based on the proportional size of the school. The non-response of schools was solved using a replacement strategy, which replaced the non-responding schools with similar schools, leading to a school participation rate of 91,1%. The second stage included the sampling of classes within the schools. Two classes within the relevant age group were randomly selected from each school (class level participation=94,5%). Finally, the third stage sampling units are the students within these classes. Surveys were conducted during school hours. Students and parents had the possibility to refuse participation. In each class five to thirty students participated (class level participation rate = 94.5%). This stage also included sampling for the parental and teachers’ survey. In total, 4363 students were surveyed in 222 classes at 100 schools (CILS4EU, 2016).

This study focuses on peer influence of classroom networks, therefore classes with less than 10 students participating were excluded. To make a sufficient network based on friendship nominations within the class a network of at least 10 students is needed. Students could nominate a maximum of five classmates. By excluding classes with less than 10 students participating in all questions about gender norms, a clear distinction can be made between

central and peripheral students. Moreover, by excluding classes with less than 10 participating students the data excludes small friend groups or ‘cliques’ existing of 5 or fewer students from our data. Because each student had a unique id and a unique class id, classes could be linked to respondents. In total, 22 classes were excluded, thus 200 classes were left to include in the analysis. Respondents who did not answer one or more questions that were needed for operationalizing variables were considered missing. Respondents who didn’t answer one of the questions about gender norms were excluded from the data since a missing answer would give a wrong value on this variable. Furthermore, because the gender norms of the parents are included, respondents with a parent who didn’t participate or answer the questions about gender norms were excluded. Finally, students in the category “brugklas” (n=36) were considered missing, since students in this category are not differentiated at a certain educational level. After excluding the respondents that were considered missing, this study analysed 2377 respondents in 200 classes.

Measurements

Dependent variable

The variable *gender norms student* reflects the extent that students link gender to certain traditionally family roles. In traditional gender role expectations, for example, men are expected to be breadwinners and women caregivers and homemakers. Therefore, a common way to measure gender norms is to ask respondents about the division of tasks within the household (Davis & Greenstein, 2009). Respondents are asked the following question: ‘In a family who should do the following tasks?’. The tasks presented included: ‘take care of the children’(1), ‘cook’(2), ‘earn money’(3), and ‘clean the house’(4). Respondents could answer according to the following answer categories: ‘mostly the man’, ‘mostly the woman’ or ‘both about the same’. The answers of each item were coded on a scale from 0 to 2, where 0 means more progressive gender norms and 2 more traditional gender norms. For questions 1, 2, and 4, the tasks considered traditionally more feminine tasks, participants received a score of 0 when they answered “mostly the man”, 1 when they answered “both about the same” and 2 when they answered, “mostly the women”. For question 3 the opposite was coded, since earning money is considered traditionally a more masculine task (Davis and Greenstein, 2009). On this item respondents received a score of 2 when they answered “mostly the man”, 1 when they answered “both about the same” and 0 when they answered “mostly the women”. Thus, higher rates indicate more traditional gender norms of the student. Respondents could score on this variable between 0, very progressive, and 8, very traditional.. This operationalization is used in various

studies that used CILS4EU data to measure gender norms (van der Vleuten et. al.,2016; van der Vleuten et. al., 2018). Reliability analysis was carried out. Cronbach's alpha showed a combination of questions to reach an alpha of 0,66. This alpha is merely acceptable since the standard rule is $\alpha > .7$ (Allen, Bennett & Hertiage, 2014). For research purposes, Cronbach's alpha is considered good enough.

Independent variable

Average gender norms class is measured by averaging the variable *gender norms student* of all classmate respondents. Each respondent has assigned a unique class id which makes it possible to calculate the average gender norm for each class. Thus all individuals in the same class score the same value on this variable. In order to solve the implication that the respondents' gender norms are included in the average gender norms of the class, the respondents' gender norms were excluded by generating this variable.

Moderator variable

To construct the variable *in-degree centrality*, social network analyses were conducted on all in-class friendships reported by students. In the questionnaire, respondents could nominate classmates responding to the question: "*Who are your best friends in class?*". The respondents could name between zero and five students in their class by giving the unique id-number of these friends. By measuring the number of incoming ties, in-degree centrality can be calculated. Asking about the five best friends is a representative measure because friendship is the primary relationship linking adolescents (Ennett et. al., 2008). Adolescents are directly and indirectly connected to each other through friends' friends, therefore forming a network of relations. Because every respondent nominated other respondents within the class, data from nominated friends are collected (all respondents nominated at least one classmate). Therefore, a complete network can be formed. All respondents nominated at least one friend within the classroom. In-degree centrality is measured by the amount of friendship nomination a student receives from its classmates. In-degree centrality was calculated by importing the friendship-nominations of students as 'node list data' into the program UCINET (Version 6.232). UCINET is a software that can be used to analyse and visualize social network data (Borgatti, Everett, & Freeman, 2002).

Control variables

This study will control for the following variables: gender, age, educational level of the class, gender norms of the parents, and immigration background

Gender. This study controls for gender, because this variable can be a predictor of students' gender norms (Kågesten et. al., 2016). The question that measured gender is: "Are you a boy or a girl?". Boys received a score of 0 and girls a score of 1.

Age. Susceptibility to peer influence declines between middle adolescence and young adulthood (Steinberg & Monahan, 2007). Therefore, age is a suitable control variable. The variable 'age' is calculated by subtracting the year of birth from the year of the questionnaire execution (2010). Since the survey was executed at the end of 2010 and beginning of 2011, it can be argued that this calculation gives a relevant age variable.

Educational level. Studies argue that support for equitable norms is associated with a higher educational level, and thus it is argued that students at a higher level of education will have more progressive gender norms (Pulerwits & Barker, 2008). Therefore, this study will control for the educational level of the class. In the Netherlands, depending on their grades in primary education, students can enter three levels of secondary education. These three levels are (from low to high): VMBO (prevocational), HAVO (intermediate general education, preparing for tertiary vocational college) and VWO (academic track, preparing for university). Students who at the level of VMBO received a score of 1, HAVO students received a 2, and VWO students received a 3.

Gender norms parents. Parental gender norms can also be a predictor of the gender norms of the students (Witt, 2000). Therefore this study will control for the gender norms of the parents. The CILS4EU data includes the parental questionnaire in which parents were asked the same questions as the students about the division of tasks between men and women within a household. One of the parents was asked to fill in the questionnaire. The formation of this variable was the same as the variable *gender norms student*. Whereas parents could also receive a score between 0, very progressive, and 8, very traditional.

Immigrant background. Because the CILS4EU project was set up to research the integration of immigrant and non-immigrant children, the data contains an oversampling of immigrant adolescents. Since this can affect the average gender norms, this study will control for the immigrant background of adolescents. If at least one of the parents or the student was born in a foreign country, the student is considered to have an immigrant background and

received a score of 1. If both parents and the student were born in the Netherlands, the student is considered to be part of the native group and received a score of 0.

Descriptive statistics

Table 1 shows the descriptive statistics of the variables. The average gender norms of the respondents are directed to the more traditional side ($M=5.528$; $SD=1.431$). This is similar to the average gender norm within classes ($M=5.571$; $SD=0.468$). Furthermore, respondents scored between 0 and 11 on in-degree centrality. Thus, at most a student is nominated 11 times within the classroom network and at least 0. On average, respondents were 3,6 times nominated by classmates ($SD=1.905$).

Table 1: Descriptive statistics

	Minimum	Maximum	Mean	S.D.*
<i>Dependent variable</i>				
Gender norms student	1	8	5.528	1.431
<i>Independent variable</i>				
Average gender norms class	4.35	7.23	5.571	0.468
<i>Moderator variable</i>				
In-degree Centrality	0	11	3,60	1.905
<i>Control variables</i>				
Gender (0=boy, 1=girl)	0	1	0.520	-
Age	13	17	14.490	0.624
Educational level	0	3	1.69	0.846
Gender norms parents	1	8	5.085	1.412
Immigrant background (0=native, 1=immigrant)	0	1	0.191	-
Valid N (listwise)	2377			

*not shown for dichotomous variables

Analytical strategy

To test the hypotheses this study will perform a linear multiple regression with an interaction variable in SPSS. The analyses will consist of multiple regression models. The first model will test hypothesis 1 and will contain the dependent variable (Gender norm student), the independent variable (Average gender norms class), the moderation variable (Centrality), and the control variables (gender, age, educational level, gender norm parent and immigration

background). To test the second and third hypotheses, a second model was added to the multiple regression. In order to confirm the moderation effect of centrality on the relationship between the average gender norms of the class and the gender norms of the student, it must be shown that the nature of this relationship changes as the values of centrality change. This can be done by adding an interaction effect to the second model, next to the same variables that are in model 1. The interaction variable will be made by multiplying the moderation variable with the independent variable (centrality*average gender norms class).

Results

Before executing the multiple linear regression, the relation between gender norms of the class (independent variable) and the gender norms of the student (dependent variable) is tested for linearity. To test if the assumption of linearity is met, and to look for outliers, a scatterplot is produced. The scatterplot shows a pattern of linearity, consequently we can assume a linear relation between class gender norms and individual gender norms.

To test the first hypothesis (*H1: The gender norms of the student will be influenced by the average gender norms of the peers in the classroom*), the first regression model was computed to predict the relation between *average gender norms of the class* (independent variable) and *gender norms adolescent* (dependent variable). The results show that there is a positive significant effect of the average gender norm of the class on the gender norm of the individual student ($B=.334$, $t=5.601$, $p<.001$). Moreover, the proportion of variance, R^2 , for the first model is 0,200. Thus, converted to Cohen's f^2 the effect size is 0,25. This is considered a medium effect (Allen, Bennett & Hertiage, 2014). The result provides support for the first hypothesis.

The second and third hypotheses are tested by adding the interaction variable to the second model. Since these hypotheses are contrasting hypotheses, they can be interpreted together. The results show that there is a small negative effect of in-degree centrality on the relation between classroom gender norms and student gender norms, however this effect is not significant ($B= -.014$, $t= -.442$, $p=.658$). Since the effect of the interaction term is not significant, it can be stated that there is no moderation effect of network centrality. Thus, there is no evidence to support the second hypothesis (*H2: Network centrality will increase the effect of classroom gender norms on student gender norms*), and the third hypothesis (*H3: Students with low in-degree centrality are more likely to adapt to the average gender norms of the classroom*).

In order to exclude alternative explanations for the relationship between the classroom gender norms and the gender norms of the individual student, control variables (gender, age, educational level, parent gender norm, and immigrant background) were added to the multiple regression analysis. The control variable *gender* has a negative significant effect on the gender norms of the student, suggesting that girls have more progressive gender norms than boys (B= -.465, t= -8.775, p<.001). The *gender norms of the parents* have a positive significant effect on the gender norms of the student (B=.369, t=19.418, p<.001). Thus, according to this analysis, parental gender norms are associated with the gender norms of students. The remaining control variables did not have a significant effect on the gender norm of the student.

Table 2: Regression effects of gender norms class (independent variable) on gender norms student (dependent variable) including interaction term of network centrality

	<u>Model 1</u>		<u>Model 2</u>	
	B	S.E.	B	S.E.
Constant ¹	2.742	.751***	2.209	1.17***
Average gender norms class	.334	.060***	.428	.172
In-degree centrality	.019	.015	.129	.187
Gender	-.458	.053***	-.458	.053***
Age	-.050	.043	-.050	.043
Educational level	-.055	.033	-.056	.033
Parent gender norm	.369	.019***	.369	.019***
Immigrant background	.083	.067	.083	.067
Average gender norms class*In-degree-centrality			-.020	.033

¹Dependent variable: *gender norms student*, ***p<.001; **p<.005; *p<.0

Conclusions & Discussion

This study aims to gain more insight into the influence of classmates on the individual gender norms. In particular, looking at the effect of in-degree centrality to explain the difference between classmates in susceptibility to influence. In order to answer the research question: *How does network centrality of the individual affect the way the individuals' gender norms are influenced by the average gender norms of the class?*; three hypotheses were derived.

According to the theory presented in the theoretical framework, it can be expected that among adolescents, gender norms are formed through peer influence within the classroom. Gender norms are formed by peers through reinforcement and imitating (Kretchmar, 2011) and by identifying with a social group and therefore conform to group norms (Turner et. al., 1987). These groups can also function as reference groups which means that those groups will define what is the 'right' and what is the 'wrong' (Kemper, 1968). In accordance with this theoretic framework, the first hypothesis was derived. The results of the analysis provided support for the expectation that the average gender norms in class influence the gender norms of the student. This finding is consistent with the expectations drawn from the theory.

The second part of the theoretical framework theorizes whether students in a more central or students in a more peripheral position in the network are more prone to conform to the gender norms of the classroom. Hypothesis 2 was derived in accordance with the theory that expects that students with a more central position, higher in-degree centrality, are more susceptible to the influence of classmates. A higher in-degree centrality indicates a higher involvement with peers in the network, and thus a higher chance for 'contagion', reinforcement and imitating of behaviour (Borgatti, 2005; Centola & Macy, 2007; Haynie, 2001). The theory that supported hypothesis 3 expects that students with a peripheral position, low in-degree centrality, are more susceptible to the influence of classmates. The theory suggested that normative social influence causes individuals to conform to group norms. Normative social influence says that human beings have a need to belong and to be accepted by the group, people conform to the group norms (Baumeister, 2012; Byrne, 1971; DeWall & Bushman, 2011; Hallinan, 1980; Newman et. al., 2007; Veenstra & Dijkstra, 2011). Therefore, students in a more peripheral position will have the need to belong and thus will conform to the gender norms in the classroom. Hypotheses 2 and 3 are contrasting: hypothesis 2 hypothesizes a positive effect, hypothesis 3 a negative effect of in-degree centrality on the relation of classroom gender norms and student gender norms. Results show no support to either of these expectations. In-degree centrality has no effect on the relation between gender norms of the class and gender norms of the student. Even though there is no support for both hypotheses, the effect is negative. Thus, the results lean more towards the expectation that students with low in-degree centrality are more susceptible to the conformation of the gender norms in the classroom.

In sum, the classroom gender norms influence the individual students' gender norms because individuals learn appropriate gender norms from peers through reinforcement and imitating. Moreover, identification with a social group causes the individual to conform to norms that are conjoined with the social group. There is no support to provide evidence that in-

degree centrality affects the influence of classroom gender norms on the gender norms of the student.

Nevertheless, I must also mention some implications and limitations of this study. A limitation of this study is the lack of longitudinal data. This makes it impossible to assume causal claims on the influence of the classroom on the student. Longitudinal data is needed to improve measurements of the effect of the socialization process. Through comparison of norms on different moments, more can be said about the influence of external factors. Furthermore, we must not forget that peer influence can be reciprocal. This study ignored the fact that individuals have the ability to influence others in the network and therefore an effect of conformity can occur. This implication can be solved by using longitudinal data. Another implication of this study is that the data that is used is clustered within classes, thus there is a chance that the answers are not completely independent. This can influence the results. This can be solved in future research that uses this data by, for example, randomly selecting one person from each cluster.

The encountered limitations of this study suggest that future research on peer influence in the classroom could be improved by using longitudinal data. Furthermore, it could be interesting to not look at the classroom norms, but at small groups or 'cliques' of friends within the classroom that influence individuals, since small friendship groups also influence individuals (Morgan & Grube, 1991). Moreover, a teacher can have a great influence on the norms that are among students in the classroom (McClain & Cobb, 2001). Hence, future research it can look at the influence of the teacher. Follow-up research on network characteristics in classrooms can also look at more characteristics than only in-degree centrality. For example, network closeness or density. Furthermore, the results suggest interesting differences between boys and girls that deserve further study. Finally, the results suggest that the gender norms of parents can also influence the gender norms of the student. Thus, research on the influence of parents can be of value.

The conclusions of this study suggests that gender norms in the classroom have an influence on the gender norms of an individual student. In order to prevent negative outcomes of gender norms, policy can be conducted to change the average gender norms in classrooms. For example, lessons on gender norms to create more favourable gender norms in the classroom.

Reflecting on the research question: *How does network centrality of the individual affect the way the individuals' gender norms are influenced by the average gender norms of the class?*; it can be answered that, according to this study, there is no evidence that in-degree

centrality affects the relation between the classroom gender norms and the gender norms of the individual. Even though there was no effect of in-degree centrality, this study did provide evidence that supports the statement that classroom gender norms influence the gender norms of the individual student. Therefore, his study can add to the existing body of research on gender socialization of peers.

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