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Marvin Harks, Lyann Zander & Bettina Hannover (Freie Universität Berlin)

***Judging students' peer-networks in class: A new facet of teacher diagnostic competence?***

*Abstract:*

Accuracy in teachers' judgment of students' competence is an important facet of teacher competence. We investigated an additional dimension of diagnostic competence: the extent to which teachers adequately perceive their students' connectedness in the peer-network of the classroom. Teachers who are aware of how well individual students are integrated should be better at preventing social exclusion and at making use of the central position of highly connected students to foster cooperation and a positive learning climate.

*Actual peer-networks* were measured using sociometric data, with every student indicating the peers he or she likes most. Teachers were asked to answer the same question for all students of their class (*teacher perceived peer-network*). Students were additionally asked to nominate peers who are liked most by others (*student perceived peer-network*).

Besides the actual peer-network data, several motivation-related characteristics of the individual students were used as predictors of teacher and student perceived peer-networks.

Teachers' perceptions were strongly predicted by actual peer-networks. In addition, teachers perceived students the more connected the stronger their grades were and the more effort they invested at school. Students' perceptions were also most strongly predicted by actual peer-networks. In addition, students' perceived their peers to be the more connected the better their grades were and the more importance they assigned to good looks.

Results suggest that teachers are quite good at judging students' connectedness and that their diagnostic competence could be further enhanced if they knew about factors influencing (appearance) or not influencing (effort investment) students' perceptions of peer-networks.

*Extended summary:*

*Aims and theoretical background*

High teacher-attunement to peer-relationships within class was found to predict prosocial peer-relations, stronger school belonging and motivation. We therefore argue that the extent to which teachers adequately perceive their students' connectedness in the peer-network of the classroom should be an additional dimension of diagnostic competence. Teachers who are aware of how well individual students are integrated should be better at preventing social exclusion and at making use of the central position of highly connected students to foster cooperation and a positive learning climate. In our research, we therefore wanted to find out how accurate teachers can describe peer-relations within their class. To that end, we included both, a sociometric measure of the actual peer-network and a measure of students' and teachers' perceptions of that network. To identify factors other than students' real status within the peer-network (measured via number of nominations they receive from others; so called indegree) which influence teachers' and students' perceptions of their connectedness, we included measures of several additional personal characteristics of the students. .

Previous studies have found that socially accepted students attain better grades and achievements. We therefore measured students' grades in core subjects and predicted that better performing students would be perceived as more connected by their fellow students and teachers.

We also included a measure of students' motivation: effort investment at school. Previous studies found a positive influence of well adapted behavior in class on teachers' perceptions of students'

popularity. We therefore predicted that teachers would perceive students to be the more embedded, the stronger their willingness to invest effort at school was. As to students' views, willingness to invest effort could be positively or negatively related to perceived connectedness – we therefore refrained from specifying a directed hypothesis.

Connectedness has also been found to depend on aspects of physical appearance during adolescence. More specifically, physical attractiveness seems to increase popularity, especially in peer-relationships. Even teachers are influenced by physical attractiveness and tend to give better grades to good looking students. Thus, we hypothesized that students' and teachers' perceptions of a student's embeddedness would be positively predicted by that person's physical attractiveness. As a proxy measure of physical attractiveness, we used subjective importance students assign to appearance.

### *Method*

We collected data of 37 class teachers (age:  $43 \pm 10$ , 12 male teachers) and their 821 students (age:  $13 \pm 2$ , 46.3% male) in 7 different schools in July 2016. To calculate sociometric indegrees for each student we asked them to nominate the class members they like most (actual peer-network). Class teachers were asked to nominate for each student which peers this student would choose as the ones he/she likes most in class (teacher perceived peer-network). In addition, we asked students to nominate class members who are liked most by others in class (student perceived networks). Further, we surveyed student's school specific willingness to make an effort and asked them to report their grades in the subjects German, English and Mathematics; these were aggregated into a combined score of academic achievement. To assess importance of appearance, we asked students to rate the sentence "My optical appearance is important to me" on a 5-point-Likert-scale (1 = not important, 5 = very important).

### *Findings*

We calculated stepwise regression models to predict student and teacher perceived peer-networks. As to the students' perspective, a person's actual sociometric indegree was the strongest predictor of perceived connectedness in the peer-network ( $\beta = .471^{***}$ ). Whereas effort motivation did not add to the prediction of perceived connectedness, average grade ( $\beta = .101^*$ ) and importance of appearance ( $\beta = .105^{**}$ ) did: Students with better grades and those who regarded appearance as more important were regarded as better connected by their fellow students ( $R^2 = .240$ ).

As to teachers' perceptions, actual sociometric indegree also turned out to be the strongest predictor of perceived connectedness ( $\beta = .494^{***}$ ). In addition, teachers perceived students to be the more connected, the stronger their effort motivation was ( $\beta = .128^{**}$ ). Neither average grade nor importance of appearance mattered for teachers' perceptions of a student's social connectedness ( $R^2 = .277$ ).

### *Theoretical and educational significance*

These preliminary findings illustrate differences in the way teachers and peers perceive students' connectedness within class. While both groups' perceptions were largely determined by a student's real sociometric status, peers additionally took the student's grade and the importance he or she assigned to appearance into account. In contrast, teachers thought of students who showed high effort investment as better connected among their peers. Only if effort motivation was not included into the model, grades appeared as a significant predictor of teacher perceived student connectedness.

Results are discussed with respect to the question whether teachers' diagnostic competence of peer-relationships could be further enhanced if they were aware of factors influencing (e.g., appearance) or not influencing (e.g., effort investment) students' perceptions of peer-networks. Further, we will discuss how a better understanding of the factors influencing students' and teachers' perceptions of peer-networks can help to increase the effectiveness of teachers' "invisible hand" in affecting social dynamics in classroom.