

VOLUME # ISSUE #

The International Journal of

Interdisciplinary Educational Studies

Social Network Analysis in Physical Education Classes

Attractiveness of Individuals and Targets of
Verbal Aggressiveness

MARIA LITSA, ALEXANDRA BEKIARI, AND KYRIAKI SPANOU

**THE INTERNATIONAL JOURNAL OF
INTERDISCIPLINARY EDUCATIONAL STUDIES**

<https://thesocialsciences.com>

ISSN: 2327-011X (Print)

ISSN: 2327-2570 (Online)

<https://doi.org/10.18848/2327-011X/CGP> (Journal)

First published by Common Ground Research Networks in 2021
University of Illinois Research Park
60 Hazelwood Drive
Champaign, IL 61820 USA
Ph: +1-217-328-0405
<https://cgnetworks.org>

*The International Journal of Interdisciplinary
Educational Studies* is a peer-reviewed, scholarly journal.

COPYRIGHT

© 2021 (individual papers), the author(s)

© 2021 (selection and editorial matter),

Common Ground Research Networks

All rights reserved. Apart from fair dealing for the purposes of study, research, criticism, or review, as permitted under the applicable copyright legislation, no part of this work may be reproduced by any process without written permission from the publisher. For permissions and other inquiries, please contact cgscholar.com/cg_support.



Common Ground Research Networks, a member of Crossref

EDITOR

Marcin Galent, Jagiellonian University, Poland

ACTING DIRECTOR OF PUBLISHING

Jeremy Boehme, Common Ground Research Networks, USA

MANAGING EDITOR

Megan Donnan, Common Ground Research Networks, USA

ADVISORY BOARD

The Interdisciplinary Social Sciences Research Network recognizes the contribution of many in the evolution of the Research Network. The principal role of the Advisory Board has been, and is, to drive the overall intellectual direction of the Research Network. A full list of members can be found at <https://thesocialsciences.com/about/advisory-board>.

PEER REVIEW

Articles published in *The International Journal of Interdisciplinary Educational Studies* are peer reviewed using a two-way anonymous peer review model. Reviewers are active participants of The Interdisciplinary Social Sciences Research Network or a thematically related Research Network. The publisher, editors, reviewers, and authors all agree upon the following standards of expected ethical behavior, which are based on the Committee on Publication Ethics (COPE) Core Practices. More information can be found at: <https://thesocialsciences.com/journals/model>.

ARTICLE SUBMISSION

The International Journal of Interdisciplinary Educational Studies publishes biannually (June, December). For more about the submission process, please visit <https://thesocialsciences.com/journals/call-for-papers>.

ABSTRACTING AND INDEXING

For a full list of databases in which this journal is indexed, please visit <https://thesocialsciences.com/journals/collection>.

RESEARCH NETWORK MEMBERSHIP

Authors in *The International Journal of Interdisciplinary Educational Studies* are members of the Interdisciplinary Social Sciences Research Network or a thematically related Research Network. Members receive access to journal content. To find out more, visit <https://thesocialsciences.com/about/become-a-member>.

SUBSCRIPTIONS

The International Journal of Interdisciplinary Educational Studies is available in electronic and print formats. Subscribe to gain access to content from the current year and the entire backlist. Contact us at cgscholar.com/cg_support.

ORDERING

Single articles and issues are available from the journal bookstore at <https://cgscholar.com/bookstore>.

HYBRID OPEN ACCESS

The International Journal of Interdisciplinary Educational Studies is Hybrid Open Access, meaning authors can choose to make their articles open access. This allows their work to reach an even wider audience, broadening the dissemination of their research. To find out more, please visit <https://thesocialsciences.com/journals/hybrid-open-access>.

DISCLAIMER

The authors, editors, and publisher will not accept any legal responsibility for any errors or omissions that may have been made in this publication. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Social Network Analysis in Physical Education Classes: Attractiveness of Individuals and Targets of Verbal Aggressiveness

Maria Litsa,¹ University of Thessaly, Greece
Alexandra Bekiari, University of Thessaly, Greece
Kyriaki Spanou, University of Thessaly, Greece

Abstract: The objective of this study is to detect combinations of students' interpersonal attractiveness and verbal aggressiveness during physical education and to point out their determinants. A sample of four students' networks (88 nodes—50 male and 38 female) from secondary education in Trikala, Greece has been collected. Standardized questionnaires were used. Social network analysis, Spearman and PCA have been implemented. Main results: Scientific attractiveness is positively related to social and physical attractiveness. It seems to protect from being a target of verbal aggressiveness. Social attractiveness seems to protect less than scientific attractiveness from being a target for verbal aggressiveness, while physical attractiveness encourages receiving verbal aggressiveness. Specific behavioral types are proposed: "the powerful and attractive mentor" who consists of scientific, social and physical attractiveness, is recognized as a mentor, attracts others' sympathy and at the same time they are protected from all forms of verbal aggressiveness and "the socially unattractive target" who is physically attractive and at the same time a target for all forms of verbal aggressiveness.

Keywords: Interpersonal Attractiveness, Verbal Aggressiveness, Social Network Analysis, Physical Education Classes

Introduction

Communication turns an aggregate of people who are in the same location but not meaningfully related to each other, into a social network. Such a network is a set of individuals within a group who are connected through social and interpersonal relationships. Interpersonal behavior is based on two complimentary processes: people want to relate to others and simultaneously they want to make others desire to relate to them (Leary 2010). Interpersonal communication and interpersonal attractiveness are interrelated (Berscheid and Walster 1969; Berscheid and Reis 1998) with the latter consisting of three dimensions: a) physical attractiveness, b) social attractiveness, and c) scientific attractiveness (McCroskey and McCain 1974). People tend to get attracted by similar others (McCroskey, Richmond, and Daly 1975; Sunnafrank and Ramirez 2004; Singh et al. 2007; Fiske 2010; Malloy 2018). Several studies have focused on the factors that may increase attractiveness. Weiss and Houser (2007) stated that work consciousness, socialization and physical appearance lead to communication desire. In other few studies attractiveness has been studied along with verbal aggressiveness, suggesting that a higher educational level and physical appearance seem to make someone attractive and protect from verbal aggressiveness at the same time (Bekiari and Hasanagas 2015; Hasanagas and Bekiari 2015), while verbal aggressiveness is negatively related to interpersonal attractiveness and its three dimensions (Rocca and McCroskey 1999). Few studies have been conducted based on social network analysis regarding interpersonal attractiveness in physical education (Bekiari and Hasanagas 2015; Bekiari and Spyropoulou 2016; Hasanagas and Bekiari 2015), indicating that physical attractiveness and social attractiveness among physical education students encourages verbal aggressiveness eminence.

¹ Corresponding Author: Maria Litsa, Karyes, Trikala, Department of Physical Education and Sport Science, University of Thessaly, Trikala, 42100, Greece. email: maria.litsa@hotmail.gr

Verbal aggressiveness is a characteristic of destructive communication which erodes human relationships (Rancer and Avtgis 2006; Mikhaleva, Dyakonova, and Ivanova 2015). It manifests as an attack to others' self-perception and may lead to psychological pain and negative sentiments (Infante and Wigley 1986; Rancer and Avtgis 2006). Attacking one's character, skills, appearance, background, using threats or facial expressions are typical of verbal aggressiveness (Infante et al. 1992; Myers, Brann, and Martin 2013). Verbal aggressiveness hinders the learning process, thinking, satisfaction and motivation (Bekiari 2012, 2014; Bekiari and Sympas 2015; Mazer and Stowe 2015; Myers and Knox 2000). In modern communication studies, Infante and Rancer (1996) suggested that the central purpose of argumentation theory is to support effectively. Rancer and Avtgis (2006) report that persuasion is involved in most interactions. Infante, Rancer, and Wigley III (2011) have focused on verbal aggression and argumentation, with aggression attacking one's self-concept, while argumentation attacks one's perspective. Few studies have been conducted regarding verbal aggressiveness and/or argumentation using social network analysis (Bekiari, Deliligka, and Hasanagas 2017; Bekiari, Nikolaidou, and Hasanagas 2017; Bekiari and Pachi 2017) implying that verbal aggressiveness relationships are denser among PE students in comparison to students of other disciplines and verbal aggression requires fanaticism or intimacy to appear. All human relationships, even friendships, are power relations (Bekiari and Hasanagas 2016). According to Popitz (1992) unified power theory, power manifests in four types: a) action force, which involves injury, deprivation of resources or isolation and is based on natural vulnerability, need and weakness of man, b) the power of external control concerning the threatened but unenforceable force of action which is based on the persuasiveness of the threat in the likelihood of its application, c) the power of internal control which is trust and love and is based on ignorance and emotional weakness and d) coercion by material means which is based on physical weakness. Pure power does not necessarily mean that one prevails. Power must be organized to lead to domination and supremacy in a field (Bekiari and Hasanagas 2016).

A social network is a social structure consisting of nodes (usually individuals or businesses) that are connected to each other by one or more types of interdependence, such as visions, transactions, friendship, kinship, dislike, conflict (Marsden 2005). Over the last decade, the use of this network approach has grown exponentially in a wide range of areas, including sociological and political ones (Scott 2000; Wasserman and Faust, 1994). Social network analysis is the mapping and evaluation of relationships and flows that develop between people, groups, computers, websites and other knowledge processing entities. Mapping is done through illustrations and metrics. Visualizing a social network is more than just creating images, as it creates learning situations. Images of social networks enable the researcher to discover new perspectives on the structure of the network and at the same time help them to present their perspective to others (Scott 2000; Wasserman and Faust 1994).

Social network analysis techniques are not widely used in research on verbal aggression and attractiveness. In a study by Bekiari and Hasanagas (2015), directed networks of verbal aggression in physical education students at the University of Thessaly were studied. Verbal aggression has been found to be a destructive feature of communication. The main targets of verbal attacks are mental weaknesses. In their research, Hasanagas and Bekiari (2015) examined guided networks of verbal aggression and physical attraction in physical education students at the University of Thessaly. Verbal aggression users and actors have been found to be looking for perpetrators without considering the victim's weaknesses or strengths. In a similar study by Bekiari and Spyropoulou (2016), networks of verbal aggression and interpersonal attraction in physical education students at the University of Thessaly were investigated. The results of research showed that verbal aggression does not seem to depend on the level of education of parents and that men seem to become targets more easily.

In the present article, the behavioral patterns of aggressiveness and attractiveness have been operationalized and measured as network variables. Thus, these behaviors have been depicted

as social relations (of aggression and imposition), proposing a structural (network-oriented) sociological view on topics which are examined only in a psychometric (individual – oriented) approach until now and shedding light on how undesirable behaviors and situations might be avoided or minimized. The networks (of attractiveness or aggressiveness), which are to be opened and analyzed, in fact, correspond to networks of power and depict hierarchies. Even attractiveness or aggressiveness relationships form hierarchies (those who attract more and those who are attracted, those who target more and those who are targeted).

Methodology

The sample consisted of four student groups of a secondary school in Thessaly, Central Greece. The total number of nodes was eighty-eight (fifty male and thirty-eight female). It was a non-random sample aiming to analyze the relationships of verbal aggressiveness and interpersonal attractiveness, and not provide descriptive results. Participation was voluntary, requiring a consent form signed by students' parents and special attention was paid to discretion in order to ensure that students give sincere answers. For complete network analysis to be carried out, students need to know each other in each class and answer standardized questionnaires about the relationships of interpersonal attractiveness and verbal aggressiveness among them (i.e. which student they would choose as a partner in a project, which student they would trust, which student has hurt them, which student has threatened them, etc.). The data or information required for network analysis concern the relationships of individuals within a group (e.g., interpersonal attractiveness within a school class of students). The two-part questionnaire consisted of a) network variables (structures of verbal aggressiveness and interpersonal attractiveness) and b) non-network variables (gender, age, financial and family status, etc.). Questionnaires implemented in previous research (Bekiari 2015; Bekiari and Digelidis 2015; Bekiari and Hasanagas 2015, 2016). Visone 1.1 was used to calculate and normalize the indicators (in-degree, Katz status, pagerank, authority) appearing in this study whose formulas are available in various websites. SPSS 21 was used for Spearman test which is a non-parametric test allowing the correlation between network and non-network variables ($p \leq 0.05$ (**)) and $p \leq 0.01$ (*)). It was also used for the PCA test that gave rise to the distinct behavioral types of verbal aggressiveness and interpersonal attractiveness.

Social Network Analysis

In Figure 1, the circle form along with several structures (hierarchies of Katz, pagerank and authority) of interpersonal attractiveness, verbal aggressiveness and argumentativeness are presented. Density differences can be observed between networks. Networks of attractiveness and argumentativeness are denser than these of verbal aggressiveness. This can be attributed to the fact that students who resort to negative, harmful behaviors do not usually outnumber those demonstrating positive behaviors and school is a place of socialization, not of conflict development.

Regarding hierarchical forms, students on the top of physical attractiveness hierarchies are simultaneously on the top of social attractiveness. Physically attractive nodes are selected at a more intimate level as friends. This indicates a correlation between physical and social attractiveness since friendliness and attractiveness are represented by the same nodes. In addition, nodes appearing to be mentors on work or study due to being high in task attractiveness, also display other characteristics of physical or social attractiveness. Looking for advice on academic issues seems to coincide with the criteria applied in terms of friendship or personal advice.

Nodes at the top of verbal aggressiveness do not appear on the top of other attractiveness hierarchies. The profile of the verbally aggressive consists of a combination of demonstrated

behaviors like offense, irony, rudeness, and threat. Verbally aggressive students are neither physically nor socially attractive or a choice for academic advice, and this is partly explained by the fact that verbally aggressive nodes are on the top of lack of argumentative skills hierarchy as indicated by a correlation between high hierarchy of verbal aggression and high hierarchy in weakness in discussion. Lack of argumentativeness is an indicator for the development of verbal aggressiveness. Students not capable of developing arguments in a discussion resort to different forms of verbal aggressiveness to compensate for this weakness. This makes the relationship between verbal aggressiveness and weakness in discussion perceptible.

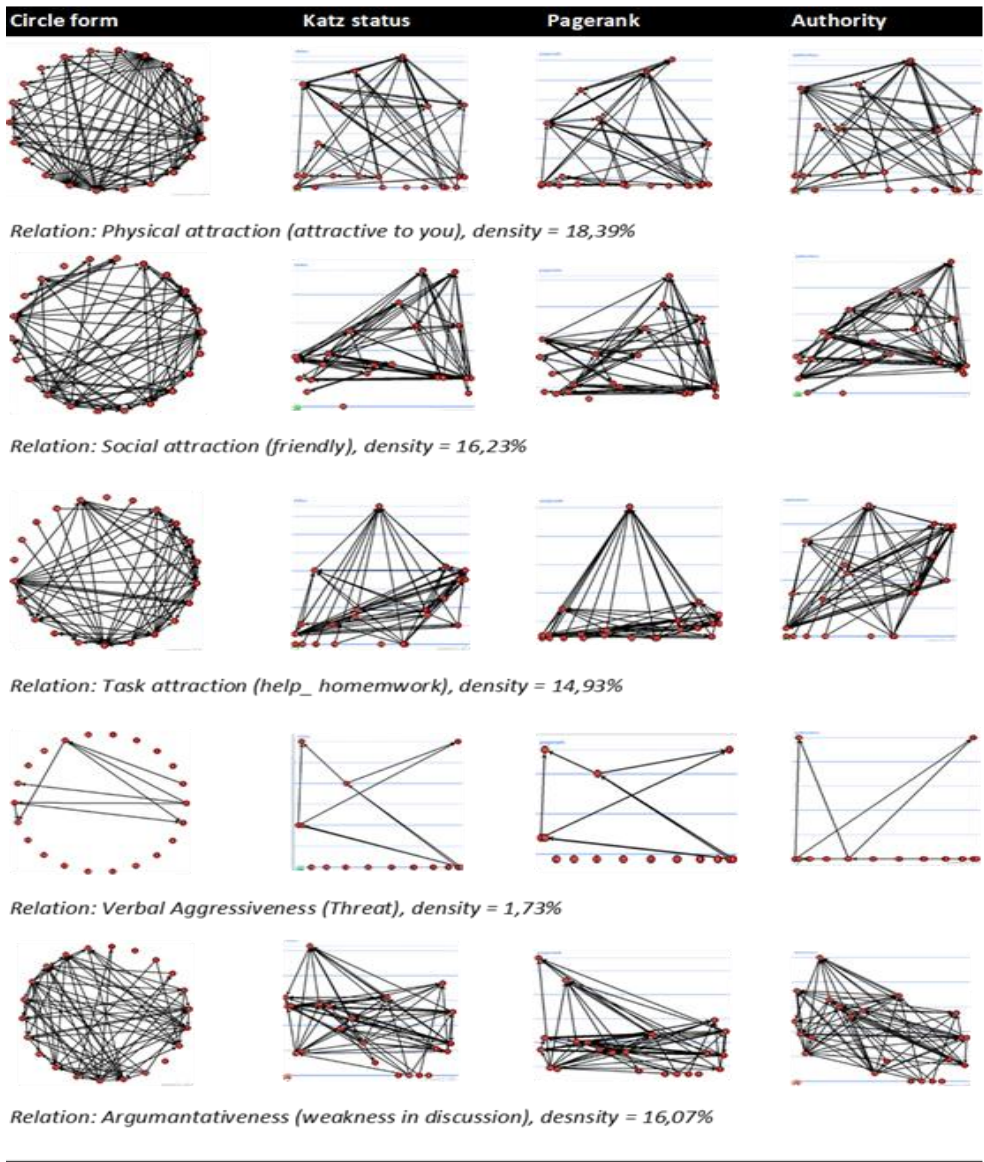


Figure 1: Examples of Structures in Interpersonal Attractiveness and Verbal Aggressiveness
Source: Litsa, Bekiari, and Spanou

Statistical Analysis

Students who are considered scientifically attractive, subjectively or objectively, usually have a good general grade (0.692, 0.469), inspire positively at lessons (0.320, 0.367) and appearance (0.328, 0.311), aim at scientific distinction (.353, .221), and success in life generally (0.377, 0.311). They also opt for friends who are gentle and friendly (0.254, 0.295) but not for friends with knowledge (-0.249). Women seem to be more often scientifically attractive (0.347, 0.321). Surfing the net for long hours is negatively related to scientific attraction (-.235) contrary to internet surfing for study purposes (0.296). Finally, overweight students seem to be scientifically unattractive (-0.291, 0.405). Socially attractive students, subjectively and objectively, usually have a good general grade at school (0.316, 0.511) but they do not appear to choose friends with knowledge (-0.250, -0.229). Objectively attractive students have not travelled abroad for the last five years (-0.285), they think that they inspire in terms of lessons (0.278) and they aim at professional distinction (0.250). Physically attractive students think that they inspire others with their appearance (0.290), do not opt for friends with knowledge (-0.243) and female seem to be considered physically attractive more often than male (0.326).

Targets of verbal aggressiveness and subsequently accusers of experiencing it, who receive hurting comments are usually tall (0.250) or overweight (0.240) and live in urban space (-0.322). Targets of verbal aggressiveness who are threatened seem to be tall (0.418), to have a low general grade (-0.308) and mostly are male (-0.352).

Table 1: Target of Attractiveness and Verbal Aggressiveness among Secondary School Students: Relation among Network Determinants and Non-network Determinants
(sum = indegree + Katz status + pagerank + authority)

	Attractiveness						Verbal Aggressiveness			
	Scientific Attractiveness		Social Attractiveness		Physical Attractiveness					
	help. homework	help.homew. others.	friendly.you	friendly. others.	attract.you	attract.others	hurt	Irony	rudeness	threat.
Height	-.174 .142	-.202 .087	.077 .516	.051 .670	-.023 .850	-.085 .477	.250 .033	.146 .218	.270 .021	.418 .000
Weight	-.291 .014	-.405 .000	-.182 .132	-.095 .436	-.200 .097	-.214 .076	.240 .045	.100 .411	.148 .220	.192 .112
Place of living (Town=1, village =2)	-.181 .105	.101 .372	-.007 .948	.016 .888	-.074 .510	-.180 .107	-.322 .003	-.101 .369	-.222 .047	-.054 .629
General grade	.692 .000	.469 .000	.316 .007	.511 .000	.091 .449	.169 .159	-.004 .974	-.103 .391	-.193 .107	-.308 .009
Travel Abroad	-.127 .260	-.089 .430	-.203 .069	-.285 .010	-.163 .146	-.167 .137	.000 .999	-.053 .637	-.009 .933	-.174 .120
Surf the net_studies	.154 .174	.296 .008	.001 .993	.126 .264	.066 .559	.057 .616	-.056 .623	.063 .577	-.004 .970	-.136 .229
Surf the net hours	-.235 .047	-.135 .257	-.019 .876	-.152 .202	.165 .166	.155 .195	.055 .649	.076 .523	.241 .041	.200 .093
Inspire lessons	.320 .005	.367 .001	.121 .298	.278 .015	.112 .337	.003 .978	-.138 .234	-.131 .260	-.203 .078	-.147 .205
Inspire appearance	.328 .004	.311 .007	.019 .874	.027 .818	.290 .012	.122 .296	.075 .520	-.042 .720	.006 .962	-.103 .379

	Attractiveness		Verbal Aggressiveness				Verbal Aggressiveness			
	Scientific Attractiveness		Social Attractiveness		Physical Attractiveness					
	help. homework	help.homew. others.	friendly.you	friendly. others	attract.you	attract.others	hurt	Irony	rudeness	threat.
Desire for distinction as student	.373 .001	.118 .294	.152 .174	.214 .055	-.005 .962	.143 .202	.049 .664	-.010 .931	-.086 .447	-.186 .096
Desire for distinction as professional	.330 .003	.080 .481	.159 .159	.250 .025	-.026 .819	.021 .853	.047 .680	.073 .522	-.127 .263	-.139 .218
Desire for distinction as scientist	.353 .001	.221 .049	.108 .339	.139 .219	.096 .397	.039 .734	-.042 .713	.025 .824	-.092 .419	-.062 .586
Desire for distinction in life generally	.377 .008	.311 .029	.056 .703	.129 .375	.268 .062	.094 .519	.209 .150	.198 .172	.141 .334	.155 .288
Opt for friends with knowledge	-.249 .027	-.210 .063	-.250 .026	-.229 .042	-.138 .227	-.243 .031	.053 .642	.107 .349	.169 .137	-.043 .707
Opt for friends with kindness	.254 .024	.295 .008	.045 .695	.098 .389	.036 .755	.065 .569	-.078 .492	-.094 .411	-.081 .478	-.001 .995
Gender (male = 1, female = 2)	.347 .001	.321 .002	.110 .309	.168 .119	.326 .002	.197 .067	.045 .682	.049 .655	-.013 .905	-.352 .001

Source: Litsa, Bekiari and Spanou

In Table 2, being scientifically attractive makes you socially attractive (0.517, 0.481, 0.351, 0.427) and physically attractive (0.372). It seems to protect you from being a target of verbal aggressiveness such as hurt (-0.230), irony (-0.250), rudeness (-0.244), threat (-0.280).

Social attractiveness protects you less than scientific attractiveness from being a target of verbal aggressiveness. It shows protection only from being a target for rudeness (-0.298, 0.228), but not from other forms like hurt, irony, threat. Physical attractiveness encourages receiving verbal aggressiveness in the form of hurt (0.234).

Table 2: Relation among Network Determinants of Being a Target of Attractiveness and Verbal Aggressiveness among Secondary School Students
(sum= indegree + Katz status + Pagerank + Authority)

	Scientific Attractiveness	Social Attractiveness		Physical Attractiveness		Verbal Aggressiveness			
	<i>help.homew.of hers</i>	<i>friendly.you</i>	<i>friendly.others</i>	<i>attractive to you</i>	<i>Attractive to others</i>	<i>hurt</i>	<i>irony</i>	<i>rudeness</i>	<i>threat</i>
Help homework	.546 .000	.517 .000	.481 .000	.372 .000	.267 .012	.093 .393	-.083 .445	-.188 .081	-.280 .009
help.homework_others		.351 .001	.427 .000	.196 .069	.082 .448	-.230 .032	-.250 .019	-.244 .023	-.102 .349
Friendly to you			.739 .000	.286 .007	.286 .007	-.130 .230	-.138 .203	-.298 .005	-.043 .691
friendlyto others				.257 .016	.234 .029	-.136 .210	-.133 .220	-.228 .034	-.125 .250
Attractive to you					.732 .000	.234 .029	.161 .137	.129 .232	-.012 .911
Attractive to others						.093 .393	.063 .562	.045 .682	-.091 .401
hurt							.567 .000	.680 .000	.159 .142
irony								.613 .000	.245 .022
rudeness									.312 .003
threat									

Source: Litisa, Bekiari and Spanou

In Table 3, specific PCA types are “The powerful and attractive mentor” and “The socially unattractive target.” “The powerful and attractive mentor” is a mentor in academic (0.691) and personal issues (0.807) and gets others’ trust (0.709) concentrating social power. They are socially attractive (0.775, 0.710), physically attractive (0.595, 0.581) and scientifically attractive (0.804, 0.476). “The socially unattractive target”, despite being mentors on personal issues (0.272) and physically attractive (0.411, 0.517), they seem to lack social attractiveness and become targets for all forms of verbal aggressiveness, like threat (0.257), irony (0.802), hurt (0.757) and rudeness (0.735).

Table 3: Typology of Targets of Interpersonal Attractiveness and Verbal Aggressiveness (Katz status)

		The Powerful And Attractive Mentor	The Socially Unattractive Target
Social Power	<i>advice_lessons</i>	.691	
	<i>advice_personal</i>	.807	.272
	<i>sympathy</i>	.709	.156
Social Attractiveness	<i>friendly_to_you</i>	.775	-.173
	<i>friendly_to_others</i>	.710	-.187
Physical Attractiveness	<i>attractive_to_others</i>	.595	.411
	<i>attractive_to_you</i>	.581	.517
Scientific Attractiveness	<i>help_homework</i>	.804	.144
	<i>help_homework_others</i>	.476	
Verbal Aggressiveness	<i>threat</i>	-.413	.257
	<i>irony</i>	-.227	.802
	<i>hurt</i>	-.231	.757
	<i>rudeness</i>	-.400	.735

Source: Litsa, Bekiari and Spanou

Discussion and Conclusion

The aim of this research was the exploration of interpersonal attractiveness and verbal aggressiveness among secondary school students of physical education. These behaviors are analyzed as structural phenomena through social network analysis so that their determinants are detected as well as the relationship between dimensions of interpersonal attractiveness and verbal aggressiveness.

It is evident that the networks present differences regarding their intensity in the different relations, with the relationships of attractiveness and argumentativeness being denser than those of verbal aggressiveness. This has been proved in similar studies (Bekiari and Spyropoulou 2016; Bekiari et al. 2019) and indicates that verbal aggressiveness is a detrimental behavior which, however, emerges in specific cases, under certain conditions and school remains a place of socialization and a learning environment. Hierarchical forms of attractiveness seem to be related with the one predicting the existence of the other, especially in the case of social and scientific attractiveness, which has also been proved (Montoya et al 2008). In the present research, scientifically attractive PE students tend to be socially attractive, while verbally aggressive PE students prove to be unattractive. Hasanagas and Bekiari (2015), Bekiari and Hasanagas (2016), Bekiari and Spyropoulou (2016) have proved that verbal aggressiveness is negatively related to attractiveness, deterring the development of interpersonal relationships. The present study suggests that verbally aggressive PE students may not be chosen as sports partners, deterring both their social inclusion and sports progress. Verbal aggression seems to be in stark contrast to leadership since it has been defined as the ability to influence others on a voluntary basis (Theocharis, Bekiari, and Koustelios 2017)

Regarding the non-network determinants, gender is an important one. Women seem to be more scientifically attractive in comparison to men. General grade at school is an indicator for students who are both scientifically and socially attractive. Good general grade at school appears to be a factor of targeting for verbal aggressiveness. Krause et al. (2014) found that aiming at distinction makes people scientifically attractive, while Muñoz Reyes et al. (2019) referred to the negative association between academic performance and sociality. Regarding physical characteristics, weight and height seem to relate to attractiveness and verbal aggressiveness. More specifically, being overweight may make students unattractive physically and scientifically, while tall students become targets for verbal aggressiveness. Students living in town are targets for verbal aggressiveness more easily than those living in village. Thus, the

urban space encourages verbal aggressiveness in comparison to the rural environment (Spanou, Bekiari, and Hasanagas, forthcoming).

What typology of Table 3 suggests is that being physically attractive may turn you into a victim of verbal aggressiveness. Physical attractiveness alone does not necessarily protect from being targeted, despite being the most frequently expressed form of interpersonal attractiveness as the content analysis of Bevan et al. (2016) showed. On the contrary, trusting someone (Singh et al. 2016) has been found to be of greater importance to the emergence of interpersonal attractiveness as scientific attractiveness turns someone into a collaborator (Nezlek et al. 2011; Lösch and Rentzsch 2018). The results are also consistent with Bekiari and Hasanagas (2015) who in a study of verbal aggressiveness networks of physical education students in University of Thessaly suggested five distinct types of verbal aggressiveness victims.

Overall, scientific attractiveness is positively related to social and physical attractiveness and it seems to protect from being a target of verbal aggressiveness. Social attractiveness seems to protect less than scientific attractiveness from being a target for verbal aggressiveness, while physical attractiveness encourages receiving verbal aggressiveness. Finally, scientific attractiveness seems to encourage adopting the profile of a mentor on personal and academic issues that facilitates the development of relationships based on trust. Physical educators who become aware of how social and scientific attractiveness may affect students' preferences for each other can think critically about the relationships developed during their lesson and facilitate group management especially by spotting the verbally aggressive students and the reasons underlying their behavior.

Limitations and subsequent challenges for future research is the restricted sample which may be enlarged spatially and structurally (e.g. extended to other education settings too). Further non-network variables (e.g. socioeconomic, family-related, etc.) can be included and correlated with the network variables. Additionally, a typology of network and non-network characteristics may be proposed. Moreover, an extensive qualitative analysis may provide deeper insights into the quantitative results (e.g. qualitative comparison among students who are located on the bottom, in the middle or at the higher layers of aggression hierarchy).

Acknowledgement

We are grateful to the school instructors and to the students who collaborated in this research project.

REFERENCES

- Bekiari, Alexandra. 2012. "Perceptions of Instructor's Verbal Aggressiveness and Physical Education Students' Affective Learning." *Perceptual and Motor Skills* 115 (1): 325–335. <https://doi.org/10.2466%2F06.11.16.PMS.115.4.325-335>.
- . 2014. "Verbal Aggressiveness and Leadership Style of Sports Instructors and Their Relationship with Athletes' Intrinsic Motivation." *Creative Education* 5 (2): 114–121. <http://dx.doi.org/10.4236/ce.2014.52018>.
- . 2017. "Verbally Aggressive Instructors and Machiavellian Students: Is the Socio-Communicative Style an Over-Bridging?" *Psychology* 8 (10): 1437–1454. <https://doi.org/10.4236/psych.2017.810095>.
- Bekiari, Alexandra, Stergiani Deliligka, and Nikolaos Hasanagas. 2017. "Analyzing Networks of Verbal Aggressiveness and Motivation." *Psychology* 8 (3): 495–515. <https://doi.org/10.4236/psych.2017.83031>.

- Bekiari, Alexandra, Stergiani Deliligka, Aikaterini Vasilou, and Nikolaos Hasanagas. 2019. "Socio-educational Determinants of "Bad Behavior" of Students: A Comparative Analysis among Primary, Secondary, and High School." *International Journal of Learner Diversity and Identities* 26 (1): 1–19. <http://doi.org/10.18848/2327-0128/CGP/v26i01/1-19>.
- Bekiari, Alexandra, and Nikolaos Digelidis. 2015. "Measuring Verbal Aggressiveness in Sport and Education." *International Journal of Physical Education* 52 (4): 112–121.
- . 2015. "Verbal Aggressiveness Exploration through Complete Social Network Analysis: Using Physical Education Students' Class as an Illustration." *International Journal of Social Science Studies* 3 (3): 30–49. <https://doi.org/10.11114/ijsss.v3i3.729>.
- . 2016. "Suggesting Indicators of Superficiality and Purity in Verbal Aggressiveness: an Application in Adult Education Class Networks of Prison Inmates." *Open Journal of Social Sciences* 4 (3): 279–292. <http://dx.doi.org/10.4236/jss.2016.43035>.
- Bekiari, Alexandra, and Vasiliki Pachi. 2017. "Insights into Bullying and Verbal Aggressiveness through Social Network Analysis." *Journal of Computer and Communications* 5 (9): 79. <https://doi.org/10.4236/jcc.2017.59006>.
- Bekiari, Alexandra, and Spyreta Spyropoulou. 2016. "Exploration of Verbal Aggressiveness and Interpersonal Attraction through Social Network Analysis: Using University Physical Education Class as an Illustration." *Open Journal of Social Sciences* 4 (6): 145–155. <https://doi.org/10.4236/jss.2016.46016>.
- Bekiari, Alexandra, and Ioannis Syrmipas. 2015. "Coaches' Verbal Aggressiveness and Motivational Climate as Predictors of Athletes' Satisfaction." *British Journal of Education, Society & Behavioural Science* 9 (4): 318–329. <https://doi.org/10.9734/bjesbs/2015/17757>.
- Bekiari, Alexandra, Zoi Anna Nikolaidou, and Nikolaos Hasanagas. 2017. "Typology of Motivation and Aggression on the Basis of Social Network Variables: Examples of Complementary and Nested Behavioral Types through Conventional Statistics." *Social Networking* 6 (2): 135–147. <https://doi.org/10.4236/sn.2017.62008>.
- Berscheid, Ellen, and Harry Reis. 1998. "Attraction and Close Relationships." In *Handbook of Social Psychology*, edited by Susan Fiske, Daniel Gilbert, and Gardner Lindzey, 193–281. Hoboken, NJ: Wiley.
- Berscheid, Ellen, and Elaine Walster. 1969. *Interpersonal Attraction*. Boston: Addison-Wesley Publishing Company.
- Bevan, Jennifer L., Jimena Galvan, Justin Villaseñor, and Joanna Henkin. 2016. "'You've Been on My Mind Ever Since': A Content Analysis of Expressions of Interpersonal Attraction in Craigslist. Org's Missed Connections Posts." *Computers in Human Behavior* 54: 18–24. <https://doi.org/10.1016/j.chb.2015.07.050>.
- Fiske, Susan. 2010. "Interpersonal Stratification: Status, Power, and Subordination." In *Handbook of Social Psychology*, edited by Susan Fiske, Daniel Gilbert, and Gardner Lindzey, 941–982. Hoboken: Wiley.
- Hasanagas, Nikolaos, and Alexandra Bekiari. 2015. "Depicting Determinants and Effects of Intimacy and Verbal Aggressiveness Target through Social Network Analysis." *Sociology Mind* 5 (3): 162–175. <https://doi.org/10.4236/sm.2015.53015>.
- Infante, Dominic A., and Andrew S. Rancer. 1996. "Argumentativeness and Verbal Aggressiveness: A Review of Recent Theory and Research." *Annals of the International Communication Association* 19 (1): 319–352. <https://doi.org/10.1080/23808985.1996.11678934>.
- Infante, Dominic A., Andrew S. Rancer, and Charles J. Wigley III. 2011. "In Defense of the Argumentativeness and Verbal Aggressiveness Scales." *Communication Quarterly* 59 (2): 145–154. <https://doi.org/10.1080/01463373.2011.563439>.

- Infante, Dominic A., Bruce L. Riddle, Carry L. Horvath, and Sherlyn-Ann Tumlin. 1992. "Verbal Aggressiveness: Messages and Reasons." *Communication Quarterly* 40 (2): 116–126. <https://doi.org/10.1080/01463379209369827>.
- Infante, Dominic A., and Charles J. Wigley III. 1986. "Verbal Aggressiveness: an Interpersonal Model and Measure." *Communications Monographs* 53 (1): 61–69. <https://doi.org/10.1080/03637758609376126>.
- Krause, Sascha, Mitja D. Back, Boris Egloff, and Stefan C. Schmukle. 2014. "Implicit Interpersonal Attraction in Small Groups: Automatically Activated Evaluations Predict Actual Behavior toward Social Partners." *Social Psychological and Personality Science* 5 (6): 671–679. <https://doi.org/10.1177%2F1948550613517723>.
- Leary, Mark R. 2010. "Affiliation, Acceptance and Belonging: The Pursuit of Interpersonal Connection." In *Handbook of Social Psychology*, edited by Susan Fiske, Daniel Gilbert, and Gardner Lindzey, 864–897. Hoboken, NJ: Wiley.
- Lösch, Thomas and Katrin Rentzsch. 2018. "Linking Personality with Interpersonal Perception in the Classroom: Distinct Associations with the Social and Academic Sides of Popularity." *Journal of Research in Personality* 75:83–93. <https://doi.org/10.1016/j.jrp.2018.06.003>.
- Malloy, Thomas E. 2018. "Interpersonal Attraction in Dyads and Groups: Effects of the Hearts of the Beholder and the Beheld." *European Journal of Social Psychology* 48 (3): 285–302. <https://doi.org/10.1002/ejsp.2324>.
- Marsden, Peter V. 2005. "Recent Developments in Network Measurement." In *Models and Methods in Social Network Analysis*, Vol. 28, edited by Peter J. Carrington, John Scott, and Stan Wasserman, 8–30. Cambridge: Cambridge University Press.
- Mazer, Joseph P., and Shawn A. Stowe. 2015. "Can Teacher Immediacy Reduce the Impact of Verbal Aggressiveness? Examining Effects on Student Outcomes and Perceptions of Teacher Credibility." *Western Journal of Communication* 80 (1): 21–37. <https://doi.org/10.1080/10570314.2014.943421>.
- McCroskey, James C., and Thomas A. McCain. 1974. "The Measurement of Interpersonal Attraction." *Speech Monograph* 41 (3): 261–266. <https://doi.org/10.1080/03637757409375845>.
- McCroskey, James C., Virginia P. Richmond, and John A. Daly. 1975. "The Development of a Measure of Perceived Homophily in Interpersonal Communication." *Human Communication Research* 1 (4): 323–332. <https://doi.org/10.1080/03634520600702562>.
- Mikhaleva, Alexandra B., Natalia Dyakonova, and Natalia Ivanova. 2015. "Psychology of Aggressive Behaviour and Will." *SWorldJournal* 8 (1): 120–125. <https://www.elibrary.ru/item.asp?id=23556807>.
- Montoya, R. Matthew, Robert S. Horton, and Jeffrey Kirchner. 2008. "Is Actual Similarity Necessary for Attraction? A Meta-Analysis of Actual and Perceived Similarity." *Journal of Social and Personal Relationships* 25 (6): 888–922. <https://doi.org/10.1177%2F0265407508096700>.
- Muñoz Reyes, Jose Antonio, Romulo Guerra, Pablo Polo, Eduardo Cavieres, Miguel Pita, and Enrique Turiégano. 2019. "Using an Evolutionary Perspective to Understand the Relationship between Physical Aggression and Academic Performance in Late Adolescents." *Journal of School Violence* 18 (1): 39–48. <https://doi.org/10.1080/15388220.2017.1368397>.
- Myers, Scott A., Maria Brann, and Matthew Martin. 2013. "Identifying the Content and Topics of Instructor Use of Verbally Aggressive Messages." *Communication Research Reports* 30 (3): 252–258. <https://doi.org/10.1080/08824096.2013.806260>.
- Myers, Scott A., and Ronda L. Knox. 2000. "Perceived Instructor Argumentativeness and Verbal Aggressiveness and Student Outcomes." *Communication Research Reports* 17 (3): 299–309. <https://doi.org/10.1080/08824090009388777>.

- Nezlek, John B., Astrid Schütz, Michela Schröder-Abé, and C. Veronica Smith. 2011. "A Cross-cultural Study of Relationships between Daily Social Interaction and the Five-factor Model of Personality." *Journal of Personality and Social Psychology* 79 (4): 811–840. <https://doi.org/10.1111/j.1467-6494.2011.00706.x>.
- Popitz, Heinrich 1992. *Phänomene der Macht* [Phenomena of Power]. Tübingen: Mohr Siebeck.
- Rancer, Andrew S., and Theodore A. Avtgis. 2006. *Argumentative and Aggressive Communication: Theory, Research, and Application*. Thousand Oaks, CA: Sage.
- Rocca, Kelly A., and James C. McCroskey. 1999. "The Interrelationship of Student Ratings of Instructors' Immediacy, Verbal Aggressiveness, Homophily, and Interpersonal Attraction." *Communication Education* 48 (4): 308–316. <https://doi.org/10.1080/03634529909379181>.
- Scott, John. 2000. *Social Network Analysis: A Handbook*. London: Sage.
- Singh, Ramadhar, Li Jen Ho, Hui Lynn Tan, and Paul A. Bell. 2007. "Attitudes, Personal Evaluations, Cognitive Evaluation and Interpersonal Attraction: On the Direct, Indirect and Reverse-Causal Effects." *British Journal of Social Psychology* 46 (1): 19–42. <https://doi.org/10.1348/014466606X104417>.
- Spanou, Kyriaki, Alexandra Bekiari, and Nikolaos Hasanagas. Forthcoming. "Socio-Informatics at the Service of Pedagogic: Dynamic Analysis of Verbal Aggressiveness, Machiavellianism and Bullying through Social Network Analysis." *Journal of Emotional and Behavioral Disorders*.
- Sunnafrank Michael, and Artemio Ramirez Jr. 2004. "At first sight: Persistent Relational Effects of Get-Acquainted Conversations." *Journal of Social and Personal Relationships* 21 (3): 361–379. <https://doi.org/10.1177/0265407504042837>.
- Theocharis, Dimitrios, Alexandra Bekiari, and Athanasios Koustelios. 2017. "Exploration of Determinants of Verbal Aggressiveness and Leadership through Network Analysis and Conventional Statistics: Using School Class as an Illustration." *Sociology Mind* 7 (2): 27–43. <https://doi.org/10.4236/sm.2017.72003>.
- Wasserman, Stanley, and Katherine Faust. 1994. *Social Network Analysis: Methods and Applications*, Vol. 8. Cambridge: Cambridge University Press.
- Weiss, Seth D., and Marian L. Houser. 2007. "Student Communication Motives and Interpersonal Attraction toward Instructor." *Communication Research Reports* 24 (3): 215–224. <https://doi.org/10.1080/08824090701439091>.

ABOUT THE AUTHORS

Maria Litsa: PhD Candidate, Department of Physical Education and Sport Science, University of Thessaly, Trikala, Greece

Bekiari Alexandra: Assistant Professor, Department of Physical Education and Sport Science, University of Thessaly, Trikala, Greece

Spanou Kyriaki: PhD Candidate, Department of Physical Education and Sport Science, University of Thessaly, Trikala, Greece

The International Journal of Interdisciplinary Educational Studies is one of four thematically focused journals that support the Interdisciplinary Social Sciences Research Network. The Research Network is comprised of a journal collection, book imprint, conference, and online community.

The journal presents studies that exemplify the disciplinary and interdisciplinary practices of the social sciences. As well as articles of a traditional scholarly type, this journal invites case studies that take the form of presentations of practice—including documentation of socially engaged practices and exegeses analyzing the effects of those practices.

The International Journal of Interdisciplinary Educational Studies is a peer-reviewed, scholarly journal.