The Attractive, the Aggressive and the Withdrawn Student in the University: Social Network and Content Analysis

Maria Litsa[1]
Alexandra Bekiari[1]

1) University of Thessaly, Greece

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Maria Litsa
University of Thessaly

Alexandra Bekiari
University of Thessaly

Abstract

The aim of this study is to detect and analyse relationships of attractiveness, social power and aggressiveness in the PE university community. A sample of 197 PE university students from University of Thessaly, Greece participated in the social network study, answering about the relationships developed with their fellow students and providing demographic non-network data as well. After the extraction of results, 8 of them were interviewed to further clarify the motives and thoughts that underlie their behaviour regarding attractiveness, social power and aggressiveness. Social network analysis, carried out with Visone 1.1, statistical analysis, carried out with SPSS 26 and content analysis of the qualitative data – interviews, carried out with MaxQDA 2020 led us to the following conclusions: Scientific attractiveness is related to social power and vice versa, protecting from verbal aggressiveness. Aggressiveness is negatively related to attractiveness and social power. Argumentativeness is important for the position one holds in their network and argumentational deficiency may lead to marginalization. Gender, body characteristics and academic distinction affect attractiveness and aggressiveness emergence.

Keywords: attractiveness, aggressiveness, social power, social network analysis, content analysis.

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El Atractivo, el Agresivo y el Estudiante Retraído en la Universidad: Análisis de Redes Sociales y Análisis de Contenido

Maria Litsa
University of Thessaly

Alexandra Bekiari
University of Thessaly

Resumen

El objetivo de este estudio es detectar y analizar las relaciones de atractivo, poder social y agresividad en la comunidad universitaria de educación física. Una muestra de 197 estudiantes universitarios de educación física de la Universidad de Tesalia, Grecia, participaron en el estudio de redes sociales, respondiendo sobre las relaciones desarrolladas con sus compañeros y proporcionando datos demográficos fuera de la red también. Después de la extracción de los resultados, 8 de ellos fueron entrevistados para aclarar aún más los motivos y pensamientos que subyacen a su comportamiento con respecto al atractivo, el poder social y la agresividad. El análisis de redes sociales, realizado con Visone 1.1, el análisis estadístico, realizado con SPSS 26 y el análisis de contenido de los datos cualitativos – entrevistas, realizado con MaxQDA 2020 nos llevaron a las siguientes conclusiones: El atractivo científico está relacionado con el poder social y viceversa, protegiendo de la agresividad verbal. La agresividad está relacionada negativamente con el atractivo y el poder social. La argumentatividad es importante para la posición que uno ocupa en su red y la deficiencia argumentacional puede conducir a la marginación. Las características del género, del cuerpo y la distinción académica afectan a la aparición de atractivos y agresividad.

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A ccording to social psychology, interpersonal behavior is based on two complementary processes: on the one hand, people seek to relate to other people and on the other, they try to make others want to relate to them (Leary, 2010). Interpersonal attractiveness is an important factor that affects interpersonal communication between individuals, the quality and quantity of communication and promotes human activity in many areas (McCroskey et al., 1974). According to Berscheid & Walster (1969), the more two people are attracted, the more they seek to communicate with each other and the greater the influence of one person on the other in the communication process. Interpersonal attractiveness is a multidimensional concept that consists of three dimensions: a) social attractiveness, based on personal preference b) scientific attractiveness, related to the desire to work with someone and c) physical attractiveness based on external appearance and physical characteristics (McCroskey & McCain, 1974).

A behavior can be characterized as aggressive when a person through the imposition of physical or symbolic force aims at best to impose and perhaps slightly harm the target of their attack, while at worst to defeat and destroy them (Infante, 1987). It may be distinguished into: (a) aggressiveness and (b) argumentativeness. Verbal aggressiveness is a characteristic of destructive communication that leads to erosion of human relationships (Rancer & Avtgis, 2014; Mikhaleva et al., 2015). It manifests itself as an attack on the self-perception of others for the purpose of psychological pain (humiliation, shame, depression) and additional negative emotions (Infante, 1987; Infante & Rancer, 1982; Infante & Wigley, 1986; Rancer & Avtgis, 2006). On the other hand, argumentativeness is constructive form of communication, based on the tendency to support one's point of view (Infante et al., 2011)

All relationships between people, even friendship relationships, are relationships of power. Every relationship is power (Bekiari & Hassanagas, 2016). According to Popitz's power theory (1992), there are four kinds of power: a) action power, concerning injury, deprivation of resources or isolation and based on the physical vulnerability, need and weakness of man, (b) power of external control or instrumental power based on the persuasiveness of the threat in its likelihood of application, (c)power of internalized control or authoritative power which is trust and love and is based on ignorance and emotional weakness, and (d) data setting power applied by

material means and based on physical weakness. Pure power doesn't necessarily mean that one prevails. Power must be organized to lead to dominance in a field (Bekiari & Hassanagas 2016). By extension, within any relationship of attractiveness or aggressiveness, one of the aforementioned forms of power is included.

The purpose of the present study is twofold: 1) quantitative analysis (with algebraic indicators of social network analysis and conventional statistics) and 2) qualitative deepening for the understanding of quantitative results, regarding the relationship among interpersonal attractiveness, social power and verbal aggressiveness.

More specifically, quantitative detection (study 1) aims to analyse and diagnose structures of a) attractiveness, b) social power and c) aggressive behavior, as well as the parameters that affect the aforementioned network variables (structures) as they are formed and perceived by university PE students. Hierarchy structures (top and bottom targets and actors) will emerge in terms of: (a) attractiveness (b) social power and (c) aggressive behaviour. At the same time, individual factors, such as age, gender, socio-economic parameters, will be detected as independent and non-network variables to see if and how they affect the position of nodes within the above-mentioned structures - hierarchies. We aim to see how high one node is in the hierarchy of structures and, therefore, how much one is targeted at the activities of physical education. Also, we aim to detect whether the hierarchies go hand in hand with the different types of structures mentioned above (e.g. whether whoever becomes the top attractiveness node, is at the same time the main target of aggressiveness or not). Thus, unconventional quantitative research (algebraic analysis), through the implementation of social network analysis is carried out to highlight structures, considering students as nodes (all nodes in a class will form a complete network, to be sampled for examination in university PE classes). In addition, exploratory interviews (study 2) are conducted with university students, with the aim to clarify the quantitative results of study 1. These targeted interviews will be conducted with students that appear at the top and at the bottom of the hierarchies of a) attractiveness b) social power and c) verbal aggressiveness in order to understand their motivations, their merit system and the wider social environment and mentality, in which they develop these behaviors and attitudes. This

enlightens the quantitative results and complements the understanding of the structures of attractiveness, social power and aggressiveness.

The main academic added value of the network analysis is that university PE students will be examined in a common hierarchy, beyond formal distinctions of the same kind of relationship with regard to the three types of relationships (attractiveness, power, aggressive behaviour), as they appear in the university environment of physical education. Consequently, an analysis of power will be attempted, e.g. whether it consists of a) trust, b) inspiration of interest-emotion, c) institutional pressure (e.g. threat) and d) action (violence). The opportunity will be given to fill the gap in the literature with regard to: (a) the qualitative investigation of these characteristics (b) the all-round quantitative examination based on network variables describing the perceived characteristics as a system. At the same time, qualitative analysis will contribute to the understanding of attractiveness, power and aggressive behavior in the field of physical education.

The practical added value lies in the identification of the main influence nodes in attractiveness and power and the main actors (persons) of aggressive behaviour, which is useful for taking preventive and pedagogical measures with regard to these students. Determinants of aggressive behaviour will be proposed enabling a preventive policy. At the same time, factors and structural (network) variables will be proposed to make it easier to identify distinct types of behaviours related to attractiveness and power that occur in academic reality. In this way, professors will be able to predict students who act as "stars" of example (positive or negative) for others and to take the pedagogical measures they consider necessary. Qualitative analysis will also contribute to understanding the need to take measures to exploit the attractiveness and to address and design these measures appropriately.

Methodology

Mixed methods have been applied with a combination of qualitative and quantitative data. Full network analysis has been applied to university PE students of University of Thessaly (n=197, 110 male – 87 female) focusing on behaviours of attractiveness, verbal aggressiveness and social power. The field of education is an accessible field of analysis of social networks due to

the complete network sample provided (Heidler et al., 2014). Network variables have measured attractiveness, power and aggressive behavior. The qualitative research has been carried out mainly on the students-nodes of the network, and it has taken the form of exploratory individual interviews. The codification of responses to a conceptual system has pursued, which helps to understand the quantitative effects (e.g. if the top aggressive node realises being aggressive and explain the reasons for their behaviour, clarifying the parameters of their aggressive behaviour).

The qualitative study has taken place after the quantitative results have been extracted in order to interpret them. Qualitative research has been systematised in terms of sampling as follows: interviews have been conducted from 1-3 of the top and 1-3 of the bottom strata of hierarchies (relationships of aggressiveness, power and attractiveness). In this way, similarities and differences between the "top" and "bottom" nodes have emerged and questions have been explored about how one ends up top or bottom in the different types of relationships mentioned above. In total, 8 interviews have taken place.

Everyone's participation in the study has been voluntary. Assurance has been given that the data, would be handled discreetly and no data would be made public that makes it possible to identify people, except for total, compiled results. Approval by the Ethics Committee of the Department of Physical Education and Sport Science, University of Thessaly has been given regarding research protocols.

Research tools

A standardised questionnaire with non-network and network components has been used to collect the data. The non-network part of the questionnaire concerns the personal data of the respondents (e.g. gender, socio-economic characteristics). The network part treats each respondent as a node of the network and relate them to the positions they hold in the hierarchies of relationships (attractiveness, power, aggressiveness). In this way, it has been possible to correlate network and non-network variables in the overall sample. The questionnaires have been based on models proposed by other researchers (McCroskey et al., 2006; Popitz, 1992; Infante and Wigley, 1986) and they

have been tested in a full network analysis pilot application (Litsa et al., 2021). Qualitative research has been conducted through exploratory individual interviews in order to draw up a semi-structured interview guide that delves into the causes (interpretation) of students' behaviour, how it affects relationships and hierarchies of attractiveness, power and aggressive behaviour, their possible interactions with their fellow students and the possible impact of their behaviour on the formation of these hierarchies. The particularization of research in Physical Education university students followed several stages in the design research (Nieveen et al., 2006). After preliminary research of literature review, a conceptual framework based on context and problem analysis was designed. Then formative evaluation and revision helped optimize the design guidelines, assess the effectiveness and finally specify the design principles and how they link to the framework of physical education in university.

Data Processing

The analysis of social networks is based on algebraic indicators and is used to detect and quantify hierarchies of relationships. Each network is captured as a polygon where the tops correspond to the respondents (members of the network) and the (existing) diagonals constitute the different relationships. Essentially network analysis is an empirical operationalization of System Theory. According to it, each node (member) of the network acquires its properties (being strong or weak) through the interactions it develops with other nodes. Network data is also called relational data that allows to measure relationships related to the attitudes, opinions and behaviours (Diosey Ramon, 2011). For example, one has power because others give it (if they trust him/her) and does not necessarily acquire it from non-network variables (e.g. gender, general social and academic characteristics, etc.). These relationships have been measured on the basis of tested socio-informatics software (Visone 1.1.). Their structural and social interpretation is described as follows:

- [1] $p(G) = \frac{m}{n(n-1)}$ (***density***), [G=graph, m=number of links, n(n-1)=number of possible links]

$$c_{iD}(v) = \sum_{e=(u,v)} \omega(e) \qquad c_{oD}(v) = \sum_{e=(v,u)} \omega(e)$$

- (***indegree***), (***outdegree***)

[directed graph: G=(V,E), where V=nodes, E=links, ω=weights, number of links $E \subseteq V \times V$, a link $e \in E$ connects 2 nodes $u, v \in V$, $\omega: x \to R$, $X \in \{V, E\}$, $x \in X$, $\omega(x)$]

$$c_{ks}(v) = a \cdot \sum_{(u,v) \in E(v)} \omega((u,v)) \cdot (1 + c_{ks}(u))$$

- (***Katz status***)

where $\dfrac{1}{\alpha} = \min\{\max_{u \in V} in \deg_\omega(v), \max_{u \in V} out \deg_\omega(v)\}$

$$c_{PR}(v) = \alpha \frac{1}{n} + (1-a) \sum_{(u,v) \in E(v)} \omega((u,v)) \cdot c_{PR}(u)$$

- (***pagerank***)

where $0 < a < 1$ is a free parameter

$$c_A(v) = \frac{1}{\lambda} \cdot \sum_{(u,v) \in E(v)} \omega((u,v)) \cdot (\sum_{(u,w) \in E_u} \omega((u,w)) \cdot c_E(w))$$

- (***authority***)

where λ is the largest eigenvalue of $A^T A$, A: the adjacency matrix of the graph G, T: natural numbers

(a) In- and Out-degree (occasional influence) concerns direct contact, i.e. the in-going means influence one receives from the other nodes and the influence that one creates towards the other nodes having out-going contact to them.

(b) Katz status (cumulative influence) means the influence exerted by a person through a successive process, i.e. the number and size of the chain-contacts leading to from each node to the next one successively. Thereby, there is a deeper, long-chain relationship rather than an occasional one.

(c) Pagerank (distributional influence) is similar to Katz status but narrows the edges because it is based on the transferred value from one node to another, i.e. counts the number of nodes that come into contact with each other and not the length of chain-relationships.

(d) Authority (special competitiveness or dominant position) shows the nodes that attract the most links from the other nodes, among those that intensively seek to maintain relationships. In this case, it reveals a clear tendency to become a target. For example, high authority in case of

attractiveness characterises a student who has attracted links from many other students who are intensively looking for attractive students. SPSS 26 allowed the statistical analysis, and specifically Spearman test ($p \leq 0.01$ (*) and $p \leq 0.05$ (**)), which identified correlations and factors that affect position position of nodes in the hierarchies.

Qualitative data analysis has been implemented by letting key categories and concepts emerge from the data (Schreier, 2012). Content analysis is based on the frequency with which particular categories of meaning are used (Given, 2008) and has long been used to codify interviews material. Categories function as means of structuring the content, creating types and evaluating statements (Kuckartz, 2014). The sequence of steps in content analysis is the following: 1.selecting material, 2.creating a coding frame consisting of main categories and subcategories, 3. dividing material into units of coding, 4. trying out the coding frame through double-coding, followed by a discussion of units that were coded differently, 5.assessing the coding frame in terms of the consistency of coding and in terms of validity and revising it accordingly, 6. coding all material, using the revised version of the coding frame, 7.interpreting and presenting findings (Neuendorf, 2002). Qualitative analysis was carried out with MaxQDA 2020.

Results

Social Network Analysis

Density is a general indicator that shows how extensively or not people are connected in a network. This indicates how intensive the respective activity is and whether all the margins for the development of this activity within the network have been exhausted. In figure 1, the network of social attractiveness is the densest among the six illustrated networks (48,54%), while the network of verbal aggressiveness in figure 2 is the sparsest one (2,04%). This shows that negative relationships despite existing among university students, they are outnumbered by positive ones, with university being a place of socialization. In figure 3, scientific attractiveness network (17,25%) and in figure 4, social power network represented by the concept of the academic mentor (17,25%) are equally dense among the networks. This shows

equivalent potency of this particular aspect of interpersonal attractiveness and the social power that an academic mentor may accumulate. In figure 5, physical attractiveness network (15,49%) is the sparsest among the three networks of interpersonal attractiveness, with social attractiveness and scientific attractiveness appearing more eminent than physical attractiveness among sports university students. This can be attributed to the fact that sports students, due to the nature of their studies and long years of sports practice, they have achieved attractive appearance (i.e. they are rarely overweight) and do not consider appearance as important as other aspects of attractiveness like social and scientific attractiveness.

Another important metric is centrality. Centrality is at the heart of social network analysis and refers to the fact that in most networks some nodes or edges are more central than others. In-degree could be interpreted as the influence one accepts only from the nodes, they have direct contact with. In-degree centrality in a network of attractiveness/ power / verbal aggressiveness calculates the degree to which other people in the network perceive this person as a target for attractiveness, power (mentor) or verbal aggressiveness through direct contact. Katz status does not create a superficial relationship, but a deeper, chained hierarchy. It presents the cumulative position of each node, i.e. how many and how large "chains" of relationships lead to each node. At the same time, it maintains the degree characteristics. Katz centrality in a network of attractiveness/ power/ verbal aggressiveness calculates the degree to which other people in the network perceive this person as a target for attractiveness, power (mentor) or verbal aggressiveness not only by direct connection but by means of power extension chains. In the networks presented, we see that top nodes of social power (academic mentorship) are at the same time top nodes in the networks of scientific and social attractiveness. This indicates a correlation between scientific acceptability and the property of academic mentors who exert internal control power since others trust them. It seems that being scientifically attractive makes someone socially attractive as well. Another important issue that arises is that top nodes in terms of attractiveness and social power (mentors) are bottom nodes in verbal aggressiveness networks. This shows that scientific and mentoring profile acts a protective shield against becoming targets for verbal aggressiveness. Also, nodes at the top of scientific, social attractiveness and social power are not

considered weak argumentatively during a discussion, as they appear at the bottom of the network. In addition, nodes at the top of verbal aggressiveness network are at the same time at the top of argumentativeness social network (weakness in discussion) indicating that lack of argumentativeness, which helps someone support themselves may lead to becoming a target for verbal aggressiveness. Finally, bottom nodes in the networks of physical attractiveness also appear at the bottom of social attractiveness, suggesting possibly that physically unattractive individuals may be unpopular socially in the university environment of the sports department.

Basic form of network	Hierarchy of Katz status	Hierarchy of pagerank	Hierarchy of authority
Relation: Social attractiveness (friendly with you) density: 48,54%			
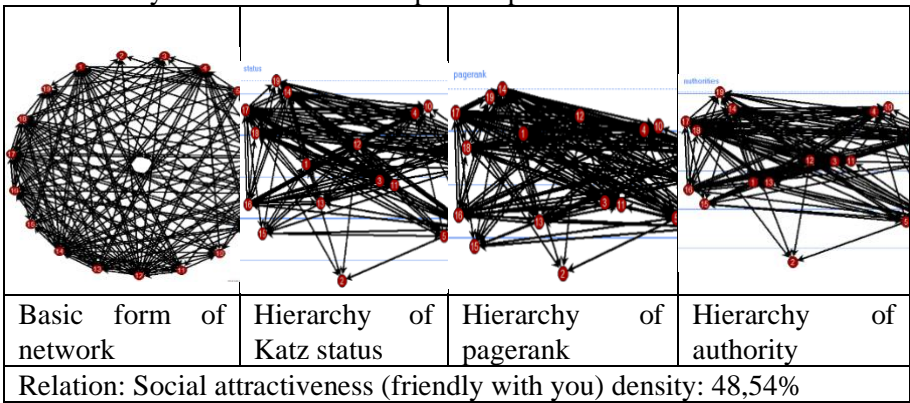
Figure 1. Network of social attractiveness

Basic form of network	Hierarchy of Katz status	Hierarchy of pagerank	Hierarchy of authority
Relation: Verbal aggressiveness (hurt) density: 2,04%			
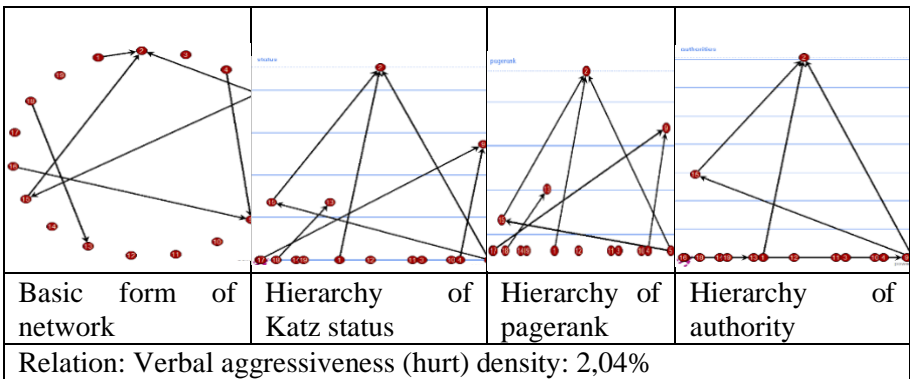
Figure 2. Network of verbal aggressiveness

Basic form of network	Hierarchy of Katz status	Hierarchy of pagerank	Hierarchy of authority
Relation: Scientific attractiveness (help with homework) density: 17,25%			
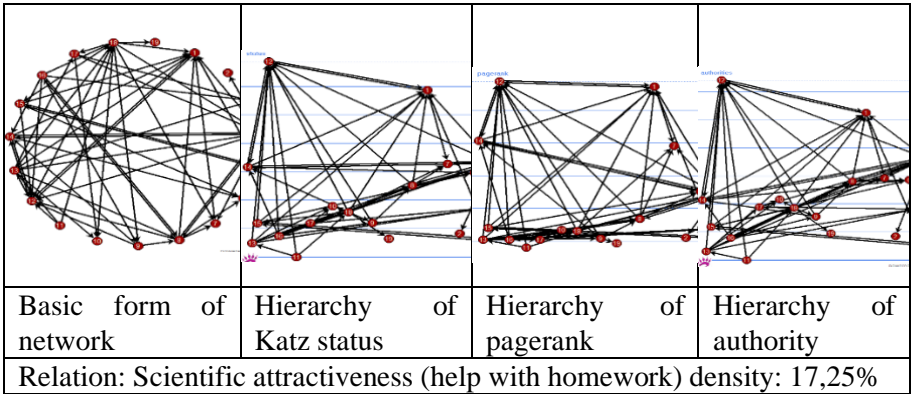
Figure 3. Network of scientific attractiveness

Basic form of network	Hierarchy of Katz status	Hierarchy of pagerank	Hierarchy of authority
Relation: Social power (academic mentor) density: 17,25%			
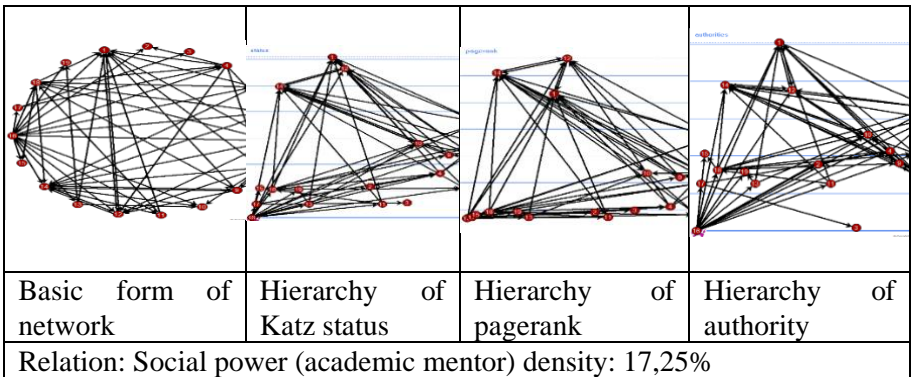
Figure 4. Network of Social power

Basic form of network	Hierarchy of Katz status	Hierarchy of pagerank	Hierarchy of authority
Relation: Physical attractiveness (attractive to you) density: 15,49%			
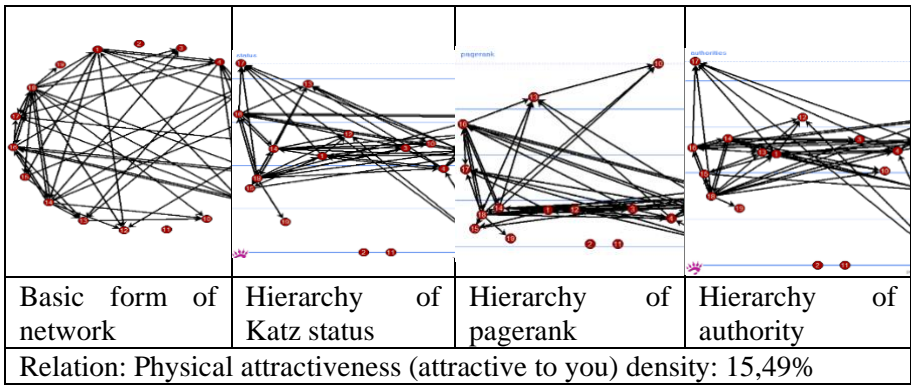
Figure 5. Network of physical attractiveness

Basic form of network	Hierarchy of Katz status	Hierarchy of pagerank	Hierarchy of authority
Relation: Argumentativeness (weakness in discussion) density: 11,69%			
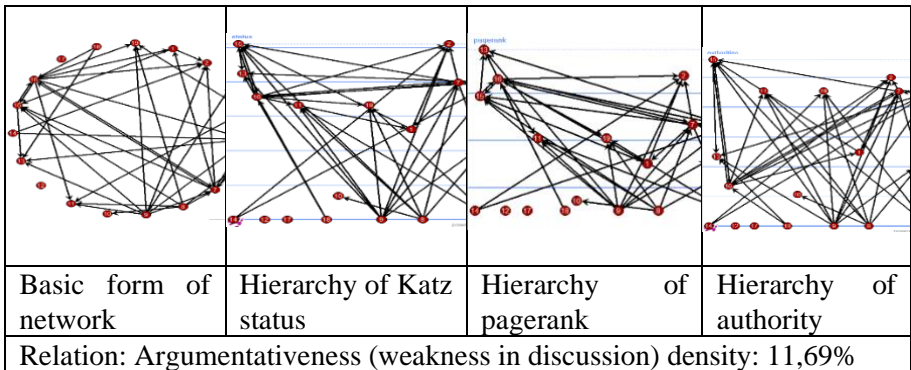
Figure 6. Network of Argumentativeness

Statistical Analysis

In table 1, female are chosen more often as academic mentors (.309) than male and are considered more scientifically attractive (.307, .516) in comparison to male. They seem to be socially attractive (.335) and during a discussion they are characterised as disputers (.244). However, they become targets of verbal aggressiveness receiving hurting (.264) and rude (.259) comments. Body characteristics such as height and weight are negatively related to social power and attractiveness. More specifically, height is negatively related to academic

mentoring (-.512) and scientific attractiveness (-.447, -.604). The same applies to weight which is negatively related to academic mentoring (-.488) and to scientific attractiveness (-. 389, -.612). The general grade enhances acceptability (.393). On the other side, absence from university courses is negatively related to academic mentoring (-.553) and scientific attractiveness (-. 385). Similar negative correlation is evident between travelling abroad and mentoring (-.460) and travelling abroad and scientific attractiveness (-.557). Surfing the net for long hours is negatively related to academic mentoring (-.460), and to verbal aggressiveness (-.392, -446). Tendency to distinct is negatively related to argumentativeness (-.423) and social attractiveness (-.511). Finally, being inspired by others in terms of appearance is negatively related to scientific attractiveness (-.429).

Table 1.

Relation among network determinants of being a target of attractiveness, verbal aggressiveness, argumentativeness and power among university students of physical education and non-network determinants (sum= indegree + Katz status +Pagerank +Authority)

	Argumentativeness			Social Power	Verbal Aggressiveness		Attractiveness		
							Task		Social
	disagreement	*agreement*	*weakness in discussion*	*advice - lessons*	*hurting*	*rudeness*	*help homework*	*help homework others*	*friendly with others*
gender	**,244***	0,097	0,178	**,309***	,264*	**,259***	**,307***	**,516***	**,335****
	0,047	0,433	0,178	0,011	0,031	0,034	0,012	0	0,006
height	-0,089	0,046	-0,009	**-,512****	-0,035	-0,012	**-,447****	**-,604****	-0,171
	0,617	0,796	0,958	0,002	0,845	0,946	0,008	0	0,335
weight	-0,105	0,123	-0,053	**-,488****	-0,014	0,03	**-,389***	**-,612****	-0,296
	0,553	0,488	0,767	0,003	0,937	0,868	0,023	0	0,09
general grade	0,095	**,393***	0,089	0,176	0,164	0,206	0,358	0,151	0,255
	0,624	0,035	0,647	0,361	0,395	0,284	0,057	**-,385***	0,182
absence from university	-0,048	0,065	-0,195	**-,553****	-0,088	-0,085	-0,182	0,027	-0,0276
	0,791	0,721	0,277	0,001	0,625	0,639	0,311	-0,0386	0,119
travelling abroad	-0,18	-0,035	0,039	**-,460***	-0,194	-0,184	**-,557****	0,076	-0,175
	0,422	0,876	0,863	0,031	0,387	0,411	0,007	-0,134	-0,36
surf the net hours	-0,163	-0,175	-0,309	**-,460***	**-,392***	**-,446***	-0,263	0,479	0,051
	0,39	0,354	0,096	0,01	0,032	0,013	0,16	0,09	-0,096
professional distinction	0,073	0,134	**-,358***	0,128	0,028	0,028	0,23	0,612	0,589
	0,683	0,45	0,037	0,469	0,874	0,874	0,191	-0,076	**-,392***
scientific distinction	-0,121	-0,103	-0,106	0,083	0,026	0,085	-0,051	0,679	0,026
	0,508	0,574	0,564	0,651	0,889	0,643	0,781	-0,063	**-,511****
distinction in other fields	-0,078	**-,423***	**-,493****	-0,076	-0,257	-0,309	-0,117	-0,063	0,005
	0,687	0,022	0,007	0,694	0,178	0,103	0,546	0,745	-0,323
be inspired (appearance)	**-,399***	-0,06	0,01	-0,26	-0,127	-0,124	**-,429***	-0,216	-0,323
	0,021	0,74	0,955	0,145	0,483	0,491	0,013	0,227	0,067

In table 2, female seem to be prone to agreement (.2.86) and to weakness

during a discussion (.394) in comparison to male physical education university students. They show tendency to be interpersonally attracted by others physically (.284), socially (.283) and scientifically (.316). However, it seems that they resort to verbal aggressiveness more often than male students using irony (.251), rudeness (.249) and comments that hurt (.336). Physical characteristics are negatively related to argumentativeness. Tall students could be characterized as disputers, without proneness to agreement (-.437) or weakness during a discussion (-.354). Family financial status may be related to social power initiating sympathy (.423). Surfing the net for study purposes seems to protect from practicing verbal aggressiveness like hurting others (.-.496), being ironic (-.431) and threatening (-.449), but does not foster scientific attractiveness either (-.369). It seems that university students who use the net for study purposes do not show tendency to be attracted by other students scientifically, preferring to work on their own rather than collaborating. Finally, university students that realise their appearance as attractive seem to be attracted socially by those students who are objectively considered friendly (.415) by the majority of physical education student community.

Table 2.
Relation among network determinants of being an actor of attractiveness, verbal aggressiveness, social power and argumentativeness and non-network determinants among physical education university students (outdegree).

	Argumentativeness			Verbal Aggressiveness				Task/scientific		Social		Physical
												Attractiveness
	agreement	weakness	sympathy	hurt	irony	rudeness	threat	help h/w	help h/w others	friendly to you	friendly _others	attractive
Gender	**,286***	**,394****	0,153	**,336***	**,251***	**,249***	0,115	0,206	**,316****	**,283***	0,219	**,284***
	0,019	0,001	0,217	0,005	0,041	0,042	0,356	0,094	0,009	0,02	0,075	0,02
Height	**-,437****	**-,354***	-0,066	-0,203	-0,193	-0,217	0,117	-0,155	-0,142	-0,02	-0,088	-0,217
	0,01	0,04	0,709	0,25	0,273	-0,217	0,511	0,38	0,424	-0,244	0,62	0,217
Weight	**-3,48***	-0,323	-0,045	-0,28	-0,263	-0,219	-0,079	-0,134	-0,158	0,164	-0,102	-0,164
	0,043	0,063	0,799	0,108	0,133	0,213	0,657	0,451	0,371	-0,161	0,567	0,355
financial status family	0,301	0,225	**,423***	0,118	0,05	-0,034	0,197	0,133	0,205	0,363	0,232	-0,015
	0,094	0,216	0,016	0,52	0,787	0,855	0,279	0,467	0,26	0,346	0,201	0,936
surf the net studies	0,065	-0,3	-0,273	**-,496****	**-,431***	-0,276	**-,449****	**-,352***	**-,362***	0,052	-0,069	-0,081
	0,716	0,085	0,119	0,003	0,011	0,114	0,008	0,041	0,035	0,054	0,069	0,65
inspire appearance	0,058	0,021	0,223	0,255	0,206	0,271	0,106	0,083	0,01	0,763	**,415***	0,047
	0,746	0,906	0,204	0,146	0,243	0,12	0,552	0,643	0,955	0,361	0,015	0,792

Qualitative Analysis

In table 3, a summary of the main points of the interviews with the top nodes of social power (indegree) is presented. Qualitative analysis of interviews with top nodes of social power (in degree) who appear at the top of scientific and social attractiveness and at the bottom of verbal aggressiveness reveals specific aspects regarding attractiveness and aggressiveness. First of all, they feel attracted scientifically by collaborative fellow students who are "team players" or socially attractive fellow students who do not resort to verbal aggressiveness.

"They are people, first of all, that I know a little more, that is, not only from university, we also have a relationship outside university. They are

people who support the team, cooperative. If in a sport, for example, I have a hard time, football or something similar that I do not know of, they will help me. If I make a mistake, they will not scold me, they will tell me that it is ok and they will show me the right way. We fit in as characters, so I can get along better with them on any issue." (Interviewee_T_I_3)

They also feel attracted by extroverted, sociable, pleasant fellow students who are ethical and honest or receptive to advice.

"At first glance, I believe that appearace matters, if they are smiling, if they are open with others. Now, when you enter a company, their behaviour plays a role, if they are honest, if they are moral in general, if they are calm, there are many things. It matters if a person is pleasant and sociable because you do not know them well. Someone who is introvetred, at first, they will seem strange. Then this may not be the case, okay, but at the beginning…" (Interviewee_T_I_1)

They will not resort to verbal aggressiveness unless they feel aggrieved or in case they know others well.

"-Did you make negative comments to your fellow students?"
"-Yes."
"-Are you used to doing this or does it happen in specific cases?"
"-In specific cases"
"-That is?"
"-That is, something must bother me, such as if someone lies to me or makes fun of me."
"-That is, you will make comments after you have been bothered. Is that what you want to tell me?"
"-Yes, or in general let's say, maybe to one of my fellow students who is one of my friends, I will say my opinion and they will have a negative comment from me. But I have to know the other, if I do not to know them at all, I won't say something negative. If I have a negative opinion, I will not tell it to them, I will not say my opinion even if it can be negative." (Interviewee_T_I_1)

Instead, they think highly of argumentativeness, regarding it as the main way to manage conflicts with fellow students. They do not feel oversensitive to contemptuous behaviour and tolerate others' weaknesses.

"I would try to integrate them even more in the game, because knowing that they are weak, maybe they are stressed and maybe try to stay on the

sidelines, and because I have suffered as a person in the past, I think I would integrate them more and I would make them feel comfortable and part of the team" (Interviewee_T_I_3)

Finally, they feel that one can get power if they affect others by persuading them, which is also considered a leadership characteristic.

"In general, I believe that in some way they will be able to influence the decisions of their company, not necessarily to do it intentionally, because they want to decide by themselves, instead they have arguments. Because if you know in the company that someone has a certain opinion and you agree with them, these people shape the decisions indirectly. It's not that others are afraid of them but they listen to them. They definitely appreciate them. Because you know that the one who has these characteristics is strong. He has some principles as a human being and this generally affects others." (Interviewee_T_I_1)

These students finally admitted that they never felt targets of verbal aggressiveness at university and conflicts were rare. This is impressed in the social network analysis as well, as nodes at the top of scientific and social attractiveness, seem to be protected from verbal aggressiveness, appearing at the bottom of verbal aggressiveness networks. Also, they stress the importance of power as internalized control by making others trust you.

Table 3.

Summary table of interviews with top nodes of social power and scientific attractiveness

Interviewee	Characteristics of social power
T_I_1	Affect decisions, persuading others because others estimate them
T_I_2	very good at lessons, active in academic life
T_I_3	arguments, showing off, use of body power
T_I_4	leadership by persuading others
Interviewee	**Causes of verbal aggressiveness**
T_I_1	Family and all the environments you live and act in
T_I_2	Character weakness
T_I_3	Insecure, feel superior to others
T_I_4	family environment_social learning
Interviewee	**Characteristics of verbal aggressiveness**
T_I_1	shouts and talks loudly at everything
T_I_2	hurting, offending others with their words
T_I_3	hurting others with words, offending for appearance and skills
Interviewee	**Use of verbal aggressiveness**
T_I_1	only in case they feel aggrieved or when they know someone well
T_I_2	only in case they were offended
T_I_3	only when they are blamed for something they were not responsible
Interviewee	**Reaction to contempting behaviour**
T_I_1	show contempt for them too
T_I_2	show patience
T_I_3	discuss with them to see the reasons behind their behaviour
T_I_4	show contempt for them too
Interviewee	**Tolerating others' weaknesses**
T_I_1	helping others
T_I_2	helping weak students, only in case of a final, probably ask them to leave the game
T_I_3	integrate weak students, make them part of the team
T_I_4	instruct them
Interviewee	**Conflict management**
T_I_1	use arguments to solve the issue
T_I_2	use of verbal aggressiveness in case of physical harm
T_I_3	use of arguments to persuade the disputer
T_I_4	discuss to find a solution
Interviewee	**Characteristics of attractive people**
T_I_1	nice appearance, smiling, sociable, ethical, honest, calm, pleasant
T_I_2	extroverted, sociable, physically attractive, "the bad guy", toxic
T_I_3	common interests, humorous, extroverted, collaborative
T_I_4	friendly, receptive to advice, good friend
Interviewee	**Scientific attractiveness**
T_I_1	Collaborative, not arrogant, good listener, not nagging
T_I_2	team player
T_I_3	familiarity, team player, collaborative, helpful, friendly
T_I_4	collaborative, not aggressive

In table 4, a summary of the main points of the interviews with top nodes of aggressiveness (outdegree), that is actors of verbal aggressiveness is presented. Verbally aggressive students do not easily admit being aggressive. In our case, only one of the two interviewees asserts turning to verbal aggressiveness frequently in order to protect themselves from others who are aggressive towards them.

"It happens…it happens frequently when I feel I need to protect myself. You know when others attack, you need to protect yourself. It's not that I suddenly become aggressive without a reason. Someone has been aggressive and I need to support myself. I may be aggressive too and say something. I don't harm. I never harm, but I may something to hurt them." (Interviewee T_O_2).

Verbal aggressiveness is attributed to lack of self-confidence or treated as an idiosyncratic characteristic:

"It's part of their character. It is the way they are. They are that way and behave aggressively."

They seem to tolerate others' weaknesses. These top nodes of verbal aggressiveness, in the social network analysis, do not seem to have a tendency to be attracted by others scientifically or socially. However, in the qualitative analysis of interviews they seem to appreciate kind, knowledgeable and skillful fellow students.

"How does one student attract others?"

"Generally with their good way or kindness. Also, by being able to talk, to say a good word. All this I think is important, but also the skills they have." (Interviewee T_O_1)

Also, regarding their concept of social power, it is represented by leaders at sport or those who like to show off:

"In the game, they will definitely show it [their power] by being good players, in general they could also show it by being leaders who show their power through leadership and others listen to them." (Interviewee T_O_1)

"by showing off to others" (Interviewee T_O_2)

This concept of social power connected to leadership only, is connected to external control power expressed as dependence upon others. We assume that verbally aggressive students would like to be followed by others who do not dispute them. This is evident by the fact that these students did not make any

reference to argumentativeness.

Table 4.

Summary table of interviews with top nodes of top nodes of aggressiveness

(outdegree)

Interviewee	Characteristics of social power
T_O_1	Leader at sport
T_O_2	Showing off
Interviewee	Characteristics of attractiveness
T_O_1	Good friends
T_O_2	Kindness
Interviewee	Scientific attractiveness
T_O_1	Skills, ablilities
T_O_2	Good collaboration
Interviewee	Causes of verbal aggressiveness
T_O_1	lack of self-confidence
T_O_2	idiosyncracy
Interviewee	Characteristics of verbal aggressiveness
T_O_1	Hurting others
T_O_2	Shouting
Interviewee	Use of verbal aggressiveness
T_O_1	They don't remember using verbal aggressiveness
T_O_2	Frequent use when others are aggressive
Interviewee	Tolerance to weakness of others
T_O_1	Instruct them
T_O_2	Help them, not isolate them

Interviews with the "withdrawn" nodes who are at the bottom of all outdegree networks of attractiveness and aggressiveness are enlightening. Table 5 summarises the main points of these interviews and sheds light on the possible reasons why these nodes may be considered withdrawn. Firstly, they do not make use of verbal aggressiveness or use non-verbal aggressiveness:

"When I met my friend at the department, because I started university in November and not in September, she told me after a long time that at the beginning when I first met her, I had looked at her as if she had been my enemy and we laughed. Yes…I know, sometimes I use expressions" (Interviewee, W_O_1)

They never react if they receive verbal aggressiveness:

"I do not play volleyball; I have stopped it for a year. Okay ... I know what a player I was, I know what I could do... she [the aggressor] did not know what she did. Again, I did not show her my anger. I only get angry inside." (Interviewee W_O_2).

In case of conflict, they avoid arguing:

"Just this… if I saw a conflict, I would avoid it." (Interviewee W_O_1)

In case they confront contemptuous behaviour, they react indifferently without showing their annoyance:

"I won't show my annoyance…No, I will be indifferent to them…" (Interviewee W_O_2)

Interviews with the withdrawn nodes reveal that their tolerance to aggressive and contemptuous behaviour and the fact that they will not react openly when they are treated aggressively, makes them invisible in their network. However, these withdrawn nodes, who do not easily show their irritation in case they receive verbal aggressiveness, and avoid conflicts, seem to have felt afflicted by verbal aggressiveness and believe that power is connected to "playing hard and showing off" (Interviewee W_O_2). We could say that these nodes are left at the margin of their network because they stay passive in front of conflicts and aggressiveness.

Table 5.

Summary table of interviews with "withdrawn" nodes (outdegree)

Interviewee	Characteristics of social power
W_O_1	Showing off
W_O_2	Playing hard and showing off
Interviewee	Characteristics of attractiveness
W_O_1	Personality, respect
W_O_2	Kindness
Interviewee	Scientific attractiveness
W_O_1	Recognised copmetence
W_O_2	Collaborative
Interviewee	Causes of verbal aggressiveness
W_O_1	Want to feel superior
W_O_2	Lack of argumentativeness
Interviewee	Characteristics of verbal aggressiveness
W_O_1	
W_O_2	Irritable, impulsive, rude
Interviewee	Use of verbal aggressiveness
W_O_1	Use of non-verbal aggressiveness
W_O_2	No use of verbal aggressiveness
Interviewee	Reaction to contemptuous behaviour
W_O_1	Not react to the aggressor
W_O_2	Not react
Interviewee	Conflict management
W_O_1	Use of arguments, discussion
W_O_2	Avoid argument

Discussion and Conclusions

The aim of the present study has been to detect and analyse the relationship among three relationships treated holistically as social network variables: attractiveness, social power and aggressiveness. Comparing the results of social network analysis along with qualitative analysis of interviews and the statistical analysis of network and non-network variables we come to the following conclusions.

At first, scientific attractiveness and social power are interrelated. Scientifically attractive students who are collaborative, characterized by team spirit and helpful, gain others' trust in academic issues and become mentors.

This is evident in social network analysis, as networks of social power and scientific attractiveness are equally dense and the top nodes of scientific attractiveness appear at the top of social power network as well. Interviews with these nodes revealed that power is conceived as active academic life along with the ability to persuade those that appreciate you. It seems that these nodes feel recognized as mentors and realise that they affect others around them. This dual identity of the scientifically attractive mentor that others trust them seems to protect from verbal aggressiveness. Similar results were suggested by Singh et al. (2007) who found that trusting someone leads to greater interpersonal attractiveness and by Losch & Rentzsch (2018) who support that collaboration is enhanced by scientific attractiveness.

Social network analysis revealed that scientifically attractive nodes are at the bottom of verbal aggressiveness hierarchy, suggesting that they do not become targets for verbal aggressiveness. In the interviews, these specific nodes stated that they have not received verbal aggressiveness at university. Gerlinger and Wo (2015) found that good academic performance translated through high grades mitigates verbal aggressiveness victimization or perpetration. Similar results were proposed by Litsa et al. (2021) in the analysis of secondary education social networks. Atkin et al. (2002) also suggested that those with lower grades in school verbally aggress at a higher rate than those with higher marks, understanding the possible relationship between verbal aggressiveness and academic performance. Krause et al. (2014) points out that aiming at future distinction academically or professionally is related to gaining others' trust and reinforces scientific attractiveness. Morrow et al., (2014) discovered that verbal aggressiveness victimization did not have a significant relationship with academic achievement whereas, in a study by Litsa et al. (2021) the desire to be distinguished as professionals reinforces the Physical Education students' role as targets regarding verbal aggressiveness strategies and targets for Machiavellian tactics (Spanou & Bekiari, 2021).

In addition, lack of argumentativeness may turn someone into a target for verbal aggressiveness. This relationship is shaped in the hierarchies of weakness during a discussion and verbal aggressiveness that share common nodes. Interestingly, nodes that accumulate scientific attractiveness, social power and are protected from verbal aggressiveness, consider

argumentativeness very important in order to persuade disputers and solve issues in case of a conflict as revealed through the interviews. It seems that argumentativeness acts supplementarily protecting from verbal aggressiveness. Kendrick et al. (2012) state that social-emotional abilities such as conflict resolution, assertiveness, and problem-solving may equip students to deter verbal aggressiveness. Syrmpas & Bekiari (2015) pointed that argumentativeness has positive relationship with interpersonal attractiveness and negative with verbal aggressiveness for PE students and according to Lybarger et al. (2017) and Cole & McCroskey (2003) argumentativeness is related to reliability. Argumentative deficiency has been indicated as a factor leading to verbal aggressiveness in social network analysis studies (Bekiari et al., 2017; Vasilou et al., 2020). Interviews with the "withdrawn" nodes reveals that being passive to aggressiveness or conflicts without reacting aggressively or argumentatively may leave a student at the margin of their network.

On the other hand, nodes practicing verbal aggressiveness, do not appear in the hierarchies of interpersonal attractiveness in social network analysis. This can be easily explained as there is negative association between popularity and aggressiveness (Yavuver & Karatas, 2019). These nodes, during interviews do not admit being verbally aggressive or they justify themselves for being aggressive, accusing others of provoking them. They seem to make use of reactive aggression, produced as defensive response to aggressiveness (Chaux, 2003). Hasanagas & Bekiari (2015); Bekiari & Hasanagas (2016); Bekiari & Spyropoulou (2016) have suggested that verbal aggressiveness is negatively related to attractiveness, deterring the development of interpersonal relationships. Litsa et al. (2021) have also provided supportive results.

Interesting enough is the fact that although in the social network analysis, these nodes do not seem to be attracted interpersonally by others, during interviews they state that they are attracted by kind fellow students. Students who feel attracted by their classmates and show respectfulness for academic or personal advice, may practice verbal aggressiveness without being excluded, (Litsa & Bekiari, 2022). It seems that verbal aggressiveness is superficial and not indiosyncratic (Bekiari & Hasanagas, 2016; Theocharis & Bekiari, 2017; Theocharis, et al., 2017).

Another interesting point of these interviews is the different concept of social power that verbally aggressive students have in comparison to the interpersonally attractive nodes. It is a totally different perspective that presents social power as showing off on behalf of fellow students and is not based on trust and persuasion. Students practicing verbal aggressiveness realise relationships asymmetrically, where someone may be the powerful that are imposed and not as a network where information and advice are disseminated.

In addition, physical attractiveness does not seem to relate to social attractiveness and scientific attractiveness in our social network analysis. Like in other studies physical characteristics like weight and height may turn someone into a target for verbal aggressiveness (Bekiari and Pachi 2017; Savoleinen et al., 2020). However, interviews revealed that students, attractive or not, aggressive or not, do not consider physical attractiveness important. This can be explained by the nature of the department, as it is a physical education and sports department, where the majority of students are more or less physically attractive.

Finally, female students despite being chosen as mentors more frequently than male, they become targets for verbal aggressiveness more often than male students. In a study by Litsa, et al. (2021) female high school students are opted as academic mentors but accept threatening comments more often than male students. However, Bradshaw et al. (2013) reported male middle school students accepting threatening comments more usually than female and similar results were delivered by Donoghue & Raia-Hawrylak (2015).

To sum up, following mixed methods in the study of attractiveness, social power and aggressiveness gave us an overview of the way these relationships are developed between university PE students. Firstly, we have been able to identify the position of nodes within hierarchies. Thus, we can talk about the scientifically attractive mentors who share top position both in scientific attractiveness and social power (academic advice), but appear at the bottom of verbal aggressiveness hierarchies, protecting themselves from receiving aggressiveness. We spot the verbally aggressive node that appears at the bottom of argumentativeness and attractiveness hierarchies and the "withdrawn" node that is left at the margin of their network, neither aggressive nor attracted by anyone, but argumentatively passive. Secondly, we

ascertained that scientific attractiveness, social power hierarchies go hand in hand. The same applies to aggressiveness and argumentativeness (weakness in discussion) hierarchies. Quantitative analysis allowed us to identify gender and general grade as determinants of the node's position in the hierarchies of attractiveness and aggressiveness. Finally, the qualitative analysis of interviews clarified the opinions and motives of the top and bottom nodes in the relationships – hierarchies examined, sheding light on the reasons why particular nodes appear at specific positions in the hierarchies. For example, interviews allowed us to see that passivity during conflicts and lack of arguments assigns a node to a "withdrawn" position within their network.

In conclusion, scientific and task attractiveness can reflect the university's values and culture, based on principles that adhere to scientific development and collaboration for students and may be incorporated in the guidelines reflecting university values and culture, aiming at student overall training. Integrating verbal aggressiveness avoidance in university policy will determine a safe learning environment, facilitating learning and academic progress. The three distinct types of students (attractive, aggressive, withdrawn) can be met in any other field of life, like a group of friends or colleagues. Social relationships saturate every life domain and realizing the effects these types of people can induce, facilitates effective handling of social encounters. Finally, in physical education, knowing the "star" students both in attractiveness and aggressiveness may enhance the management of teams. Thus, trainers can handle the position of the team players more effectively, making adjustments in the synthesis of teams which can improve team performance.

Applying network analysis discloses the structural nature of interpersonal attractiveness and verbal aggressiveness in the academic community, provides insights in these phenomena from a social point of view. Certain limitations which can constitute challenges for future research are the following: the expansion of the sample to more academic departments and fields so as to find out comparatively similarities or differences deriving from socio-epistemological determinants, formulating a typology of such or further social determinants, dynamic (diachronic) network analysis on the same classes (e.g. considering the beginning, the middle and the end of a semester or a year) which could also reveal the relevance or not of the familiarity

acquired through the time. etc. Finally, the combination of social network analysis with qualitative research, especially in larger samples of any future research, is the key to a meticulous approach attempting to provide insights in such social phenomena.

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Maria Litsa (corresponding author) is a PhD candidate at University of Thessaly, Greece

Contact Address: maria.litsa@hotmail.gr