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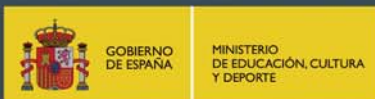


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Disagreements in working as a team: A case study of gifted' science students

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### Abstract

The purpose of this study is to explore social relationships, especially disagreements, among five gifted science students during their group work in an enrichment summer program. The data consist of five hours of videotaped and transcribed teamwork sessions. The level of disagreement was analyzed deductively utilizing Netz's (2014b) taxonomy and themes of disagreements inductively. The results showed that gifted science students' disagreements were mainly task-oriented, and students expressed contradictions by utilizing an explicitly aggravated style. The study also revealed that gifted science students' disagreements can escalate into non-constructive conflicts. The results highlight the need for professional and ethically sensitive teachers to support gifted students' intellectual and moral growth through teamwork.

**Keywords:** Disagreement, gifted education, gifted science student, group work, team

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### Resumen

El propósito de este estudio es explorar las relaciones sociales, especialmente los desacuerdos, entre cinco estudiantes de ciencias con altas capacidades durante su trabajo en equipo en un programa de enriquecimiento durante el verano. Los datos consisten en cinco horas de sesiones de trabajo grabadas y transcritas. El nivel de desacuerdo fue analizado deductivamente utilizando la taxonomía de Netz (2014b), y los temas de desacuerdo, de forma inductiva. Los resultados evidencian que los desacuerdos en el caso de los estudiantes de ciencias de altas capacidades estaban fundamentalmente orientados hacia la tarea, y que los estudiantes expresaban sus discrepancias con un estilo explícitamente agravado. El estudio también revela que los desacuerdos entre estudiantes de ciencias con altas capacidades pueden incrementar su escala hasta convertirse en conflictos no constructivos. Los resultados subrayan la necesidad de docentes sensibles profesional y éticamente que puedan apoyar el crecimiento intelectual y moral de los estudiantes superdotados mediante el trabajo en equipo.

*Palabras clave:* Desacuerdo, educación de alumnos con altas capacidades, estudiantes de ciencias con altas capacidades, trabajo en equipo, equipo.

### Introduction

The purpose of this study is to explore the social relationships among a team of five gifted science students during their group work in an enrichment summer program in Finland during the summer of 2012. The special focus in this paper is on the disagreements between peers during a period of one week when the students worked as a team to finish their course project. We know from earlier research that, in addition to academic needs, gifted students also have a unique set of social needs. They need support from their families, teachers, and peers to realize their full potential (Tannenbaum, 1983). They also want to engage in challenging and meaningful learning experiences (Author, 2013).

Gifted students in mathematics and science have emphasized the importance of a community of learners for their needs. Important parts of this community are like-minded friends with similar learning interests (Author, 2012; Author, 2014). We also know that gifted students in mathematics and science are bullied in public schools, both in the United States and in Finland. Those students who have been trained to take part

in the international Olympics in science and mathematics have reported negative school experiences, with one-third of them reporting being bullied (Campbell, 1996; Author, 2001; Author, 2012). Gifted Finnish students have also reported the lack of challenge and the emphasis on equality in the Finnish system as hindrances to learning during their school years. They have found social contacts and challenges among the other Olympians who shared their interests in mathematics and science (Author, 2001; Author, 2012). These earlier findings call for special programs and enrichment opportunities in which gifted science students can interact and learn with like-minded peers. We also have research evidence to show that group membership has an effect on a student's educational outcomes. If the group devalues academic effort and achievement, it is possible that the gifted student will also devalue these things (Bliuc, Ellis, Goodyear and Hendres, 2011). Furthermore, a supportive learning community helps the gifted student reach a higher level of independent learning, which can be associated with academic success and satisfaction (Bliuc et al., 2011; Pike, Schroeder and Berry, 1997; Zhao and Kuh, 2004).

Thus, it is very important to pay attention to the learning environment and to the peers with whom gifted students are studying. According to previous studies on the ideal learning environment for the gifted, a holistic learning setting (Author, 2011; Author, 2012) that acknowledges the social and emotional needs of the gifted student is recommended (Author, 2013). Gifted students tend to prefer homogeneous groups over heterogeneous ones, mainly for academic reasons (Adams-Byers, Whitsell and Moon, 2004). Gifted students also value an emphatic and encouraging teacher who creates a friendly and social atmosphere for learning (Author, 2008). The students identify themselves as being different academically, but not socially (Cross and Coleman, 1993), which cautions us to pay a special attention to the social aspects of studying.

Teamwork in groups with like-minded peers is one possible way to meet the academic and social expectations of gifted students and provide them with meaningful learning experiences. Furthermore, it has been argued that the biggest challenge for the future in gifted education is to invest in social capital and development of executive function skills together with the traditionally emphasized intellectual and creative capitals (Renzulli, 2012). However, according to Netz (2014a), previous research on gifted education has not explored the social interactions and

verbal interactions of gifted students. Instead, investigations have focused more on reception skills (reading, listening) rather than on production skills (writing, speaking) (Pau-San, 2005). In this study, we try to fill this research lacuna on social interaction among gifted students. We continue and make use of Netz's pioneering work (2014ab) by studying gifted students' social interaction, especially their disagreements during teamwork sessions, which were videotaped and analyzed. Our main goal is to demonstrate the nature of the disagreements among gifted peers and the negotiations between them to reach solutions to achieve a mutual learning goal.

### **Gifted students' disagreements**

Disagreements can be defined as oppositional comments to something previously said or done (Kakawa, 2002). Disagreeing is not understood as inherently negative or positive (Angouri, 2012). However, it has been pointed out that cultural and contextual norms influence how disagreements are interpreted. For example, in Western and Asian cultures disagreeing has negative connotations (e.g., Kakawa, 2002). By contrast, in many cultures such as those in southern Europe (e.g., Greece), South America, the Middle East (e.g., Israel), disagreeing is a positive feature and even promotes intimacy and solidarity (Kakawa, 2002). From the point of view of developing critical thinking and creativity, disagreements are important and even crucial, since traditional and old ways of thinking and doing must be questioned in order to create something new (Angouri, 2012). Therefore, it has been argued that in gifted education, teachers should provide and promote disagreeing as a teaching and learning method (Nevo, 2004, as quoted in Netz, 2014b). It has also been found that gifted students are willing to debate, and they enjoy heated discussions (Netz, 2014b). Furthermore, Netz's results reveal that gifted students mainly disagree in an aggravated style, meaning that they are concise and they explicitly contradict and challenge the previous speakers. Gifted students utilized an aggravated style, both when disagreeing with their peers and with their teachers (Netz 2014b), which reflects the characteristics of gifted students, such as having a high level of curiosity and being strongly motivated, task oriented, perfectionist, and opinionated, as well as demonstrating superior language abilities (verbally

fluent, with a large vocabulary and complex grammar), but also showing emotional intensity and intellectual honesty (Davis et al., 2014, 33-34).

Disagreements can escalate into conflicts (Angouri, 2012). But Netz (2014b) observed that in the context of a classroom, escalations were prevented whenever gifted students relied on their teacher, who was seen as a moderator. Angouri (2012) divides conflicts into two categories: task-oriented conflict and personal attacks. In the latter, disagreements lose their constructive and beneficial purpose and can be described as unethical.

While noting healthy boundaries for disagreements, we argue that both students and teachers need moral sensitivity. According to Rest (1983), moral sensitivity refers to the interpretation of a situation to identify how one's actions will affect the welfare of others (see also Bebeau, Rest and Narvaez, 1999). Without moral sensitivity, it would be difficult to identify the kinds of moral issues involved in disagreements. However, to respond to a situation in a moral way, both students and teachers must be able to perceive and interpret events in a manner that leads to ethical action. A morally-sensitive person observes various situational cues and is able to visualize several alternative actions in response to that situation. He or she draws on many aspects, skills, techniques, and components of interpersonal sensitivity. These include taking the perspective of others (role taking), cultivating empathy for others, and interpreting a situation based on imagining what might happen and who might be affected. Moral sensitivity is closely related to a new type of intelligence that has recently been suggested, namely, social intelligence, which can be defined as the ability to get along well with others and get them to cooperate with you (Albrecht, 2006; Goleman, 2006). Ethical sensitivity has been shown to include components similar to those found in the so-called "hacker ethics" among gifted scientists (Himanen, 2001; Author, 2013). Both build on caring and communication with the idea of finding innovative solutions to ethical dilemmas in the community of ethically sensitive people.

### **Teamwork in the Millennium Youth Camp project**

The context of our study is a special enrichment summer course for gifted science students, the Millennium Youth Camp, known as MY CAMP, held in Finland in the summers of 2010 to 2014. Each year the number of

applicants has been approximately 1,000 or more. The top 30 applicants are chosen, based on their academic achievements and motivation (Vartiainen and Aksela, 2012; Author, 2014). The camp is organized by Finland's Science Education Centre LUMA in collaboration with the Technology Academy Finland (TAF), Aalto University, and Finnish industries (LUMA, 2014).

The international students are between 16 and 19 years of age and are divided into theme groups based on their interests. All of these groups follow the camp's general curriculum, work together on a group project, and participate in certain activities, which are both academic and social in nature. Academic activities include visiting universities and companies, attending the Millennium Prize Gala, participating in the Amazing Race of Science, and visiting a science center. The formal social activities consist of an international evening, a sauna night, a tour of Helsinki, evening entertainment, and welcome and farewell parties (for more details, see Tolppanen and Aksela, 2013). In addition to the formal program, campers have free time to interact with their teachers and with one another. They also work on a project assigned two months before the camp begins (Author, 2014, 8).

In the application phase, almost seventy percent of the students mention their social expectations for the summer enrichment camp. They want to meet new people, make new friends, and share ideas with like-minded peers from around the world (Author, 2014). In order to meet these social expectations, teamwork is emphasized in MY Camp projects as a pedagogical approach. The projects are usually carried out in teams of five or six students. With the help of this pedagogical approach, the students get to know each other well during the camp and learn how to carry out scientific work in teams. The teachers also give the students a great deal of freedom and responsibility in all their work. This approach forces them to rely on each other, building up the team and providing maximum opportunity for peer interaction. In addition to peer interactions, the students have opportunities to meet scientists in universities and companies, giving them the chance to see what scientists really do and allowing them to ask questions about scientific work (Author, 2014).

The five students in this study belonged to the ICT (Information and Communications Technology) group and worked together as a team to determine how ICT can improve literacy in developing countries in

cooperation with the children's development organization called Plan International and the mobile telephone company Nokia. Students worked on their project every day during the camp. They had the opportunity to begin working on their theme even before the camp got underway by means of a Moodle platform. However, the ICT group was not active on Moodle, so their work on the assignment essentially started from scratch on the opening day of camp (Author., 2013).

During the one-week camp, the campers worked on their projects two to four hours a day. At the end of the week, the participants presented their work at the Millennium Youth Camp Gala to an audience of experts from universities and ambassadors from the campers' home countries.

## Data and Methods

This article is a case study of a team of five international students who attended the Millennium Youth Camp in Finland in the summer of 2012. The students belonged to the Information and Technology theme group at the camp. Table I shows background information and the special interests of each student. The students represented five different nations: three came from Eastern European countries (Bulgaria, Lithuania, Romania), one came from southern Europe (Spain) and one from Asia (China). The students had participated and been successful in national and international competitions such as the Science Olympiads. Alex's, Mike's and Pablo's interests included programming and computer and mobile technologies. Justas's interests included languages as well, and Valeria, who was the only female member of the team, was accomplished in bioinformatics.

During the camp, the ICT group's teamwork sessions were videotaped and transcribed, yielding a total of 12.5 hours. For this study, we analyzed five hours (33,000 words) of group work time. This period covered sessions on the fourth day of camp and was chosen because on that day, for the first time, the ICT group worked without their mentors and also had to complete their poster presentation. On the previous days, the students had discussed the topic with their mentors and gotten to know each team member's interests, strengths and personalities (Author, 2013). Thus, the fourth day was the first time that the students worked together concretely and purposefully as a team: They chose and modified the



content, wrote and edited the texts, searched for and drew pictures and made the layout; in other words, the students prepared the poster which had to be ready by the end of the day in order to be printed for the Gala.

After several readings of the interactions transcribed from the video, the researchers identified and coded the statements of disagreement, using AtlasTI-software. All statements which included opposition or disagreement (Kakawa, 2002) were coded. If the content of the disagreement was unclear or if it was difficult to interpret, then the statement was left out. It should also be noted that the video data were taped with two microphones during real-time group work, but sometimes it was not possible to catch what the students were saying, since all five might be talking at the same time.

Selected statements were further analyzed deductively and inductively. In the deductive analysis Netz's (2014b) 5-level taxonomy was utilized to determine students' disagreeing styles. Netz's taxonomy is based on previous studies of formal (Goodwin, 1983) and functional (Muntigl and Turnbull, 1998) characteristics of disagreement: formal referred to the level of mitigation and aggravation and functional referred to the function or purpose of the disagreement. Netz's taxonomy's levels are identified as follows: Level 1 Highly mitigated; Level 2 Mitigated; Level 3 Neither mitigated nor aggravated; Level 4 Aggravated; and Level 5 Highly aggravated. Mitigation means that disagreement is expressed with compounded hesitations and downtoners accompanied by accounts and/or counterclaims. Mitigated or highly mitigated styles are understood as the most polite ways of disagreeing. Aggravated disagreements are characterized by a concise style with explicit contradictions and challenges. A highly aggravated style includes a concise style, but the disagreement is brought up with a sarcastic tone and throwing back speaker's phrases. Furthermore, highly aggravated disagreement contains a total rejection of the previous sentence, and accounts or counterclaims are lacking. Neither mitigated nor aggravated disagreements include explicit contradictions followed by accounts and/or counterclaims, indicating that the disagreement is expressed in a neutral way and is neither particularly polite nor aggressive nor does it carry negative connotations.

The themes of the disagreements were analyzed inductively without any specific theoretical framework; however, the learning environment and knowledge about gifted students guided the researchers'

understanding and provided theoretical concepts for use in the analytical work. In mutual discussions, some of the themes were eliminated, some re-created and others emphasized. Finally, the students' disagreement profiles were investigated by comparing accentuated styles and themes of each team member's disagreements.

TABLE I. Student's name, country, age, interests and achievements (Author, 2013, 135-136)

Name Country Age	Interests	Achievements
Alex Romania 17	hardware and software, mobile and web applications, networks and interface design, to tackle a big world problem	<ul style="list-style-type: none"> <li>- First place in AcadNet, a national contest held by Cisco Networking Academy at the Polytechnic University in Bucharest</li> <li>- 11th place and honorable mention at InfoEducatie national project contest, sponsored by Google</li> <li>- finished Stanford Online classes: Introduction to Databases, Machine Learning, and Introduction to Artificial Intelligence.</li> </ul>
Justas Lithuania 17	math, sciences, languages, especially English	<ul style="list-style-type: none"> <li>- 2nd place in nationwide physics contest in 2010</li> <li>- 15th place in the nationwide "Kangaroo" contest (a math contest with ca. 10,000 participants), 2009</li> <li>- 3rd round of Lithuanian Olympiad in Informatics, 2011</li> <li>- honorable mention in another informatics contest, 2010</li> <li>- best physicist in his grade in his city</li> <li>- in the ranks of the top programmers</li> <li>- 1st place by a wide margin in the English Olympiad 2008</li> <li>- 2nd best in his country in the National English Olympiad of 2012</li> </ul>
Mike China 16	intensive programming, (dis)assembling and playing with underlying software and hardware, user-end products design, network architecture	<ul style="list-style-type: none"> <li>- published applications: BitTorrent application on iPhone or iPad, a Linux kernel extension, a more sophisticated kernel extension on Mac OS X</li> </ul>
Pablo Spain 18	computer engineering, math, physics, industrial technology, programming languages	<ul style="list-style-type: none"> <li>- on a high school physics team to participate in the Physics Olympiad 2012</li> <li>- published a regional newspaper article about research on grafeno and carbon nanotubes at the University of Zaragoza</li> </ul>
Valeria Bulgaria 16	science, math, informatics, physics, especially bioinformatics	<ul style="list-style-type: none"> <li>- won a Bronze Medal at the International Mathematics Competition, 2010</li> <li>- won a Bronze Medal at the International Zhautykov Olympiad, 2011</li> <li>- speaker at the TEDxLPBT conference, January 15, 2012</li> <li>- carried out research in Bioinformatics: Gene Prediction Using the LZW Data Compression Algorithm, which presented a unique approach to problem solving. The paper was presented at the High School Summer Institute (HSSI) conference and received an award for excellence in 2011</li> <li>- invited to present her research at the international conference InfoTech11 as well as at Expo-Sciences International, where she won a medal in 2011.</li> <li>- participated in a three-week HSSI Research Summer Camp in 2012</li> </ul>

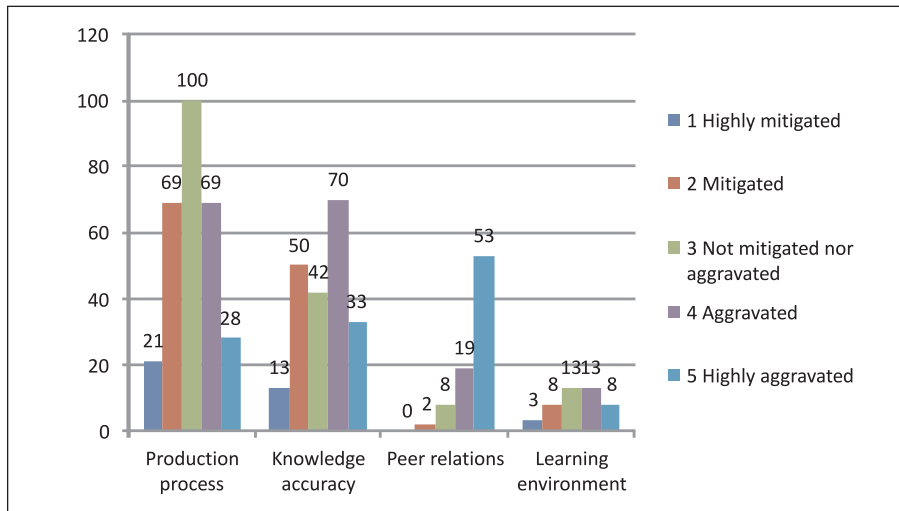
## Results

### Themes and Disagreement Styles

In the data analysis, 622 disagreeing statements were identified. Figure I shows the frequencies of disagreement by level and theme. Disagreements dealt with four themes: the learning task, product process and knowledge accuracy, peer relations, and the learning environment. Eighty percent of the disagreements were *learning task*-related (a total of 495 statements) and referred either to the *production process* (287 statements) or *knowledge accuracy* (208 statements). Product process means choosing the content, editing texts and pictures, and finalizing the layout of the product, which in this case was a poster. Knowledge accuracy refers to the text editing when the students wanted to find the most grammatically correct and idiomatic expressions in English, which was not the mother tongue of any group member; the students also discussed the interpretations of symbols and pictures. The themes of disagreement show how the students in the ICT group were highly task oriented, opinionated and persistent in seeking the best solutions (e.g., Davis et al. 2014). Especially the male students were able to utilize their knowledge of ICT and other fields during the group work: Justas was passionate about languages, just as Pablo was passionate about connectivity, and Alex, about interface design. Mike's broad knowledge of programming and English endowed him with the role of a helper who was capable of and willing to advise all the other group members, whatever problems they encountered. Only Valeria, the one female team member, could not utilize her competence in algorithms and bioinformatics, which influenced her role and led her to work as a team manager who took responsibility for the editing process, the monitoring of the deadline and the evaluation of the product (Author. 2013).

A minority of the disagreements dealt with *peer relations* (a total of 82 or 13%) and *learning environment* (45 or 7%), highlighting the task centeredness of the group and rarity of disputes on social issues or structures in the camp such as computers, internet connections, breaks and snacks.

FIGURE I. Frequencies of disagreements by level and theme



Students' disagreeing styles were mostly aggravated, meaning that their disagreements were expressed with explicit contradictions in concise style with possible challenges addressed to their counterpart. When the aggravated statements (171) and highly aggravated statements (122) were counted, they accounted for nearly half (47 percent) of the all disagreeing statements, which is in line with Netz's findings (2014b) on gifted students' disagreement patterns in a classroom context. Similarly, the gifted students in this case study seemed to be frank and straightforward in their communication.

The next excerpt is an example of disagreement about knowledge accuracy. Other themes are also apparent, such as peer relations and learning environment in relation to the timetable. The background to the excerpt is that Valeria has written a text and asked Mike to check it. Afterward, she begged Justas to be the last editor. At the same time, Alex is working with his laptop, searching for learning games, and does not participate in the discussion at all. Pablo is occupied with his text on connectivity, but from time to time he laughs to support Valeria or comments briefly.

EXAMPLE I. Disagreement about knowledge accuracy

M Level 3	1	M you have to use his or her but every student then it's his or her because
V Level 4	2	V no
J Level 2	3	J yeah I would have to use all students
V Level 2	4	V if it's his or hers it's their
J Level 3, moderator	5	J no actually he is right
M Level 3	6	M no every somebody something
J Level 2	7	J if I change it, all students can have their own but
M Level 4	8	M his or her
V Level 3	9	V no I have checked the Oxford Dictionary
M Level 3	10	M it's in the grammar it must be actually, if I use their
J as moderator	11	J let's see
M Level 4	12	M wrong actually
V Level 2	13	V well try to google
M Level 4	14	M google is so, people on the internet always write wrong
J Level 2	15	J actually if you write it in quotes and then look for identical
V Level 4	16	V some of their someone lost their sock
	17	V write someone lost their sock
M Level 4	18	M his or her
V Level 4	19	V their yep
	20	M see
	21	V write in google
	22	J write their own
	23	M their own let's see
M Level 4	24	M now it still does not work
V Level 1	25	V well
M Level 4	26	M his or her actually this is the right one
V Level 4	27	V I have check ed the Oxford Dictionary I mean I checked it when I had to write my essay. I know their
M Level 4	28	M every his or her: what do you want to search?
V Level 4	29	V ok someone their
V & M laughing	30	[Valeria and Mike laughing]
	31	J what happened?
	32	J what happened?
	33	M ok
	34	J he gives yeah
	35	V he gives someone their toys
	36	J yeah in English
	37	M yeah
J as moderator	38	J so yeah she was right
M Level 2	39	M I think it is really idiomatic , his or her
J as moderator	40	J she was actually right
	41	V yhyhy
M Level 3	42	M no the [...] is his or her right?
	43	V ok
J Level 1	44	J I am not entirely sure actually
M Level 4	45	M I am hundred percent sure
	46	J do you know why I am not sure because if I think it intuitively I am usually right
V Level 3	47	V their so it should be their
	48	J when I think intuitively I am usually right
	49	M its idiom it's not always grammatically correct
	50	J what
	51	M its idiom it's not always grammatically correct

V Level 5	52	V but how do you? HOW DO YOU?
	53	J press esc possibly
V Level 5	54	V quote Oscar Wilde "you do not love someone for their looks or their clothes or their fancy car"
M Level 2:	55	M yeah actually everybody write
V Level 2	56	V Oscar Wilde I believe him ok?
P laughing	57	[P laughing]
	58	J I usually write intuitively and I am usually correct
	59	M I just googled in word spell-check actually
J Level 4	60	J it's not perfect
V Level 5	61	V it's not perfect, Oscar Wilde!
	62	J reference
	63	M sorry, sorry you can
	64	J we can more or less try this
V Level 5	65	V Oscar Wilde! then we have less than one hour and half, please
	66	P yeah [supports Valeria]
J Level 4	67	J it's all fine
V Level 5	68	V it's all fine, of course!
M Level 4	69	M it must be his or her
J as moderator	70	J let's see
P Level 1	71	P can we start part of the content?
	72	J hmm sentence [reads from the internet]
	73	A me too
	74	P Spanish [laughter]
J as moderator	75	J amm actually you can use there is a very simple way to prove it when you use everyone you have to use their but everyone is the same as one and you can use their so yeah
	76	V yeah[00:29:35.16]
M Level 3	77	M either it would be more correct to say his or her?
	78	J more correct [00:29:39.19]
V Level 5	79	V no because you believe asses dot com and you do not believe Oscar Wilde
J as moderator	80	J it's correct here. [reads the internet] has been valid hundreds of years. You were actually both right
M Level 2	81	M we were actually looking for the better solution!
J Level 1	82	J actually all right hmm
M Level 4	83	M please his or her
J Level 3	84	J no really, you were all right
	85	M I am maniac in grammar so
J Level 2, moderator	86	J if this was incorrect in any way I would agree with you, but it is not incorrect
V Level 5	87	V If I if you find somewhere where its written that it is more correct like not more correct, but like really
	88	M ok
	89	V Oxford Cambridge anywhere I will send you a chocolate to China Bulgarian chocolate ok
	90	M ok that's a deal [00:30:30.15]
	91	J I actually thinking that he is going to win this [laughter]
	92	V ok later!
J Level 5	93	J no, no, we have to do this now. You do not understand anything [humor]. It's a matter of principle
V Level 2	94	V well
	95	J I actually understand him
	96	M this is an EU site

The excerpt starts with Mike's contention that Valeria's choice of a pronoun should be replaced with another pronoun. Mike gives his counterclaim in neutral, but relatively straightforward style (line 1, Level 3). Valeria declines Mike's proposal (line 2). Justas supports Mike, which includes opposition to Valeria's choice. Discussion continues, as Mike and Val are both persistent and absolutely sure of their choices. Valeria also explains that she has done research on this issue and that she relies on the *Oxford Dictionary* and Oscar Wilde's authority (lines 9, 27, 54, 56, 61, 65, 79). Mike refuses to believe her; he is eager to find a "more correct" way (line 78) and finally explains his eagerness, saying, "I am a grammar maniac" (line 85). The example illustrates how gifted students want desperately to find the truth and the most correct solution, and their willingness to defend and fight when they think they know the right answer (Davis et al. 2014).

The excerpt also illustrates that, even though discussion can be identified as aggravated, as when Mike and Valeria explicitly contradict each other and even completely reject each other's points of views, still they seem to have fun because they start laughing and even decide to make the debate into a bet and a little bit of competition (lines 30, 89, 90). Valeria, sure of winning, promises in humorous style to send Bulgarian chocolates to Mike in China if he manages to win. Laughter and humorous competition reveal that, to some extent, these students seemed to enjoy disagreeing (see also Netz, 2014b). However, Mike was the one who, in the interviews, brought up that he found debates painful (Author., 2013).

It should also be noted that when discussions in this excerpt got heated, Justas began to act like a moderator or judge (lines 5, 11, 38, 40, 70, 75, 80, 86), which has been the teacher's role in gifted classrooms (Netz, 2014b). At the same time, Justas wants to help Mike find the right answer (lines 86, 95). Furthermore, while the example demonstrates Justas's solidarity, empathy and caring for Mike (as is similar in Netz, 2014b), he turns against Valeria with negative words, even though his tone suggests a humorous connotation when he says to Valeria, "You don't understand anything" (line 95). This quotation is an example of how discussions between Justas and Valeria start to heat up in line with Kotthoff's (1993) notion that, once disagreement has been stated, the levels of aggravation tend to increase. In Justas and Valeria's case, their confrontations later became more and more aggressive with negative messages having elements of personal attacks (see Angouri, 2012). It can

be argued that a professional teacher might have helped the students moderate these kinds of disagreements (see Netz, 2014b). A professional and ethically sensitive teacher would have been able to support all parties in the study and learning process without turning against anyone, and teacher could have prevented the later escalations of disputes between Justas and Valeria. However, it should be noted that by the end of the session, Valeria and Justas continued to work on their relationship and managed a reconciliation.

### Disagreement profiles

Next, we investigated students' disagreement profiles by examining the frequency of the disagreements expressed by each student. As figures II and III and table II show, Pablo and Alex disagreed less than the other three team members, and when they disagreed, their disputes were related to the production process: Pablo had a passion for connectivity, and Alex was enthusiastic about learning games as a teaching method as well as about the poster layout. They almost never participated in disagreements on accuracy of knowledge or peer relations. Once Alex took the role of moderator when he commented on Justas and Valeria's dispute: "It's like you're in kindergarten." Overall, Alex's and Pablo's disagreeing styles were mainly polite or neutral. Therefore, their disagreement profiles could be described as *neutrally task-oriented*.

Mike disagreed mostly on the production process and knowledge accuracy. His disagreeing style was either mitigated or aggravated. His polite style of disagreeing was evident, especially in discussion with Pablo, when he seemed to choose his words so carefully that his respectful attitude toward the addressee was evident. This style does not irritate the addressee, as shown in the following excerpt in which Mike and Pablo disagree on how they should illustrate Pablo's findings on connectivity and off-line internet.

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#### EXAMPLE II. Mitigated disagreements

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M Level 2	1	M and this icon is supposed to refer to the mobile phone?
	2	P yeah
M Level I	3	M the thing is that it does exactly not look like one, it is quite weird to me
P Level I	4	P but I don't know how to show people that they can connect to the internet
	5	M oh, so actually you can add the title offline internet here
	6	P oh yeah[00:57:03.17]
	7	M yeah
M Level I	8	M well I think it works, but maybe better if we have an icon for a phone



Mike kept the polite style, even when he was debating about the grammar or word choices in more aggravated style. He did not use pronouns like “you” or “she/he;” instead he always spoke from the perspective of “it,” referring to the issue in question, or he utilized “me” and “I” talk. It seemed that Mike’s disagreements left the other person safe and intact, and did not make irritating personal comments. Therefore, Mike’s disagreement profile was labelled *politely accurate*.

Even though Justas and Valeria’s disagreements were mostly task-oriented, they were the ones who used “you” talk when confronting each other. Interestingly, they did not talk this way to the other members of the group. Furthermore, Justas utilized “she” talk when observing and commenting aloud on Val’s actions and feelings. It seemed that that this style increased negativity and shifted their disputes to a personal level. Justas and Valeria’s profiles were called *personally aggravated*.

FIGURE II. Frequencies of disagreements by theme and source

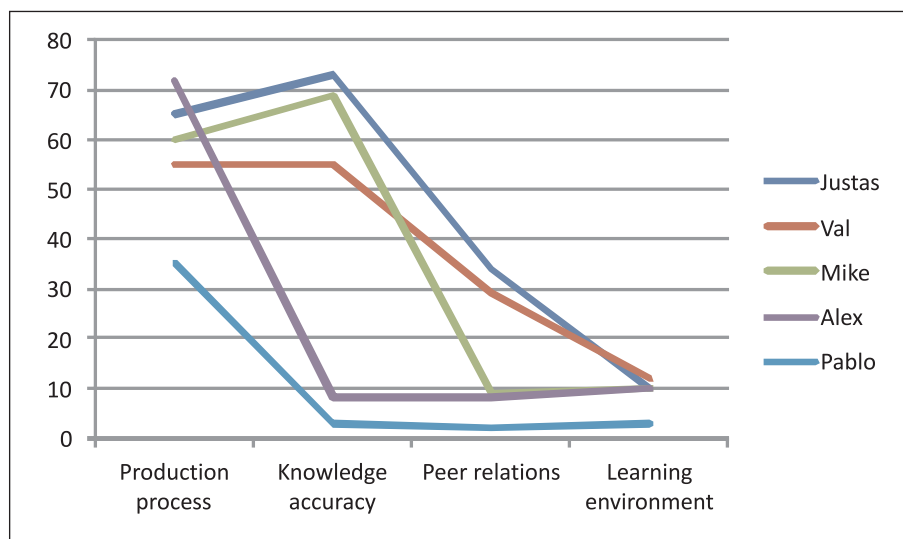


FIGURE III. Frequencies of disagreements by level and source

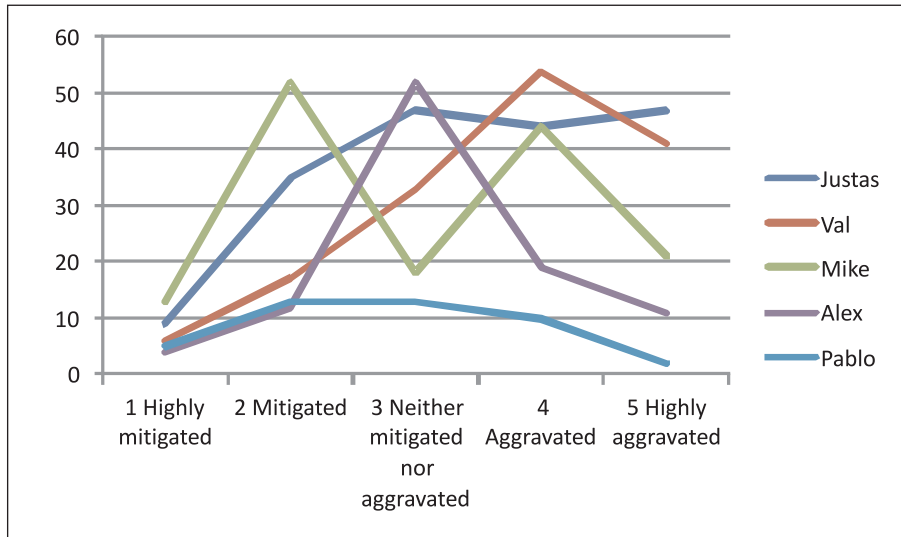


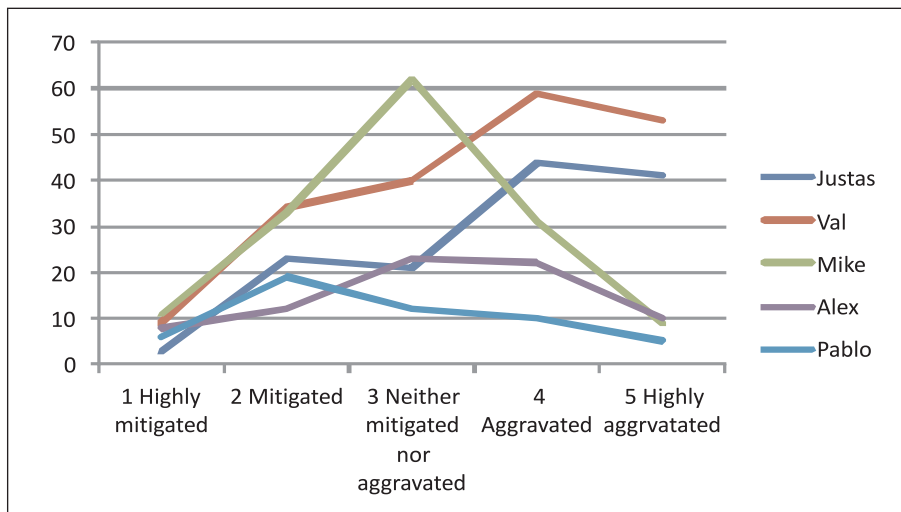
TABLE II. Frequencies of disagreements by source, theme and level

	Production process n (%)	Knowledge accuracy n (%)	Peer relations n (%)	Learning environment n (%)	Level 1 Highly mitigated n (%)	Level 2 Mitigated n (%)	Level 3 Neither mitigated/ aggravated n (%)	Level 4 Aggravated n (%)	Level 5 Highly aggravated n (%)	Total n (%)
Justas	65 (36)	<b>73 (40)</b>	<b>34 (19)</b>	10 (5)	9 (5)	35 (19)	<b>47 (26)</b>	44 (24)	<b>47 (26)</b>	182 (29)
Val	55 (36)	<b>55 (36)</b>	<b>29 (19)</b>	12 (8)	6 (4)	17 (11)	33 (22)	<b>54 (36)</b>	<b>41 (27)</b>	151 (24)
Mike	60 (41)	<b>69 (47)</b>	9 (6)	10 (7)	13 (9)	<b>52 (35)</b>	18 (12)	44 (30)	21 (14)	148 (24)
Alex	<b>72 (73)</b>	8 (8)	8 (8)	10 (10)	4 (4)	12 (12)	<b>52 (53)</b>	19 (19)	11 (11)	98 (16)
Pablo	<b>35 (81)</b>	3 (7)	2 (5)	3 (7)	5 (12)	<b>13 (30)</b>	<b>13 (30)</b>	10 (23)	2 (5)	43 (7)
Total	287 (46)	208 (33)	82 (13)	45 (7)	37 (6)	129 (26)	163 (26)	171 (27)	122 (20)	622

Students' different disagreeing profiles were evident when the disagreeing styles were examined from the point of view of the addressees (Figure IV and Table III). Table III also shows that thirteen disagreements were addressed to the group as a whole and nine were addressed to others, meaning camp staff members who visited the group during their sessions.

*Neutrally task-oriented* Pablo and Alex were not addressed with disagreements as often as the other members of the ICT group. Furthermore, Pablo was disagreed with in a mitigated way, and Alex was disagreed with in a neutral or aggravated style. *Politely-accurate* Mike was disagreed with in neutral sentences; however, he was the second most often team member confronted, which indicates his activity in the group as well as his eagerness to wrestle with grammatical issues. *Personally-aggravated* Justas and Valeria were disagreed with mostly in an aggravated or highly aggravated style. However, Valeria was confronted much more often than any other group member. Interestingly, Justas was the person who disagreed with the others the most (Table III), but Valeria and Mike were the ones who were mostly addressed with disagreement statements.

FIGURE IV. Frequencies of disagreements by level and addressee



**TABLE III.** Frequencies of disagreements by addressee and level

	Level 1 Highly mitigated n (%)	Level 2 Mitigated n (%)	Level 3 Neither mitigated /aggravated n (%)	Level 4 Aggravated n (%)	Level 5 Highly aggravated n (%)	Total n (%)
Justas	3 (2)	23 (17)	21 (16)	<b>44 (33)</b>	<b>41 (31)</b>	132
Val	9 (5)	34 (17)	40 (21)	<b>59 (30)</b>	<b>53 (27)</b>	195
Mike	11 (8)	33 (23)	<b>62 (42)</b>	31 (21)	9 (6)	146
Alex	8 (11)	12 (16)	<b>23 (31)</b>	<b>22 (29)</b>	10 (13)	75
Pablo	6 (12)	<b>19 (37)</b>	12 (23)	10 (19)	5 (10)	52
Group	0 (0)	3 (23)	2 (15)	4 (31)	4 (31)	13
Others	0 (0)	5 (56)	3 (33)	1 (11)	0 (0)	9

### Concluding remarks

This case study investigated the social interactions, especially their disagreements, of five gifted science students. The data were gathered by videotaping international students' teamwork sessions during an enrichment summer program in Finland. Disagreements were analyzed from the point of view of style and theme, as well as with a disagreeing profile. In the analysis of the disagreement styles, Netz's (2014b) taxonomy was utilized as a deductive tool, which revealed that the gifted students' disagreeing style was mainly aggravated when they contradicted their counterparts explicitly and frankly. Inductive analyses of the themes showed that the students were highly task-oriented. They argued mostly about production process and knowledge accuracy, which reflects characteristics of gifted students in terms of high levels of curiosity, perfectionism and intellectual honesty (Davis et al., 2014 33-34). The students did not often disagree about the learning environment or peer relations. However, a few arguments regarding peer relations escalated into non-constructive conflicts. In these situations, the group would have benefitted from the intervention of a professional and ethically sensitive

teacher, who could have moderated the situation; such was the case in a previous study in which gifted students were able to rely on the teacher (Netz, 2014b). Students' disagreement profiles were identified as neutrally task-oriented, politely accurate, and personally aggravated. These profiles were connected to the styles which the students used in order to disagree when they were addressed in teamwork situations. Neutral and polite styles triggered less aggravation and aggression, while aggravated styles provoked aggressive behaviors. (see Muntigl and Turnbull, 1998; Kotthoff, 1993)

Research on the importance of a teacher for gifted students revealed that the students valued an emphatic and encouraging teacher who creates a friendly and social atmosphere for learning (Author, 2008). In this study, the students had to cope without a teacher in conducting their teamwork, and the results indicate that a teacher was indeed needed to create a more sensitive and friendly environment for expressing disagreements. In a few disagreements among the team members, some of the students took the role of negotiator or moderator between the arguing peers, but we also witnessed situations in which the disagreements led to mean and unethical communication between the students with an intention to hurt. Without the teacher, the students allowed their personal relationships to influence the nature of the disagreeing communications, which led to unfriendly and unethical exchanges. The teacher as the ethical professional can guide the communication toward more ethically sensitive and equal language between the students. An important part of that guidance is to educate the students to tolerate differences between each other and not allow race or nationality or gender to influence their behavior and communication in disagreements. We know from previous research on gifted females in science that they have to struggle in a male-dominated field and adopt special roles when working on a team in order to be successful (Author, 2014). We know from the interviews with the team members studied here that Valeria had taken on a team-builder role in her interaction with the males and ended up being praised for it (Author., 2013). Successful women in science need a strong measure of resilience and self-efficacy to compete with males (Author and, 2012). In this study, Valeria stood up for herself, but she also hurt others with her insensitive language.

In this study, we have demonstrated a case in which disagreements among gifted students called for sensitive, ethical communication. Even

though the students completed their learning task in time, some of them reported negative experiences related to the teamwork (Author., 2013). This study points to the need to have a teacher guide gifted students' teamwork and create a friendly and ethically sensitive learning environment in which every member of the team is treated equally and with respect, even in the midst of debates and possible disagreements. Future studies are needed to show the pedagogical methods with which a good teacher can guide gifted students and support both intellectual and moral growth in teamwork.

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