Everything in Moderation: The Effects of Adult Moderators in Online Youth Communities

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1. Introduction

There is considerable debate over the appropriate role for adults in youth online communities. Although many within the mass media argue for adult supervision of youth online, our research suggests that many young people are using the Internet to communicate productively with peers, to solve problems and learn collaboratively online. However, without studies that explicitly explore the positive aspects of youth online community involvement and the actual effects of adult intervention and oversight, only misguided and chilling stories may hit the news. In this study, we examine the 1998 Junior Summit, a well-studied, early example of a large-scale international community for youth, in order to look at the effects of moderator involvement on several measures of positive youth involvement. Children who participated in the Junior Summit were asked to identify and write white-papers about the ways in which technology could help young people. We have selected the Junior Summit as our community of focus because we have access to data that is mostly otherwise unavailable to researchers – the content of all of the community's posts as well as information about each participant, follow-up interviews five year's after the community's launch, and questionnaire data about self-efficacy and well-being. In this study, we compare the content of three different sub-forums, with different adult moderators and different involvement levels, in order to evaluate the impact of adult moderation on the community. Results

demonstrate that adult moderation has a mixed effect on the participation, network formation, and concrete solutions proposed by the youth participants in online communities. Our findings indicate that medium level adult moderation works best in mediating youth participation in online communities. Our conclusions bear on the nature of youth participation online, and the design of future youth online communities.

2. Background

The Junior Summit (JRS) was organized by the Massachusetts Institute of Technology (MIT) in 1998 in an effort to empower young people around the world by inviting them to come online and discuss world problems and potential technological solutions (Cassell 2002). 3,062 young people between the ages of 10 and 16, from 139 different countries, represented a wide variety of socioeconomic backgrounds, geographic settings, and exposure to computers and the Internet, participated (Cassell, Huffaker et al. 2005). The participants were chosen on the basis of applications, and winning applicants showed effort, commitment, and passion in their essay or artwork entries. Computers and Internet access were provided for those who lacked the technology (Cassell 2002).

Participants logged into a central online message forum where they could read and post messages in one of five languages (English, Spanish, French, Portuguese, Chinese) – those messages were automatically translated into each of the other languages. For the first several weeks, participants were assigned to one of twenty "homerooms," in which they could get used to the technology while introducing themselves to each other. Afterwards, participants on their own developed twenty unique topic groups focusing on a particular problem in the world such as education, poverty, or child abuse. Most participants contributed to only their own homeroom and topic group but all were allowed to post anywhere and occasionally did so.

Twenty adult moderators were present in the forum during homerooms and topic groups. The moderators, who were multilingual, were selected based on their interests and previous work with international youth online. Moderators were instructed in the basic 'youth empowerment through expression of voice' philosophy of the Junior Summit and were given basic tasks to organize such as ensuring that the participants were online. Their major role was to assist young people in participating in the forum to the best of their abilities by keeping events on schedule, stimulating discussions, and assisting with technical and language difficulties. A moderator

mailing list allowed moderators to air issues and seek feedback, but otherwise there was no oversight of their behavior.

In short, the Junior Summit represents a unique online community. Not only is the population geographically broad (139 countries), but it also consists of youth whose voices would not ordinarily be heard, from countries where Internet technology is rare or unavailable. It serves as a test of whether technology can be used to empower and connect people, especially young people. Elsewhere we have addressed the development of the community, and the role of child leaders (Cassell, Huffaker et al. 2006). In the current paper we examine the role of adults. Our study particularly targets questions of participation, interconnectivity, and task-oriented language when adults were more or less dominant in the group

2.1 Adults in Youth Communities

To date, there is little literature on the role of facilitators in online youth communities. However, we can look to offline correlates to begin to understand why and how adults facilitate groups of young people. Groups of youth have adult facilitators for a number of reasons. On the one hand, the adult-youth relationship is an important one for personal and community development. Mentoring youth has had a place in history, from apprenticeships to formal youth recreation organizations (Cotterell 1996). Child development theorists claim that an adult should assist children, whether it is to provide children with just the tools, or, the social and instructional support to succeed at a task (Crain 1992). Many formal youth organizations, like 4-H, Girls and Boys Club of America, and the Girl Scouts and Boy Scouts of America, therefore employ professional and voluntary adults to model responsible behavior for youth who are on their own for recreation and companionship. The Boys and Girls Club of America affirms that "Young people need to know that someone cares about them" (2006). There is evidence that integrating modern technology, like email mentoring programs, provides important adult support for young people (Tapscott 1998).

On the other hand, the adult-youth relationship is not always about support; sometimes it is about control. Many adults feel that young people ought not to congregate without adult supervision. Evoking "Lord of the Flies" images, adults often maintain that unstructured, unsupervised groups of youth quickly degenerate into deviant behavior. In recent years, many social programs in America have begun to focus on pairing adults with youth in schools, homes and after school programs, to prevent juvenile

crime, substance abuse, and unsafe sex (2006; 2006). Adults structure and regulate children's socialization to encourage them to become responsible members of society.

Today, unstructured, unsupervised, and extraordinarily popular social networking websites such as MySpace and Facebook have created a new worries about young people's behavior online in the absence of adult involvement (Fitzpatrick 2006). Adults are calling for the online supervision and parental control of youth in cyberspace; the government is legislating exactly such control. But is adult supervision on the Internet really necessary or productive? Are supervised children in online communities more productive, or less? While there is little research about adult moderators or facilitators in social networking sites, we can look to research on online classrooms to begin to understand this space.

Research on online classrooms suggests that when youth gather in classroom settings, the presence of an adult authority affects their interactions in both positive and negative ways. In online classrooms, in addition to learning from the instructor, members of large learning groups may be more likely to also learn from one another. Questions and comments are more often found to be addressed to the group as a whole rather than to the instructor (Lobel, Neubauer et al. 2005). In one study, researchers found that during face-to-face discussions, the instructor becomes the center hub of interactions, where almost all comments were directed towards or mediated by the instructor. Conversely, during online sessions the students not only posed more comments when online, but also directed comments toward fellow students and toward the group as a whole. This suggests that a group-centered rather than an authority-centered discussion occurs online, and that the instructor fulfills a different function in the online classroom (Lobel, Neubauer et al. 2005).

In another online classroom study, findings demonstrate that: "Instructors who were active in initiating discussion threads did not appear to stimulate more discussion, and may actually have limited the amount of discussion and the length of discussion" (Mazzolini and Maddison 2003). These results suggest the possibility that adult participation stifles rather than jumpstarts youth productivity online. Questions posed by instructors may be construed as attempts to elicit certain information and to keep students within a structured discussion. The study posits that for those reasons student participation was inversely correlated with instructor involvement (Mazzolini and Maddison 2003).

In the above study, it is interesting to note that the students said that they appreciated instructors who contributed often. So, discussions may appear to be thriving when moderation by an adult is low, but a moderator

who had low involvement is unlikely to be popular with students. In fact, students may give high ratings to the instructor *and* have lower involvement because the students are spared from some of the effort of communication (Mazzolini and Maddison 2003). A similar situation holds in face-to-face discussion groups as well (Fern 1982). Because youth are in positions of subordination at schools and in households, adult presence online may run the risk of replicating certain structures of power.

2.2 Youth in Youth Communities

Groups of youths under supervision or tutelage may risk losing the benefits of peer interaction. As expressed by the notion of the "zone of proximal development (Vygotsky 1978), children's relationships with peers propel many learning processes. When peers work side by side, children learn to take the perspective of the other, and modify the understanding of their own actions (Rogoff 1991). Peer interaction can aid social and cognitive development (Damon and Phelps 1989). Peer collaboration appears to allow children to function at a level higher than they can alone-- but what can youth-only communities do for development?

First, participation in a youth only community might influence the development of the participants by engaging them with peers who may be slightly more advanced by grade, by social skills and by cultural knowledge (Cassell, Huffaker et al. 2006). Second, youth-based communities offer individuals a chance to share and negotiate ideas with others, to learn how to trust peers, and to foster a sense of group solidarity or collective identity (Flanagan 2004; Flanagan, Gill et al. 2005). From peer to peer interaction, friends and acquaintances are made which promote individual development and adaptation   Ties among peers in a community influence daily life, decision making and self esteem (Burkowski and Cillessen 1998). Finally, youth-based communities may have positive effects on how adolescents contribute to groups. Studies have found that social skills such as communication and negotiation, as well as encouraging the importance of volunteerism and civic duty, emerge from group activity. In the absence of external control, these skills are often motivated by the goals of the group or a result of peer influence (Flanagan 2004).

So, do we need adult moderation adults in online communities, for safety, productivity or developmental outcomes? Wheeler (2000) suggests that offline organizations led by youth are more authentic and representative of adolescent needs. Similarly, placing the responsibility of important activities directly on adolescents results in stronger skill development, as

well as the potential to find insights unavailable to adults (McCormack-Brown, Forthofer et al. 2001). If adult presence is not always necessary in face-to-face communities, we must then evaluate if moderation is necessary in all online communities.

2.3 Moderation in Online Communities

There is considerable literature on the role of moderators and facilitators in adult online communities. Although little deals with young people directly, we can nonetheless begin to understand how adult facilitators might influence participation, empowerment, and social connections within online youth communities. Facilitators of working groups would not exist if they did not improve teamwork. However, looking at the network structures in virtual organizations, one study found that the important question was not whether authority should exist, but for what types of tasks (Ahuja and Carley 1998). Professional and focus-group based online communities have shown increased productivity with proper management. The results of one study suggest that for dispersed online workers to be effective, they need managers who are good communicators via information technology (Staples, Hulland et al. 1999). In another study of group management in the virtual workplace, results indicate that leadership enhanced participation, group performance and satisfaction: formal leadership was "not unnecessary or useless." (Kahai, Sosik et al. 2004).

Due to high volume and high turnover, new group sites, like Usenet, elicit a variety of experimental moderator systems. Initial research focused on team moderation in the context of controversial, high-volume newsgroups; one study looks at an AIDS newsgroup in which a team of moderators edited and selected articles and were found to have increased the quality of information available (Greening and Wexelblat 1988). Moderators have also been shown to improve the user experience for large scale conversation spaces by reducing information overload (Lampe and Resnick 2004). For example, the website Slashdot has implemented a system of distributed voluntary moderation. For the developers, in the beginning of SlashDot, "moderation was unnecessary, because we were nobody" (Slashdot 2006). The distributed moderator system has proved to be the best option for the site's heavy volume of contributions and effective to quickly and consistently separate high and low quality comments in an online conversation (Lampe and Resnick 2004).

2.4 Moderation in Junior Summit

In some ways the Junior Summit community is similar to an online work-space. The forum was task oriented, had a timeline and action objectives for each group and each time period. Moderators checked up on progress, stimulated discussion and encouraged participants to stay on task. If we believe the previous research on work environments, we might think that the Junior Summit participants would be more effective in their work objectives in the presence of skilled moderators. The previous research on newsgroups suggests that if Junior Summit had continued to grow, monitoring of messages because of content *and* volume might have become necessary (Lampe and Resnick 2004; Slashdot 2006). However, the communication in this online forum encompasses a range of functions in addition to providing information and producing action plans. We know from follow up interviews that the participants valued the experience of simply being online with a diverse group of youth, and being connected through social ties, just as much, or more, than the task that they were carrying out. Even though Junior Summit was organized around a task to be completed, the youth desired and came away with friendships, a sense of intercultural sharing and knowledge of others from this online experience (Cassell and Tversky 2005). In this sense, the Junior Summit facilitates social networking and cultural sharing like many of the youth-based social networking sites do today. Thus, studying Junior Summit can provide relevant design implications for many kinds of youth online communities.

The literature we have reviewed above suggests that at least in online classrooms, youth participate less in groups when an adult is active. Additionally, peer interaction is important for both cognitive and social development. Finally in the absence of adult oversight, youth participation is motivated and inspired by the goals of the group. However, there is little if any literature that extends these findings to online communities, and that draws conclusions about the use of moderators in youth communities online. In order to examine this issue, in this study we look at the role of moderators in youth participation, collaboration and social network formation. Our approach is to examine three topic group forums within the Junior Summit community for analysis: one with high moderator involvement, one with medium moderator involvement, and one with low moderator involvement. Our hypotheses are:

1. Youth participation in the Junior Summit online community will be higher in topic groups with low adult moderation than in topic groups with higher adult moderation.

2. Youth participants will be more interconnected in topic groups with low adult moderation than in topic groups with higher adult moderation.

3. Youth participants will accomplish more work in topic groups with low moderation than in topic groups with high adult moderation

3. METHODS

3.1 Participants

For the topic groups in the Junior Summit, each consisting of 15-30 participants and one adult, hundreds of messages were posted over a three-month period. In this study we chose three representative topic groups that had different moderator involvement. The low moderation group consisted of 29 youth participants writing 751 messages discussing "The dangers and advantages of increased use of computers in society". The middle moderation group consisted of 17 youth participants and 519 messages focusing on "How to keep children in school". The high moderation group consisted of 20 youth participants and 349 messages collaborating on "How to end sexual abuse of children and child prostitution". The participants' ages in all three ranged from ten to sixteen years old. The participants in these three groups represented 37 different countries and 29 native languages (all analyses were carried out on messages in English, or on the English translations of messages written in other languages).

3.2 Procedure

Content Analysis

This study allies several methodological approaches, including a hand-coded content analysis of each message posted by the youth participants in the online forum. The messages were coded by utterance and characterized by the presence or absence of the attribute or attributes found in the message. We selected these six attributes to represent a variety of speech acts that we considered to be important markers for participation and task-orientation within this community. Namely, the coded attributes were: apology, delegate, cultural narrative, feedback, solution, thank. These attributes had inter-rater reliability with a Cohen's Kappa of over .7. Partici-

pants expressed regret for comments or actions in *apology* messages. In *delegate* messages, participants proposed or assigned concrete tasks to other individuals or the entire group. In *cultural narrative* messages, participants shared information about their local community, culture or country, typically for the benefit of individuals from other countries. In *feedback* messages, participants asked for information, invited critiques or comments to ideas. *Solution* messages proposed concrete resolutions about the world problem that the group discussed. Lastly, participants expressed gratitude in *thank* messages. We examined these message attributes through multiple regression analysis to determine the predictive relationship between moderator involvement and language use.

Social Network Analysis

In addition to the content analysis, we used a social network analysis to examine the connections between members of each topic group. Each message was hand coded for name references within the text. Participants were connected when an author wrote to or about another author. Participant directly acknowledged other participants, (e.g. "Dorothy, I like your idea!" or "Hi Steven"). Participants also indirectly recognized other participants (e.g. "Dorothy has some great ideas" or "I disagree with Steven"). Direct and indirect name coding was reliable with a Cohen's Kappa of .7.

   The name references were evaluated using *UCINET and NetDraw*4. Both indirect and direct references were included in the analysis. We examined the connections between the names (i.e. the participants) with graphical representations of the network and centrality measures.

3.3 Measures

We are interested in the effect of level of moderation on youth communities. The level of moderation is determined by the percentage of total messages contributed by a moderator. The moderator contributed 3% of messages in the low moderation forum, 8% of messages in the medium moderation forum, and 42% high moderation forum. This study evaluated the impact of high, medium, low levels of moderation on the Junior Summit community. Note that in this analysis only the *number* of messages was used to characterize involvement. However, the length of moderator messages might also be profitably examined in later work.

   We choose to exclude time as an additional variable because it was controlled for across all groups. Our previous work has examined the influence of time on community development (Cassell & Tversky, 2005) and

language use (Huffaker, Jorgensen, Iacobelli, Tepper & Cassell, 2006), and revealed similar patterns in both features across time, regardless of topic group.

As we discussed above, the moderators were told that their role was to read messages, find non-participating users and remind participants of important deadlines. Even though they were instructed to let the messaging happen between the participants, the moderators chose to interpret this in different ways, resulting in varying involvement between the groups. The following messages, taken from the forums, exemplify the moderator involvement levels:

Low Moderated Forum: "Sorry to be silent, I have been away and just got word of the topic area. I am [moderator's name] and I will be following your topic. I have one question, for you all. Would you like me to stay in the back ground and only answer questions when you need help our would you like me saying things all the time? I ask this because this is your project and I don't what you to think of me as the grown-up who as been sent to watch and tell you what to do and say. Also if you have problems please feel free to ask me directly."

Medium Moderated Forum: "Hello everyone, I think this may be a good way to go at this point, we really need to get our ideas organized so that the delegates have a concrete plan to present at the summit. We have about one month left and a lot of work to do, so let's solidify some of your ideas and get them organized. So many of you have wonderful and exciting ideas that may have been overlooked. You might want to go back to some of the older messages and save them in an organized way by specific topic or whatever makes sense to you. This may help you sort out what has already been talked about and where to go from here."

High Moderated Forum: "Hi, all of you Topic 20 children! You might have noticed that when I answer a newcomer I never say *tell me* or *I'm glad to hear from you* (at least I try not to!) Instead I say *We hope*, or *We share your views*, etc. You might well ask why I do this. It's because I envision all of us as team. You, me, teams and individuals. We are here to try and find solutions to issues we all agree are hideous crimes. So, feel free, any of you to *step in* any message that is posted to me or that I post to any of you in this Topic room. That's why I often ask a child a question and add, something like"*Children, what do you think?* I expect many of you will answer. Rarely individuals alone can achieve solutions to the big problems of humanity. But many people together can and they did! Try and see all of you as ONE TEAM fighting against any manner of abuse. Let's try to find solutions together. The sooner the best. That's what we're here for! :-* :-*"

Looking at these groups, we are interested in the effect of moderation on: participation levels, interconnectedness, and polite language and task orientated language.

Participation Levels were defined in terms of the total messages posted to the forum by each topic group, the total number of words contributed by each of the participants, and the average message length of each participant's posts.

Interconnectedness was measured by a standardized degree centrality measure as outlined by Wasserman & Faust (1994). In a social network analysis, degree centrality describes the amount of links between a participant and all the other participants in the group.

Polite and Task Oriented Language are comprised of: (a) messages of apology, gratitude, and sharing. These attributes represent interactions of social niceties between the participants; and (b) messages that stated solutions, asked for feedback, and delegated tasks. These attributes represent exchanges between participants for task related purposes.

4. Results

We rely on several statistical techniques and data sets to test our hypotheses. First, in order to understand the effect of adult moderation on youth participation, we utilized a one-way ANOVA to compare the mean number of messages produced by individual participants with the varying levels of moderation in their associated topic groups. In order to examine interconnectedness among the participants, we relied on social network analysis statistics that measure centrality between all participants, and compared means between the three different topics groups. Finally, in order to examine the relationship between young people's language use and adult moderation, we utilized multiple regression analyses involving the individual messages, our content analysis, and the amount of moderation in the topic groups.

4.1 Participation Levels

Our first hypothesis was that youth participation in the online community would be higher in topic groups with low adult moderation than topic groups with higher moderation. This hypothesis was supported both in

terms of the overall number of words contributed to the topic group and the number of messages. As shown in Table 1, from a purely descriptive standpoint, the topic group with low-moderation posted more messages than the medium- and high-moderation topic groups.

Table 1.   Total Number of Messages for Topics Groups with Low, Medium and High Moderation

Moderation Level	Total Posted Messages
Low	751
Medium	519
High	350

However, total number of words does take into account the number of participants in each group. We therefore next compared the average number of total words posted by each participant, and found a significant overall effect, $F(2,31) = 23.48$, $p<.001$. Tukey HSD contrast tests indicated significant group differences between the low and medium, and low and high moderation groups. Here, however, it is the group with low moderation that contributed the least number of words per message (see Table 2). Significant group differences were not found between medium and high moderation groups.

Table 2.   Average Message Length Across Topic Groups with Low, Medium and High Levels of Adult Moderation (n=1101)

Moderation Level	Average Message Length Mean (Std Dev)
Low	110.8 (144.7)[ab]
Medium	180.2 (276.7)[a]
High	177.6 (164.7)[b]

   Note: a. Pairwise differences between Low and Medium Moderation, p<.001, b. Pairwise differences between Low and High Moderation, p<.001.

4.2 Interconnectedness

Studying participation levels gives us an overall sense of the contribution of each individual participant. It is also important to understand how well each participant is connected to the other members of the group, at least in terms of referring to each other by name. Again, in order to measure interconnectedness, we rely on a *Degree Centrality* measure as outlined by Wasserman & Faust (1994), which calculates the amount of links between

each participant and all other participants in the group. This formula is listed below, which is the sum of all connections between any two participants, i and j, in each topic group:

$$C_D(n_i) = \sum_j x_{ij}$$

Our second hypothesis was that participants would demonstrate more interconnectedness in topic groups with low adult moderation. There is an overall main effect, $F(2,61) = 2.946$, $p=0.06$. However, contrast tests reveal that the differences lay between the topic groups with medium and high moderation, such that group with medium moderation demonstrates the highest interconnectedness among members (See Table 3).

Table 3. Mean Interconnectedness Scores Across Topic Groups with Low, Medium and High Levels of Adult Moderation (n=64)

| Moderation Level	Degree Centrality Mean (Std Dev)
Low	2.85 (3.61)
Medium	5.74 (6.36)[a]
High	2.69 (3.59)[a]

Note: a. Pairwise differences between Medium and High Moderation, p<.06.

We also utilized NetDraw to illustrate the connections between participants in each type of topic group. In Figures, 1, 2 and 3, the circles represent the individual participants, the lines represent a link between two participants, and the arrows represent whether the connection is one-way or reciprocated. The circle sizes represent the number of connections each participant has, where the largest circles represent the participants with the most connections to others. The figures illustrate how the topic group with medium moderation shows strong centrality among several of its members (i.e., large circles), and less isolated participants (i.e. small dots on the edges of the network) than the topic group with high moderation.
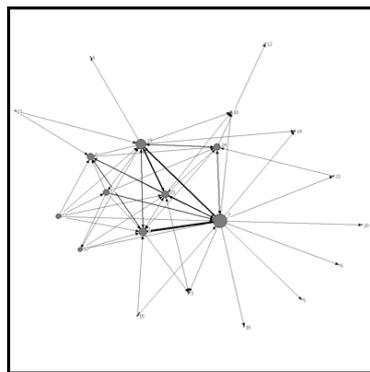
Figure 1. Interconnectedness in Low Moderation Group
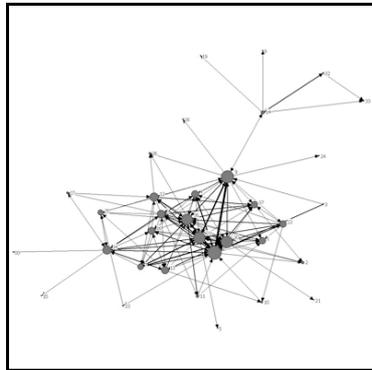
Figure 2. Interconnectedness in Medium Moderation Group
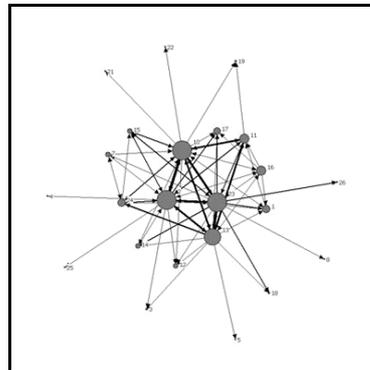
Figure 3. Interconnectedness in High Moderation Group

4.3 Polite and Task-Oriented Language

In order to examine the relationship between language use and moderation levels, we relied on a multiple regression analysis that included several variables from our hand-coded content analysis, and represented aspects of polite and task-oriented language use in all messages. The overall regression model was significant, where $F(7,1098) = 14.872$, $p<.001$, and these language variables explain 8.1% (adjusted $R^2 =.081$) of the variance in our dependent variable, moderation level.

The first finding was that participants in topic groups with higher adult moderation are more likely to apologize to others, as shown in Table 4. We believe this occurs because young people may want to appear 'nicer'

in the presence of adults, but it is also likely that these apologies come from regretting their lack of participation (i.e., "I'm sorry I haven't contributed lately…I had a big exam") in the group.

Our last hypothesis was that participants in topic groups with low moderation would demonstrate more task-oriented language, including asking for feedback, providing concrete solutions and delegating tasks to others. In fact, the more participants asked for feedback from others, the more likely they were to be in a topic group with low adult moderation. This supports our hypothesis and suggests that without a lot of adult moderation, young people are prone to ask for feedback themselves, and facilitate interaction independently. By contrast, however, it appears that participants presented more concrete solutions in topics groups with higher adult moderation. This contradicts our hypothesis, and may be the direct result of adult facilitation of decision-making in the Junior Summit project.

Table 4. Summary of Multiple Regression Analysis for Polite and Task-Oriented Language Use in Messages found in Topic Groups with Low, Medium and High Moderation (n=1101)

Variable	B	SE	β
Cooperation			
Thanking Others	.125	.123	.030
Apologies	.324	.107	.090**
Sharing Biographical Info	-.034	.059	-.017
Sharing Cultural Narratives	.106	.087	.035
Task-orientation			
Delegating Tasks to Others	-.102	.085	-.035
Offering Concrete Solutions	.229	.073	.092**
Asking for Feedback	-.529	.058	-.268***

Note: R^2 = .087; *p<.05, **p<.01 ***p<.001

5. Discussion and Conclusion

Based on these results, it is clear that the levels of moderation have an effect on participatory behavior in the online Junior Summit youth forums. More specifically, an adult's presence in an online community has both significantly positive and significantly negative effects on the level of participation, interconnectivity, and task oriented language of the youth.

First, we hypothesized that discussion aided by an adult may discourage participation. It was true that the low moderation group did post more mes-

sages, however these were the shortest messages; both medium and high moderation groups posted longer messages on average. We posit that these low moderation groups are more conversational, (i.e., messages that simply state "good idea!" or "I agree" are short, but still foster interactivity) while groups with more adult moderation tend to contribute more in terms of the sheer amount of words (i.e., longer posts with uninterrupted speech). This is also supported by our finding that the low moderated group had significantly more instances of asking for feedback. It is also supported by the network analysis showing distributed and highly collaborative community in the low moderation condition. These types of messages elicited a synchronous, discussion-oriented style of communication. We believe that although comparatively the low moderation group had lower average message lengths, the experience may have felt more spontaneous and fostered more open-ended collaboration. In sum, topic groups with low adult moderation demonstrate a higher frequency of posted messages, ask for feedback from peers more often, and represent a highly interconnected network structure, which could all be construed as aspects of a distinctly interactive community.

Topic groups with medium moderation, in which the moderator facilitates (but does not *control*) the conversation, seems to share many of these same benefits of low moderation, and add additional ones. Some adult facilitation appears to enhance interactivity, such as increasing the extent of the conversation (i.e., message length) or encouraging attention to task. For example, social network analysis revealed that interconnectivity, measured in terms of peer references, was greatest in the medium moderated group. This includes greeting one another, asking questions, providing feedback, and doing other important social and work related tasks. The medium moderation group also revealed a wider range of participants taking part in collaborative discussions more so than the low and high moderation groups. In short, the medium moderated group seems to have provided an atmosphere in which youth relied on one another for information and feedback, fostering more collaboration and interactivity. Therefore, in practice, online youth communities with medium levels of moderation may stimulate the most participation from their members.

This is an important factor when considering the design of interactive online youth communities. When youth see adults controlling discussions, they may feel less responsibility to provide framework and ideas for the discussion on their own. However, in this study, the participants did feel responsible to structure discussion on their own in the medium moderated topic group. In online communities, we believe that youth may be less likely to participate when a moderator is filling a highly involved role

similar to that of a teacher in a traditional classroom. With slight moderation, young people are more collaborative and give free responses within a structured discussion.

Peer collaboration is clearly important, and, the more inclusive the community, the more chance for this interaction to occur. In the design of online communities, we can look toward this medium moderated group as an environment that maximizes the ties connecting participants to each other. We argue that a fair amount of moderation not only allows for more participation, as shown in our first measure, but also helps to facilitate more connections among the participants. By contrast, topic groups with high adult moderation seem to create barriers to online interactivity and collaboration, or influence the natural behavior of adolescents online.

For example, we found that in the high moderation group, participants use apologetic language more so than in the other moderator conditions. What are some reasons that might motivate youth members of an online community to exchange social niceties of this sort? For one, it seems likely that in the presence of an adult, adolescents tend to model their behavior on adult social norms. Likewise, a desire to impress an authority figure may lead young people to apologize for not doing as much work in the forum as they think the adult wants. From this finding we infer that in a moderated context, the desire to receive approval from a highly regarded adult is important. Conversely, in an environment consisting of low and middle levels of moderation, polite language between peers occurred less frequently. These findings are important as we continue to explore the future impact of online moderation in the cognitive and social development of today's youth.

Depending on the goal of the community, the influence of heavy adult moderation is not necessarily negative. Increased levels of moderation appear to influence the completion of task-related work, such that topic groups with more adult moderation contributed greater amounts of concrete solutions in comparison to the low and middle moderated contexts. These findings demonstrate that the increased guidance and structure provided by a highly involved adult moderator may allow youth to adhere to their task-oriented roles as forum participants working toward a common goal. However, this accomplishment comes at some cost — it is clear from the participation and network analysis results that the increased number of concrete solutions are being proposed by a decreased number of participants. The high level of moderation may succeed in producing task-oriented solutions at the cost of unequal participation from online adolescents.

This points toward another important factor in the design of adolescent online communities. It is clear that one must establish the goals of community early on. Higher adult moderation can be successful at task solution or lesson completion, but it also create situations reminiscent of the old-fashioned classroom with the highly-involved students sitting at the front of the room. Medium moderation, on the other hand, creates a more distributed and collaborative environment, but it may result decentralization, shorter exchanges, and less attention to task. Although the data studied here was collected nearly 10 years ago, we believe that the identified behaviors of youth participants in online communities are fairly consistent over time, and thus still relevant today. In fact, we argue that these findings on moderation extend to adult online communities, in which highly moderated communities have the same influence on interactivity and equality of participation.

In this study, we have offered an initial exploration into the effects of adult moderation in online youth communities. We hope that our findings inspire future research on adult moderation, especially in educational and civic engagement interventions. We intend to continue to examine the role of adult moderators in youth online communities, comparing the results of this study to patterns that emerge in other topic groups characterized by different levels of moderation within the community. We also hope to repeat this study with other communities of young people that have different objectives than the Junior Summit did. Finally, we believe it is important to apply our findings to the design of new communities in order to test the applicability of our results and implications for community design and development.

6. Acknowledgements

7. References

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