

The Language of Online Intercultural Community Formation in Junior Summit '98

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1 Introduction

Almost paradoxically, technologies that allow people to communicate across great distances have allowed social scientists to make advances in understanding the construction and maintenance of community. In particular, information and communication technologies (ICTs) have provided a miraculous window into the processes of community formation when the community members are vastly different from one another along the axes of age, culture, economic benefits, language, and other dimensions that would hinder if not prohibit communication in the physical world. But to what extent do online groups really demonstrate the hallmarks of community: increasing identification with group goals, patterns of assimilation to the other community members, growing enjoyment of joint tasks – not just work but also play? And when a group of people from many different countries come together online at the same time to create their own new community, does one culture dominate or are the collective voices of different world regions distinguishable? Does the voice of the nation that designed the forum influence the nature of the communication among the participants? How do these variables change over time as the members of the community come to know one another?

We approach these questions through an investigation of the “Junior Summit '98”, an international online community that brought 3062 children from 139 countries online to discuss global issues. The participants, speaking many different languages and representing a wide variety of economic and cultural backgrounds, discussed and planned ways to make the world better using technology. In order to analyze the tens of thousands of messages of the forum, we employ a set of research tools borrowed from psychology and sociolinguistics, including word frequency, content analysis and in-depth interviewing, and applied them to this new online context. In this paper we discuss some of our results concerning the maintenance of separate cultural, age, and gender identities vs. their integration, by looking at how the different children presented themselves online.

2 The Junior Summit Online Youth Community

The Junior Summit's goal was to connect and empower motivated youth from around the world to make their voices heard on issues concerning young people. Eighty-thousand calls for participation, translated into 16 languages, were sent out worldwide to ministries of education, non-governmental organizations and schools, with the goal of attracting participants with a passion for changing the world. The instructions read: “If you will be between 10 and 16 years old ...we want to know how you see the state of children in your community and in the world, what changes you think can and should be brought about, and how these changes could be affected by the growth of the Internet and other new communication technologies.” Any format for entry was accepted, including a video or photographic essay, a musical piece, a drawing or painting, or an essay in their native language. There was no requirement that the children have used a computer or the internet previously.

Ultimately, the hosting institution, MIT, received over 8000 applications in 30 languages. With the help of international graduate students and faculty from across the campus, 1044 entries were chosen. Table 1 shows the countries with the greatest representation, both in terms of participants and messages those participants posted to the online forum.

[INSERT TABLE 1 ABOUT HERE]

The forum was neatly divided between boys and girls (55% of participants were female), and the ages of participants ranged from 10 to 16, with the majority of participants aged between 14 and 16 years old.

[INSERT TABLE 2 ABOUT HERE]

Once the 1044 winning entries were chosen, participants were contacted with instructions and a CD containing software to allow them to participate in the Junior Summit forum. In addition, 200 computers were distributed to schools or community centers around the world for the use of participants, and 500 Internet subscriptions were also given out. When neither of these options was appropriate, the young people were reimbursed for using web cafés. The forum was implemented as a simple mailing list with the option of participating either by e-mail or through a web interface. Server-side were 5 translation engines to translate messages into either English, Spanish, French, Portuguese or Chinese, as specified by each participant. These translation engines were modified versions of off-the-shelf software of the translation quality available in 1998, meaning that the output resembled *gisting* more than actual translation. To improve children's access to messages written in other languages, the participants were invited to translate messages for one another.

Important to the design of the summit was the philosophy that all participants be given equal access to the features of the forum, regardless of whether they were using a Pentium 4, or an Apple IIC¹. For example, even once chat was implemented, after several months, a system was put in place to relay chat messages to students with only e-mail access.

The main activities of the Junior Summit took place over a 3 month period. When the young people first logged on to the Junior Summit, they found themselves in homerooms, divided by geographic region. After four weeks, the participants suggested and voted on 20 topics to address, and divided themselves into those topic groups. After spending another two weeks in the topic groups, the participants elected two delegates per topic group to attend an in-person summit in Boston. An additional six weeks was spent in the topic groups, preparing for the summit, after which point the 100 delegates left to spend one week in Boston. At no point was there more than one adult participating in each online group, and those adult moderators were trained to keep their participation to the absolute minimum – dealing with technical issues, and questions about the structure of the program.

Some of the participants dropped out when they discovered that they had not been elected as delegates, and some dropped out after the in-person summit. Many stayed on for an additional 9 months however, and some are still participating in the Junior Summit – for example, writing an online newspaper that has survived for 5 years.

3 Previous Literature

Previous researchers have investigated how different alphabets are adapted for use in ICTs; for instance the way in which Arabic is transformed into roman characters in instant messaging (Palfreyman and Al-Khali, 2003). The use of difference languages on the Internet has also attracted attention, with researchers exploring how and why English continues to be the lingua franca of the Internet (Durham, 2003) as well as when machine translation can offer help support other languages and when it cannot (Climent et al, 2003). Several studies have looked at cross-cultural interactions using ICTs, though most of these have been limited to two cultures and using self-report as data. For example, Ma (1997) tested 5

¹ For more details about the design of the forum, see Cassell, 01.

propositions about culture and CMC through written reports and interviews with American and Asian university students who had participated in a relay chat system. Based on the self-report data, Ma argues that both East Asians and Americans were more direct in CMC than face-to-face communication; interestingly, he reports a discrepancy in self perceptions among the groups – even though East Asians thought of themselves as direct online, Americans still found them polite and reserved. Similar methods were employed by Meagher and Castanos (1997) in an attempt to look at how perceptions of Mexican and American culture are modified by participation in an online community. The authors measured changes in attitude towards one's own culture and the other culture using a questionnaire before and after a cross-cultural exchange. Transcripts were also referred to for supporting evidence, although no results from systematic coding were reported.

Research on language use in the physical world has shown that, as people get older, they use more positive emotion words, fewer negative emotion words, fewer first person singular self-references, more future tense, and less past tense verbs (Pennebaker, Mehl & Niederhoffer, 2003). People also show more cognitive complexity in their words as they age, using more causation (because, effect) and insight words (think, know, consider). Differences in the way women and men present themselves verbally has been the subject of much scientific debate, although little consensus. Lakoff (1975) argued that women speak in a less assertive manner evidenced by a greater degree of politeness, more hedges and intensifiers, and more “tag questions”. In contrast, men are purported to be briefer, more direct and less emotional in their choice of words. More recently, Eckert and McConnell-Ginet (1992) have looked at gendered ways of speaking as arising from intersections of class, race, gender and particular discursive contexts.

The standard for analyses of language use online comes from Herring (1997), who looked at one female-dominated and one male-dominated listserv. She found that both men and women structure their messages so the exchange of views is paramount to imparting information. Although messages posted by women are more interactive, they also contain more information while men tend to express their views (often critically) more often. Her research further suggests that the minority gender on each listserv conforms to the style of the majority. Panyamethekul and Herring (2003) extended this research to look at the interaction between gender and culture. In their analysis of turn-taking in a Thai chat room they found patterns of interaction unlike those found in previous literature, which focused on predominately Western online communities. Thai females both participated more often than males and received more feedback to their messages, contradicting common expectations about the roles of women in Thai society, and the role of women online.

Much research on online communities has been aimed at educational outcomes. Particularly relevant work has been done by Rourke et al, (2001) on "social presence," in their view, a necessary feature of a successful online learning community. Rourke et al (2001) measure social presence using three types of communicative responses: interactive responses, affective responses and cohesive responses. To date the research has focused on development and testing of the coding tool. Jones (1997) presents an archeological approach to studying online communities, arguing that the cultural artifacts and physical traces created by a community can be examined to see if they fit the requirements of a true community, for which he sets forth four conditions: (1) a virtual common-public-space where a significant portion of interactive group-CMCs occur; (2) a variety of communicators; (3) a minimum level of sustained stable membership; and (4) a minimum level of interactivity. Another methodological approach comes from Herring (2003) who outlines an approach for the empirical analysis of on-line verbal interaction. She places an emphasis on the allied use of qualitative and quantitative language-focused content-analysis, and describes a range of techniques that can be adapted to different research questions. Content analysis has been employed since the 1950s, and was extensively employed by Flanders (1970) and Sinclair and Coulthard (1975) to study patterns of verbal interactions between teachers and students in the classroom. One of the problems reported by researchers using these observational tools is the labor required to

transcribe real-time, face-to-face interactions, the labor required to develop bottom-up (non-a-priori) coding schema, and the time and energy required to code the transcripts.

Although debates about children on the Internet rage in the popular media, few studies have shown conclusive findings about the relationship between children's use of ICT's and social and psychological outcomes. The famous Internet Paradox study (Kraut et al., 1998) initially demonstrated adverse psychological effects of Internet use -- greater loneliness and depression with greater Internet use -- but these effects disappeared with time. Reviews of the literature on social outcomes and ICT use among children shows few documented social effects, either positive or negative (Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay, & Scherlis, 1998; Kraut, Kiesler, Becker, 2000; Subrahmanyam, Kraut, Greenfield & Gross, 2000 Boneva, Cummings, Helgeson, & Crawford, 2002), leaving both a lacuna and a serious need for studies that address the effects of participating in online communities such as the Junior Summit.

4 Methods

The data sets that comprise the Junior Summit are of three types: (1) messages posted to the online forum for the period September 1998-September 2003; (2) in-depth interviews about the effects of the Junior Summit conducted with eighty participants from 20 countries 5 years after the Summit began; (3) questionnaires on socio-psychological variables filled out by the same eighty of the children 5 years after the summit began. In this article, we discuss results from analyses carried out on a subset of this huge data set: (A) all of the messages posted by those children who participated independently (as opposed to as a part of a large group of children) and who chose English as their primary language of communication over a three month period; (B) in-depth interviews with 37 children in 17 countries.

4.1 Word Count Use over Time

As discussed by Pennebaker, Francis, & Booth, 2001, word frequency can be a powerful tool in understanding the psychological and sociological profiles of individuals and communities. Publicly available software based on Pennebaker et al.'s Linguistic Inquiry Word Count technique, analyzes text files on a word-by-word basis by comparing each word in a given file to words in an internal dictionary representing a variety of different psychological or linguistic dimensions. The categories include basic linguistic measures such as frequency of nouns, pronouns, and articles as well as more complex ones that tap into psychological processes, such as linguistic measures of anxiety and sadness. In this way, LIWC provides a fairly straightforward index of how individuals use language, in a way that may serve as a marker of a wide variety of individual differences and commonalities, including demographics and personality.

The data set we used for the LIWC analysis includes all the messages posted in the first three months of the forum by individual participants who chose to write in English, amounting to a total of 18,785 messages. It includes children from every region of the world. In this sample, girls wrote 62% (11,630) of the total messages while boys accounted for 38% (7150). Our analysis employed most, though not all of the LIWC categories, and we also added several of our own, including hedges, WH questions, apologies. Examples of LIWC categories that we will discuss here include first person singular and plural pronouns, negations, assent, positive emotion, family, money and reference to the future tense. In order to look at changes in the LIWC features over time, each feature was standardized by time period and participant. For example, one of the features in the LIWC set is "first person plural pronouns" which includes 'we', 'our', 'us'. etc. For the "we" feature we created a score for each participant by taking the total number of "we" words used in each period and dividing it by the total number of words written in each period for that user. This gave us a feature density for each participant in each time period. Next, we calculated the mean of this new "density" variable, and normalized it to one by dividing it by its mean so that the mean for each feature is always one. We refer to this value as a "normalized feature score" (NFS). The NFS allows us to quickly determine if a time period or a sub-sample of the population is

above or below mean, and to track changes over time. Thus, for example, if children from Southeast Asia have a “we” score of 1.07 NFS, we know that they speak in the collective voice more than the general population; we then look at standard deviations and other aspects of the data to determine if that difference is significant.

4.2 A More Content-Oriented Approach

The LIWC is capable of capturing many aspects of an individual’s writing style, but only those that can be explored through the frequency of particular lexical items or groups of words. Thus, in addition to LIWC analyses, we also used a methodology that allowed us to concentrate on the content of the participants’ messages. For example, categories such as “giving feedback on an idea” cannot be captured through analyses of single words, but is an important index of community involvement. Our content analyses, therefore addressed questions such as how the children proposed new ideas, whether they gave feedback to one another, and the nature of their feedback.

No previous work captured the granularity we hoped to achieve with our analysis, and thus after looking at work by Bales, 1951; Henri, 1997; Herring, 1996; Rafaeli and Sudweeks, 1997; Rourke, Anderson, Garrison and Archer, 2001, we ultimately developed our own codebook. Using a Grounded Theory–inspired methodology (Strauss and Corbin, 1994), in which codes are *inductively* derived from the study of the phenomenon represented, we developed a 34-feature codebook to capture the ways in which participants express ideas, give feedback to peers, and present themselves online.

The codes fall into two general categories: (1) “informative”-- meaning that the utterance conveys information, and is able to stand on its own, as in the case of an idea or an opinion; and (2) “interactive” or “interpersonal” -- meaning that the utterance is in some way a response to the contribution of another writer (Rafaeli and Sudweeks, 1997).

Informative: present solution, present extensive solution, provide global knowledge, express strong opinion, express opinion with hedging, share personal narrative, share biographical information, synthesize

Interactive or interpersonal: agree, agree add ideas, disagree, counterpoint, acknowledge input, ask for information, invite feedback about an idea, thank, offer advice, sympathize, humor, express disappointment, delegate work to the group, rally cry, negative rally cry, volunteer

Listed below are three examples of the categories in the codebook we developed, along with their definitions and examples. The first two are examples of *informative* codes, while the third is an example of an *interactive* category.

- **PNAR** Share personal narrative
Tell a story or provide personal experience, knowledge directly related to the topic
Ex. “I know quite a few people who say education is boring and expensive”, “We have to sing a song called 'KIMIGAYO', a kind of national anthem.”
- **BIO** Share biographical information
Offer personal information not related to task about themselves (1-3 sentences)
Ex. "I like to fish." "I love to listen to Metallica." "As you may know I have been fasting.”
- **AG+** Agree and add ideas
Agree with or praise someone’s ideas and add one’s own idea(s) to that of peer
Ex. “I agree about your plan. And I also think we could raise money by ...”

Since the content coding was done by hand, and is therefore far more time-intensive, this round of coding was carried out on a subset of the data: that is, the complete set of messages posted by 36 users who represent a spread of geographical representation and level of participation in the program (as measured by how many messages they posted). These participants come from 15 different countries and include 23 girls and 13 boys. The number of messages analyzed using the content analysis codebook totals 4377.

It is clear that an analysis of 36 children's messages will not allow us to examine regional differences, but it does allow us to look at community formation in a more detailed way. To make up for the smaller number of messages, and in order to look at the effects of particular events in the Junior Summit on community formation, we divided the summit into six 2-week periods for our application of content analysis, as shown in Table 3.

[INSERT TABLE 3 ABOUT HERE]

4.3 Coding Reliability

Inter-rater reliability was assessed for team of three coders, and kappa scores were calculated. The kappa score of the individual codes (from example, BIO or PNAR) ranged from 0.22 to 1.0 with a mean and mode of 0.66. Codes that had low inter-rater reliability, or were very infrequent, were omitted from analysis (eg the code for 'express sympathy'). Only five out of the 32 codes used had kappa scores below 0.5.

5 Results

In what follows we first look at a number of indices of group formation, using both the word frequency and content analysis approaches to our data. We then turn to our interviews with the participants five years after the forum to discover their own perspective on how and whether the Junior Summit participants became a community. After discussing community convergence, we then turn to divergence: differences by region, age, and gender, as well as questions of mutual influence. Finally we address some of the ramifications of the influence of one culture on another, before concluding with more general remarks on the general lessons to be drawn from our results.

5.1 Cross-Cultural Community Formation

As described above, several studies have examined community behavior online, but none have looked at communities as geographically diverse as the Junior Summit. Our first analyses therefore concern whether the Junior Summit participants showed any signs of acting as a single community. In this context we first look at the most basic marker of group vs. individual identification, and that is the use of "we" vs. "I". The choice of pronouns gives us one very simple index of community identification; a more complex and ultimately more interesting index comes from the choice of topics over the course of the first 3 months of the Junior Summit. Did the participants converge on a finite set of topics, or did their conversations deal with all and every subject possible? We also examine whether the Junior Summit took on an identity of its own as a program, in terms of how topics changed over the first 3 months. And we end this section by looking at the children's own perceptions of the value of community membership.

5.1.1 Personal pronoun use as a signifier of community

To see if a group identity emerged among the participants, we first examined the use of personal pronouns over time, hypothesizing that if the Junior Summit was merely a gathering of individuals and not a true community, then there would be no change in participants' use of individual and collective pronouns throughout the three month period.

In effect, as time wore on over the first 12 weeks of the forum, children decreased references to themselves as individuals, and increasingly spoke with a collective voice – they used “I” less and “we” more. More specifically, “we” words (lets, let's, our, ours, ourselves, us, we, we'd, we'll, we're, we've) increased by 16% from period 1 (0.81 NFS) to period 2 (0.94 NFS) -- that is from the first two weeks to the second two, and by another 7% over the following two weeks until period 3 (1.04 NFS). The “we” feature reached a final peak in the 6th time period at 1.25 NFS. The data points and regression line are plotted in Figure 1. (We: coef= 0.0425; std. error= .0054; t= 7.79; p<0.000 [CI] = -0.0318-0.0531)

Conversely, a regression analysis of the use of “I” words (I, I'd, I'll, I'm, I've, me, mine, my, myself), showed a significant decrease over time (I: coef = -0.0159; std. error= .0020; t= -7.89; p<0.000 [CI] = -0.0199-0.0120). By looking more closely at the data points plotted in the graph, we find that there was a significant decrease by 4% between the first (1.07 NFS) and second time periods (1.03 NFS), and then again by 5% between the second (1.03 NFS) and third time periods (0.98). First person singular pronouns hit their nadir in the 6th period at 0.9 NFS (See figure 2).

[INSERT Figure 1 and Figure 2 ABOUT HERE]

In addition to demonstrating individual versus group identity (I vs. we), pronouns are thought to be indicative of people’s level of focus or involvement with others (Pennebaker, Mehl, & Niederhoffer, 2003). It has also been found that people decrease their use of “I” and increase their use of “we” in periods of shared trauma (Stone and Pennebaker, 2002)). In one study of personal pronouns in an online chat room before and following the death of Princess Diana, researchers found that after Diana’s death, the use of 1st person plural increased by 135% and the use of “I” dropped by 12%. The effect lasted ten days before pronoun use returned to normal. As opposed to a shared trauma, the Junior Summit may represent a shared joy, in which participants feel closer to each other, and more involved as a result of taking part in the program.

[INSERT Figure 3 and Figure 4 ABOUT HERE]

An analysis of the use of WH questions (who, where, what . . .) also shows significant change, increasing over the course of the Junior Summit forum (**WH questions** - coef = 0.0494; std. error= .010; t= 4.98; p<0.000 [CI] = 0.0300-0.0689). Likewise, talk about the future shows a similar increase from the homeroom stage to the point where 100 of the participants leave for Cambridge (**Future** coef = 0.0341; std. error= .0060; t= 5.60; p<0.000 [CI] = 0.0021-0.0460). One might expect that WH questions and references to the future would start off strong as the young people asked questions about one another and about their individual goals for the future. The fact that the pattern is the opposite, however, seems to indicate that these questions and references to the future concern the goals of the Junior Summit, rather than their individual lives. Thus, as the forum continues, the children become increasingly active and goal-oriented members of a Junior Summit community.

5.1.2 Topics of conversation as a signifier of community

Whereas the previous analysis relied on word frequency to establish the fact of a Junior Summit community, below we use our analysis of the content of the children’s posts to look at *how* the community took shape. As described above, for the purposes of this analysis we divided the first 3 months into time periods. Here we look at each of these months in turn, and find that each can be characterized in terms of the nature of the exchange among the participants.

5.1.2.1 Time1 - Time2: Information exchange

In their first month online, (T1-T2), the children introduced themselves and started raising ideas for problems to work on during the forum. They voiced opinions about issues and supported them with stories from their own experiences (what we refer to as “personal narratives”) or information learned from outside sources (“global knowledge”). Most of the forms of communication that dominate this period are informative as opposed to interpersonal in that they do not directly respond to another person. Interestingly, all of the features of communication that peak in the first month, including opinion, solution, personal narrative and global knowledge, then follow a similar pattern in showing significant decreases in frequency over the next five periods ($p < 0.05$).

Below are graphs showing the frequency over time with which children gave ideas supported with global knowledge (GK) and gave opinions about topics (OP). As can be seen, it is during the first month that children engaged in a veritable deluge of information sharing.

[INSERT Figure 5 AND Figure 6 ABOUT HERE]

Although this period of time was dominated by information-based communication, there is evidence to suggest that the children were also learning *how* to converse with each other across cultural boundaries. For example, both straightforward objections to another person’s idea (“I don’t think that is a good way to go”) as well as more diplomatically stated differences of opinion in which children first praise an idea and then criticize it (“That is a nice thought, but wouldn’t it be better if...”) diminished after time 2 (Disagree: $F(4616,5) = 3.95$ $p < 0.001$; Counterpoint: $F(4616,5) = 7.22$ $p < 0.000$). Meanwhile, positive feedback began to rise, and was the most frequent sort of feedback after time 3 (Agree: $F(4616,5) = 7.26$ $p < 0.000$).

In addition, during this early period of the summit, and not surprisingly, the children were also interacting and getting to know each other on a personal level. Thus, one other characteristic of the first two weeks of the forum was a discussion of children’s personal lives. For example, when they first came online, children spent a message or two telling their fellow participants about where they came from and what they liked doing. The underlined section of the following message is an example:

Namaste!Hi!!I am Deepak from Bombay (India) . I study in Rajhans School. My hobbies are collecting old coins and making electronic projects . I feel strongly against the exploitation of children and feel great that I am given an opportunity to combat this menace. I would feel great if you would send a reply . Bye!

However, while it is commonly thought that online communities, particularly for young people, are primarily based around this kind of small talk, chat about personal lives and other non-task related common ground (politics, movies) in order to bond or become committed to a group, our data suggests otherwise. The amount of time spent discussing personal affairs started high during the first week but immediately began dropping rapidly until the very last two weeks, T6, when some of the participants were in Boston. In fact, these results accord with more recent research suggesting that social messages can interfere with work or learning in online communities (Rourke & Anderson, 2002)).

[INSERT Figure 7 ABOUT HERE]

[INSERT Table 4 ABOUT HERE]

5.1.2.2 Time3 - Time4: Interaction

More messages were posted during the times 3 and 4 (the second of three months online) than during any other time, and this period also demonstrated the most interactive exchanges between participants. Whereas in the first two periods, children spent their time suggesting novel ideas or solutions, in the second period they primarily modified each other's ideas, further developing their plans and working collectively. As noted above, negative feedback or disagreements appear rarely during this period, replaced instead with abundant positive feedback and appreciation for one another's opinion. The participants also requested feedback from one another frequently, implying that the children had begun to take each other's opinions into account. In addition, rallying cries to the group were common during T3 and T4, signifying a need for the group to act together, and a commitment to one another. Some of this positive energy may also have served as a way of garnering support by making apparent their dedication to the community – note that voting for delegates to travel to Boston took place at the end of T3 and that delegates were announced at the beginning of T4.

4.1.2.3 Time5 - Time6: Planning for the real world

After delegates to Boston were announced, each topic group was tasked with creating an action plan, and as we see in Figure 8, we find that discussion of the action plan and delegating work to one another go hand-in-hand, during the fourth and fifth periods. In this third month online, the children not only delegate to one another but also volunteer for tasks themselves – including offering to build a website for the group or write a wrap-up report on the discussions of the past week. This introduction of action into a forum that has primarily been about talk supports the interpretation that the community has cohered to the point where the assignment of roles – to one another and to oneself – has become possible. The increased use of rallying cries over time also suggests that by time 5 and 6 there was something to rally around.

[INSERT Figure 8 AND Figure 9 ABOUT HERE]

Finally, one other code that supports the notion of increased community coherence based on action is the use of apologies, which rose steadily from T1 to T6 (Apologies: $F(4,616,5)=5.00$; $p<.000$). Apologies usually took the form of “sorry I haven't written in 2 days”. It seems one would need to feel sufficiently invested in a project in order to apologize for being missing from it.

A community has indeed therefore been constructed. In this context, if the first stage of a community formation is speaking as a collective voice (we instead of I), and the second stage is marked by interactive patterns of conversation (giving feedback or responding to each other's ideas), we might say that the third level of commitment to a forum occurs when children start volunteering for tasks in the real world, outside the online community.

5.1.3 Participants' views of community formation

Five years after the start of the online forum, extensive follow-up interviews were conducted with a sample of the original participants. The interviews employed a standardized protocol relying on a set of open-ended questions, and the interviews lasted between two and four hours. Transcripts from the interviews were transcribed and coded for common themes. Ultimately, a codebook containing 245 codes, capturing participants' impressions and experiences with the Junior Summit, was created using the children's own words. The data below comes from 37 interviews (24 girls and 13 boys) in 17 countries.

So as not to put words in the participants' mouths, the interview protocol didn't contain any direct questions about community formation or intercultural communication, but these ideas emerged when interviewees talked about how their attitudes had changed because of the Junior Summit and the benefits they felt they received.

In general terms, interviewees referred to the Junior Summit as a “big extended family” that was “united”

and that made them feel like “we were in a massive global network of people all around the world.”

Motivated by the group

One issue that was addressed during the interview was whether participants “felt heard” on the online forum, and by whom. The overwhelming majority of those interviewed said they felt their peers were listening to them. For those children who said they didn’t feel heard, the main reasons cited related to adults in the world not providing adequate feedback or take-up of their ideas. For example, one participant from Nepal was bothered when he found out that the ideas presented by the children at the in-person conference had not been implemented by governments around the world. Another participant from Botswana was disappointed by the response she got from her school when she presented a Junior Summit idea to her headmaster, who discouraged her from carrying it out.

Within the context of the online forum, however, most of the children felt like they were listening to each other and being heard:

“I guess, [can’t think of an] email [I sent], and didn’t get some sort of reply to. That sort of showed that someone was out there reading them and listening to what I was saying and so that no matter what you said, someone would come back with something about that subject, so you could tell that they really were listening.” (Girl, Australia)

The community that was constructed seemed to empower the participants.

“I mean I felt really powerful. I felt we could do, I mean I couldn’t do anything by myself at all but with people, with everyone there like with the help of adults but with all the good will that was there, with this great environment and this all this tech instrument we could do anything.” (Boy, Mexico)

As one delegate from Morocco put it, “Well, the summit made it easier to change the world, obviously, because we had 3,000 kids supporting us, you know. We’re going to do it, and we felt like our voices were louder.”

“...You know, the most important part in where I found my motivation in all this, or encouragement was to look at other young people in different countries doing so much more for their society and then looking back over here and seeing that, oh, the youngsters here are not really interested in doing things, you know? So, that was where I got my inspiration. OK, if someone in U.S. can do something, as amazing as this, or someone in Nigeria can do something like this, then why can’t I not do that in my society over here where I need to do it. That was the most important, or inspirational part in motivating part which I got out of it, and why I kept on doing what I wanted to do for the society. (Girl, India)

What did they really get out of the Junior Summit?

At the end of the interviews, children were asked “what did you really get out of the program?” and the most common responses were that they made friends (14) and became more open to other cultures (14). These two were far more frequent than the other benefits mentioned, such as that they received free stuff, won trips to Boston or learned about the Internet, though for some participants, they were connected.

Friends

Twenty-three of the thirty seven young people interviewed reported making real friends during the Junior Summit while only eight said no. Many of the friendships formed at the Junior Summit have lasted until today. In some cases, those bonds replaced relationships missing from local environments.

“I suppose Junior Summit was really an amazing experience in meeting a whole bunch of people who

were very much like myself in some respects, and ...So it was a great, and that also continued on, like those friendships continued on for like three years and were a significant part of my life for those next three years or four years, and still are today, in some respects. I suppose, to reflect on this a bit more, ...[in] grade 10, there weren't like as many of my friends in my school anymore, so to some extent, for about a year, like the junior summit friends almost became my friends, for like, well, didn't really become my friends, but they filled a gap that I had for like a year, and I think that that kind of dropped away as [. . .] within a year of junior summit, but it was a good oppor-, like a good timing, to some extent, for me.

In many cases, the friendships moved offline. A participant from Malta explained her relationship with a girl from Argentina by saying: "Even though we never met, we only saw each other, we never even phoned each other or heard our voices or anything, but we sent a lot of pictures to each other. ...once, [I] didn't have Internet for a couple of months. I had no Internet subscription. I didn't pay for it. And because she didn't hear from me she was really panicking, and I think she called me then...She panicked that something happened to me. And I was really amazed. I said, oh, she's a real friend."

Friendships from the Junior Summit extended not just offline but also beyond the children. In one instance, the mothers of two participants, one from Pakistan and one from India developed a friendship online, in an era when tensions between those two countries ran high.

Cross-cultural exchange

The sense of community also seemed to facilitate cross-cultural exchange. In fact, when asked if any of their personal attitudes changed as a result of the Junior Summit, the most common responses fell into the categories:

I am now able to . . .

"look at different perspectives" *8 responses*

"cross barriers and talk to people" *5 responses*

I became . . .

"more open minded" *7 responses*

"more tolerant/appreciative of diversity" *13 responses*

"wanted to address world problems, other cultures" *21*

"more aware of/wanted to do things in my community" *4*

...the whole thing was an experience to me that has opened my mind, you know, as in now, after the Summit, I did not have my perspective of things, but I had people's perspectives, people who were from the UAE, people from India and Mozambique, from everywhere. Girl, Botswana)

Many elaborated with comments about the fact that, although they lived in different environments, they felt similar to one another:

"... it helped to, to learn that even though we are far away physically, there are a lot of ways to unite and our ideas and that we are very lucky to be in an age where we have the tools to communicate so easily and that, that when we communicate, even though we are from different cultures, we have something that make us the same. If we are young, we have the same idea, and we have the same spirit. I learned that from the junior summit. I think everyone who has participated, that even though we have different languages, different cultures, we live in different communities and different countries are different, [. . .] are different, religions, we have the same spirit." (Boy, Argentina)

Finally, the most common skills interviewees reporting gaining from the program were all related to

communication. Fourteen reported learning how to use the Internet while eight discussed learning how to write and be understood. Three cited practicing their English as a skill learned.

Note that although the majority of the participants were quite positive about the value of the Junior Summit, they reported the major benefit derived as friendships . . . which might be considered to be of less importance ultimately than changing the voice of children in the world, or effecting global change on children's behalf.

5.2 Homogeneity or Diversity in the Community

The data, and the children's self-report, point to a cohesive online community. Thus far, however, we have not investigated the extent to which there were differences among the participants due to geographic origin, and whether these differences persevered over the course of the forum.

5.2.1 Regional differences

In order to investigate the differences between cultures, we divided the group into eight regions – Europe, the Middle East, Africa, East Asia, Southeast Asia, Central & South American and the Caribbean, North America and the Pacific Islands and conducted a stepwise regression analysis of a sample of the features from our modified LIWC list. The regression analysis included interaction terms between time period and region indicators so that each region has its own intercept and slope and we could compare each region to the others as time progressed. Europe was chosen as the reference group, as it was the largest, though this has no effect on the differences reported for each country division. The features chosen for the analysis are: singular and collective pronouns (we and I words), affect (words capturing all emotional processes), apologies, references to the future, hedges and 'WH' questions (who, what, where, etc.).

- **Personal pronouns:** The population trend showing that "we" words decrease and "I" words increase with time appears to hold true for each of the regions independently as well. That said there were some differences in the amount each region used the pronouns. A regression analysis showed that North American children used "we" words significantly less than the mean, and also increased their use at a rate slightly slower than their peers; meanwhile, children from Central and South America started at a lower point but increased at the same rate (I: coef (Europe) = 0.0463; std. error= .0056; t= 8.26; p<0.000 [CI] = 0.0353-0.0573). There were also some differences in the way regions used or stopped using singular first person pronouns. Pacific islanders and children from Central and South America and the Caribbean as well as North America, started out using "I" significantly less than the mean and decreased in parallel with the general population. In contrast, Asia used "I" words significantly more than the mean, starting at a higher point and then decreasing their usage at a faster rate than the others. (I: coef (Europe) = -0.0132; std. error= .0021; t= -6.21; p<0.000 [CI] = 0.0174-0.009)
- **Affect:** Use of emotional language increased over the forum. The Middle East, Asia and Southeast Asia, however, used significantly more of this kind of language than their peers.
- As described earlier, **Apologies** increased over time. Children from Asia, however, increased their use of apologies more rapidly than the others.
- **Future:** There were no regional differences in the amount children used references to the future although, as reported above, all groups increased use over time.
- **Hedges:** Middle Eastern participants used significant more hedges initially than did other children, while children from Africa and Central/South America/Caribbean used fewer initially than the others.

- As reported above, the use of **WH questions** increased with time. The Pacific Islands and Africa however, stayed at a higher level of WH question use than the others while the Middle East used these terms less frequently. In addition, the Middle East and North America increased more rapidly in their WH questioning than the others.

Each of these results could form the topic of an entire research investigation into patterns of language use among young people from different countries. Here, however, it is the general fact of differences that interests us. First of all because this is the first report, to our knowledge, of the use of word frequency data to characterize differences in online language use among participants from different countries, and secondly, and more importantly for our purposes, because it becomes clear that each culture was able to maintain characteristics of individuality and culturality in the midst of abundant evidence of the formation of a tightly-knit and cohesive community.

5.2.2 Mutual Influence

Tracking the differences between regions over time also allows us to look at how the groups interrelate. We were interested to find out if the different country groups converged, diverged or operated independently over time. We found they did all three and sometimes concurrently, depending on the feature. Convergence and divergence were measured by subtracting the differences between regions at the end of the six periods from the differences observed at the start to determine if they were meaningful.

Convergence: singular first person pronouns

The community showed important convergence in their use of I words over time. Children from the Pacific Islands, North America, Central and South America & the Caribbean all started significantly below mean and decreased at a constant rate while East Asia, which started out at higher use of “I” words, decreased faster than the other regions and converged with the remainder of the population.

[INSERT Figure 10 ABOUT HERE]

Divergence: apologies and collective first-person pronouns

Within the sample of features concerning community formation, children showed diverging use of two – apologies and first person pronouns. As corroborated by the manual-coded data, the amount children apologized increased over time. Within the group though, children from East Asia increased at a faster rate than the rest and so diverged from all the rest of the regions. In the case of “we” words, on the other hand, it was children from North America who diverged from the rest of the population, as their rate of increase was significantly slower than that of the rest of the population.

Convergence and divergence: WH questions

The total usage of WH-questions increased over time. Within the community, children from the Pacific Islands and Africa asked more WH questions than the others and from the Middle East asked fewer. In addition, the Middle East and North America also increased faster in their questioning than the others. North America diverged with all groups except the Middle East, with whom it converges. The Middle East converges with all the others as well – Africa, Asia, Southeast Asia, Central and South Americas and Caribbean and the Pacific Islands.

One index of divergence comes not from the presence of a feature, but from its absence. Although we coded for humor, it rarely turned up as children almost never told jokes or engaged in teasing. One participant explained this to us in her interview by saying that whereas she frequently used humor in her letters to the group early on, she soon realized that the group perceived what she meant to be sarcasm as

truth, and as a result, she was confusing and alienating her peers. She said she quickly stopped joking, and only started again once she met people at the in-person conference. Towards the very end of the forum, after the in-person Summit, use of humor spikes, perhaps indicating that common ground has been established between the participants, allowing them to try more casual forms of communication.

Another noticeably absent feature from this international forum was flaming. Although they may have disagreed with each other and on occasion engaged in argument, (Cassell, 2001), conflict remained at the level of topics and never entered a personal arena.

[INSERT Figure 11 ABOUT HERE]

5.3 Regional Dominance

In order to investigate how one group might have influenced the others, we compared how changes within regions from each time period to the next affected the whole groups' progress in the following two periods. To do this, we examined the change in a feature between T1 and T2 for children from each region and then checked to see what happened to that same feature in the total population between T2 and T3. The region that was most closely associated with the entire group in the subsequent time period was labeled the "leading group".

Table 5 shows which region led the group for each feature in each time period. Looking at "affect" for example, what the overall group did between T2 and T3 was best predicted by what the children from the Middle East did between T1 and T2. The Middle East was then replaced as the leading group in the next period, T3-T4, by the children from the Central and South America and Caribbean group.

As evident from the chart below, different "leading groups" appeared for each time period in the eight features under examination. However if we look at who led each feature, we see evidence to suggest that that the group of children from Central and South America & the Caribbean led the way for the rest of the children in their use of both the singular and plural first person pronouns. In three out of four of the time period changes, this region preceded the larger population in both decreasing their use of "I" words and increasing their use of "we" words. No other region showed as much dominance over a group's use of a feature.

[INSERT Table 5 ABOUT HERE]

Another issue involving regional dominance concerns the role of English in the Junior Summit. Although automatic language translation was implemented for five languages – English, Spanish, French, Portuguese, Chinese – the vast majority of messages were written in English. For participants who had the option of conversing in their native language or English, many started in a local language and then switched. Many interpretations are possible. Many of the children chose to write in English from the outset because it was an easy second language (as was the case for participants from India, for example). Certainly English is cited as the most widely-used language in inter-language situations.

Follow-up interviews with participants provided further explanation for the use of English in the forum: The most common reason reported was because the participants wanted to practice their English. In fact, "improving English skills" emerged as one of the more common benefits participants cited from the program. Other interviewees reported switching to English because most of the conversation was taking place in English. From the chart below, it is apparent that as time wore on, participants write increasingly in English. During the first month online (T1 –T2) 84% of the total messages were written in English while during the next two months it was 90% and 91% respectively.

[INSERT Table 6 ABOUT HERE]

Frustrations about language use were also reported by seven of the interviewees. Several participants mentioned struggles they had or watched others have with the language translation mechanism. Two reported switching from Spanish to English in order to be better understood, though that didn't always solve the problem:

“Sometimes I didn't understand what some kids wanted to say because it was too difficult. If you think about, it's another language and besides the other kid maybe also writes bad because he doesn't know English well.” (Girl, Argentina)

Two other interviewees told stories of trying to understand children from China and having a very difficult time at it. An Indian boy explained what would happen when “we were talking of something and Jin would have a problem comprehending, and he would shoot off a comment which is tangential from what our discussion was going on.”

6 Conclusions

Word frequency features of the kind we describe have been found to be reliable predictors of demographic variables such as age and gender. Until now, however, little if any research has examined geographic differences. Here we have used word frequency and content analyses to discover the ways in which young people from very different cultural, linguistic, and socio-economic backgrounds increasingly referred to themselves as a community, speaking in the collective voice, and concurring on the topics of conversation, the goals of the community and their strategies for achieving them.

Research online and off suggests that we match our words to those of our conversation partners. A number of researchers have examined how participants in conversation exhibit language synchrony or entrainment on the conversational level, turn-by-turn level and level of lexical items (Brennan, 1996; Niederhoffer, and Pennebaker, 2002). We also demonstrated significant convergence in and mutual influence over language use during the first three months of the online forum that these young people were a part of. Interestingly, as the community came together as one, the participants reported that their appreciation for diversity, ability to see different perspectives, and their positive reactions to one another increased, and they began to see each other as friends, and to care about what was happening in the parts of the world that their new friends came from.

Of course convergence of the sort illustrated here could be perceived as an essential part of the formation of a new international community or an index of the loss of local culture. Our analyses demonstrate that despite their increasing consensus, the children of the Junior Summit still demonstrated diversity in their local patterns of language use. The meaning of the particular differences in the use of WH questions, hedges and other linguistic features is beyond the scope of the current work. Here we hope to have shown that the field of online intercultural communication and community formation is a fruitful one, and that one same community can illustrate convergence, divergence, and constancy in conversational style and interaction.

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FIGURES AND TABLES (Eleven figures and six tables)

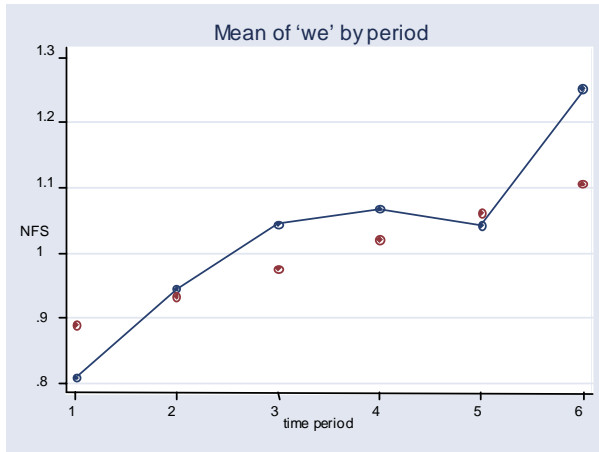


Figure 1. Collective first person pronouns

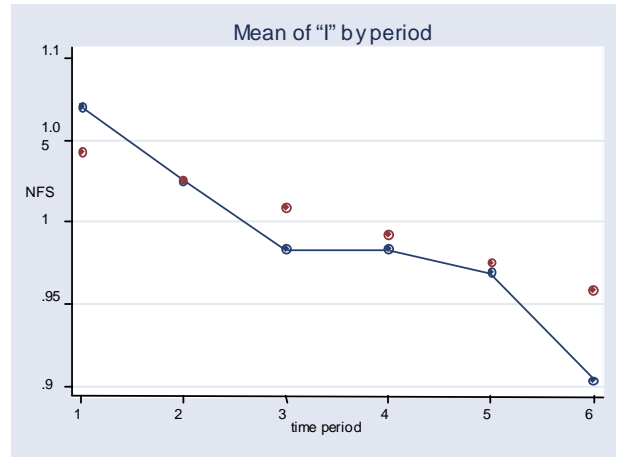


Figure 2. Singular first person pronouns

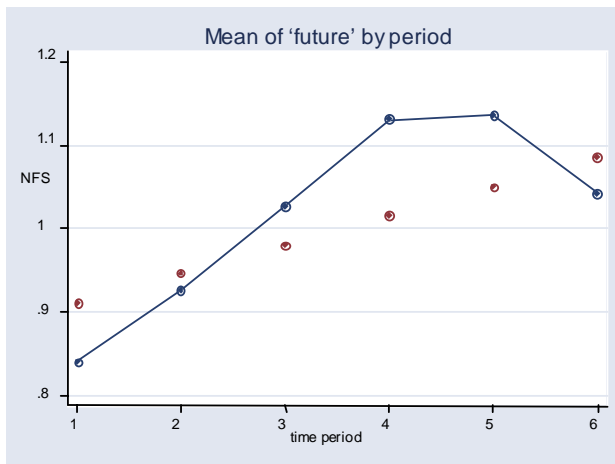


Figure 3. Future words

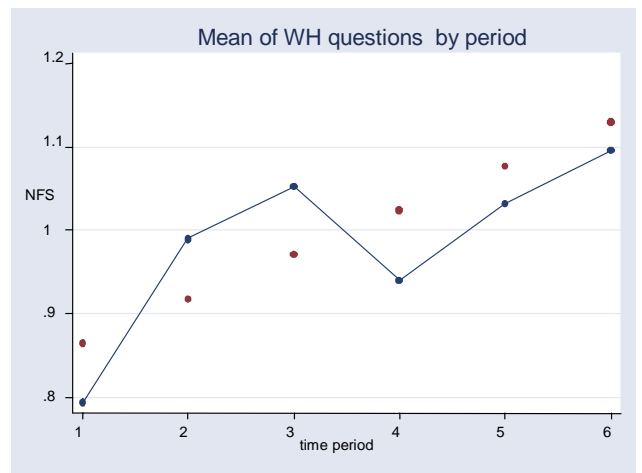


Figure 4. Wh questions

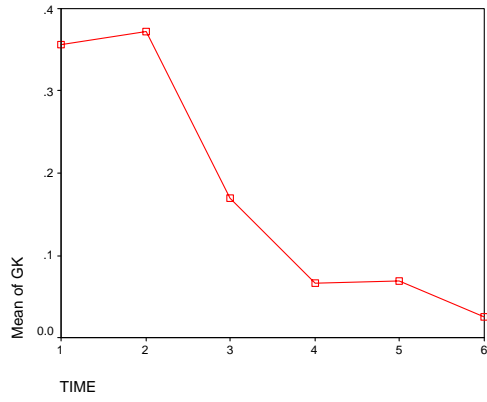


Figure 5. Global knowledge

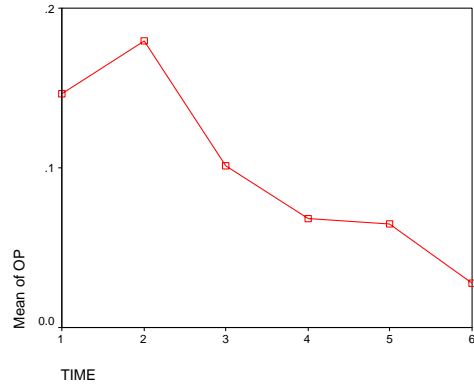


Figure 6. Opinion

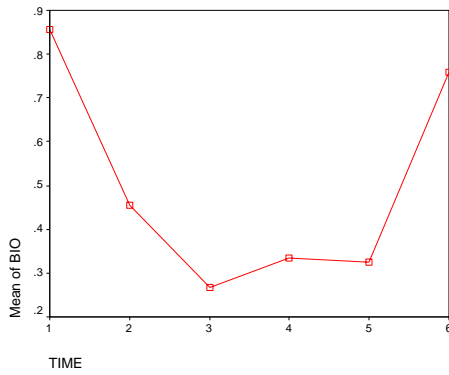


Figure 7. Biographic information.

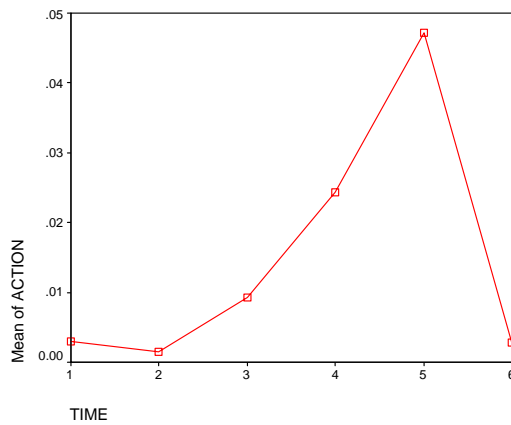


Figure 8. Action plan

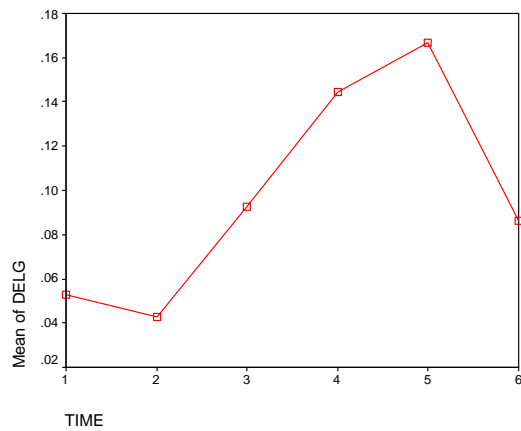


Figure 9. Delegate

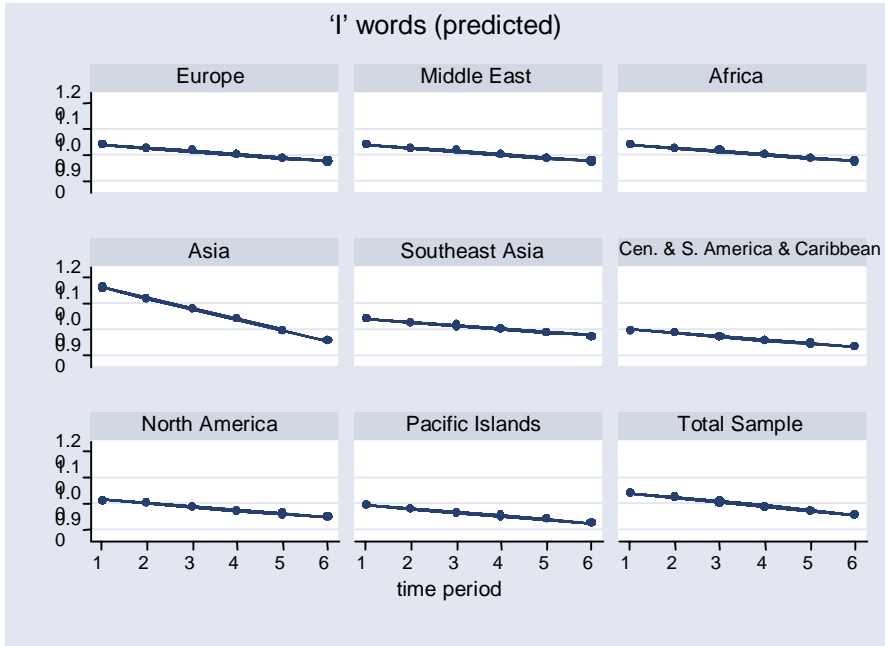


Figure10. Singular first-person pronouns by region

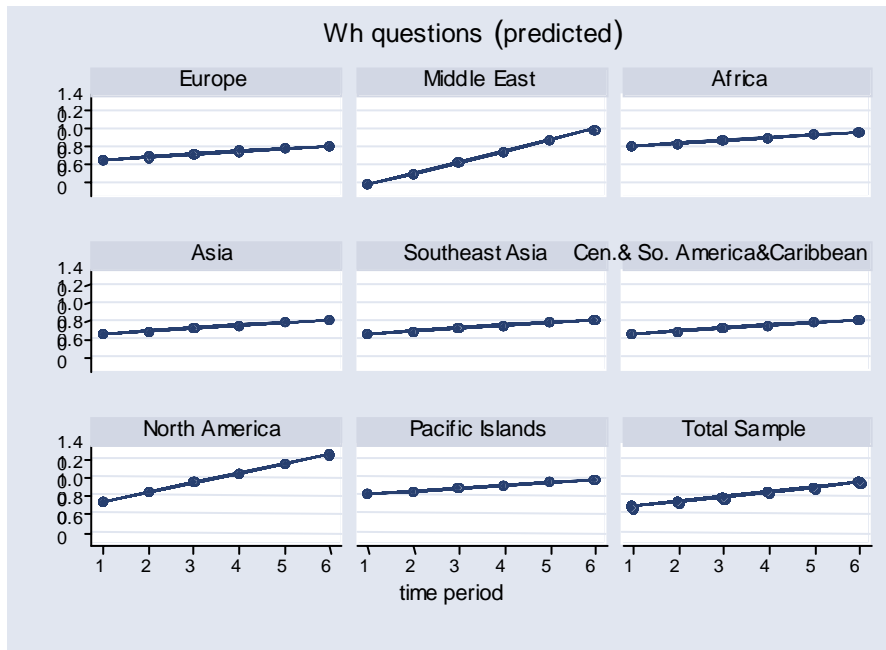


Figure11. WH questions by region

Table 1. Countries, children, and posts.

COUNTRY	# CHILDREN	# POSTS	COUNTRY	# CHILDREN	# POSTS
United States	67	4165	Philippines	6	449
Greece	32	3313	Malaysia	6	440
India	19	2734	Israel	10	420
New Zealand	17	2704	Ukraine	6	396
Canada	36	2521	Kenya	10	345
Australia	22	2416	Romania	11	311
United Arab Emirates	17	2277	Taiwan	13	306
China	58	1746	Nepal	8	284
Brazil	38	1428	Hong Kong (China)	8	242
South Africa	30	1242	South Korea	8	206
Mexico	15	1231	Uruguay	19	174
United Kingdom	14	1213	Thailand	15	152
Singapore	14	1190	Lithuania	9	146
Jamaica	20	1078	Bolivia	9	96
Argentina	21	910	Croatia	11	65
Lebanon	23	902	Senegal	12	55
Morocco	2	828	Uganda	8	55
Costa Rica	17	824	Bangladesh	8	51
Colombia	23	752	Namibia	9	28
Pakistan	20	642	Zimbabwe	9	20
France	27	613	Honduras	10	3
Indonesia	5	471	Cameroon	10	--

Table 2. Representation and message contribution by age.

Age	% by population	% of messages
10 years	2.7	1.2
11 years	6.7	7.2
12 years	12.4	10.2
13 years	11.6	17.7
14 years	23.8	23.8
15 years	23.8	28.3
16 years	16.7	7.4

Table 3. Phases of the forum

Phases of the Forum	Duration	Time Period
Homeroom	4 weeks	T1-T2
Topic Groups	8 weeks	T3-T8
Elections	1 week	T3/T4
In-person conference in Boston	1 week	T6

Table 4. Stages of the forum in terms of content:

Content codes that peak in ...		
T1-T2 1 st month	T3-T4 2 nd month	T5-T6 3 rd month & conference
Opinion	Agree (Positive feedback)	Apologies
Solution	Agree and add ideas	Action plan
Global knowledge	Thank	Delegate
Disagree	Acknowledge input	Volunteer
Personal narrative	Rally	Humor
Bio	Request feedback	Bio

Table 5. Table of "leading" regions

Feature	Time interval			
	(1,2,3)	(2,3,4)	(3,4,5)	(4,5,6)
Affect	Middle East	C/S America & Caribbean	East Asia	Middle East & Pacific Islands
Apologies	Europe	Middle East	Africa	Pacific Islands
Future	Pacific islands	Middle East	Europe	East Asia
Hedges	Southeast Asia	Middle East, Pacific islands	Pacific Islands	Middle East
I	C/S America and Caribbean	C/S America and Caribbean	East Asia	Africa, C/S America & Caribbean
Jrsummit	East Asia	Southeast Asia, C/S America and Caribbean	Africa, Southeast Asia	C/S America & Caribbean
We	C/S America & Caribbean	C/S America and Caribbean	C/S America & Caribbean, N. America	East Asia
Wh questions	Africa	North America	Southeast Asia	C/S America & Caribbean

Table 6. Messages posted in each language

	Number of individual participants	Number of messages posted by individual participants				
		Time 1-2 (9/04-10/01)	Time 3-4 (10/02-10/29)	Time 5-6 (10/30-11/26)	Total # of messages	Percent of total
English	542	7232	13354	3630	23490	91.1%
Spanish	62	879	1124	214	2167	8.4%
French	62	145	60	21	224	<1%
Portuguese	20	286	264	102	635	2.5%
Chinese	10	38	62	4	99	<1%
Total	696	8580	14864	3971	25766	