Still Hoping: The Relation of International Auxiliary Languages to
Worldview and Perception

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Abstract

Constructed international auxiliary languages (IALs) have been proposed to influence the cultural identities and world perspectives of their speakers. The creation of IALs surged in the late 19th century as a response to rising nationalism; through their sociopolitical neutrality and ease of learning, IALs sought to introduce unity to a divided world. Though IAL adoption remains limited, their speakers still believe that given the ability to spread, IALs could unite our global community. To examine group trends and individual perspectives in how IALs may influence identity and perception, I surveyed and interviewed an online Esperantist community. I also performed close reading of randomly-selected posts on online forums for Esperanto, Volapük, and Toki Pona, as well as the general forum Linguistics and Conlangs. Finally, I analyzed content for six months of posts from the Volapük and Toki Pona forums. Most speakers (68.8%) self-reported that IALs changed their perception and, fewer (34.4%), beliefs. Survey respondents and interviewees cited community membership, broader communication, and IALs' simplified linguistic features as influences on their worldviews. Accordingly, more years speaking Esperanto, seeking and feeling part of Esperanto communities, and believing the world would be a better place with more IAL adoption significantly correlated with change in beliefs. Different IAL forums statistically differed in their content, interactivity, and post length, which may reflect language-influenced disparities. The results suggest that IALs may affect the beliefs of learners in relation to their community-building properties and widening of communication ranges and impact the perceptions of learners through their unique structures.

Key Words: international auxiliary languages or constructed languages; Esperanto or Toki Pona, and Volapük; linguistic relativity; Facebook and social networks; descriptive survey; standardized open-ended interview; content analysis

Introduction

Though small in scope, many constructed international auxiliary languages (or IALs), such as Esperanto and Ido, have global networks of speakers. Natural languages can influence worldview through their grammatical structure and the sense of community built amongst speakers. Whether IALs share these properties is unclear. If so, and current barriers to adoption were overcome, constructed IALs might not only foster efficient communication (Gobbo, 2005) but also promote global community.

Constructed IALs were conceived as neutral languages that could transcend cultural and national barriers to enable communication between those who might not share a first language (Jespersen, 1931; Smokotin & Petrova, 2015). Ludovic Zamenhof, Jewish and raised in a multilingual community, developed the IAL Esperanto in the late 19th century. He hoped that a common, but neutral, language would help people let go of their individual prejudices (Algeo, 1989). Historically, talk of implementing IALs grows when national tensions come to a head, exemplified during the years surrounding World War I and World War II (Jacobs, 1946; Jespersen, 1931).

The hypothesized potential of IALs to build community aligns with the theory of linguistic relativity, which holds that the structure and lexicon of a language shapes how its speakers see the world (Boroditsky, 2003; Wolff and Holmes, 2011), a view formalized in the Sapir-Whorf hypothesis (Kay and Kempton, 1984; Russell, 2000). Whorf originally posited that the structure of a language almost fully determined the worldview of its learners. However, research has yielded the modern view that language influences thought because it highlights certain properties of the world, prepares for verbal descriptions by slightly changing perception, and can either interfere with or facilitate nonlinguistic processing (Kay and Kempton, 1984; Wolff and Holmes,

2011). For instance, linguistic descriptions of color, spatial and temporal relations, and gendered objects contribute to perceptual differences in speakers of different languages (Boroditsky, 2003; Wolff and Holmes, 2011). Russian speakers, with distinct words for light blue (*goluboy*) vs. dark blue (*siniy*), are quicker on a matching task when colors fall on either side of the dividing line than their English-speaking counterparts (Wolff and Holmes, 2011). In the political domain, during the negotiated founding of modern New Zealand, the Māori language did not have a direct translation for the English word *sovereignty*. As a result, in the bilingual Treaty of Taitangi, Māori speakers agreed to *kawanatanga*, which translates to governance by the Queen; they believed they would retain *te tino rangatiratanga*, a Māori word that conveys unqualified chieftainship over the lands, villages and property. Because the Māori language did not contain a word for overarching sovereignty, the chiefs expected a power-sharing partnership in which they retained local authority. The British exercise of sovereignty was thus experienced as a treaty violation, and the New Zealand Wars followed (Belgrave, Kawharu, & Williams, 2005). It is therefore demonstrable that language influences worldview. Non-linguistic factors (e.g., culture, upbringing) in turn influence how one sees one's surroundings, which reciprocally feeds back into the use and lexicon of the language.

IALs may influence worldview through their simplified structure, which is designed to facilitate learning. For example, in Esperanto grammar, as in many IALs, a single root predictably becomes numerous parts of speech per regular endings (Eaton, 1927; Harlow, 1995; Macloskey, 1906). Most IALs also have small lexicons; Toki Pona only contains about 125 words, fewer than the most economical natural language (Lang, 2014). With small lexicons, concepts are communicated more abstractly via generative word combinations. Such simplified language may promote a different manner of communication and worldview than highly

differentiated languages with orders more words (100,000-1,000,000), such as Turkish, German and English. Thus, one goal of the present study is to compare whether different levels of simplicity across IALs are reflected in different communication patterns of speakers in IAL communities.

To determine if IAL communities also influence cultural identity, a definition of culture is needed. Gusfield (2006) provides several meanings, but the most applicable here is anthropologist E. B. Tylor's 1874 definition: "[culture is] that complex whole which includes knowledge, belief, art, morals, custom, and any other capabilities and habits acquired by man as a member of society." Language falls solidly into the "capabilities and habits" and "knowledge" categories that Tylor proposed. Ware (1951) further proposed that IALs foster the creation of art. Accordingly, a sizable body of Esperanto literature has developed, and an Esperanto writing "style" has emerged suggestive of growing unity in Esperanto culture (Ware, 1951). Similarly, the Toki Pona IAL, designed around the principles of a simple and modernity-unencumbered life, is associated with a Taoist-like mindfulness in its literature and art (Lang, 2014).

Enthusiasts of Volapük, an IAL with German origins that preceded Esperanto, have facilitated competitive dissemination of knowledge; they grew its Wikipedia entries from 797 to 112,000 during 2007 (Nevelsteen, 2007; Wimmer, 2007), which led to a spirited response from the active Esperanto community (Greene, 2013). As of September 2018, Esperanto and Volapük had respectively about 250,000 and 121,000 Wikipedia entries. The former ranked 32nd of all languages ("List of Wikipedias," 2018), and IALs collectively ranked 15th, ahead of Korean (426,782 vs. 426,641 entries) ("List of Wikipedias by language group," 2018).

The above Wikipedia rivalry supports the view that language influences not only culture, but also positive community identity, as also seen at the nation-state level. Indeed, as the world's

colonies gained their independence in the 20th century, many clung fiercely to their national pride via a common language (Hobsbawm, 1996). Today, while fluency in widespread languages is valued in a global society, national pride and language remain closely linked (Hobsbawm, 1996). Local languages are both dividing and unifying factors, exemplified during the process of Balkanization. Could an internationally spoken, neutral language provide a unifying sense of pride, hope or community that bridges nation-state divisions associated with local language (Gobbo, 2005)? No IAL has yet spread widely enough to provide population-level data. Here, I study smaller networks of IAL speakers within Internet Facebook groups to examine the hypotheses that IALs are associated with different communication or positive community behavior and identity. Essentially, might constructed international auxiliary languages (IALs) influence the cultural identities or world perspectives of their speakers?

Methods

Study design. The present study had four components: 1) a descriptive survey, 2) a standardized open-ended interview, 3) close reading of several Internet IAL forums, and 4) content analysis of six months of IAL forum messages. This multifaceted, triangulated approach aims to combine multiple data sources, as well as both idiographic and nomothetic analyses, to produce a robust view (Cohen & Crabtree, 2006; Thomae, 1999).

Research context. The research was conducted using public Facebook groups for the IALs. The descriptive survey and interview involved volunteers who responded to a public post in the Esperanto USA – Usono Facebook group, chosen for its size (about 1,500 members), activity (4 posts/day), and availability of English speakers for research communication. In my solicitation, I specified that the survey would be anonymous and that it was intended to

determine the effects of Esperanto on its speakers. The close reading of IAL public groups involved the aforementioned Esperanto group as well as the most-subscribed Toki Pona group (about 3,500 members, mix of English and Toki Pona content); the Volapük group (about 330 members, mix of English and Volapük), and Linguistics & Conlangs (about 10,000 members, not focused on any one IAL). The content analysis compared posts in the above Toki Pona and Volapük groups.

Descriptive survey. The cross-sectional survey examined the relationship between speaking an IAL and self-reported worldview or perception changes (Kelley et al., 2003). I designed a Google Form survey with three sections: one collected demographic data, a second gave statements about beliefs concerning Esperanto for which Likert-scale responses could range from “strongly agree” to “strongly disagree”, and a third asked if and how speaking Esperanto had changed respondents and what they viewed as barriers to its spread. The questions in the third section were both closed (multiple choice or select-all-that-apply) and open (asking respondents to share personal experiences). Closed questions helped group responses into clear themes with common trends. Open questions gave respondents an opportunity to expand upon their answers or provide personal experiences that might not have been covered in the closed questions. The final question solicited participants for the standardized interview. All data were collected automatically into a spreadsheet.

Standardized open-ended interview. Survey respondents who expressed interest were emailed the standardized open-ended interview which, as per Turner (2010), used identical interview questions, but phrased so as to allow for a variety of interviewee answers. After anonymizing interviewees by letter designation, I sorted these qualitative, individual responses by common themes into a table.

Close reading of IAL public groups. Close reading, as per Burke (n.d.), involved analysis of five randomly selected posts from the most recent thirty (as of December 20, 2016) in the Esperanto, Volapük, Toki Pona, and Linguistics & Conlangs IAL Facebook groups. The primary categories examined were the content and tone (e.g., academic, friendly, proud, etc.) of the original post, the number of threaded responses to posts, and the content and tone of comments. Posts were qualitatively compared and contrasted for the above categories both within and between the IAL groups. The independent close reading offered a way to identify patterns that forum participants were unaware of or did not self-report, provided context for interpreting the survey and interview results, and established themes to study further in the follow-up content analysis.

Content analysis. To follow-up themes identified in the first 3 components of the study, a content analysis (Krippendorff, 2004; Neuendorf, 2002) was performed. The analysis involved all posts and comments in the Toki Pona and Volapük public Facebook groups during the six-month period from November 18, 2017 – May 18, 2018. This period did not overlap with the period during which the other data were collected. The primary purpose of the content analysis was to replicate and quantify with larger, independent datasets themes that had been identified using the previous three methods. A secondary purpose was to determine whether the two IAL groups were associated with systematically different language in structure or content. For the latter purpose, I quantified for each public group: 1) the average number of IAL words in each Facebook post or comment, 2) the average number of IAL words in each full thread (a post, plus its comments), and 3) the frequencies and translated meanings of the 20 highest frequency IAL words within each IAL group.

Data Analysis. To analyze data, results for each method were sorted into two categories:

the putative effect of language communities on speakers (Hobsbawm, 1996; Ware, 1951) and the putative effect of language structure or lexicon on speakers (Boroditsky, 2003; Kay and Kempton, 1984; Russell, 2000; Wolff and Holmes, 2011). Resulting trends were condensed into tables that were then tested inferentially in the follow-up extended content analysis. To compare frequencies of categorical variables, χ^2 and Fisher's exact tests were used. To identify relationships between continuous variables, Pearson's correlation was used. To identify mean group differences, *t*-tests were used. Log-transformation was used to normalize distributions and promote homogeneity of variance, if necessary, before parametric analysis.

Results

Descriptive survey. There were 32 survey respondents, 26 of whom identified as male (81.3%) and 6 as female. Respondent national origin was predominantly from the United States (26 out of 32; 81%), but respondents also originated from Hungary (2), Brazil (2), Spain (1) and the Dominican Republic (1). The predominant language spoken by respondents aligned accordingly; most spoke predominantly English (26/32, 81%), with 2 endorsing Hungarian, 2 Portuguese, and 1 Spanish. A final respondent reported speaking German, English and Esperanto in equal measure, and none were native Esperantists. Respondent age and time speaking Esperanto ranged widely. Volunteers ranged in age from 10-19 years old to 80-89 years old (median: 30-39 years) and in time speaking Esperanto from less than 1 year to over 20 years (median: 1-5 years).

Table 1 illustrates the self-reported effects of speaking Esperanto on survey volunteers. Most reported that Esperanto had affected their world perception, and a substantial minority also endorsed a change in beliefs. Increased range of communication and structure of the language were commonly cited reasons for both changes. Belonging to a language-based community was

uniquely attributed to be a common reason for a change in beliefs, but not perception. Of the 11 respondents that endorsed a belief change, 1 had been speaking for less than a year, 3 had been speaking for 1-5 years, and 1 had been speaking for 5-10 years. The descriptive results suggest that IALs may impact learners' world perceptions and beliefs, despite not having a national origin or native speaker basis of their own.

Table 1: Self-reported Effects of Esperanto on Beliefs and Perception				
Question	Yes	Maybe	No	Top 3 Reasons for Change
Has speaking Esperanto affected your beliefs in any way?	11 / 32 (34.4%)	7 / 32 (21.9%)	14 / 32 (43.8%)	1. Increased range of communication (83.3%) 2. Belonging to a language-based community (77.8%) 3. Structure of the language (61.1%)
Has speaking Esperanto affected your perception in any way?	22 / 32 (68.8%)	2 / 32 (6.3%)	8 / 32 (25%)	1. Structure of the language (69.6%) 2. Increased range of communication (65.2%) 3. Enjoyment from learning/speaking the language (56.5%)

Table 2 shows responses to statements regarding the identity- and culture-building effects of Esperanto, the majority of which were endorsed by respondents. While only 34.4% of respondents reported that Esperanto had affected their beliefs (Table 1), the significant majority agreed or strongly agreed that the language was an important part of their identity, a source and impetus for community, and a source of pride (Table 2). Most also agreed that the language would make the world a better place (Table 2).

Table 2: Self-reported Effects of Esperanto on Community and Culture					
Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

1. Being able to speak Esperanto is an important part of my identity.	9 / 32 (28.1%)	13 / 32 (40.6%)	8 / 32 (25%)	2 / 32 (6.3%)	0 / 32 (0.0%)
2. I consider myself part of a worldwide community of Esperantists.	11 / 32 (34.4%)	14 / 32 (43.8%)	6 / 32 (18.8%)	1 / 32 (3.1%)	0 / 32 (0.0%)
3. I feel proud when I read Esperanto literature or hear songs in Esperanto.	12 / 32 (37.5%)	15 / 32 (46.9%)	4 / 32 (12.5%)	1 / 32 (3.1%)	0 / 32 (0.0%)
4. I believe that if more people spoke Esperanto, the world would be a better place.	11 / 32 (34.4%)	10 / 32 (31.3%)	8 / 32 (25%)	3 / 32 (9.4%)	0 / 32 (0.0%)
5. I often try to convince friends to learn Esperanto or tell them about my experiences with the language.	5 / 32 (15.6%)	13 / 32 (40.6%)	10 / 32 (31.2%)	4 / 32 (12.5%)	0 / 32 (0.0%)

Finally, Table 3 lists the top three challenges to Esperanto's spread, as seen by respondents.

Table 3: Top Three Perceived Challenges to the Spread of Esperanto	
Challenge	Number of Respondents
Competition with natural languages (e.g. English or Spanish)	28 / 32 (87.5%)
Lack of awareness about Esperanto's existence	27 / 32 (84.4%)
Lack of interest in language learning in general	16 / 32 (50%)

Inferential analysis. *Identity and community.* Statistical analysis showed that longer-

term speakers of Esperanto ($r(32) = 0.38, p < 0.04$) and to a lesser degree women ($r(32) = 0.33, p < 0.07$) agreed more that “being able to speak Esperanto was an important part of their identity.” In contrast, years spent speaking Esperanto and female gender were not associated with feeling part of an Esperanto community, feeling proud of using Esperanto, sharing Esperanto experiences with friends, or feeling that the world would be a better place if more people spoke Esperanto. Participant age similarly did not correlate with agreement on the identity or community statements (all $|r|s > 0.15$, ns).

Self-reported Esperanto identity (Item 1) and community (Item 2) were highly correlated with one another ($r(32) = 0.81, p < 0.0001$). Feeling part of an Esperanto community also correlated with the belief that the world would be a better place if more people spoke Esperanto ($r(32) = 0.41, p < 0.03$) and, to a lesser degree, with being proud of using Esperanto and seeking out Esperanto communities ($0.05 < p < 0.10$).

Change in beliefs and perception. Longer-term speakers of Esperanto (>5 years) were more likely to report a change in beliefs as a result of speaking Esperanto than shorter-term speakers (46% vs. 26%) ($\chi^2[1] = 3.8, p = 0.05$). A similar trend was seen for a change in perception ($\chi^2[1] = 3.5, p = 0.06$). In contrast, respondent age was unrelated to Esperanto-related changes in belief ($r = 0.01$, ns) or perception ($r = 0.11$, ns).

Scores for identifying as an Esperantist ($r = 0.48$), feeling part of the Esperanto community ($r = 0.49$), seeking Esperanto communities ($r = 0.46$), and believing that a world would be a better place if more people spoke Esperanto ($r = 0.49$) each were significantly associated with a change in beliefs as a result of speaking Esperanto (all $ns = 32, ps < 0.009$). Furthermore, the composite (average) agreement with these four community- and identity-

focused statements strongly correlated with reporting an Esperanto-related change in beliefs ($r(32) = 0.68, p < 0.00003$). This relationship remained after controlling for years spent speaking Esperanto and sex (partial $r(28) = 0.64, p < 0.00008$). Mean composite community scores for those who had changed beliefs fell between “Agree” and “Strongly Agree” whereas scores for those who had not changed beliefs fell one category lower, between “Neutral” and “Agree” ($M + \text{SEM}$: $1.4 + 0.1$ vs. $0.6 + 0.1, p < 0.0001$).

Reinforcing the open-ended descriptive analysis (Table 1), neither the community/identity items nor their composite average were significantly associated with an Esperanto-related change in perception (all r s < 0.32 , all p s > 0.05), indicating a specific relation with belief change.

Standardized open-ended interview. The 9 survey participants who volunteered to be interviewed further showed a range of Esperanto speaking experience: 2 had been speaking < 1 year, 2 for 1-5 years, 2 for 5-10 years, 1 for 10-15 years, and 2 for over 20 years. All described themselves as realists. They did not believe Esperanto alone would achieve Zamenhof’s goal of world peace, but they thought it could be used to understand world cultures better. This cautious optimism was seen in most responses; even as respondents allowed for Esperanto’s limitations, they reflected on the better future they hoped it would bring.

Table 4 shows common themes in responses to selected interview questions. Of particular interest was why participants had agreed vs. disagreed with the statement, “I believe that if more people spoke Esperanto, the world would be a better place.” Interviewees again expressed cautious optimism that Esperanto would be one step towards equalizing the world, but it would not be the whole process. This moderate outlook may explain why only a minority (34.4%) of

respondents saw their beliefs and worldviews as being affected by Esperanto while almost twice as many agreed that more people speaking Esperanto would make the world a better place.

Because their pre-existing beliefs had been solidified rather than drastically changed, they chose a middle ground when responding.

Table 4: Commonalities in Responses to Interview Questions	
Question	Response Themes
What is your favorite thing about belonging to the Esperanto community? Why?	<ul style="list-style-type: none"> • Welcoming community; sense of unity in keeping with Zamenhof's idea of the <i>homa familio</i> (human family) • Cross-cultural communication; sharing ideas with people worldwide
What is your least favorite thing about belonging to the Esperanto community? Why?	<ul style="list-style-type: none"> • Some political intolerance; conservative views may be shouted down by the liberal majority • Often seen as silly by non-Esperantists • Small community size limits local activity
One survey question asked you to respond to the statement, "I believe that if more people spoke Esperanto, the world would be a better place." If you answered Agree or Strongly Agree, what features of Esperanto do you think would benefit the world? If you answered Neutral or Disagree, what features of Esperanto do you think would hurt the world (or keep it as is)?	<ul style="list-style-type: none"> • Among agreeers: <ul style="list-style-type: none"> • Cross-cultural communication could improve relations between people worldwide • Esperanto's simple structure and neutrality would make it a lasting common language • Among non-agreers: <ul style="list-style-type: none"> • Communication does not always lead to peace • Other hobbies could also bring like-minded people together
Based on survey responses, one major perceived barrier to Esperanto's spread is competition with widely spoken natural languages. Would you describe Esperanto as superior to natural languages in use today? A peer to those languages? Still catching up to them? Why?	<ul style="list-style-type: none"> • Superior in structure; fairly simple to learn relative to natural languages like English • Superior in its neutrality; it doesn't promote a specific national origin • A peer in that it's meant to be used alongside natural languages rather than

	to replace them <ul style="list-style-type: none"> • Still catching up in community size; difficult to find speakers to communicate with in person
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Close reading of IAL online forums. Table 5 summarizes results from close reading of the Facebook public groups for Esperanto, Toki Pona, Volapük, and Linguistics & Conlangs. Across groups, post content reflected substantial contributions and orientation of the groups to culture, as defined by knowledge and art. Posts consistently involved positive, supportive, collaborative, and community-minded tones. Of note, the Linguistics & Conlangs forum, which was not defined by a single language but rather an affinity for building languages, shared these characteristics. Its posts were overwhelmingly accommodating and curious in nature. Activity in the Linguistics & Conlangs forum showed that the concurrent existence of multiple IALs was not a hindrance to their spread. Rather, focusing on the commonalities between different IALs, speakers built a wider community that celebrated the IAL concept and an environment in which the diversity of new languages was not a zero-sum competition, but instead a way to understand the best aspects of each. Descriptively, the rank-ordered activity for the IAL-specific groups in both emoticons and comments was Toki Pona > Esperanto > Volapük.

Table 5: Close Reading Trends from Online IAL Communities				
Community	Post Content	Post Tone	Average # of Comments	Comment Tone
Esperanto (U.S.A.)	<ul style="list-style-type: none"> • Esperanto app for young children • Three questions about meeting with other 	<ul style="list-style-type: none"> • Helpful; enthusiastic • Friendly; eager to find other Esperantists • Festive; 	10.6 likes and 4.6 comments per post	<ul style="list-style-type: none"> • Grateful • Helpful; willing to talk to original posters • Admiring;

	<p>Esperantists in person</p> <ul style="list-style-type: none"> • Picture of cookies baked for Esperanto Day 	<p>proud of Esperanto's history</p>		<p>happy to share their own celebratory methods</p>
Toki Pona	<ul style="list-style-type: none"> • Two poem/song/ popular culture translations • Two questions about the language's structure • Link to download a new font for the language's hieroglyphic system 	<ul style="list-style-type: none"> • Eager to practice the language and share the ideas behind different works • Curious • Helpful; enthusiastic 	<p>18.8 likes and 13.2 comments per post</p>	<ul style="list-style-type: none"> • Supportive; gently correcting or cheering on translators • Helpful; willing to discuss different aspects of the language • Grateful; admiring the new font
Volapük	<ul style="list-style-type: none"> • Thank-you message for publishing a Volapük magazine • Two questions about the language's structure • Mock-debate about banning Pokémon Go • Appreciation for a former Volapük leader 	<ul style="list-style-type: none"> • Grateful; supportive • Curious; ready for clarification • Inviting discussion • Proud of Volapük history 	<p>1.6 likes and 4.6 comments per post</p>	<ul style="list-style-type: none"> • Glad for the poster's support • Helpful; providing tips and clarification about the language • Passionate but polite in debating • Similarly proud of Volapük
Linguistics & Conlangs	<ul style="list-style-type: none"> • Two descriptions of different conlangs with requests for feedback • Question 	<ul style="list-style-type: none"> • Enthusiastic; eager to improve • Curious • Lighthearted • Relieved; passionate 	<p>5.6 likes and 5 comments per post</p>	<ul style="list-style-type: none"> • Supportive; suggesting changes to some features and commending others

	about conlang grammar <ul style="list-style-type: none"> • Comic about sentence diagramming • Joyful post on finishing a conlang's first lexicon 	about the new language but tired from creating it		<ul style="list-style-type: none"> • Helpful; willing to explain • Lighthearted • Admiring; willing to share own experiences
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Further Content Analysis of IAL Online Forums. Table 6 summarizes posted content of the Toki Pona and Volapük groups during the 6-month analysis period. The Volapük group had fewer posts than the Toki Pona group (about 20/month vs. 87/month), but a similar proportion of posts involved discussion threads (89%). In both groups, most of the remaining posts involved multimedia posts, including audio of the language, with or without video. In both groups, the majority of threads did not involve conversations in the IAL, but conversational threads in the IAL were more common in the Volapük vs. Toki Pona group (49% vs. 28%) (Fisher's exact test, $p < 0.0001$). Consistent with the close reading analysis (Table 5), Table 6 shows that most of the non-IAL threads involved culturally-significant, community-enhancing discussions. Interestingly, however, the nature of the content systematically differed between groups. A greater proportion of posts in the Toki Pona than the Volapük group were meta discussions in English about the IAL (61% vs. 21%, Fisher's exact test $p < 0.0001$) and involved humor adapted to the IAL context (6% vs. 0%, $p = 0.05$), whereas a greater proportion in the Volapük community involved references or tools for the IAL (79% vs. 13%, $p < 0.0001$). The Toki Pona group also uniquely had polls and discussions of numbers, the latter reflecting that Toki Pona does not have unique words for most numbers. Both groups had a similar rate of new member introductions and queries. Both groups also had translations of literature or songs; for Toki Pona, however, these involved translations from Western media to the IAL, whereas

Volapük translations were predominantly from Volapük media to English. Tables 7 and 8 compare examples of culturally-relevant and community-enhancing translated works, IAL references/tools, and humor discussions in the Toki Pona and Volapük groups, respectively.

Table 6: Frequencies of various post types in the Toki Pona and Volapük Facebook groups		
	Toki Pona	Volapük
Total posts (threads and non-threads)	522	123
Threads (% of posts)	462 (89%)	109 (89%)
Conversational in IAL (% of threads)	128 (28%)	53 (49%)
Other, often in English (% of threads)	334 (72%)	56 (51%)
Of other threads (%)		
Meta (grammar, syntax, language theory, how best to say)	204 (61%)	12 (21%)
Language tool or reference	43 (13%)	44 (79%)
Introduction/new poster	26 (8%)	7 (12%)
Humor/jokes	21 (6%)	0 (0%)
Translation of literature or song lyrics	16 (5%)	6 (11%)
Seeking words for numbers	9 (3%)	0 (0%)
Non-threads (% of posts)	60 (11%)	14 (11%)
Multimedia (YouTube, SoundCloud) (% of non-threads)	52 (87%)	14 (100%)
Polls (% of non-threads)	8 (13%)	0 (0%)

Table 7: Selected translated works, languages resources and humor in Toki Pona group threads		
Translated Works	Language Resources	Humor

Avatar: The Last Airbender	Quizzes (alphabet, meaning)	Best pickup lines
All Star (Smash Mouth)	External Forums (tokipona.org)	Tongue twisters
Magic Dance (David Bowie)	Original content (poems, stories)	Do you even pu?
Psalms 22, 150 (Bible)	Glyphs/fonts (e.g., sitelen pona)	What happens in Vegas...
The Golden Rule (Bible)	Condensed grammar PDF reference	Black Adder in Toki
Ten Commandments (Bible)	Syllabic meaning/structure reference	That moment when....
Lamb of God (Catholic hymn)	Idioms reference	Paper airplane joke
Preamble, Declaration of Independence (United States)	Pu/pije reference	“Dirty” limericks/jokes
The Odyssey (Homer)	Extinct words list (tokipona.net)	Memes (Red pill, SNL)
Hamlet (William Shakespeare)	Web sites (Tatoeaba, Mudolingua)	Animal sounds
Tao Te Ching (Laozi)	Dictionaries (GitHub, tokipona.net)	Translation of WTF
Epic of Gilgamesh	Toki pona Wikipedia, Weebly, Wiki	Dinosaur dream in Toki
Dick and Jane (Gray and Sharp)	Google Docs corpus	Most embarrassing time...
Desiderata (Max Ehrmann)	Phone tools (keyboards, emojis)	Alphabet for equines
Limerick (Andrew Dice Clay)	Chat (Amikuma, WhatsApp, Discord)	Hashtag toki on Twitter

Table 8: Selected translated works, languages resources and humor in Volapük group threads

Translated Works	Language Resources	Humor
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Padosedons poem (J. Schmidt)	Volapük Wikipedia, Wikisource.org	None
Log cila poem (A. Wirsching)	Dictionary of Volapük	
Jimatan (V. Wheatley)	A Short History of the International Language Movement	
Letters from Volapük founders	First original Volapük work (J.M. Schleyer)	
Poem by Hagiawara Sakutaro	Gramat Volapüka (A. de Jong)	
	Vödabuk Volapüka pro Deutänapükans (A. de Jong)	
	Volapük novels (J. Schmidt and R. Midgley)	
	Critique of Esperanto (J.M. Schleyer)	
	Volapük - Hymne (Zorell and Schleyer)	
	Monthly magazines (Vög Volapüka, Sirkülapenäd)	
	Volapükagased pro Nedänapükans compilation	
	Websites (http://volapuk.temerov.org)	
	An International Language (O. Jespersen)	
	Handbook of Volapük (C.E. Sprague)	
	Online Volapük courses	
	Volapük in Action reference	

The 128 conversational Toki Pona threads originated from 90 unique posters and involved 10,356 words, while the 50 conversational Volapük threads originated from 9 posters

and involved more than 16,411 words. Thus, the Volapük threads contained significantly more words per post/comment ($14.7 + 0.4$ vs. $12.3 + 0.4$, $n=1,116$ vs. 837 comments, respectively, $p<0.0001$) and more words per thread than their Toki Pona counterparts ($M+SEM$) ($328 + 187$ vs. $80.9 + 7.1$ words, $n=128$ and 50 threads, respectively; $p<0.0005$).

Table 9 shows the 20 most frequent 1-grams for each language. As expected, substantial frequency differences were seen. For the more minimalistic Toki Pona language, the top 20 1-grams collectively accounted for 58% of all Toki Pona words, with individual frequencies of 1.1 – 7.6%; for Volapük, in contrast, the top 20 accounted for only 13.5% of words with individual frequencies of 0.3 - 1.9%. For Toki Pona, verbs representing communication and thought (*toki*), knowledge and skill (*sona*) and capability and capacity (*ken*) were represented. For Volapük, however, only *binon* which translates to “to be,” was a highly represented verb. Perhaps reflecting that Volapük verbs such as *binon* can be conjugated to convey first, second, or third person, Volapük’s list of frequent words did not have highly represented nouns that refer to people; in contrast, Toki Pona’s list included multiple, separate words for people, including *mi* (I, me, we, us), *jan* (human being, person, somebody), and *sina* (you).

Table 9: Most frequent 1-grams in Toki Pona and Volapük group posts and comments					
Toki Pona			Volapük		
Word	Meaning	%	Word	Meaning	%
li	(particle, between subject and verb) is	7.1	in	(place) at, in	1.9
E	(particle, before direct object)	5.9	no	(adj.) no, not	1.1
mi	(noun) I, me, we, us	5.5	el	(determiner) the	1.0
toki	(verb) to communicate, say, speak, talk, think	4.0	binon	(verb) to be	1.0
ni	(determiner) that, this	3.8	das	(determiner) that	1.0

pona	(adj.) good, positive, useful; friendly, peaceful; simple	3.7	ad	(prep.) for, in order to, to	1.0
pi	(particle) of	3.7	at	(determiner) this	0.9
jan	(noun) human being, person, somebody	3.2	de	(prep.) of, from	0.6
la	(particle, between context phrase and main sentence)	2.3	tefū	(prep.) concerning, with regard to	0.5
sina	(noun) you	2.2	pro	(prep.) for	0.4
tawa	(prep.) going to, toward; for; from the perspective of (adj.) moving	2.2	fa	(prep.) by	0.4
ala	(adj.) no, not, zero	2.2	ed	(conj.) and	0.4
lon	(prep.) located at, present at, real, true, existing	2.0	pö	after, behind (spatial)	0.4
sona	(verb) to know, be skilled in, be wise about, have information on (pre-verb) to know how to	1.8	ko	(prep.) with	0.4
nimi	(noun) name, word	1.5	atos	(noun) this	0.4
mute	(determiner) many, a lot, more, much, several, very (noun) quantity	1.5	lū	(prep.) to, towards	0.4
kama	(adj.) arriving, coming, future, summoned (pre-verb) to become, manage to, succeed in	1.5	me	(prep.) by means of, with	0.4
ona	(noun) he, she, it, they	1.3	ün	(prep.) at, in, on (time) within, in the course of (time)	0.4
tenpo	(noun) time, duration, moment, occasion, period, situation	1.2	anik	(determiner) several, some	0.3
ken	(pre-verb) to be able to, be allowed to, can, may (adj.) possible	1.1	obik	(determiner) my	0.3

Discussion

When Ludovic Zamenhof first introduced his international auxiliary language to the world in 1887, he simply named it Lingvo Internacia, meaning “international language.” It became known as Esperanto after Zamenhof’s nom de plume Doktoro Esperanto, or “one who is hoping.” Results of the present study with modern speakers support Zamenhof’s hope that IALs can promote unifying community, collaboration and culture, including creation and translation of literature, music, and humor as well as sharing of knowledge such as language tools and references. Participation in the IAL or its community also bring most individual speakers feelings of pride, community and well-being. Modern speakers of IALs have tempered the unbridled idealism of founders like Zamenhof with a cautious optimism. However, most agree that IALs are an important part of their identity, a source and impetus for community-building, and a means to make the world better as a whole. Most speakers here reported that their IAL has changed their own perceptions, and a substantial minority similarly reported a change in beliefs. The changes in beliefs and worldview associated with IALs also may relate to their unique grammatical structures and lexicons, perhaps exemplified here in the similar community-mindedness, but different specific content, verbosity and word frequency between speakers in Toki Pona vs. Volapük Facebook groups.

Though current IAL communities are small in size, they appear to have marked self-reported effects on their speakers. 68.8% of surveyed Esperantists agreed that speaking Esperanto had affected their perception. This was even more true of long-term (>5 years) speakers. Only 25% of all speakers answered that no perception change had occurred. The most endorsed reason (69.6%) for this change in perception was the language’s structure. In the words of one respondent:

I now think more about how my language has colored my experience of life. I have always viewed broccoli and cauliflower as being similar foods because of their appearance and culinary uses. After learning that cauliflower is "florbrasiko" and that cabbage is "brasiko," I looked the foods up and learned that cabbage is in the same genus as broccoli and cauliflower. I had always assumed cabbage was related to lettuce, but it turns out "laktuko" is a separate genus.

This anecdote suggests that Esperanto, even as a second language, has weight under the theory of linguistic relativity. Changes such the one above fit especially into the category of thinking after language; Wolff and Holmes (2011) wrote, "The long-term use of a language may direct habitual attention to specific properties of the world, even in nonlinguistic contexts." Thus, while 8 of 22 respondents mentioned a heightened attention to the grammar of other languages, 11 of 22 commented that Esperanto had altered their perception in nonlinguistic contexts. The comparative content analyses for the Toki Pona and Volapük groups may additionally support the idea that the structure of a language changes the way its speakers think. Posts in Volapük, an older IAL designed merely to be simpler and more neutral than a natural language, differed drastically in content from posts in Toki Pona, a younger IAL designed to help speakers "simplify their thoughts" (Lang, 2014). Humorous posts, for instance, were relatively common in the Toki Pona group (21 posts, 6% of total posts catalogued) and completely absent in the Volapük group. Toki Pona's simple structure overwhelmingly focuses on positivity; 'pona,' the sixth most common 1-gram in the group, can refer to something good, friendly, or simple. It is possible that this structural emphasis on friendliness led to the noticeably lighter tone and heightened interaction of many Toki Pona posts.

Most respondents (65.2%) also cited a change of perception as having resulted from being able to interact with a variety of people worldwide. For example, one respondent described having his eyes opened to the reality that English is not as widely spoken throughout the world as many native English speakers believe. Speaking only English had put him in contact with more English speakers and allowed him to perceive more English being spoken; learning Esperanto introduced new and contradictory perspectives.

A smaller minority of respondents also said that speaking their IAL had changed their beliefs. Self-reported changes in beliefs were independently associated with more years speaking the IAL and greater endorsement of IAL identity and community; these associations are consistent with a relationship between the belief change and the IAL activities. Interestingly, belief change was more common in women than men, though it may be worth examining a larger sample of speakers to see if this relationship holds true. Most (83.3%) respondents attributed their change in beliefs to the widened communication range that IALs provide. One commented, “The members of our [online community] come from three continents plus Cuba. Two are not English speakers.” The Facebook communities for Toki Pona, Volapük, Esperanto, and the more general Linguistics & Conlangs all shared this focus on the global and cross-cultural spread of ideas. Many analyzed posts from these communities involved sharing of knowledge and culture, including translations of poetry and songs, IAL-dedicated magazines and literature, and meta-discussions regarding the language itself. The Toki Pona and Esperanto groups also had socially-oriented, but still culturally-relevant, posts, including translation and sharing of humorous memes. Interviewee H pointed out that because IALs facilitate global communication, “through Esperanto, you can reach many cultures around the world, and with a natural language, you [only] catch a few.”

Consistent with the inferential analysis, the sense of community seen in these IAL groups was another frequently cited (14 of 19) reason for a belief change. Indeed, most (78.8%) of the responding Esperantists saw themselves as members of a greater community, and a full 84.4% reported feeling proud when they heard music or read literature in Esperanto. This tallies with anthropologist E. B. Tylor's 1874 definition of culture as "knowledge, belief, art, morals, custom, and any other capabilities and habits acquired by man as a member of society." Thus, IALs such as Esperanto have both exposed speakers to other cultures through a widened communication range and infused them with their own unique, shared culture. Most (68.7%) Esperantists surveyed agreed that speaking Esperanto was important to their identity. Although IAL communities are not perfect (Interviewees A, F and G tell of intolerance towards conservative Esperantists), most speakers saw the groups a step towards the idea of the *homa familio* (human family) for which Zamenhof worked. A majority (11 of 19) respondents who reported a change in beliefs specifically named Esperanto's unifying properties as the reason for that change. Interviewee G illustrated the sense of community that Esperantists have created as follows:

Someone from Ukraine today asked "Is your car green?" and gave a picture of an electric car. A bunch of folks began to post the color of their car as joke answers to the question. Here is where those who answered are from: Germany, Brazil, Poland, the United States, Hungary, Sweden, New Guinea, the United Kingdom, Mexico, Switzerland, Bosnia and Herzegovina, and Japan. Tell me, where else can one find such a diverse group bonding over a silly joke like that?

Although IALs have speakers from disparate cultures, they still manage to draw together over things as small as jokes about the color of a car. This supportive environment also was evident in

the Facebook communities for Toki Pona, Volapük, Esperanto, and Linguistics & Conlangs, where commenters on analyzed posts were quick to provide language clarification, provide links to chat apps and literature, share their original poetry, engage in humorous banter with each other, or even conduct a mock debate over banning Pokémon Go. Just as Hobsbawm (1996) wrote that colonies emerging as sovereign states in the 1900s drew their communal identities from their languages, IALs without nations to call their own may bring together speakers worldwide into communities with shared identities. Whether these communities come closer over small things (like car color jokes) or big ones (like Zamenhof's concept of the *homa familio*), they provide a network of support and even belief change for their members.

While IALs may notably affect their speakers, the languages still face barriers to their spread. The most common roadblock cited by Esperanto speakers in the present study was the lack of speakers with which to practice. Similarly, content analysis showed that much activity in the Toki Pona group was directed towards sharing information on the existence of other forums and chat platforms for the IAL. Because no official apparatus to identify speakers exists, the exact numbers of speakers for each IAL are unknown and estimates often conflict. For the relatively common IAL Esperanto, the “Finnish linguist [Jouko Lindstedt] who studied the 1,000 or so native Esperanto speakers in the world [guesses that] around 100,000 can speak it to some degree, and only 10,000 are totally fluent” (Dean, 2015). Much more optimistic estimates, including a frequently cited survey by Sidney Culbert from the University of Washington and a more recent estimate based on Facebook users, suggest as many as 2 million may converse to some degree (Wandel, 2015). The total membership and number of unique posters in the IAL Facebook groups reflected comparatively small numbers. At the outset of this research, Esperanto's international group had 5,548 members, Toki Pona's had 2,669 and Volapük's had

274. Underscoring the small number of speakers, only 90 and 9 unique individuals initiated threads in the Toki Pona and Volapük groups, respectively, during the 6-month content analysis period. Indeed, a Cifal, or linguistic leader, of Volapük estimated roughly 20 years ago that there may have been as few as 20 Volapük speakers worldwide (LaFarge, 2000), a substantial decrease from the highwater mark of 1 million Volapük adherents in the late 19th century (Baugh & Cable, 2002). Thus, while IAL speakers are enthusiastic about their languages and communities, their low numbers suggest that the world at large does not share their views. Many Esperantists surveyed see competition with widely spoken natural languages (87.5%) and lack of awareness about its existence (84.4%) as barriers to the IAL's spread. Three survey respondents said they even had been ridiculed for learning what those around them see as a niche language. One noted:

Some friends and family have been upset with me for learning Esperanto. A co-worker became angry at the idea of Esperanto as an alternative to English, believing English to be a perfectly good fit for a universal language. My grandfather felt similarly, saying that Latin would be better than Esperanto. In both cases, the ease of learning Esperanto was not a factor. Its opposition to English, and, to a lesser extent, its artificial nature, seemed to be the most offensive.

The above sentiments illustrate a common perception amongst non-IAL speakers of competition between constructed languages, resembling the early observations of Danish linguist and Novial inventor Otto Jespersen (1931), "The general impression among the public ... is that these attempted interlanguages ... fight each other vigorously." Yet, only 1 of 32 surveyed Esperantists viewed competition with other IALs as a threat to Esperanto's spread. In fact, one interviewee spoke not only Esperanto, but also Toki Pona and Lojban. Content analysis of the IAL groups similarly identified several polyglots of multiple IALs, with cross-pollination seen in

Internet Relay Chat, Discord and other social media forums, including the Linguistics & Conlangs Facebook group. If there is a sign of conflict between IALs, it might be the lack of agreement about the “best” one to adopt, which has so far prevented any one IAL from accumulating a critical mass of speakers (Jespersen, 1931). Some critics have also noted that the limited lexicons of IALs may hamper their use in technical fields. Toki Pona, which purposely lacks numbers other than “wan” and “tu,” exemplifies this issue. Other detractors take a different tack, asserting that the simplicity of IALs will simply devolve into the needless over-complication of older languages (Jacobs, 1946).

Several caveats of the present study require mention. First, samples were recruited exclusively from online communities. Thus, it is uncertain whether results can be generalized to offline communities or less enthusiastic speakers that had not chosen to join an online community. Second, IAL speakers were self-selected, rather than randomized, so causal inferences regarding the effects of the language are uncertain. Although the relation of changes in belief to a longer time speaking and greater feelings of identity and community with the IAL are consistent with a causal relation, it is unclear whether IAL engagement would have a similar effect on randomly selected groups of individuals. This concern is especially true of comparisons between the IALs; individuals who choose to speak Volapük may be different in personality or demographics from those who choose to speak Toki Pona. Third, I am not fluent in any IAL, so surveys and interviews were conducted in English; thus, non-English speakers could not participate without outside translation, further limiting the sample. Similarly, I was able to perform only limited content analysis of the IAL communication itself, in contrast to the more detailed analysis of English-language communication within the IAL communities. Fourth, it is unclear what aspects of identity and community-building are specific to the IAL itself, as

opposed to the effects of being part of a small, voluntary community. Whether the same unifying, pro-cultural factors still would be evident in much larger communities is uncertain. Fifth, the studies involved self-reported changes in perception and belief; a useful follow-up direction could involve assessment with standardized belief/perception scales or experimental measures that are less subject to demand characteristics.

Despite the lack of awareness and perceived competition with natural languages that remain obstacles to IALs, the present results are consistent with the hypothesis that constructed international auxiliary languages significantly impact their speakers' perceptions and worldviews through both their unique grammatical structures and the sense of community they foster among learners. Because of their neutrality and ease of learning, IALs may have advantages to facilitate global communication over universal adoption of colonialism-rooted natural languages such as English (Pennycook, 2017). Governmental and international efforts to spread awareness about and educational access to IALs could bring the dreams of founders like Ludovic Zamenhof closer to reality. The world does not merely need an international language for communication, but also for the better planet predicted to come with it. Those shared hopes are what could turn Lingvo Internacia into Esperanto.

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