Adult Second Language Learners' Social Network Development and Perceived Fluency Gain in an Immersion Environment

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ABSTRACT

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This study investigated the social networks developed by language learners and their relationship with perceived changes in the learners' fluency in the context of an intensive English as a second language (ESL) program. Using data from the Study Abroad Social Interaction Questionnaire (SASIQ) to determine SN development and native speaker ratings to determine perceived fluency, a simple linear regression to test the relationship between social network variables and fluency gain, as well as a hierarchical regression measuring (a) the combined effect of variables previously found to be significant in fluency gain, and (b) the additional joint effect of the remaining social network variables. We found that participants were successful in developing complex social networks, and that their oral fluency did increase significantly in connection with their social networks. Density (the average number of people listed in a social group) was the most important factor when only social network variables were considered. In the hierarchical regression, initial proficiency level and the percentage of native English speakers in the network were the most significant of the established variables in the first step, and overall size and density were the most important of the added social network variables in the second step.

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1. Introduction

As the world continues to become globalized, the importance of knowing more than one language is becoming increasingly emphasized—not only in language education, but in the varied fields of international business, politics, and academia, among others. The numbers of students worldwide who are participating in language-learning programs—especially to learn English – are growing at a rapid pace. International students studying in the U.S. alone—more than 750,000 in 2012—increased nearly 6% from the previous year and are funded by employers, universities, governments, and other institutions in addition to their personal funds (Institute of International Education, 2012). Additionally, over 190,000 students participated in the European Union's Erasmus student exchange program in the 2010/2011 school year, with over two million participants since the program's inception in 1987 (European Commission, 2011). In accordance with this trend, a variety of venues for language learning have developed to accommodate the growing demand in all of its forms, encompassing traditional study abroad programs, intensive language schools, employer-sponsored language classes, and university-sponsored language schools, among others. If study abroad is defined as "residing in a country where the language spoken is other than one's own," as Freed (1998) states, then many of these language-learning venues share critical characteristics with the research in that field. (We will use the term "study abroad" (SA) to refer to language learning in an immersion context throughout this paper.) Given these facts, it is evident that the way in which language students learn in an immersion environment—even apart from the traditional study abroad program—is ripe for study.

In the current study, we examine the effects of social network factors on native English speakers' perceptions of L2 students' oral fluency in the context of an intensive English program

(IEP), a format often intended to prepare students for advanced English use at the university level. The number of students studying in IEPs in the U.S. has been steadily increasing over the past decade (about 73,000 in 2011), as has the amount of time that students spend in the program (currently about 15 weeks on average—approximately the length of a university semester), which makes this research especially relevant (Institute of International Education, 2012). However, the act of studying a language in an immersion environment is frequently clouded by many misleading assumptions. It is not uncommon to find statements asserting that "there is no better way to learn a language than to be immersed in a culture that speaks the language you are learning" ("Why study abroad? 10 reasons," 2013). A significant body of research has attempted to address the veracity of this type of statement.

The promise of "fluency" in the L2 is one of the most commonly-cited reasons for studying abroad. One website advertising a year-long program for high-school students asserted that "a six- to nine-month study abroad program is the perfect length for most high-schoolers to reach fluency" (D'Addario, 2012). Freed (1998) commented on the expectation that students would "'pick up' if not become 'fluent' in the target language," noting that this expectation is based on a sparse and inconsistent research base. However, the impact of an immersion environment on fluency gain has become the topic of more study in the ensuing years, resulting in a body of literature that suggests that amount of time in the country and amount of L2 contact with native speakers are consistently related to fluency gain (Derwing, Munro, & Thomson, 2007; Dewey, Bown, & Eggett, 2012; Du, 2013; Regan, 1995; Trofimovich & Baker, 2006). In this study, we have chosen to concentrate on native speakers' perceptions of the participants' fluency (termed *perceived fluency* by Segalowitz (2010)), as this is more related to their willingness to interact and form relationships with them than other types of fluency might be.

The same source cited above advertised "true cultural immersion" via homestay, illustrating another commonly held misconception about immersion study: that physical proximity to native speakers of the L2 is sufficient to develop a social network of native speakers (D'Addario, 2012). The research suggests otherwise. While many students do form strong networks of relationships in the target language, previous studies have found that their success is much more a matter of individual variables such as participant motivation and attitudes toward the host culture (Isabelli-Garcia, 2006; Papatsiba, 2006; Wang, 2010; Whitworth, 2006).

In order to further the research on the relationships between social network and fluency development in an immersion setting, we determined to explore how these concepts functioned in the context of an intensive English program (IEP).

2. Review of Literature

2.1. Input and Interaction in an L2 Context

Krashen (1982) asserted in his Input Hypothesis that face-to-face interaction is highly beneficial to the development of language proficiency, especially if a learner is exposed to comprehensible input only slightly above what he or she has already acquired (i+1*)*, with Long (1996) later countering that interaction requiring negotiation of meaning is even more effective. Swain's 1985 theory of comprehensible (or "pushed") output also argued that acquisition frequently takes place when a learner encounters a gap in his or her own linguistic knowledge or abilities, and is forced to "push" through that boundary of ignorance or discomfort to express him- or herself. Through this process, the speaker must "notice" the gap, "test" a hypothesis about how that gap should be filled, and reflect on what they have learned (Swain, 1985). While these hypotheses argue seemingly opposing viewpoints, they can all be used to argue for the importance of social interaction in the language acquisition process. The following sections will summarize some of the findings in L2 research on the principles of input and interaction, followed by instances where they are examined in learning situations.

Due to the widespread assumption that SA entails constant exposure to and input from native speakers, it is a natural setting for research on input and interaction. Many researchers have found that a high level of interaction with native speakers of the target language is usually a good predictor for language gain (Meara, 1994; Freed, Segalowitz, & Dewey, 2004; Derwing, Munro, & Thomson, 2007; Martinsen, et al., 2010; Du, 2013). However, there are exceptions. Magnan and Back (2007) found that French language students who often spoke the L2 with fellow Americans tended to have significantly lower scores than those who did not, potentially due to exposure to their fellow students' interlanguage rather than native speech. They conclude

that, while studying abroad is generally acknowledged by researchers to improve oral proficiency, "there is no recipe [of input factors] to ensure language improvement" (Magnan & Back, 2007, p. 56).

Dewey, Belnap, and Hillstrom (2013) further examined this concept with their study of the effects of students' L2 social networks on their self-perceived oral proficiency. For students studying abroad in Jordan and Morocco, the authors found that those whose Arabic-speaking acquaintances had a higher English proficiency were allowed greater ingress into social circles made of primarily native Arabic speakers. Beyond this, the average degree of closeness (or intensity) between students and their Arab friends was highly predictive, as was the amount of time spent speaking with people outside of their established social circles. While noting the social advantages provided by tutoring exchange between the native speakers of two languages, Dewey et al.'s (2013) paper presents a compelling argument for the importance of social networks in a study abroad environment.

One of the primary problems that arises when researching interaction in second language learning is the dominance of personal factors in determining how much a learner is likely to interact in the target language. Beyond the classroom, the profusion of opportunities for L2 interaction in an immersion environment is counteracted by the ability of learners to "opt out" of the difficulties and discomforts associated with authentic communication in the L2 and choose instead to stay at home – or to associate only with speakers of his or her native language. Miller and Ginsberg (1995) noted that, when not in a formal classroom setting, "it is the learner's views that matter, for they shape the learning opportunities that arise and the learning strategies that will be employed" (p. 293). Isabelli-Garcia (2006) also noted that "the unwillingness to interact and create social networks with the speakers of the host culture stemmed from motivational and

attitudinal deficits maintained by the learner" (p. 256). Thus, when examining relationships between social networks and any kind of linguistic change, it is essential to keep in mind that, apart from the variables being measured for their predictive power, individual variation among the participants will always introduce some degree of variation that cannot be neatly categorized or predicted.

2.2 Fluency

Freed (1995c) described fluency as "something that is intuitively perceived in the speech. . .perhaps the flow of their language, its intonation and rhythm, its speed or accuracy—all of which interact to create the impression of fluent language use" (p. 123). Although we frequently use the word, especially in connection with learning a second language, Freed's comment highlights how impressionistic and subjective our usage really is—and, similarly, how vague our understanding of fluency can be in practice. Despite its vagueness, we regularly describe and make judgments on the speech of language learners using this label without a clear idea of what it entails. Lennon (1990) suggests that we often use fluency to refer to "the highest point on a scale that measures spoken command of a foreign language" (p. 389). However, researchers are still attempting to isolate the individual factors that determine our perceptions of fluency (and, thereby, our judgments of the speaking abilities of non-native speakers). The elusiveness of this concept has led to a significant body of research attempting to both define and measure the way in which native speakers perceive fluency in the speech of non-native speakers, as the ability to quantify these factors has important implications for the fields of language testing, pedagogy, and research.

There has been some debate among researchers about how to define and measure fluency. Kormos and Dénes (2004) assert that these approaches have generally fallen into four different

camps: temporal, temporal/interactive, phonological, and formulaic (p. 148). For example, Lennon (1990) measured fluency in terms of quantity and rate of speech, number of filled pauses per t-unit, and number of t-units followed by a pause; Olynyk, d'Anglejan, and Sankoff (1990) measured only the positioning of repair markers (prepositioned or postpositioned); and Segalowitz and Freed (2004) measured fluency based solely on rate of speech and hesitation phenomena. Kormos and Dénes (2004) summarize some common predictors of native speaker subjective judgments that have emerged from these studies, which include speech rate and mean length of runs, followed by phonation time ratio (amount of time speaking as a proportion of total time taken to produce the speech sample), as well as word and phrasal stress and pace (or number of stressed words per minute).

Native speakers are the ultimate judges of "foreignness" in a social interaction, making their perceptions of fluency perhaps the most significant measure in terms of examining social networks. Lennon (2000) stated that "a good touchstone of acceptable fluency is the degree to which listener attention is held" (p. 34)—and, similarly, that "fluency reflects the speaker's ability to focus the listener's attention on his/her message by presenting a finished product, rather than inviting the listener to focus on the working of the production mechanisms" (Lennon 1990, pp. 391-392). From this perspective, speech that has become "automatized" and does not distract the hearer unduly by drawing attention to the process over the message can facilitate ease of communication with native speakers—and thereby, the formation of a social network in the second language.

It is often assumed that immersion in a SA context is connected to fluency gain, and the research frequently supports this claim. Freed (1995c) found that students who had studied abroad were ranked as being significantly more fluent than those who had not by native speaker

judges. The speech of these SA students exemplified similar qualities to those described by

Kormos and Dénes (2004): amount and rate of speech, number of dysfluent silent and filled

pauses, and fewer clusters of dysfluencies, which align closely with previous fluency research.

Most of the research in this area agrees that students' oral fluency does tend to improve

significantly over the course of the SA program (Freed, Segalowitz, & Dewey, 2004; Segalowitz

& Freed, 2004; Isabelli-Garcia, 2004; Derwing, Munro, & Thomson, 2007; Du, 2013). Some

specific factors have shown correlation with oral fluency gain during SA: time in country

(Regan, 1995; Trofimovich & Baker, 2006), initial proficiency level (Regan, 1998), and L2

contact with native speakers (Derwing, Munro, & Thomson, 2007; Dewey, Bown, & Eggett,

2012; Du, 2013, Regan, 1995). However, Freed, Segalowitz, and Dewey (2004) showed that

these gains may be more a factor of learning and using the L2 in an immersion context than of

mere physical location. Language programs vary significantly, as do the participants, their

opportunities, and their individual characteristics, which could account for some of the variation

in these results. The current study differs from previous research in its context (an intensive

English program, in which students come from a variety of backgrounds and often do note share

a native language) and its focus on the role of social network development in perceived fluency

gain.

2.3 Social Network Theory

Borgatti and Halgin (2011) define a social network as "a set of actors or nodes along with

a set of ties of a specified type (such as friendship) that link them…through shared end points"

(p. 1169). Network theory asks questions about the way our connections introduce new

information into our network, thereby giving us access and exposure to novel language and

culture.

One of the most cited concepts in the field of social network theory is Granovetter's (1973) Strength of Weak Ties model, which argued that exposure to a person or group outside of an individual's "comfort zone" of close friends is significantly more likely to introduce new language than is the continued close association with people who are in the same social group and see each other frequently, and therefore "weak" social ties can be more beneficial than "strong" ties in terms of language gain . By interacting with native speakers of the target language, language students are more likely to hear and discuss ideas that would not be addressed in their homophilous circle. They are also more likely to encounter an attendant variety of vocabulary, grammatical structures, and pragmatic practices that could not be learned from another non-native speaker of approximately the same proficiency level.

In one application of Granovetter's theory, Krywulak (1995) examined the social networks assembled by international graduate students at McMaster University, and found that, due to unfamiliarity with the host culture and language, many students tended to come together into groups of "fellow-strangers," often from the same cultural background, nationality, and/or native language (p. 9). When, on the other hand, these conational groups were not formed, students learned to function without strong reliance on their native language or culture and instead developed the ability to independently negotiate unfamiliar situations, despite the constant potential for misunderstanding or frustration (Krywulak, 1995, p. 43). They were often compelled to "communicate in the English language in which proficiency was seriously deficient," exemplifying Swain's (1985) pushed output hypothesis. These students were found to be better adjusted to the host culture overall and experienced greater linguistic gains than those who remained entrenched in dense conational groups, a trend which can be found across SA literature.

A growing number of studies have examined L2 learners' success in building social networks in a SA context. There is considerable variation in these findings due to differences in program length, country, and organization, as well as the individual characteristics of the students themselves. However, some factors that have been found to be predictive are initial proficiency level (Freed, 1990b), time in country (Mendelson, 2004), and gender (Polanyi, 1995; Isabelli-Garcia, 2006; Hillstrom, 2011), as well as such individual variables as participant attitudes (Isabelli-Garcia, 2006; Wang, 2010; Whitworth, 2006; Papatsiba, 2006) and motivation (Isabelli-Garcia, 2006; Wilkinson, 1998, 2002). In contrast to these studies, the current study examines L2 learners' success in building social networks in the context of an intensive English program (IEP). This is a significant contribution to the literature; no previous studies have examined social network formation in an IEP context at this time. By applying previous research in SA to an IEP context, we can take advantage of the differences between the two contexts (student heterogeneity, motivation, and overall proficiency levels, as well as program size, location, and purpose) to further generalize our understanding of the characteristics of social network development displayed by language students, enriching our understanding of both how this process functions and how we can facilitate it in practice.

In accordance with the concepts discussed in the review of literature above, our research questions for this study were as follows:

1. What types of social networks do IEP students develop, as measured by the Study Abroad Social Interaction Questionnaire (SASIQ)?

2. What changes in perceived fluency do IEP students exhibit?

3. Is there a relationship between IEP students' English language social network development and change in how their fluency is perceived by native English speakers?

    a.   If there is a relationship, which social network measure(s) is(are) most correlated with the participants' change in perceived fluency?

We hypothesize that students who have more extensive contact with the L2 and target culture through large, multifaceted social networks will demonstrate greater perceived fluency development over the period of the study than those who have less developed social networks.

3. Methods

3.1 Participants

All participants came from Brigham Young University's English Language Center, an intensive English program (IEP) designed to prepare students for university study. Participants volunteered for the study after it was presented in their classes, following IRB-approved procedures. Students took four classes a day (Listening/Speaking, Writing, Reading, and Linguistic Accuracy) four days a week during a 14-week semester. Participants consisted of 41 students who had scored between Intermediate Low and Intermediate Mid on the ELC's OPI-equivalent scale (Cox & Davies, 2012). About 39% of participants were male and 61% were female.

The IEP's student body is dominated by speakers of Spanish (45.9%), Portuguese (14.2%), and Korean (13.8%), but serves students from 33 countries speaking 18 languages. The participants' L1 and demographic characteristics roughly mirrored those of the IEP: 39% of participants spoke Spanish as their native language, followed by Portuguese (12%), Korean (10%), and Russian (10%). Other languages spoken were Chinese, Japanese, Ukrainian, Hungarian, Vietnamese, Italian, and French Creole (see Figure 1 for a comparison with the IEP population). Note that this variety in participant L1s is a departure from previous studies and a product of the IEP environment.

All participants included in the study were between the ages of 15 and 40. Age was broken down into 5-year categories. The largest number of participants was in the 15-20 age group, followed by the 21-25 age group. Age group 36-40 only had one participant.

All but 7% of participants had lived in the U.S. for less than two years at the time of the survey, and 56% of them had been in the U.S. for less than six months. These lengths of

residence (summarized in Table 1) corresponded almost exactly with the amount of time each

student had been studying at the IEP, indicating that nearly all time in country had been spent at

the IEP.

Table 1

Relationships Between Time at the IEP and Time in the U.S.

ELC Time

USTime	0-6 mos	6-12 mos	12-24 mos	Total
0-6 mos	23	0	0	23
6-12 mos	0	14	1	15
12-24 mos	0	1	1	2
Total	23	15	2	40

3.2 Measures

The development of the participants' social networks was measured by the Study Abroad

Social Interaction Questionnaire, (Dewey, Belnap, and Hillstrom, 2013; Dewey, Bown, &

Eggett, 2012; Ring, Gardner, & Dewey, 2013). The Study Abroad Social Interaction

Questionnaire (SASIQ), adapted for English language learners for the purposes of this study, is

designed to measure participants' L2 social networks along the following parameters:

Size: Number of people in the L2 social network

Durability: Average frequency of association with each individual

Intensity: Average closeness of the relationship with each individual

Density1:   Size of largest social group

Density2:   Average size of social groups

Dispersion: Number of social groups listed

The SASIQ was administered to participants via Qualtrics survey (http://www.qualtrics.com/) at the end of the IEP semester (see Appendix). Participants were asked to list the names of people with whom they regularly spoke English, and then to answer a series of questions about their frequency of association with each person, the closeness of their relationship, and the social group to which each individual belonged.

To measure L2 speaking fluency, we used recordings from the speaking portion of the IEP's Level Achievement Test and Placement Test, a test given each semester to place entrants into levels. We used each participant's response to the same task, which asked them to record a "voicemail" making an excuse for missing an important appointment. This item was chosen because it asked participants to record a self-contained monologue, which would be the natural form for this task to take in the real world.

Naïve native English speakers' judgments were collected following procedures described in Freed (1995c). Speaking samples were rated by 22 native speakers of English, all of whom were undergraduates who had little exposure to L2 learners. Each rater listened to a randomized set of 20 15-second samples of the participants' pre- and post- speech recordings and rate them on a seven-point scale (where 1 = not fluent at all and 8 = extremely fluent) via Qualtrics survey. Pre- and post- audio recordings were randomly presented via Qualtrics survey so that raters were unaware of which recordings were collected earlier. Raters were told that they would hear

recordings from a variety of learners and that some recordings would be from the same people. They were instructed not to consider the other recordings when rating each individual audio file.

3.3 Analysis

After collecting the data described above, we first conducted a simple multiple regression, regressing the social network measures against the perceived fluency gain. Additionally, to test the role played by variables which had proven significant in previous research on fluency gain, we conducted a hierarchical regression which first controlled for these "established" variables and then added the remaining social network variables to determine their joint significance on fluency gain.

4. Results & Discussion

4.1 Social Network Analysis

The first research question asked what type of social networks students developed in the IEP environment. Table 2 displays summary statistics for the data collected using the SASIQ.

Table 2

Summary Statistics for Social Network Results

Variable	Average	SD	Min	Max
Size	24.81	8.59	2.00	30.00
Size w/o IEP	14.86	7.86	1.00	30.00
Durability	5.89	0.74	3.13	7.00
Intensity	3.39	1.09	1.00	6.11
Density1	12.42	5.38	2.00	23.00
Density1 w/o IEP	8.11	4.72	1.00	19.00
Density2	6.22	2.24	2.00	10.00
Density2 w/o IEP	4.97	2.71	1.00	13.50
Dispersion	4.17	1.28	1.00	6.00

The results of the SASIQ show that the average size of the participants' social networks was about 25 including fellow non-native speakers (IEP participants) and about 15 when they were excluded. Calculating size and density without the IEP members allowed us to get a better view of the people that the participants were interacting with on their own initiative, and the results indicated that students were able to establish quite a few acquaintances and friendships independent of the built-in ELC structure. The sizes reported in this study are noticeably larger

than those reported in Dewey, et al. (2012), likely due to the difference in context (IEP vs. small SA program) as well as the larger cap on size (30 vs. 20).

Students were in fairly frequent contact with their L2 acquaintances, interacting with them in English on average between one and three times per week. It is encouraging that participants were able to have such regular interaction in the L2, as this has been shown to be a good predictor of oral proficiency gain (Meara, 1994; Derwing, Munro, & Thomson, 2007; Du, 2013). Overall network intensity (or closeness of relationships was not high for this group, as the average was 3.39—slightly below the midpoint on the 8-point scale used. This could be due to the IEP environment, which brings students into contact with many English-speaking companions in a classroom setting but does not necessarily entail emotional closeness. Along with smaller networks, Dewey, et al. (2013) reported higher average intensity values than the current study, which proved to be the most significant social network predictor of proficiency gain for the Arabic SA students. When examining the number of people listed in each participant's largest social group (density1), we observed that, on average, the participants tended to list 12.42 people in their largest social group. However, when IEP values were removed, density1 was equal to 8.11 people – a considerable reduction, demonstrating that many participants had only one large group and several other smaller social groups. Similarly, density2, or the mean size of all social groups, was 6.22 when IEP values were included and 4.97 when they were not. We observed that, of those who completed the SASIQ, about 58% reported that their largest social group was associated with the IEP, while the remaining 42% were divided between church, neighbors, and friends. The development of these self-directed social groups could have been aided by the fact that many participants lived and worked with regular university students—another way in which the IEP environment often differs from a typical SA

program. It is encouraging to find that so many participants had at least one individually-motivated social group larger than the IEP group.

The social networks described by this study differ from those described in Dewey, et al. (2013) in terms of size and density1, both of which can likely be attributed to the IEP context, which could tend to lead to one large social group rather than a variety of diverse social groups. Some differences could also be due to the fact that Dewey, et al. (2013) instructed students not to include fellow NNS who shared their L1, while that distinction was not made in the current study as English was the primary means of communication among this diverse group of students. However, even taking these influences into account, the participants for the most part demonstrated large, fairly diversified social networks. While not extremely close to their English-speaking companions, they nonetheless had frequent, varied exposure to English in the form of both native and non-native speakers and successfully formed social groups independent of the ELC environment as well as within it.

4.2 Fluency Analysis

The second research question addressed the perceived fluency gains made by participants over the course of the study. The raw scores from the native speaker fluency ratings are summarized in Table 3:

Table 3
Summary Statistics for Fluency Gain Results

	Mean	SD	Min	Max
Pre	4.79	1.13	3.00	7.33
Post	5.38	1.11	3.75	8.00

Our second research question examined whether participants exhibited a significant gain in fluency over the course of the study. The average difference in mean fluency ratings from the beginning to the end of the study was 0.592 (on a scale of 1 to 8). Results of a paired *t*-test indicate a significant gain from pre (*M* = 4.79, *SD* = 1.13) to post (*M* = 5.48, *SD* = 1.10), t(37) = 3.15, p = .0016 (one-tailed).These results echo the findings of other researchers who have observed fluency gain in SA contexts (Freed, Segalowitz, & Dewey, 2004; Segalowitz & Freed, 2004; Isabelli-Garcia, 2004; Derwing, Munro, & Thomson, 2007; Du, 2013; Magnan & Back, 2007). Numerous factors could have contributed to fluency gain in this situation, many of which are described in the studies above, including amount of L2 use (Freed, et al., 2004), and prior coursework (Magnan & Back, 2007), as well as other factors distinctive to the IEP context or to the participants themselves. Our results show that at least part of this gain may be due to the students' social network development, which is addressed by our third research question.

4.3 Relationships between social networks & fluency

The third research question addressed whether the participants' social network development was related to their fluency gains over the course of the semester. Table 4 shows correlations between all variables used in the regressions described in this section. (Note: density1, or average size of the largest social group (including fellow IEP students), was not found to be significant in any of the models employed here, and was therefore omitted from our analysis.)

Table 4

Correlation Table for Variables Used in Regressions

	Fluency Gain	Time in Country	Initial Proficiency Level	%NS	Dispersion	Intensity	Size	Durability	Density2
Gain	1.00								
Time	-0.38*	1.00							
Level	0.07	0.19	1.00						
%Eng	0.22	-0.08	-0.30	1.00					
Disp	-0.40*	0.34*	-0.02	0.04	1.00				
Int	0.02	-0.06	0.04	-0.19	0.03	1.00			
Size	-0.12	0.10	0.12	0.12	0.55*	-0.11	1.00		
Dur	-0.07	0.11	0.18	-0.36*	-0.21	-0.46*	-0.15	1.00	
Den2	0.28	-0.14	0.12	0.02	-0.23	-0.07	0.66*	0.11	1.00

*Note: * significant at $p < 0.05$*

First, to measure the relationship between the social network measures and perceived fluency gain, we conducted a simple multiple linear regression including only the subscales of the SASIQ. The results are summarized in Table 5.

Table 5

Summary of Social Network Regression Results

	β	SD	t	P>|t|	[95% Conf. Interval]	
Size	-0.21	0.11	-1.94	0.06*	-0.43	0.01
Durability	-0.39	0.28	-1.40	0.17	-0.96	0.18
Intensity	-0.13	0.20	-0.63	0.53	-0.53	0.28
Density2	0.73	0.33	2.20	0.04**	0.05	1.41
Dispersion	0.64	0.53	1.21	0.24	-0.44	1.71
Constant	1.31	2.47	0.53	0.60	-3.75	6.37
Obs:	34					
R-squared:	0.31					
Prob > F:	0.048					

*Note:*p<0.10. **p<0.05. ***p<0.01.*

The results of the regression show that the social network measures jointly explained about 31% of the variance (adjusted R^2 = .19) and were statistically significant in predicting fluency gain, $F(5, 28)$ = 2.57, p<.05. Factors found to be individually significant were density2, or average size of social groups (p<0.05), and size (p<0.10). This would seem to indicate that larger social groups were beneficial to fluency gain, but a larger total size was not—potentially due to a collinearity issue.

We found that the SASIQ measures jointly accounted for about 31% of the variance in students' perceived fluency gains, which was significant at the p<0.05 level. Therefore, we can

assert that social network development, as a holistic measure, is a significant predictor of fluency gain in this case.

A hierarchical regression analysis was also conducted to determine the combined predictive power of social network variables when controlling for variables that the literature has suggested have a significant effect on fluency gain (see section 2.2) with results represented in Table 6. These variables include time in country (Regan, 1995; Trofimovich & Baker, 2006), initial proficiency level (Regan, 1998), and L2 contact with native speakers (Derwing, Munro, & Thomson, 2007; Dewey, Bown, & Eggett, 2012; Du, 2013; Regan, 1995). We also included the two social network variables that had been found to be significant to fluency gain in previous studies involving the SASIQ: dispersion, or number of social groups (Dewey, Bown, & Eggett, 2012) and intensity, or closeness of relationships (Dewey, Belnap, & Hillstrom, 2013). While these studies were examining social network variables in relation to oral proficiency gains rather than perceived fluency gains in their original context, we included these variables in this regression to test how they were related to fluency. This set of five "established" variables was regressed against fluency gain in Step 1 of the regression. In Step 2, the remaining subscales of the SASIQ were entered into the equation to test their significance as a subset (see Table 6 for results).

Table 6

Summary of Hierarchical Regression Results

	Step 1 β (S.E.)	Step 2 β (S.E.)
Time	-0.42	-0.36
	(0.28)	(0.28)
Level	0.53**	0.45*
	(0.22)	(0.22)
%NS	1.84**	1.64*
	(0.79)	(0.86)
Dispersion	-0.31**	0.53
	(0.15)	(0.50)
Intensity	-0.09	-0.11
	(0.18)	(0.20)
Size		-0.18*
		(0.10)
Durability		-0.17
		(0.30)
Density2		0.60*
		(0.31)
Constant	0.63	-0.92
	(1.01)	(2.74)
Obs:	34	34
R-squared:	0.39	0.47
Prob > F:	0.01	0.02

Note:$p<.10.$ **$p<.05.$ ***$p<.01.$

Standard errors are included in parentheses below the unstandardized coefficients.

Step 1 of the hierarchical analysis, which regressed only the established variables mentioned above against fluency gain, exhibited an R^2 value of .39, meaning that these five variables jointly explained nearly 40% of the variance in the model. When the adjusted R^2 value (0.27) was compared to the adjusted R^2 value for the initial regression (0.19), the strength of the Step 1 regression was reinforced, perhaps indicating the important role that ostensibly non-social network variables (such as proficiency level or amount of interaction with native speakers) play in developing those networks. When the variables in Step 1 were examined individually, initial proficiency level, percentage of native speakers in participants' social networks (%NS), and dispersion were found to be significant at the $p < 0.05$ level, as shown in Table 6, Step 1. Time in country and closeness of relationship were not significant predictors of fluency gain in this model. Each of the significant variables is discussed in more detail below.

Initial proficiency level was shown to be a significant positive predictor of language gain under this model, showing that, all other variables held constant, a student starting at a higher proficiency level would make more gains in perceived fluency than another student starting at a lower level. This conflicts slightly with studies by Regan (1998) and Cubillos (2013), both of whom found that students starting at a lower proficiency level tend to make faster, more obvious gains in fluency than their counterparts with a higher initial proficiency level. However, Regan notes that students starting at a higher proficiency level may be gaining more in pragmatic skills, which are less easily observable but also have a positive impact on perceived fluency (pp. 73-74). This could account, at least partially, for these discrepancies.

The percentage of the participants' social networks made up of native speakers of the target language (%NS) was also a significant predictor of fluency gain, aligning with many previous studies (Derwing, Munro, & Thomson, 2007; Dewey, Bown, & Eggett, 2012; Du, 2013,

Regan, 1995). IEP students, as mentioned above, have multiple opportunities to interact with native English speakers (roommates, fellow church members, and coworkers, as well as groups of friends developed individually). These opportunities for authentic exposure to the L2 could have a significant impact on participants' fluency gains.

Finally, dispersion (or number of social groups listed by the participant) was determined to be significant at the $p<0.05$ level by Step 1 of the hierarchical regression. In contrast to the other two significant variables (initial proficiency level and percentage of native speakers), which both maintained their significance and their sign into Step 2 of the analysis, dispersion both lost its significance and changed its influence from negative to positive. This could be indicative of an omitted variable bias, which occurs when one or more relevant explanatory variables is left out of the model and can cause over- or underestimates in the effects of one or more factors in the model.

Upon adding the remaining SASIQ measures to the model in Step 2, we found that the addition of these factors was *not* jointly significant (Prob>F = 0.29). In this model, it appears that size, durability, and density2 have no joint effect on fluency gain when controlling for the variables in Step 1, even though size and density2 were significant individually.

The results of this study point to the importance of a large social network in the L2 on perceived fluency gain, both in terms of overall size and the size of individual social networks. Similarly, the importance of having a network largely composed of native speakers of the L2 (as opposed to fellow non-native speakers) is also emphasized. All of these findings fit comfortably within the common perception of how language learning and fluency gain function within an immersion environment. One unexpected finding, however, was the positive effect of proficiency level on perceived fluency gain. Previous research has indicated that SA students with a *lower*

initial proficiency level tended to make more gains over the course of the program (Regan, 1998; Cubillos, 2013). This difference could be due to the IEP context unique to the current study. Students preparing for university study in the second language are likely at a higher overall proficiency level than students participating in a traditional study abroad program, which may have some impact on the results. Generally speaking, however, the findings of previous researchers holds true in the IEP context described in the current study.

4.4 Limitations & Suggestions for Application

This study was not without its limitations. The social network information used in this study was collected via self-report, which is problematic in that we have no way of confirming the truth or accuracy of the participants' responses. However, self-report is one of the primary methods of collecting data in social network research (Knoke & Yang, 2008; Scott, 2000) and has regularly been used in SA research as well. The perceived fluency ratings could also be seen as a limitation, due to the lack of precise definition of fluency and the related subjective nature of rater judgments. However, given that the intention of this study was to determine the relationship between social network development and naïve native speakers' perceptions of SA participants' fluency, this measure was most appropriate. Future studies could look at connections between social networks and fluency using more objective measures, following patterns similar to Segalowitz and Freed (2004), who investigated relationships between language use and change in temporal measures of fluency over SA and perhaps adding measures of social networks other than self-report (observation, reports from interlocutors, etc.). Additional research could further investigate the way that social networks are developed in various types of immersion environments as discussed in this paper.

The results of this study point to the paramount importance of integration into the host culture, as evidenced by connections shown between having multiple strong social groups and interacting with native speakers of the L2 on fluency gain. A large proportion of the participants' contacts were fellow IEP participants, but we found that students who had a larger proportion of native English speakers in their social networks were perceived to be more fluent at the end of the study than those who had a smaller proportion. This element of interaction with native speakers could be facilitated in any immersion situation by encouraging accountability on behalf of the students in the form of reports on language use outside of class or specific assignments to interact with native speakers, such as in a club or service activity. Dewey, Ring, Gardner, and Belnap (2013) found that students viewed a program requirement to talk to native speakers for two hours each day (accompanied by careful follow-up) as the most helpful factor in developing social networks. Another potentially helpful tool is living situation – for example, native speaker roommates or host families. Research on the benefits of living with a host family has shown the great influence that a successful relationship can have on a student's social network development and proficiency gain, (Dewey, Belnap, & Hillstrom, 2013; Isabelli-Garcia, 2006; Wilkinson, 1998). Any of these methods, especially in combination with one another, would be excellent ways to implement the findings of this study.

5. Conclusion

In this study, we explored social network development in the context of an IEP in the U.S., attended by a wide variety of students and situated in the students' L2 environment. We found that participants were able to successfully develop multifaceted social networks, as measured by the SASIQ. Participants were able to draw from the IEP environment as well as from external social settings to form large, diversified social networks in comparison with

previous studies using the SASIQ (Dewey, Belnap, & Hillstrom, 2013; Dewey, Bown, & Eggett, 2012; Ring, Gardner, & Dewey, 2013). These external contexts commonly consisted of neighbors and church communities, which points to the importance of integrating into the local community for L2 learners, as put forth by Martinsen, et al. (2010) and Cubillos (2013). We also found that the participants' overall oral fluency was perceived to have increased significantly over the 14-week period measured by the study.

In determining interaction between social network development and fluency gain, we found that the SASIQ's subscales were jointly significant in predicting fluency gain and that, taken individually, the average size of a participant's social groups was the best indicator of fluency gain, followed by dispersion of one's network over a variety of social groups, demonstrating the primary importance of building a diversified social network which is strong in multiple areas rather than concentrated in only one.

However, social network development does not occur in isolation in the real world. When we controlled for factors commonly found to be significant in fluency gain (previous coursework, initial proficiency level, percentage of English speakers in social network, number of social groups, and average closeness of relationship) using a hierarchical regression, we found that these combined factors predicted more of the variance in fluency gain than the five SASIQ measures did. Thus we can see the value in maintaining a holistic approach to determining factors associated with language gains rather than examining these factors in isolation. Within the framework of the hierarchical model, initial proficiency level and the percentage of English speakers in each social network were found to be significant factors in the first step of the regression, with overall network size and average size of social groups also playing a role in the second step.

There is significant room for error in this data. It is possible that we failed to include all of the relevant variables, or that the analysis did not uncover the meaning behind the interaction of these variables, the context, and the outcome. Investigation of immersion settings such as study abroad and IEPs is still in many ways an exploratory field, one in which contexts and individuals vary so greatly that it is difficult to draw generalizable conclusions from a single study. However, by continuing to investigate immersion-based language learning and social network development in a variety of locations, programs, and sociocultural settings as well as with many different groups of people, we can come closer to a general understanding of how these ideas interact with one another and their environment.

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Appendix

Study Abroad Social Interaction Questionnaire

Q1.1 What is your name?

Q15 What is your BYU ID number?

Q1.2 What is your email address?

Q1.3 What is your native language?

Q1.4 What is your age?

○ 15-20 (1)
○ 21-25 (2)
○ 26-30 (3)
○ 31-35 (4)
○ 36-40 (5)
○ 41+ (6)

Q1.5 What is your gender?

○ Male (1)
○ Female (2)

Q1.6 How long have you been living in the U.S.?

○ 0-6 months (1)
○ 6-12 months (2)
○ 1-2 years (3)
○ More than 2 years (4)

Q1.7 How long have you been studying at the ELC?

❍ 0-6 months (1)
❍ 6-12 months (2)
❍ 1-2 years (3)
❍ More than 2 years (4)

Q1.8 What is your current level at the ELC?

❍ Foundations C (equivalent to OPI Intermediate Low)
❍ GAP
❍ Academic A (equivalent to OPI Intermediate Mid)

Q1.9 In the boxes below, please type the names of up to 30 friends or acquaintances with whom you speak ENGLISH most often. (Please list both native and non-native English speakers that you interact with in any context—ELC classmates, your roommates, family, friends, coworkers, etc.)

Q2.1 What is each person's native language?

Q2.2 How often do you interact with each of these people?

    a) Daily (7)
    b) 2-3 Times a Week (6)
    c) Once a Week (5)
    d) 2-3 Times a Month (4)
    e) Once a Month (3)
    f) Less than Once a Month (2)
    g) Never (1)

Q2.3 How close are you to each of these people? (8 = best friend, 1 = not close at all)

Q2.4 Separate your acquaintances into social groups (people who know each other from the same place—for example, the ELC, work, church, etc. Follow the instructions below to create your social groups.

(1) Name each box (ex. ELC, work, church)
(2) Select one of your acquaintances' names, then click the > button for the group that they belong to.
(3) Try to put people who know one another in the same box.
(4) DO NOT click the X buttons beside the boxes! This will PERMANENTLY delete the person's name.