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Factors Affecting Accent Acquisition: The Case of Russian Immigrants in Israel

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ABSTRACT

A debate centers on whether the native accent is acquired early in life or whether it can be acquired at any time. This study investigated factors that may affect native accent acquisition in a second language. Participants in this study were 50 Russians who immigrated to Israel, 17 males and 33 females. Their age on arrival was 5 to 25 years. They were asked to fill out a questionnaire, read aloud a text in Hebrew, and speak spontaneously on any topic they chose. Three native Hebrew speakers judged the last two parts of the questionnaire. The results indicated that age of arrival in the host country was the strongest predictor of native accent acquisition whereas level of exposure to the native language proved not to be a good predictor. The results are discussed in light of these findings.

INTRODUCTION

Social, cultural, and cognitive variables affect second language acquisition (Gardner, 1985; Bialystok, 1991; Cummins, 1991). An important component in second language learning is accent acquisition. The literature is divided between those who believe that there is a critical age by which learners can acquire a second language accent-free and those who hold that an accent can be acquired at any time in life depending on the level of second language exposure and the contact with the target language group. The question “What are the factors that may affect successful native language acquisition in host countries?” was investigated in this research. The study was conducted among Russians who had immigrated to Israel at different ages.

RUSSIAN IMMIGRANTS IN ISRAEL

Israel is a country that welcomes new Jewish immigrants from all over the world, resulting in a dynamic people population of different cultures, languages, and color. More than 50% of the population of Israel was born elsewhere (Olshtien, 1997). Immediately after the collapse of the former Soviet Union (approximately 1985-1991), Israel absorbed about one million Russian Jewish immigrants, who now constitute about 16% of the population.

This Russian group has maintained its Russian cultural identity: Russian language, Russian media, and Russian extra-curricular activities for children after school. They have produced two political parties based on Russian cultural identity with representation in the Knesset (Israeli parliament) and ministers in the current Israeli government. The Russian immigrant group is cohesive. Solomonick (1980) explains the emotional attachment of Russian-Jewish immigrants in Israel to their Russian language and culture. He adds that only 43% of them speak fluent Hebrew and they do not seek spiritual acculturation into Israel (Abu-Rabia, 1999, 2001).

The different cultural and linguistic resources of Israeli society make it a good field for research into different aspects of second language acquisition, and researchers such as Abu-Rabia (1999) and Olshtien (1997) have already investigated the Russian-Jewish situation.

FACTORS AFFECTING SECOND-LANGUAGE ACQUISITION

Research literature reveals a multitude of variables affecting second language acquisition in general, and its accent in particular. These include attitudes toward the second language and the target language group, openness of the new culture to the learner, individual differences, teaching methods, and design of the learning environment. According to Olshtien and Persman (1997), the desire of Russian immigrants in Israel for social interaction is very high, while the desire to use Hebrew within the family is very low. The environmental and psychological factors that affect second language acquisition are motivation, level of exposure, and the conditions for learning the second language (Spolsky, 1989; Berman, 1990). Interest in learning the second language is a function of the attitude of the specific learner, the learning situation, instrumental motivation, and integrative motivation (Abu-Rabia, 1999; Gardner, 1985).

Critical Age and Accent Acquisition

Accent acquisition is one component of second language learning that learners sometimes may not feel comfortable with. Research on accent acquisition is divided between those scholars who believe that it can only occur during a critical age and those who do not. According to Pallier, Bosch, and Sebastian (1997), adults find it harder than younger learners to acquire the native accent of the second language. The critical age period is the period in which the learner can still learn the new phonetic system of the new language. Lennenberg (1967) claimed that there is a neurological critical age period and it ends near the teenage years. Oyama's (1976) research point to the existence of a critical age period for acquiring a native accent in the second language.

Scovel (1981) theorizes that there is one critical age period for second language accent acquisition that is neurological, involving the intervention of certain nerves in the human body. Learners who start learning a second language after the age of twelve will never be able to acquire its true native accent, although there may be a few unique exceptions. Long (1990) concurs with Scovel (1981), holding that the acquisition of the native accent occurs through exposure to the native accent before age six and not later than age twelve.

Conversely, Neufeld (1979) found that Canadian native English speakers who started to learn French as adults succeeded in acquiring the native French accent. This proved that acquiring the accent of the second language was possible even after the presumed critical age period. Similarly, Bongaerts, Planken, and Schils (1995) indicated that Dutch people who began learning English in a formal instructional setting after the age of twelve were able to

attain English pronunciation ratings within the same range as those attained by native speaker controls—the second language accent was perceived as native by native speakers. Studies have been conducted on adult Dutch people learning English as a second language, on the learning of French as a second language by Dutch subjects (Bongaerts, Van Summeren, Planken, & Schils, 1997), and on late learning of Dutch as a second language (Bongaerts, Mennen, & Van der Slik, 2000). All these studies replicate the findings of Bongaerts et al. (1995).

Moyer (1999) investigated the second language phonological attainment of 24 Anglophone graduates of German, none of whom had had any exposure to that language before age 11, but were now employed as teachers of German at the university level. According to the ratings of four native German speakers, the German accent of those Anglophone graduates did not match the accents of native speaker controls. However, one of the subjects was mistaken by the raters for a native speaker. This individual had begun learning German at age twenty-two, and was largely self-taught. What distinguished him from his peers was a strong desire to sound German.

Much of the recent work of Flege and his colleagues has demonstrated the importance of environmental factors on second language pronunciation. Time spent in a country where the target language is in use (Riney & Flege, 1998) and time spent in the company of native speakers (Flege, Frieda, & Nozawa, 1997) emerged as major determinants of quality of second language accent. Klein (1993) argues that extensive and continuous exposure to the second language is an essential factor, but not enough in attaining native second language accent. Accent can be acquired only if the learner is highly motivated to learn the language and has a strong desire to be like and sound like the native speakers. This must be combined with good linguistic aptitude and the ability to learn the native second language accent even after the critical age period.

Asher and Garcia (1969) found that none of their subjects who immigrated to the United States had attained a true American accent regardless of the age of arrival and length of residency. However, many were rated as having near-native English pronunciation. The highest probability of this near-native pronunciation occurred when the subject had arrived in the United States as a child between the ages of one and six years, and had lived there five to eight years. They concluded that the younger the child, the higher the probability of pronunciation fidelity.

Motivation

Motivation is recognized as being related to second language acquisition, and the stronger the learner's desire to sound like a native speaker, the more likely it is that they will (Pursel & Suter, 1980). However, Oyama (1976) found that motivation had no effect on accent improvement and, further, was not related to the phonological system of either the first or the second language. His subjects were 60 Italian immigrants in the United States who had started to learn English at different ages and whose length of residence in the United States differed. They underwent a period of training in the English language, and their motivation to learn it was tested by a questionnaire. Only one variable was found to predict the quality of the second language accent acquisition, namely, age of arrival in the United States.

The other variables, length of residence, and phonological systems of first and second languages, were not good predictors of accent acquisition. Social researchers agree that positive attitudes to the language and the target language group cause strong motivation to learn the second language and to interact with the community. Some of these studies indicate that motivation may positively affect native accent acquisition (Gardner & Lambert, 1972). However, Oyama (1976) found that identification of Italian-born residents of the United

States with the second language culture and community did not affect their lack of desire to acquire a native American accent. Likewise, Suter (1976) found negative correlations between students' attitudes to integrate with American society and their ability to pronounce words like native English speakers. He tested 61 Arab, Japanese, and Persian (which is widely spoken in Iran, Afghanistan, Tajikistan, and Uzbekistan, and to some extent in Armenia, Iraq, Bahrain, and Oman) students whose first language was not English. The variables that predicted native accent acquisition were similar phonological systems of the two languages, importance of accent acquisition as reported by the participants, and importance of speaking English as natives in workplaces and schools. The last two variables demonstrated negative correlations with accent acquisition.

Spontaneous Talk

Accents of learners or immigrants in the second language can be tested by read-aloud tasks and spontaneous talk. These assignments can be judged by a team of native speakers.

Everson (1998) tested word recognition in 20 native English speakers who studied Chinese as a second language, including correlations between word recognition and acquisition of the native accent. The results indicated significant relationships between the ability to identify and understand Chinese words and the ability to pronounce them correctly. Everson concluded that whenever the students knew the meaning of the target word, they were more likely to pronounce it right.

Tarone (1983) pointed out some internal components that may affect accent acquisition. When Korean adults were learning to correctly pronounce syllables in English that were different from those in Korean, their accent was significantly poorer than when the assignment was with syllables similar to those in Korean. Likewise, Neufeld (1988) found that even people highly proficient in the second language found difficulty, like native speakers, in pronouncing non-words and words with complicated phonological rules.

Thompson (1991) conducted a study similar to Neufeld's by testing accent acquisition in the second language. He assumed that acquiring an accent in the second language like that of native speakers was impossible even when the learner was exposed to the language at an early age. Participants were 36 Russian-born adults who had migrated to the United States. They were asked to conduct three assignments: read sentences in English, read a paragraph, and talk spontaneously. Their accent was judged by three groups of judges on a scale of 1 = native accent, to 5 = heavy foreign accent. The results indicated that the younger the immigrant when he or she arrived in the United States, the better he or she acquired a native accent. Thompson also tested gender differences, and found that females acquired a better native accent than males. Females also ascribed more importance to speaking in the native accent. However, motivation exerted no significant effect on accent acquisition.

As seen in this literature review, researchers have yet to reach consensus on the existence of a critical age period for second language acquisition in general and native accent acquisition in particular.

The Present Study

The study presented next investigated native Hebrew-accent acquisition among Russian immigrants in Israel. We wanted to identify some of the independent factors that may affect or relate to accent acquisition: age, gender, age of arrival, length of residence, years of education in Hebrew, the importance of native accent to learners, use of Hebrew on a daily basis, number of native Hebrew speakers, places where one speaks Hebrew, and situations where one must speak Hebrew.

METHOD

Participants

Fifty Russian immigrants, 17 males and 33 females of different socioeconomic status, participated in this study. Their ages on arrival in Israel ranged from 5 to 25 years (mean average age on arrival was 14.9 years, standard deviation 5.38). Their first language was Russian. None of them suffered a hearing and/or speech impediment. Most of the participants were university students; some were elementary school pupils when they arrived in Israel. There were also adults with university education and some with only high school education. The mean average time of residence in Israel was 6.4 years with a standard deviation of 3.0. Three judges evaluated the participants' accents in both reading and spontaneous talk. The judges were Israeli-born, native Hebrew speakers and none of them had any knowledge of Russian or any formal experience with foreign accents before this study. Two of the judges were females and one was male, and all had an university-level education.

Measures

Participants were tested individually as well as in groups. They had to fill out a questionnaire, read a text in Hebrew, and talk about themselves for one minute. The questionnaire consisted of five background knowledge questions and personal information, and then another six questions about the participant's exposure to the Hebrew language in his or her daily life. The reading text was half of a page from a children's storybook, composed of short and easy sentences in Hebrew. The level was very easy in order to avoid difficult and unknown vocabulary and syntax that might have impeded reading fluency. The text contained Hebrew syllables considered difficult for native Russian speakers to pronounce, as they do not exist in the Russian phonetic system. For example, the sound of the Hebrew definite article "the" does not exist in Russian, and the -r sound is pronounced differently in Russian and in Hebrew. Lastly, participants were asked to choose a topic, then talk about it for one minute at their usual speed.

Procedure

Participants were tested in their free time. They first completed a questionnaire on background and exposure to Hebrew. They then read the text aloud after reading it a few times so as to avoid any reading-error effect. Thereafter, each reading was tape recorded and each participant's one-minute spontaneous talk was also taped. Participants could self tape in private if desired to avoid embarrassment, and some preferred to tape themselves privately on both assignments in a different room while others prepared and taped both assignments individually in their free time.

The recorded reading text and the spontaneous talk were then submitted to the three judges for accent evaluation on a scale of 1 = very heavy foreign accent, 2 = heavy foreign accent, 3 = moderate foreign accent, 4 = sort of Israeli accent, and 5 = true native Israeli accent. Each judge evaluated the tapes individually and without sharing ideas with the others. They disregarded reading errors and/or language errors, and they evaluated the reading and the talk on two separate sheets. The judges were informed that they will be receiving the reading tapes in random order to ensure the tapes did not match the spontaneous-talk tapes.

RESULTS

At the time of this study, the youngest participant was eight years old, the oldest 35. Table 1 presents the statistics of the independent variables. As shown in Table 1, the participants graded the importance of acquiring a true native Hebrew accent on a scale from 1 = very little, to 5 = very much. They similarly graded their exposure to Hebrew on a daily basis. They were asked to note a specific number of Hebrew-speaking friends.

Table 1. Descriptive Statistics of the Independent Variables

Variables	Mean	SD	N
Chronological age (years)	21.3	6.27	50
Age on arrival (years)	14.92	5.38	50
Residence in Israel (years)	6.42	3.02	50
Importance ascribed to accent acquisition	*3.94	1.10	50
Exposure to Hebrew	*3.90	0.93	50
Number of Israeli friends	4.96	4.21	50

* Maximum score = 5.00

Table 2 presents descriptive statistics and MANOVA results of the dependent variables, reading and spontaneous talk. The rating of the first judge was $x = 3.62$ on reading, and $x = 3.58$ on the spontaneous talk. The second judge's rating was $x = 3.66$ on reading, and $x = 3.64$ on spontaneous talk. The third judge's rating was $x = 3.44$ on reading, and $x = 3.44$ on spontaneous talk. The total mean rating of the three judges on reading was $x = 3.57$, and on spontaneous talk $x = 3.54$. The MANOVA procedures revealed no significant differences in the evaluations of the three judges on reading and spontaneous talk. Further analyses were conducted to find gender differences in accent acquisition.

Table 2. Means and Standard Deviations of Three Judges' Rating of Participants on Reading and Spontaneous Talk (N=50)

Variables	Mean	SD	f	p
Reading 1*	3.62	0.88	1.54	0.14
Reading 2*	3.66	0.82	0.95	0.53
Reading 3*	3.44	0.81	1.24	0.30
Total	3.57	0.68	1.35	0.22
Talk 1*	3.58	0.93	1.42	0.19
Talk 2*	3.64	0.85	1.50	0.60
Talk 3*	3.40	0.76	0.94	0.54
Total	3.54	0.73	1.44	1.80

*1, 2 and 3 are the evaluations of three judges. Maximum score is 5.00.

As seen in Table 3, t-test procedures revealed no significant differences between males and females. The differences in the reading task between males and females were not significant ($t(48) = -0.61$, $p < 0.54$), and no significant differences existed between males and females on the spontaneous talk ($t(48) = 0.47$, $p < .064$). A significant negative correlation existed between age of arrival in Israel and accent on all tasks among all judges ($p < 0.01$), namely, the younger the immigrant the better he or she acquired the native accent. For example, the total mean evaluation by the judges on all spontaneous talk was significantly

and negatively correlated with age of arrival, $R = -0.43$. Likewise, reading was significantly and negatively correlated with age of arrival, $R = -0.51$. All these values were significant at the 0.01 level.

Table 3. Statistical T-Test Analysis of Gender Differences on Reading and Spontaneous Talk as a Function of Accent Evaluation

Variables	t-test	p
Reading 1	-0.18	0.86
Reading 2	-0.44	0.66
Reading 3	-0.54	0.59
Total	-0.47	0.64
Spontaneous Talk 1	-0.27	0.78
Spontaneous Talk 2	-0.31	0.76
Spontaneous Talk 3	-1.11	0.27
Total	-0.61	0.54

Further, a Pearson correlation matrix was calculated among all variables, dependent and independent: chronological age, gender, age of arrival, length of residence in Israel, education, importance ascribed to accent acquisition, importance ascribed to Hebrew, number of Israeli friends, reading 1, reading 2, reading 3, spontaneous talk 1, spontaneous talk 2, spontaneous talk 3, total reading, and total spontaneous talk. The correlations were calculated to test the relationship between the different variables. The results of the Pearson correlation matrix are presented in Table 4.

Table 4. Pearson Correlation Matrix between All Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Chronological age		-0.88**	0.875**	0.518**	0.114	-0.152	-0.142	-0.194	-0.335*	-0.371**	-0.339*	-0.237	-0.274	-0.297*	-0.431**	-0.309*	
Gender			-0.035	-0.111	0.7	0.038	-0.124	0.145	0.026	0.063	0.078	0.04	0.044	0.158	0.068	0.088	
Arrival age				0.04	-0.254	-0.136	-0.226	-0.275	-0.43**	-0.384**	-0.417**	-0.383**	-0.35*	-0.379**	-0.509**	-0.428**	
Length of residence					0.686**	-0.066	0.109	0.072	0.061	-0.073	0.31	0.181	0.052	0.05	0.01	0.114	
Education						-0.059	0.155	0.09	0.192	0.099	0.141	0.223	0.185	0.116	0.14	0.206	
Importance ascribed to accent							0.174	0.013	-0.003	0.135	-0.039	-0.025	0.042	0.005	0.038	0.007	
Importance ascribed to Hebrew								0.343*	0.152	0.274	0.086	0.21	0.16	0.87**	0.211	0.181	
No. of Israeli friends									0.30*	0.055	0.334*	0.246	0.178	0.36*	0.285*	0.286*	
Reading 1										0.298*	0.754**	0.877**	0.766**	0.603**	0.855**	0.835**	
Reading 2											0.381**	0.37**	0.462**	0.256	0.686**	0.424**	
Reading 3												0.711**	0.647**	0.705**	0.881**	0.795**	
Spontaneous talk 1													0.735**	0.594**	0.814**	0.913**	
Spontaneous talk 2														0.514**	0.731**	0.876**	
Spontaneous talk 3															0.646**	0.795**	
Total reading																0.851**	
Total spontaneous talk																	1.00

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

A positive significant correlation was found between number of native Hebrew-speaking friends and accent acquisition on both tasks, reading and spontaneous talk, $R = 0.285$ and $R = 0.286$ respectively, with the significance of $p < 0.05$. Further, the use of Hebrew was also significantly and positively correlated with number of Hebrew-speaking friends. The more such friends one had, the more conversations and opportunities one had for speaking in Hebrew. No significant intercorrelation was found among the following variables: chronological age, gender, length of residence in Israel, education, importance of native accent, accent in reading, and accent in spontaneous talk.

Furthermore, a linear regression analysis was conducted to test the predictors of accent acquisition; all the independent variables were entered into the regression equation. The dependent variable was the accent evaluation by the three judges on the separate reading and spontaneous-talk tasks and the total scores. The regression analysis revealed that the only predictor of accent acquisition was age of arrival to Israel. None of the other variables made any significant contribution. For example, the total mean score by the judges on the reading task explained 26% of the total variance, $R^2 = 0.259$, ($F(1,49) = 16.76$, $p < 0.01$). Likewise, on the spontaneous-talk task, the total mean score given by the three judges explained 18% of the total variance, $R^2 = 0.184$, ($F(1,49) = 10.72$, $p < 0.01$). The other variables did not show any significant prediction.

To test the critical age period for second language accent acquisition, a cutoff score was determined from the distribution of age arrival. This resulted in two categories: younger people aged ≤ 13 years ($N = 16$) and older people aged ≥ 14 years ($N = 34$). If the critical-age period view was right, it was assumed there would be two clear categories, the younger group with better accent results and the older group with poorer accent results. The t-test results revealed significant differences between the two age groups in favor of the younger = 4.06, $SD = 0.56$, as against the older = 3.29, $SD = 0.06$. Significant differences appeared in the reading task results, $t(48) = 3.57$, $p < 0.01$ and in the spontaneous-talk task results, $t(48) = 3.95$, $p < 0.01$, as shown in Table 5 below.

Table 5. Means and Standard Deviations and T-Test Analysis of the Two Age Groups

Variables	Age Group	N	Mean	SD	t	p
Reading	≤ 13	16	4.06	0.6	3.95	0.01
	≥ 14	34	3.29	0.66		
Spontaneous Talk	≤ 13	16	4.03	0.63	3.57	0.01
	≥ 14	34	3.36	0.06		

DISCUSSION OF RESULTS AND CONCLUSION

All three judges made similar evaluations in the two tasks, reading and spontaneous talk. Namely, the accents in reading and talking seemed very similar to the native Hebrew judges. Also, there were no gender differences in these accent evaluation tasks. The most important finding of this study was that age of arrival was a strong predictor of accent acquisition. The younger the learner, the better she or he managed to acquire the native accent of their second language. This finding confirms the assumption of a second language critical-age period for native accent acquisition. It was clear from the findings of this study that the younger the child (i.e., younger than 13 years), the greater the chance he or she had in acquiring the second-language native accent. These results accord with those of Thompson (1991) that the age of arrival of the immigrant to the United States was the best predictor of native English-accent acquisition and, furthermore, they confirm Scovel (1981) and Long's (1985) theory of the existence of an early critical age in life for second language acquisition.

and especially for native-accent acquisition. Scovel (1981) argued that a person older than twelve years learning a second language will never acquire the native accent. Long (1985) concurred with Scovel's (1981) position. However, Lennenberg (1967) and Neufeld (1979) presented an opposing argument, namely that no "critical age period" existed for native accent acquisition and learners may acquire the native accent even later. Neufeld (1979) found that immigrants in Canada could learn English at an advanced age and still acquired the language as well as the accent after the presumed critical age.

Furthermore, gender differences were examined in this study, and no significant differences were found. Similar results were obtained by Snow (1982). However, Asher and Garcia (1969) found significant differences between males and females on accent measures. They investigated native American accents in Spanish-speaking immigrants to the USA, and found that gender may predict native accent acquisition among young learners of a second language. Their results accorded with those of Thompson (1991).

Motivation to learn the second language was tested in this study by investigating participants' desire to take advantage of opportunities to speak with native Hebrew speakers. Results obtained indicate a non-significant relationship between motivation and second language native accent attainment. This finding is in accordance with the findings of Oyama (1976) among Italian immigrants in the United States who found no significant relationship between native accent and motivation to learn the second language (Suter, 1976).

Furthermore, the level of exposure to the second language, Hebrew, was tested in our study as a possible factor affecting acquisition of a native Hebrew accent. Exposure had no significant relationship with accent acquisition, that is to say, participants who reported a high level of exposure to the Hebrew language and actual engagement in situations where they were obliged to speak Hebrew scored no better on the native accent measures than those who reported less exposure to Hebrew. Thompson (1991) argued that exposure did not affect acquisition of the native accent. Klein (1993) supported the idea, stating that massive and continuous exposure to the second language did not affect the learner's accent. However, Berman (1990) found that the level of exposure did affect the level of accent acquisition.

Thus, the most important variable effecting native accent acquisition was age of arrival in the host country, or age of starting to learn the second language from its native speakers. Based on the results of this study, there appears to be a critical age period for native accent acquisition, which is roughly up to thirteen years. The later people start learning the second language, the harder will they find the learning process.

For future research, we would suggest the use of a larger sample with different testing conditions, namely, to test accents of different immigrants who arrived in the host country at different ages, under different social and emotional testing conditions (fortunate and unfortunate circumstances, and different levels of alcohol consumption). These conditions may reveal whether or not the native accent of the second language speaker is authentic. Fluctuations of the subjects' mood may cause them to read or speak naturally or unnaturally because they may not be able to invest maximum cognition in pronunciation. Testing accent acquisition under such different conditions will undoubtedly shed further light on the implications of this important concept. Alternatively, we suggest testing motivation via more authentic methods such as in-depth interviews.

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