The Effect of Bilingualism on Iranian EFL Learners' Multiple Intelligences

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Abstract

There is paucity of studies particularly on the possible relationship between multilingualism and intelligence in EFL (English as a Foreign Language) context of Iran in particular and all around the world in general. The current study, therefore, aimed at investigating the effect of bilingualism on Iranian EFL learners' multiple intelligences (MI) across gender. To this end, 80 EFL learners, including 20 females and 20 males in each group, from Urmia state and Azad universities participated in this study. The participants were within the age range of 18-26. Data was collected through Multiple Intelligences Profiling Questionnaire offered by Armstrong (1995) including 40 items. Results of an independent samples t-test revealed a significant effect of linguistic background on the MI profile of the participants. In other words, it was in favor of bilinguals who reported higher level of MI. In addition, findings indicated no significant effect of gender on MI. The findings are discussed in relation to effective EFL instruction especially to multi/bilinguals contexts.

Keywords: Bilinguals, Monolinguals, Multiple Intelligences, Iranian EFL learners, Gender

Introduction

There has been a growing consensus upon the claim that humans embody similar brains and are exclusively molded into differences by a variety of experiences in the world (Lynch & Granger, 2008). Skehan (1989) believes that the uniqueness or individuality of learners has vigorously brought many benefits to any EFL learning environment. Tomlinson (1999) subscribed to the view that educationalists must provide the learners with sufficient opportunities to make sense of their own existing differences and potentials. Equally important, exposure to a variety of contexts might increase such a distinction between individuals; therefore, experts need to deeply consider this at the leading edge of education to obtain a clear-cut understanding of why learners behave in certain ways (Aiken, 1999).

According to Cenoz (2009), "multilingualism refers to the acquisition, knowledge or use of several languages by individuals or by language communities in a specific geographical area" (p. 2). Due to the world's interconnectedness, multilingualism is not regarded as an exception (Bialystok, Craik, Green & Gollan, 2009). Every speaker has the

ability to become bi/multilingual that is why bi/multilinguals can be found in every country of the world, in every social class and in all age groups (Baker, 2001).

Multilingualism (including bilingualism) is an interdisciplinary approach which can be easily related to different fields, such as sociology, sociolinguistics, psychology, pedagogy, etc. Therefore, it is evident that there should be multitude factors influencing the acquisition of an additional language other than one's mother tongue. Among these factors, learners' variables seem to contribute a lot to one's success or failure, but, the influence of all these variables is not of the same degree. In one classification, Cenoz (as cited in Sanz, 2000) grouped the learners' variables in this way: (a) cognitive factors like intelligence; (b) psychological factors like attitudes and motivation; (c) educational factors like linguistic background and the number of years of additional language study; (d) socio-structural factors such as socioeconomic status.

Furthermore, the degree of multi/bilingualism which simply means the proficiency in each of languages, have been shown to have determining role in enhancing cognitive abilities in the process of learning an additional language. In this respect, multiple studies have claimed a positive link between second language proficiency and enhanced cognitive skills in visual-spatial skills, analogical reasoning, and classification tasks (Hakuta, Ferdman, & Diaz, 1986).

Literature Review

The theory of MI brings to light a pragmatic approach to the definition of intelligence and is a gateway to use learners' strengths in better learning. MI-based classrooms, institutes, and schools can be settings in which a variety of skills, talents, and abilities are likely used in learning and solving the problems. Preferably, MI is a student-centered model. To the surprise of many, the appeal of MI is that any teacher can utilize it in a way reflecting their unique context and culture. Not unexpectedly, it is possible for teachers to misapply MI. At the outset, MI can be viewed as the potent means of reaching students, but effective use of that requires teachers to spend time and energy to comprehend MI-theory and then decide about its implementation in curriculum development, instruction, and assessment (Hoerr, 2000).

Learners might be unaware of the number of intelligences they possess. Howard Gardner in his MI-theory proved the existence of a few number of quite discrete 'intelligences' in human beings that can be taken together in various ways to create the intellectual repertoire of individual learners (White, 2002). According to Baum, Viens, and Statin (2005), "MI-theory posits that individuals are different, unique blends of intelligences to solve problems and fashion production. In the school context, MI theory validates teachers' intuitive notion that children learn and are smart in different ways" (p.42).

The positive or negative effect of bilingualism on cognitive ability is based on the belief that language is an integral part of cognitive activity. Although for Piaget language has a minimal role in cognitive development, Vygotsky emphasizes the importance of language in guiding thought processes and the role of bilingualism in intellectual growth (Hakuta, 1990).

To shed more light on the direction of the relationship between bilingualism and intelligence, Diaz (1985) did a short-term longitudinal study to identify the direction in the

relationship between bilingualism and intelligence. Diaz concluded that bilingualism positively affected intelligence rather than intelligence affected bilingualism.

Furthermore, Bialystok (2003) and Carlson and Meltzoff (2008) compared bilinguals and monolinguals on development of executive control and concluded that bilinguals are faster than monolinguals. Fayyazi, Sahragard, Roshan and Zandi (2013) tried to explore the different intelligences in monolingual and bilingual high school students. The findings indicated that the bilinguals had higher linguistic, logical/mathematical, spatial, and interpersonal intelligences than monolingual and monolinguals had higher intrapersonal intelligence than bilingual students.

Despite the consistent positive findings of the above-mentioned studies on the effect of bilingualism on cognitive abilities in general and intelligence in particular, these results are sometimes looked at suspiciously because of some methodological problems reported. Thus, more attention must be paid to the issue of multilingualism. According to Modarresi (2001), bilingualism, multilingualism, and language maintenance are among the major issues of Iranian sociolinguistics that need scientific consideration. Nonetheless, in this regard, there is paucity of studies particularly on the possible relationship between multilingualism and intelligence in EFL (English as a Foreign Language) context of Iran in particular and all around the world in general. In order to fill the gap in the literature, the researcher formulated the following research questions:

- Is there any significant difference between monolingual and bilingual Iranian EFL learners in terms of their MI?
- Does gender affect the relationship between bilingualism and multiple intelligences?

Method

Participants

The study included 40 monolingual (speaking Farsi) and 40 bilingual EFL learners (speaking Turkish and Farsi) including both males and females (20 females and 20 males in each group) studying in state university of Urmia and Azad university of Urmia between the age ranges of 18-26 were selected. The participants were majoring in TEFOL.

Instruments

For the study to smoothly run forward and to accomplish its expected objectives, Multiple Intelligences Profiling Questionnaire including 40 questions, offered by Armstrong (1995), was utilized in the study. The questionnaire elicited demographic information including the participants' gender and age group. In addition, the first part seeks some information about the participants' linguistic background, frequently used languages, length of learning English or other foreign languages. Moreover, assessing eight intelligences, the questionnaire has forty statements, five for each specific intelligence type. The participants were guided to select on the Likert scale of 1: Not at all like me, 2: A little like me, 3: Somewhat like me, 4: A lot like me, 5: Definitely me. The questionnaire was translated into Farsi for the ease of learners' understanding and its reliability was 0.88.

Design of the Study

Within a descriptive design, the current study aimed at comparing two groups of participants in terms of their MI profiles to determine if their linguistic background has any impact on their MI.

Procedure

As regards the sampling procedures, the convenient sampling method was used in this study. 40 monolingual (speaking Farsi) and 40 bilingual EFL learners (speaking Turkish and Farsi) including both males and females studying (20 males and 20 females in each group) in Urmia state university and Azad university majoring in TEFOL were selected.

Employing MI questionnaire as data collection tools, researcher piloted the Farsi version of it to make sure about its reliability which was 0.88. Having calculated the reliability of the questionnaire, the researcher distributed the questionnaire among the learners of English in Urmia state university and Azad university. First, the participants were orally informed about the aim of the study and were assured that their information would be used just for research purposes. Participants were asked to read each part carefully and give honest answers to what was needed. In cases of misunderstanding, more instructions were provided by the researcher.

Data Analysis

The Statistical Package for Social Sciences (SPSS, version 20) was employed to analyze the data. Assigning the significance level of 0.05, an independent samples t-test was used to examine the effect of linguistic background (monolingualism and bilingualism) on MI profiles of the participants. Additionally, the effect of gender as a moderator variable was tested.

Results

Quantitative Data Analysis for the Difference between Bilinguals and Monolinguals Regarding their MI Profile

An independent-samples t-test was run to compare the mean score of bilinguals and monolinguals regarding their MI profile. The results of the descriptive statistics are presented accordingly in Table 2.

Table 1

Descriptive Statistics for the Difference between Bilinguals and Monolinguals Regarding their MI Profile

	Linguistic Background	N	Mean	Std. Deviation	Std. Error Mean
MI Profile	Bilinguals	40	85.26	5.70	.65
	Monolinguals	40	58.26	5.55	.64

According to the mean scores, there was a difference between two groups, that is, bilinguals and monolinguals regarding their MI profile and an independent-samples t-test was employed to confirm it (see Table 2).

Table 2

Independent-samples T-test for the Difference between Bilinguals and Monolinguals Regarding their MI Profile

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
MI Profile	Equal variances assumed	.028	.867	29.3	78	.00	27.00	.91	25.18	28.81
	Equal variances not assumed			29.3	78	.00	27.00	.91	25.18	28.81

An independent-samples t-test was conducted to compare the scores of bilinguals and monolinguals regarding their MI profile. There was a significant difference in scores for bilinguals (M=85.26, SD=5.70) and males [M=58.26, SD=5.55; t (68) = 26.3, p=.00 < .05], that is, bilinguals reported higher MI compared with monolinguals.

Quantitative Data Analysis for the Difference between Bilingual Males and Females Regarding their MI Profile

An independent-samples t-test was run to compare the mean score of bilingual males and females regarding their MI profile. The results of the descriptive statistics are presented accordingly in Table 3.

Table 3

Independent-samples T-test for the Difference between Bilingual Females and Males Regarding their MI Profile

	Gender	N	Mean	Std. Deviation	Std. Error Mean
MI Profile	Females	20	81.5	2.20	.239
	Males	20	80.2	2.18	.279

A closer look at the table given above illustrates that there was no difference between the two groups in terms of their MI profile. Besides, to confirm the results obtained, an independent-samples t-test was employed (see Table 4).

Table 4

Independent-samples T-test for the Difference between Bilingual Females and Males Regarding their MI Profile

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
MI Profile	Equal variances assumed	1.55	.22	.06	38	.94	1.01	.368	-.720	.770
	Equal variances not assumed			.06	37.1	.94	1.01	.368	-.720	.770

An independent-samples t-test was conducted to compare the scores of bilingual males and females regarding their MI profile. There was no significant difference in the scores for the females (M=81.5, SD=2.20) and males [M=80.2, SD=2.18; t (38) = .06, p=.94> .05].

Quantitative Data Analysis for the Difference between Monolingual Males and Females Regarding

their MI Profile

An independent-samples t-test was run to compare the mean score of monolingual females and males regarding their MI profile. The results of the descriptive statistics are presented accordingly in Table 5.

Table 5

Independent-samples T-test for the Difference between Monolingual Females and Males Regarding their MI Profile

	Gender	N	Mean	Std. Deviation	Std. Error Mean
MI Profile	Females	20	75.04	3.31	.662
	Males	20	74.12	2.92	.584

According to Table 5, there was no difference between the two groups in terms of their MI profile and an independent-samples t-test was employed to confirm it (see Table 6).

Table 6

Independent-samples T-test for the Difference between Monolingual Females and Males Regarding their MI Profile

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
MI Profile	Equal variances assumed	.81	.37	38	38	.30	.920	.882	-.854	2.69
	Equal variances not assumed			38	38	.30	.920	.882	-.855	2.69

An independent-samples t-test was conducted to compare the scores of bilingual females and males regarding their MI profile. There was no significant difference in the scores for the females (M=75.04, SD=3.31) and males [M=74.12, SD=2.92; t (38) = .06, p=.94> .05].

Discussion and Conclusion

In the first research question, the differences in MI profile scores obtained by Iranian EFL learners from different linguistic backgrounds (i.e., monolingual and bilingual) were explored. Taking into account the MI profiles mean scores obtained by the participants, significant differences favoring bilinguals were noted. In other words, bilinguals demonstrated higher scores in intelligences proposed through the MI theory than monolinguals.

The findings are in line with McLeay's (2003) study in which bilinguals performed a series of spatial test items more quickly than monolinguals. Similarly, Clarkson (1992) reported that bilingual students competent in both of their languages scored significantly higher on two different types of mathematical tests compared to their counterparts who had low competence in their languages.

According to Peal and Lambert (1962), the ability to code-switch provides bilinguals with an additional mental flexibility when solving cognitive tasks. The experience of having two or more ways to describe the world give bilinguals the basis for understanding that many things could be seen in two or more ways, leading to more flexible approach to perception. In other words, bilinguals have two or more linguistic systems and two or more names for things. This capability, in turn, helps them to see things from different perspectives. Therefore, while thinking in one language to solve a problem when blocked they switch to another language. This habit may develop their cognitive abilities.

Similarly, Ben-Zeev (1977) found that bilinguals showed higher cognitive flexibility in symbol substitution and verbal transformation tasks and this metalinguistic awareness leads to greater cognitive development in general and intellectual growth in particular; because "intelligences development is positively impacted by metalinguistic awareness" (Crosby & Prescod, 2009, p.5).

Moreover, Cummins (1976) maintains that this superiority can take ground on the fact that bilinguals may have a wider and more varied range of experiences than monolinguals because they operate within two languages or probably in two cultures as well. Bilingualism gives individuals the ability to communicate with people they would otherwise not have the chance to know. It opens the door to other cultures.

Regarding the second question used to examine the effect of gender on the relationship between Iranian EFL learners' linguistic background and their MI, no significant differences were found between males and females in terms of MI scores. The findings are not in agreement with Furnham and Chamorro-Permuzic's (2005) and Tirri and Nokelainen's (2008) studies showing that men's overall MI estimates were higher than women.

The differences in the studies might be related to the differences in the contexts of the studies. In other words, the participants' context has an important role in one's intellectual

growth and even in one's self-image of his or her intelligences. Beloff (as cited in Furnham & Chamorro-Permuzic, 2005) states that females are brought up with much emphasis on humility and this can result in poor self-perception of intelligence compared to males.

Findings of the current study may present new insights about the nature of bilingualism in a rarely touched context of Iran for researchers and help them to gain enough background information for conducting novel research in the similar areas. The findings encourage educators and policy makers to promote multilingual education. Thus, EFL educational authorities are required to train EFL instructors with up-to-date knowledge of theories of first and additional language acquisition and EFL teachers should equip themselves with all the languages spoken in the context they do teaching. Moreover, teachers should develop a holistic view of learners and take into consideration physical, affective, and cognitive sides of learning as well. The results of this study may encourage learners to be more inclined in acquiring more than one language; moreover, they may find this study helpful in identifying their own strengths and helping them to be aware of the fact that everyone is intelligent in one way or another.

Regarding the limitations of a study, this study failed to take into account the participants' proficiency in the languages known to them. Hutchinson (2010) believes proficiency is an important variable in bi/multilingual research and proficiency testing should always be conducted in all languages available to multi/bilinguals.

Moreover, the only tool used in this study was a questionnaire which might seem somehow invalid. Because, according to Gardner (2006) intelligence should be assessed via "intelligence-fair" ways. Since there are other ways through which one's multiple intelligence profile can be estimated for example, observations, interviews, talking with parents, etc. Moreover, the participants were selected only from two universities of Iran and neglecting a noticeable number of EFL learners at institutes and secondary and high schools can endanger the generalization of the findings of this study.

Future research should use a stronger measure of bilingualism and multiple intelligences in order to have more valid results. More specifically, participants' proficiency level should be taken into account. Furthermore, future researchers should use different instruments instead of having only MI questionnaire. Moreover, instead of comparing different groups of bilinguals on their MI profile as a whole, one can conduct the similar study on all or a few of MI sub-categories as specific.

References

Aiken, L. R. (1999). *Human differences*. New Jercy: Lawrence Erlbaum Associates, Inc.

Baker, C. (2001). *Foundations of Bilingual Education and Bilinguqlism(3rd ed.)*. Clevedon: Multilingual Matters LTD.

Baum, S., Viens, J. & Statin, B. (2005). *Multiple intelligences in the elementary classroom. A teacher's toolkit.* New York: Teachers College Press.

Ben-Zeev, S. (1977). The influence of bilingualism on cognitive strategy and cognitive development. *Child Development, 48*, 1009- 1018.

Bialystok, E. (2003). *Bilingualism in Development: Language, Literacy, and Cognition*. Cambridge University Press.

Bialystok, E., Craik, F. I. M., Green, W. D., & Gollan, H. T. (2009). Bilingual Minds. *Psychological Science in the Public Interest, 10*(3)*,* 89-129.

Carlson, S. M., & Meltzoff, A. N. (2008). Bilingual experience and executive functioning in young children. *Developmental Science, 11*(2), 282-298.

Cenoz, J. (2009). *Toward multilingual education: Basque educational research from an international perspective*. Bristol, Buffalo, Toronto: Multilingual Matters.

Clarkson, P. C. (1992). Language and mathematics: A Comparison of bilingual and monolingual students of mathematics. *Educational Studies in Mathematics, 23* (4), 417-429.

Crosby, R. & Prescod, R. (2009). Effect of bilingualism on cognitive abilities: The annals of Gifu Shotoku Gakuen University. *Faculty of Foreign Language, 48,* 15-21.

Cummins, J. (1976). The influence of bilingualism on cognitive growth: A synthesis of research findings and explanatory hypotheses. *Working papers on bilingualism, 9*, 1−43.

Diaz, R. M. (1985). Bilingual cognitive development: Addressing three gaps in current research. *Child Development, 56,* 1376–1388.

Fayyazi, A., Sahragard, R., Roshan, B., & Zandi, B. (2013). Bilingual and monolingual differences on self-estimates of multiple intelligences regarding gender: A study of high school students in Iran. I*nternational Journal of Language Learning and Applied Linguistics World, 4*(4), 513-533.

Furnham, A., & Chamorro-Premuzic, T. (2005). Estimating One's Own and One's Relatives' Multiple Intelligences: A Study from Argentina. *The Spanish Journal of Psychology, 8*(1), 12-20.

Gardner, H. (2006). *The Development and Education of the Mind. The Selected Works of Howard Gardner*. London and New York: Routledge, Taylor & Francis Group.

Hakuta, K. (1990). Language and cognition in bilingual children. In A. Padilla, C. Valdez & H. Fairchild (Eds.), *Bilingual education: Issues and strategies*. (pp. 47-59). Newbury Park, California: Sage Publications.

Hakuta, K., Ferdman, B. M., & Diaz, R. M. (1986). *Bilingualism and cognitive development: Three perspectives and methodological implications*. UCLA: Center for Language Education and Research.

Hoerr, T. R. (2000). *Becoming a multiple intelligences school*. USA: Association for Supervision and Curriculum Development.

Hutchinson, S. M. (2010). *Executive Function and Bilingualism: What are the Effects of Language Proficiency?* Unpublished master's thesis, University of Athabasca, Canada.

Lynch, G. & Granger, R. (2008). *Big brain. The origins and future of human intelligence.* USA: Palgrave Macmillan.

McLeay, H. (2003). The Relationship between Bilingualism and the Performance of Spatial Tasks. *International Journal of Bilingual Education and Bilingualism, 6*(6), 423-438.

Modarresi, Y. (2001). Aspects of sociolinguistics in Iran. *International Journal of the* Sociology of *Language*, *148*, 1-3.

Peal, E., & Lambert, W. (1962). The relation of bilingualism to intelligence. *Psychological Monographs, 76*, 1-23.

Sanz, C. (2000). Bilingual Education Enhances Third Language Acquisition: Evidence from Catalonia. *Applied Psycholinguistics, 21*, 23-44.

Skehan, P. (1989). *Individual differences in second language learning*. London: Edward Arnold.

Tirri, K., & Nokelainen, P. (2008). Identification of Multiple Intelligences with the Multiple Intelligence Profiling Questionnaire III. *Psychology Science Quarterly, 50*(2), 206-221.

Tomlinson, C. A. (1999). *The diffentiated classroom. Responding to the needs of all learners*. USA: Association for Supervision and Curriculum Development.

White, J. (2002). *The child's mind*. USA and Canada: Routledge Falmer.

Appendix: Multiple Intelligences Profiling Questionnaire

اطلاعات شخصی

لطفا اطلاعات زیر را به دقت تکمیل کنید.

نام و نام خانوادگی:

سطح:

1) جنس: مذکر ○ مونث ○

2) گروه سنی: الف 15-13 ب: 20-16 ج: 25-21 د: 26 به بالا

3) زبان اول (مادری):

4) بیشتر به کدام زبان صحبت میکنید؟

5) اگر بیش از یک زبان در خانه استفاده میشود آنها را به ترتیب اولویت استفاده بنویسید.

1: 2: 3:

6) چند مدت است که انگلیسی یاد میگیرید؟

سال:..... ماه:.....

7) آیا زبانهای دیگری در کنار انگلیسی یاد گرفته اید؟ ○

بلی ○ (زبان..... سال..... ماه.....)

خیر ○

پرسشنامه زیر را با نوشتن عدد 1 الی 5 با توجه به جدول کامل کنید.

1: کاملا مخالفم	2: مخالفم	3: تا حدودی موافقم	4: موافقم	5: کاملا موافقم

1) من به احساسات و تواناییها و ضعف های خود احاطه کامل دارم.	

2) دارای حس استقلال قوی و اراده محکم از خودم هستم.	
3) وقت گذاشتن در دنیای خصوصی خودم را به فعالیتهای گروهی بزرگ ترجیح میدهم.	
4) برای پرداختن به سرگرمیها ، علایق یا برنامه های دراز مدت ، مایلم تنها باشم.	
5) اعتماد به نفس در من نهادینه است.	
6) بودن در میان جمع را به تنها بودن ترجیح میدهم..	
7) دوستان زیادی دارم.	
8) معاشرت در مکانها و موقعیتهای متنوع برایم لذت بخش است.	
9) از طریق فعالیتهای گروهی بهتر یاد میگیرم.	
10) من ید طولانی در برقراری ارتباط ، سازماندهی و گاهی هدایت افراد در جهت اهداف خودم دارم.	
11) از طریق حرکت کردن ، لمس کردن یا بکارگیری اطلاعات ، یادگیری من بی نقص است.	
12) بیشترین دانسته های خود را از طریق حواس پنجگانه بدست می آورم.	
13) توانایی غیر قابل وصفی در مهارتهای ظریف و زمخت دارم.	
14) از باز و بسته کردن وسایل لذت میبرم.	
15) خو و رفتار دیگران را به خوبی تقلید میکنم.	
16) خواندن ، نوشتن و گوش دادن برایم لذت بخش است.	
17) لطیفه ها برایم لذت بخش هستند و داستانهای کوتاه و بلند تعریف میکنم.	
18) به آسانی نام مکانها ، تاریخ ها ، قرار مدارها و سایر جزئیات را به یاد می آورم.	
19) کلمات را به دقت هجی میکنم و دامنه لغت بسیار گسترده ای دارم.	

20) از جدول متقاطع کلمات و بازی با کلمات خوشم می آید.	
21) علاقه مند هستم که الگوها ، مقوله ها و ارتباط بین اطلاعات را بررسی کنم.	
22) قادر به حل آسان و سریع مسائل ریاضی میباشم.	
23) اطلاعات را میتوانم گروه بندی ، سازماندهی ، تجزیه و تحلیل ، تفسیر و پیش بینی کنم.	
24) بازیهای نیازمند به اندیشیدن مثل شطرنج و برنده شدن در آن برایم لذت بخش است.	
25) در مورد چیزهای اطرافم سوالات زیادی میکنم.	
26) در بحر عکسها و تصاویر می اندیشم.	
27) رسم نقاشی و مجسمه سازی و درگیر شدن در فعالیتهای هنری را دوست دارم.	
28) زمان فکر کردن در مورد مفاهیم و توضیح اطلاعات از تصاویر واضح بصری استفاده میکنم.	
29) قادر به رسم کردن دقیق تصاویر مردم و اشیاء هستم.	
30) زمانی که اطلاعات تازه را یاد میگیرم حواسم پرت میشود.	
31) آگاهی من در مورد صداهای موجود در محیط زیست در حد اعلاست.	
32) موقع کار یا استراحت معمولا موسیقی میگذارم.	
33) به آسانی آهنگها و نوتهای آوازها را به یاد می آورم.	
34) زمانی که موسیقی یا نوت کوک نباشد معمولا متوجه میشوم.	
35) آواز خواندن ، زمزمه کردن ، و حفظ ریتم یک آهنگ به طور طبیعی در نهاد من وجود دارد.	
36) من از گروه بندی اشیاء بر اساس ویژگیهای مشترک لذت میبرم.	
37) طبقه بندی بر اساس سلسله مراتب (رتبه بندی بر اساس ارزش و اهمیت) برایم معقول است.	

38) به اعتقاد من بازیافت در محیط مهم است.	
39) از یادگیری در مورد گیاهان و حیوانات لذت میبرم.	
40) بیشتر وقتم را بیرون از خانه صرف میکنم.	