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ASSESSING SUCCESSIVE LEARNING ACCELERATION IN GERMANIC LANGUAGES: A RESEARCH PARADIGM PROPOSAL

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Abstract. *The phenomenon of successive language learning acceleration, frequently experienced by polyglots, when in order to learn a new language from a familiar language group the polyglot requires less time with each new language, is widely known, but, it seems, it has never been thoroughly examined. This article presents a simple mathematical model based on the author's own data, which has been collected over the course of three years' worth of independent language study and describes how much faster one learns languages from the same group. The number of hours spent on a new language as a function of the number of previously known languages is described by a simple exponential function with two parameters: the "starting time" and the "half-life". According to the author's hypotheses, these parameters may provide a numerical measure of certain aspects of language that are difficult to quantify otherwise. The "starting time" could be a measure of propinquity between the learner and the language group, whereas the "half-life" could be a measure of propinquity between the languages of a given group. Additionally, reviewed are three different approaches to keeping track of time spent on language activity as used by different polyglots. These approaches are of importance for collecting data to be used in studies of successive language learning acceleration. At the end of the article, an idealized algorithm for conducting such a study is presented, and particular attention is drawn to the various parameters that must be controlled in order to carry out this kind of research in an appropriate manner. This particular study did not manage to satisfy all of the criteria mentioned, so the reliability of the claims made in this article is debatable, and additional validation is required. Furthermore, the validity of the model has to be confirmed by other researchers and polyglots.*

Keywords: *polyglot, polyglottery, language acquisition, accelerated language learning, Germanic languages, time tracking*

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ОЦЕНКА УСКОРЕНИЯ УСВОЕНИЯ ЯЗЫКА ПРИ ПОСЛЕДОВАТЕЛЬНОМ ИЗУЧЕНИИ ГЕРМАНСКИХ ЯЗЫКОВ: ПРЕДЛОЖЕНИЕ ПАРАДИГМЫ ИССЛЕДОВАНИЯ

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Аннотация. *Феномен ускорения овладения языками при последовательном изучении часто отмечается разными полиглотами. При изучении нового языка из известной им группы языков им требуется меньше времени с каждым последующим языком. Это явление широко известно, однако попытки его изучения, по имеющимся данным, ранее не предпринимались. В этой статье на основе собственных данных автора, собранных за последние три года изучения им языков, представлена простая математическая модель, которая описывает, как уменьшается время изучения языков из одной генетической группы. Количество часов, которые были потрачены на достижение должного уровня в новом языке в зависимости от числа языков, для которых этот уровень уже был достигнут, описывается обычной экспоненциальной функцией с двумя числовыми параметрами: «начальное время» и «период полураспада». Данные параметры, согласно гипотезам автора, могут служить численными мерами некоторых характеристик, которые трудно оценить иными способами. «Начальное время» может выступать мерой степени близости между полиглотом и изучаемыми языками, в то время как «период полураспада» может рассматриваться как мера степени близости между языками в пределах одной группы. Также рассматриваются три разных способа мониторинга времени изучения языков, используемых разными полиглотами. Эти способы важны для сбора данных в целях проведения исследований ускорения последовательного изучения языков. В конце статьи приводится идеализированный алгоритм такого исследования, и особенное внимание обращается на различные параметры, которые необходимо контролировать, чтобы обеспечить его должное проведение. В данном конкретном исследовании не удалось соблюсти всех этих критериев, поэтому точность и надёжность выводов, полученных на основании одного набора данных, представленных в этой статье, спорны и нуждаются в дополнительном обсуждении в плане их валидности. Помимо этого, необходимо подтверждение справедливости модели другими исследователями и полиглотами.*

Ключевые слова: *полиглот, полиглотия, усвоение языка, ускоренное изучение языков, германские языки, мониторинг времени*

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Introduction

Polyglots frequently experience the phenomenon when they require progressively less time to achieve proficiency in new languages from the same language family. The phenomenon is widely known but, to the best of my ability, I have been unable to find studies that attempt to quantify it. Moreover, this phenomenon lacks a name, so for the purposes of this article I shall refer to it as *successive language learning acceleration* (SLLA).

When talking about the time that it took them to learn a given language, many polyglots use vague terms such as "months" and "years", which are not very informative because the intensity of study or exposure is unknown. By contrast, Alexander Arguelles used to keep a detailed record of the time that he spent on his language activity [1]. This prompted me to create my own record of my language activity using MS Excel spreadsheets that would allow effortless summation of the data for further analysis, which I present here.

In this article, I attempt to give a quantitative description of SLLA and build a simple two-parameter model. My hypothesis is that comparing the parameters of this model obtained from different polyglots can give insight into both the relationship between polyglots and the languages that they learn as well as between the languages of a given language family. I also propose an algorithm for future research aiming to aid those who may wish to continue this endeavour. This algorithm was devised by myself after monitoring my own language studies. Since the data from one individual is insufficient, many more studies are required in order to check the validity of my model and confirm or falsify the hypotheses that I propose.

Methodology

From June 2019 up to the present day, I have been documenting the time I spent on learning and using foreign languages daily, differentiated by language and type of activity. I made use of my own MS Excel spreadsheets to keep this report, and I added up the data covering the last three years. In Table 1, I present the data for Germanic languages. Upon examining this data, I realised that by changing the summation limits I could quantify how much faster I learned new languages from the same language family. This, however, requires a common competence threshold for all of my languages. Unfortunately, since I did not make use of standardised testing for the vast majority of my languages, I do not have any objective measure by which to compare my competence, so I resorted to a more subjective way of comparing my language competence.

	Time frame	Reading	Grammar	Talking	Revision	Listening	Transl.	Sum
Norse/Faroese	03.20-06.22	105	14	12	4	187	1	324
Danish	12.19-06.22	21	1	9	0	334	2	366
Nynorsk	06.19-06.22	103	1	241	4	172	46	566
German	06.19-06.22	156	11	40	2	349	51	609
Old English	09.21-06.22	31	14	0	0	56	1	102
Dutch	01.22-06.22	17	0	0	1	45	0	63
Frisian	01.21-08.21	17	10	0	0	42	0	69
Totals:		450	52	302	12	1185	100	2100

Table 1. The total time spent on Germanic languages by July 1, 2022[1]

In addition to the spreadsheet report, I kept a sporadic and admittedly less detailed record of my impressions from learning and using languages. I made particular note of instances where I would experience great joy from being able to understand a previously unknown written text or an audio recording.

[1] I had studied Nynorsk Norwegian and German prior to starting my record. The additional time spent on Nynorsk is estimated to be 200 hours, and 100 hours on German.

Henceforth I refer to this event as the "Eureka" moment. I believe that this experience roughly corresponds to breaching the A2~B1 level of competence. Knowing the month when I first had a "Eureka" moment with a new language, I would calculate the number of hours spent on this language by that point and correlate that with the number of languages from the same family that I had already studied. In my case, the language group that made the most sense for this investigation were the Germanic languages, as they met the following criteria:

1. I have studied a large enough number of them to make a decent approximation (more than five).
2. I have studied most of them to the point where I have sufficient competence in both speaking and writing.

Data acquisition

There are several ways of keeping track of the data to be used in a study of SLLA. Different polyglots have made use of various spreadsheet designs and time-tracking applications for their personal use. I have learned of some of these approaches and below I shall briefly examine three particular approaches, my own, that of Alexander Arguelles, and Alan Bigulov's one, and discuss the strengths and weaknesses of these three approaches.

I myself made use of my own Excel spreadsheets, which I created in 2019. The initial design was suboptimal in terms of ease of use for the sake of data analysis, so, for the purposes of this article, I will focus on the improved design, which I have been using since April 2022. The current design has two sheets, the "Report" sheet and the "Plans" sheet.

	Latin								
	Reading	Grammar	Talking	Listening	Translation	Total (h)	Notes	Reading	Gramr
Date\Time	10.50	0.00	2.83	11.33	0.00	24.67		13.25	0.0
04.05.2022	10					10			
05.05.2022	10					10			
06.05.2022	10					10			
07.05.2022	10					10		15	
08.05.2022	10					10			
09.05.2022	10					10			
10.05.2022	20		40			60	Latin discussion circle with Arguelles		
11.05.2022	10					10			
12.05.2022	10					10			
13.05.2022	10		10			20	It's nice to be bac	15	
14.05.2022			10			10			
15.05.2022			5			5			
16.05.2022	10					10			
17.05.2022			30	40		70	Latin discussion circle with Arguelles		
18.05.2022	10					10		15	
19.05.2022	10					10			
20.05.2022	10					10			
21.05.2022	10					10			
22.05.2022	10					10			
23.05.2022	10					10			
24.05.2022			20	40		60	Latin discussion circle with Arguelles		

Figure 1. The "Report" sheet of my spreadsheet design[2]

[2] The "Latin" column represents the activity for that language, further subdivided into the following columns: Reading, Grammar, Talking, Listening and Translation. The rows represent the days of a month, in this case, May 2022. The intersections of day and activity represent the amount of time in minutes that I spent on a given activity in a given language on a given day. The spreadsheet formulae are set up to calculate the sum total number of minutes spent on a given language on a given day in the "total" column. The topmost row of numbers is the sum total number of hours spent on a given activity in a given language over the entire time that I have been keeping this record. It is also possible to adjust the summation limits in order to obtain the sum total number of hours spent on a given activity in a given language over an arbitrary period of time. The rightmost column contains the notes where I record any and all pertinent information about my language-learning process, such as the resources that I make use of, and my impressions from using the language.

The "Report" sheet (see Fig. 1) is comprised of large columns, which stand for the different languages that I study. The large columns are further subdivided into smaller columns that represent the activities in a given language. My list of activities usually includes the following:

1. Reading (both intensive and extensive).
2. Grammar study.
3. Talking (spoken and written communication).
4. Revision (any form of grammar-centric exercise).
5. Listening.
6. Translation.

The rows represent days. I write the number of minutes spent on a given activity in a given language on a given day in the cell at the intersection of the respective language activity and day. Next, the formulae in the top section of the column convert the total number of minutes spent on a given activity into the number of hours, and the upper right-hand corner of the column displays the total number of hours spent on that language. Additionally, there is a "Notes" column, which allows me to write any additional information about my study of the language on that day. In particular, I tend to note down the following:

– impressions about my level of comprehension, how well I managed to understand a piece of text that I read, how well I managed to understand a video, and so on;

– the names of books, movies, series, YouTube channels and other types of media that I am currently using for my language studies, and that in turn also allows me to keep track of the resources that I have made use of, so as to be able to recommend them in the future.

I use this sheet to keep a detailed record of my day-to-day activity, and I can adjust the summation limits to get the total number of hours for an arbitrary time frame.

Month	1/1/22						
Language\ Activity	Reading	Grammar	Talking	Pattern Drills	Listening	Translation	Time (app.)
OCS		10					10
Polish					15		15
Slovene	15						15
Norse	10				10		20
Danish					20		20
Norwegian			20				20
German	15				15		30
Old English	13.33		3.33		13.33		30
Dutch	20	10			20		50
Scottish					20		20
Japanese	5			10	15		30
Latin	5		5		10		20
Catalan	15						15
French					20		20
Wildcard							15
Total:	98.33	20	28.33	10	158.33	0	5.5

Figure 2. The "Plans" sheet of my spreadsheet design[3]

The "Plans" sheet (see Fig. 2) is comprised of blocks that represent my plans for a given month of study. The uppermost row lists all of the activities, just like in a column of the "Report" sheet, whereas the leftmost column lists the languages, and in this sheet the cells at the intersections contain the intended amount of time that I wish to spend on a given activity on a given language every day of a given month. I use this sheet to make my monthly plans and to keep track of the time that I spent on my language activity

3 The activities are listed in the uppermost row, the languages in the leftmost column. The cells at the intersections contain the desired amount of time that I wish to spend on a given activity on a given language every day of a given month. In addition to making plans, I also use this sheet to keep track of the time that I spent on my language activity daily.

daily, by writing in the number of minutes spent on a given activity in a given language, before transferring these figures into the "Report" sheet at the end of the day.

This spreadsheet design has the following advantages:

– it is very easy to use and read off of;
– the data is easy to extract as it is presented in the upper section of the spreadsheet;
– it is possible to acquire data for an arbitrary time frame by adjusting the summation limits to cover a desired range;
– it is easy to set up new languages by inserting a number of new columns and copy-pasting the format and the formulae into the new columns;
– likewise it is easy to "quit" a language by simply ignoring the respective column or concealing it using the MS Excel "Hide" functionality;
– it is possible to create graphs to show day-to-day progress, to be able to clearly observe high and low points in terms of the amount of language study;
– it has a convenient place to write notes, which are of utmost importance for future data analysis, as the researcher will be able to clearly observe an inflection point in the polyglot's understanding of the language and the steps that lead up to that event.

The drawbacks of my spreadsheet design are the following:

– it requires detailed manual input;
– navigating multiple languages is inconvenient owing to the large size of the columns, both in terms of length and breadth.

Overall, this design provides extremely detailed information at the cost of a small amount of time in order to manually record and transfer data daily.

The second design that I wish to highlight is that of Alexander Arguelles himself, who used to keep a spreadsheet for tracking his language progress for a certain period in his life. He graciously shared his spreadsheet with me and gave me permission to showcase it during my talk on the use of spreadsheets for keeping track of time spent on language activity at the Polyglot Gathering Online 2022.

Arguelles's approach was quite different from mine: instead of keeping track of his daily activity, he chose to track his cumulative hours spent on languages across a select few activities, which certainly makes sense as he wanted to account for a very large number of languages, and having a daily report detailing information on every single language would be too time-consuming. Thus, Arguelles made use of a very simple but effective design: he would time his activity and then manually add that time to the current time in the appropriate cell, which gives the total time that he had spent doing a given activity in a given language. Next, the spreadsheet is set up to calculate the average number of minutes spent daily, based on the number of days that the polyglot had been using the spreadsheet (which is calculated from the starting date and the current date).

The advantages of Alexander Arguelles's spreadsheet design are the following:

– the design is very simple, easy to use, and requires minimal effort on the part of the user;
– it does not present issues with navigation like my personal design.

Meanwhile, the disadvantages of his design are as follows:

– this kind of report lacks the time dimension – once the data for the day has been entered, it is impossible to tell how much time was spent on a given activity on a given day; instead, the spreadsheet returns an average value for the time spent on a given language activity daily, but this is naturally not indicative of the actual time that was spent on a particular day;
– likewise, it does not allow for the polyglot to keep a daily record of his impressions from learning the language. While it is possible to write down notes in the cells to the right of a language, keeping a detailed daily record is not quite straightforward or easy to implement.

In spite of the aforementioned drawbacks, this design is still viable for the sake of studying SLLA, aside from being generally applicable for the personal use of any polyglot with a large number of languages. In order to use it for the study of SLLA, the polyglot should either take screenshots or make another type of record of his spreadsheets on a day when he felt a significant breakthrough or otherwise achieved a particular goal. Next, this information is passed on to the researcher who will then be able to analyse the

amount of hours spent on a given language by the time that a breakthrough occurred and make a plot based on that information in order to analyse the data. This procedure should then be repeated for every single language that the polyglot studies.

Finally, I would like to examine a method for tracking the time spent on language learning devised by the Russian polyglot Alan Bigulov from Vladikavkaz. As part of his self-imposed challenge "10 languages in 1,000 days" [2], [9] he made use of the online time tracking application toggl™. This application allows the user to set up different languages and activities for each language. It then tracks time spent on a given activity in a given language when the user presses the respective button. Detailed information on how to set up this application is available in a video by Bigulov in Russian [3].

His approach has the following advantages:

– it allows one to easily keep track of a multitude of activities in a very ergonomic manner, without taking up a lot of on-screen space;

– the application allows the user to view many different statistics and compare assorted data, permitting for diverse kinds of data analysis.

However, Bigulov's approach has several drawbacks:

– the application is online-only and thus it would be impossible to use it for keeping track of time spent on language activity in locations far removed from Internet access;

– the application requires some knowledge of how to use it and how to adapt it for the use of tracking time spent on language-learning, as the application was initially designed for tracking time in corporate settings.

Alan Bigulov's approach is very efficient and allows for incredible ease and variety in terms of data analysis, but it has a steep learning curve and requires an online connection.

Results

In Table 2, I present the number of languages that I was already competent in prior to starting a new language, the month when I felt like I had crossed the threshold ("Eureka" moment) and the number of hours it took me to get to the tentative A2~B1 threshold in that new language. It must be noted that I had studied both Norwegian Nynorsk and Standard German prior to starting my record, so, in order to include them in the dataset, I attempted to estimate the number of hours that I had previously spent on these two languages by assuming a uniform amount of time spent on those languages monthly and multiplying that number by the number of months that I had spent studying Nynorsk and German, respectively. This does imply that the first two points on the graph (Fig. 3) are not as reliable as the later points, which is something that one needs to keep in mind when analysing the data further.

Language	# known languages	Month of "Eureka" moment	Hours spent on language
Nynorsk	1	11.2019	372
German	2	12.2019	281
Danish	3	10.2020	184
Faroese	4	-	*
Norse	5	11.2021	107
Frisian	6	-	*
Old English	7	12.2021	66
Dutch	8	04.2022	46

Table 2. The time spent on languages up to A2~B1 level
(* see text for an explanation of the controversial status of Faroese and Frisian in my study)

A major complication arose out of the fact that I had studied Faroese in close proximity to Old Norse. Two months after starting my studies of Old Norse, I took up Faroese, which makes it difficult to delineate how much of the time spent on learning Old Norse affected my Faroese learning. I acquired spoken

competence in Faroese rather rapidly, in a matter of about 40 hours, but that was preceded by substantial study of Old Norse grammar and I was competent in both Nynorsk and Danish, and the combined effect of these facts made it feel like I learned Faroese "for free", with minimal effort. Since I had a "Eureka" moment with Old Norse much later, I decided to count Faroese as my fifth language, but I did not include it in the dataset, as I acquired it far too quickly due to a confluence of circumstances (akin to acquiring competence in a language closely related to the one studied, as is often the case with Czech and Slovak, Hindi and Urdu, or variants of Serbo-Croatian). In spite of that, I do believe that my learning Faroese contributed to my further understanding of the Germanic languages, which is why I count it as my fifth language instead of simply ignoring it.

A similar issue arose with Frisian: I failed to connect emotionally to the language and gave up on it after eight months (69 hours) of study. I did not experience a "Eureka" moment in that time, so I do not record Frisian as a point in the dataset. Yet, knowledge of Frisian grammar did play a role in my study of Old English, so I still feel that it is necessary to count Frisian as language number seven. This decision, along with the decision to count Faroese as a "known" language without recording it in the dataset, is indeed a point of contention and it makes my data less reliable. However, the data is still worth investigating and discussing, as it may serve to inspire more thorough and rigorous research in a similar vein. The improved algorithm for this research is proposed in one of the subsequent sections.

After compiling the data[4] for the six languages included in my analysis, I made a graph with the number of hours $\boldsymbol{t}$ needed to reach the A2~B1 threshold as a function of the number of known languages $\boldsymbol{n}$. The data is approximated fairly well by an exponential function. The plot and the graph are presented in Fig. 3. The blue diamonds corresponding to the data in Table 2 seem to follow an exponential function, so I used the built-in MS Excel tools to graph out an approximation of the data, represented by the black exponential curve with the parameters $\boldsymbol{t_0 = 481}$ **h** and $\boldsymbol{n_{1/2} = 2.4}$**.** The accuracy of the approximation is given by the square of the correlation coefficient, $R^2 = 0.99544$. A correlation coefficient equal to one corresponds to a perfect mathematical relationship expressed by the function in question, whereas in practice the correlation coefficient is always less than one. The closer it is to one, the better the approximation [6].

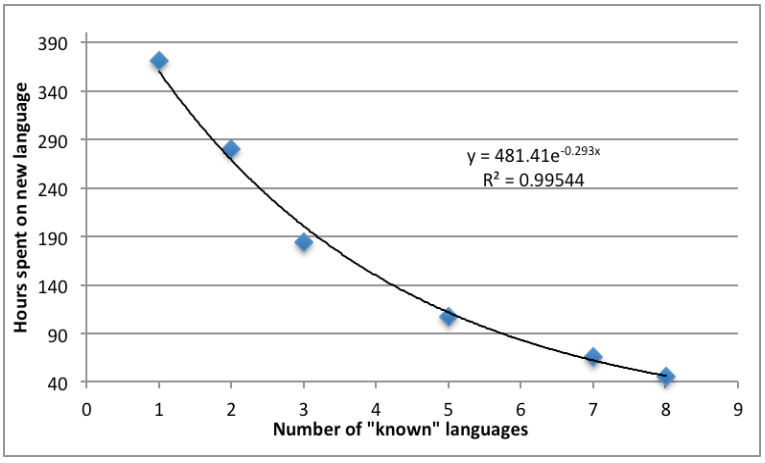

Figure 3. The graph showing the number of hours spent on a new language vs. the number of languages that were already "known" prior to starting on the new language

[4] The author is prepared to share the original data used in this paper upon request.

[5] The blue diamonds represent experimental data, whereas the black curve is the exponential approximation corresponding to the formula in the upper right-hand corner. R^2 is a measure of the accuracy of the approximation, the closer it is to 1, the better the approximation. Values over 0.5 are considered to be sufficiently good.

Analysis

As was mentioned in the preceding paragraph, the two parameters that characterise the exponential function that approximates the experimental data are $t_0 = 481$ **h** and $n_{1/2} = 2.4$.

The first parameter is the "starting time", the time that it would have hypothetically taken me to reach the A2~B1 threshold in my first Germanic language (i.e. English), assuming I were to learn it under the same conditions as all the other Germanic languages that I have since studied. The second parameter is the "half-life", the number of languages that I need to learn in order to halve the number of hours for my next language. The number is not an integer because it simply describes the data given. In reality, one can never halve the number of hours, as it will instead decrease by a different amount each time. Table 3 gives a summary of the meaning of these parameters and their significance, which is expanded upon below.

Parameter	t_0, "starting time"	$n_{1/2}$, "half-life"
Meaning	The time that it would have taken to learn the first language in a group	The number of languages needed to cut the number of hours for the next language in half
Significance	A measure of propinquity between the learner and the language studied	A measure of propinquity between the languages in a group
Examples	Large value: the learner's native language is more distant from the language learned (native Japanese speaker learning Belarussian). Small value: the learner's native language is closer to the language learned (native Danish speaker learning English)	Large value: the languages in a group are very diverse and have a low degree of mutual intelligibility (Uralic languages). Small value: the languages in a group are very close and have a high degree of mutual intelligibility (Slavic languages)

Table 3. A summary of the hypothesised properties of the two parameters for my exponential model

To test the accuracy of my model, I decided to compare the hypothetical "starting time" to known data about the time needed to achieve B1 in English, which was the first Germanic language that I studied. Sources vary as to the level cited and the number of hours required to achieve a given level, most sources giving a range of values. Several online publications [4], [5], [7] cite the time needed to achieve B1 to be somewhere between 480 and 520 hours, with my hypothetical value of 480 landing on the lower bound of the range. An article from Pearson [10] gives the lower bound needed to achieve B1 in English as 380 hours, and the upper bound as 1,386 hours. The lower bound corresponds to ideal learning conditions, viz. a highly motivated learner, whose first language is not too distant from English. The upper bound corresponds to unfavourable learning conditions, most importantly, poor motivation. While the range is quite large, my predicted value is on the same order of magnitude as the lower bound, which makes sense considering the fact that my learning conditions leaned closer to the "ideal" end.

A paper by Ben Knight from Cambridge University Press [8] states that an adult in a positive learning environment, i.e. with good motivation and with access to good resources and instructors, should get to B1 in English in 420 ± 70 hours. My predicted value of 480 hours falls well within the range, lending credence to my model. In addition, the environment specified in the paper perfectly describes the environment in which I learned all the Germanic languages after English: I was highly motivated, I had good resources and I made use of effective techniques.

Based on these numbers, it seems that my model managed to give an adequate estimate of the time that it would have taken me to achieve B1 in English had I been learning it under the same conditions as the other Germanic languages. However, I believe that the numerical parameters of the model can also provide insights into the relationships between languages of the same group as well as polyglots and their languages.

Proposal for future research

If the learner's native language is genetically close or grammatically similar to the language that they are studying, it will take them a relatively small amount of time to achieve a given competence threshold. If the learner's native language is more distant from the language that they are studying, it will take them considerably longer to achieve the same competence threshold. Thus, the "starting time" is an indicator of the level of propinquity that a learner has for the languages in a language family. For example, as a native speaker of a Slavic language, I should have a relatively small "starting time" for Germanic and Romance languages, whereas my "starting time" for Turkic, Uralic or Japonic languages is probably much higher.

If the languages in a group are similar from the viewpoint of structure and vocabulary, they will have a high degree of mutual intelligibility and it stands to reason that learning a given number of languages in a group will decrease the time needed to acquire a new language from the same group by a considerable amount. Likewise, if the grammar and vocabulary of the different languages in a group are disparate, they will have a low degree of mutual intelligibility and consequently, in order to decrease the number of hours needed to acquire a new language by the same amount, the learner will have to learn a greater number of languages. Thus, the "half-life" should display the level of propinquity and mutual intelligibility between the languages of a given family. A diverse family like Uralic is likely to have a relatively large "half-life", whereas Slavic languages, renowned for their high degree of mutual intelligibility, probably have a very small "half-life".

These hypotheses should be tested further using data from other polyglots. If the data acquired from other polyglots does correspond to an exponential function, we should compare variation in the two parameters to answer the following questions:

– whether the "starting time" is consistent across different learners with similar mother tongues;
– how much the "starting time" differs between native speakers of radically different mother tongues (i.e. speakers of German vs. speakers of Arabic);
– how other aspects may influence the "starting time" for a particular learner (method, materials used, bilingualism, linguistic environment, age when starting the language, etc.);
– if the "half-life" for a given language group is consistent across different learners;
– whether the "half-life" varies with any of the learners' characteristics (mother tongue, method, materials, knowledge of other language groups, etc.) or whether it really is a characteristic of a language group, as I hypothesise;
– whether knowledge of ancient languages from the same group alters the "half-life" in any significant manner;
– whether knowledge of academic linguistics influences the "half-life";
– how the parameters change based on the level that one is trying to achieve (A2 vs. B1 vs. B2; C1 and C2 are too impractical as these levels take far too long to attain).

If the other polyglots' data is not approximated by an exponential function, the researcher should answer the following questions:

– What function best approximates the new data?
– What are the parameters of this function?
– What is the significance of these parameters?
– Is this approximation consistent across different polyglots?
– Do the parameters vary with the polyglots' characteristics (see the paragraph above)?

It would be impossible to check any of the abovementioned correlations accurately, since every individual learner is unique in his learning aptitude and can only learn a language once, meaning that it is impossible to mitigate interference from undesired sources like personal issues, health problems and other unexpected events. However, even such tentative correlations might provide insight into the process of language acquisition and into the relationship between language families.

Having taken into account the problems that arose during my investigation, I formulated the following algorithm for conducting a study of SLLA:

1. The study should be conducted by a tandem of a polyglot and a polyglottery researcher. With due diligence, a polyglot may play the role of the researcher.
2. Decide on the language family (Slavic, Germanic, Romance, Uralic, Turkic, etc.) and the particular languages to be studied (around six to seven, they should be sufficiently distinct, so as to avoid issues with delineating the languages, e.g. the similarities between Hindi and Urdu would make it difficult to draw the line between "having learned Hindi" and "having learned Urdu"; likewise with Czech and Slovak, ideally, only one of a pair of such closely related languages should be studied by a polyglot for the sake of simplifying the division between languages).
3. Decide on the goals that are to be measured: A2, B1, B2 levels; scoring a certain number of points on an oral proficiency test or a reading proficiency test; a certain number of minutes of uninterrupted spontaneous conversation, etc.
4. The polyglot works through every language sequentially, recording the time that he spends on his language activity daily (see Table 1 for an example of a daily report).
5. The polyglot records his experiences with the current language and his impressions of the learning process.
6. The researcher conducts periodic standardised tests of the polyglot's competence, preferably around the time that the polyglot notices considerable breakthroughs.
7. The date when the polyglot either noticed a considerable breakthrough or when a test was taken is recorded.
8. The time needed to reach a considerable breakthrough or to get a successful test result is recorded.
9. After repeating the procedure for each of the six to seven languages, the researcher makes a plot of the number of hours necessary to achieve a given level vs. the number previously known languages.
10. The resulting data is approximated by a function and the results of this approximation are interpreted.
11. The researcher may conduct separate studies for different language competencies: understanding written or spoken text, producing speech, creative writing. Different thresholds will have to be decided upon for each of the competencies.

In conclusion, while my analysis is not devoid of subjectivity, I believe that the proposed research paradigm could provide some useful insights and objective measures for several phenomena of interest.

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