Examining Confidence in Perceptions of ASL, Russian, and Portuguese

Research Thesis

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By

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Abstract

There are common misconceptions about American Sign Language (ASL) such as it is mostly gesture or that it is easy to learn. These misconceptions can lead to parents delaying the teaching of ASL to their deaf children which could cause developmental delays and permanent problems. This project examined people's confidence in guessing ASL signs and compared it to confidence in guessing words from an unknown foreign spoken language. An experiment was adapted from a study done by Sehyr and Emmory (2019) which asked participants to guess what ten different ASL signs meant in English. It was changed to also have the participants rate their confidence in their guess. This experiment was further adapted to replace ASL signs with words from Portuguese and Russian. Experiment 1 collected accuracy and confidence ratings from 713 participants across 425 signs. Participants were inaccurate and overconfident in their guesses. Confidence was correlated with accuracy but there was a higher correlation with dominant guess percentage and confidence which indicates that there is a hidden group consensus that leads to confidence. Experiment 2 (Portuguese) and 3 (Russian) collected accuracy and confidence ratings from 98 and 95 participants respectively across 30 words from each language. Both experiments had lower accuracy and confidence on average than ASL. However, both experiments had correlations between confidence and dominant guess which indicates that it is not just accuracy that contributes to confidence. Additionally, in experiment 2 and 3 participants were flatly asked whether they thought ASL was easier to learn than other languages. On average, participants thought ASL was easier to learn than spoken languages. This project indicates that on average people are disproportionately confident in ASL compared to spoken foreign languages, and that misconceptions of ASL still persist.

Keywords: ASL, Confidence, Dominant Guess Percentage

Examining Confidence in Perceptions of ASL, Russian, and Portuguese

According to recent studies, as much as over 2.5% of the adult US population uses sign language to communicate (Mitchell & Young, 2022). That is just slightly over 2 in 100, and other than interacting with a Deaf person, one of the only other ways someone could be exposed to American Sign Language is through television or media. It is perhaps this lack of exposure that causes some prevailing myths to become commonplace. It is also possible that discrimination from the past still has effects on people's attitudes today. A few common myths about sign languages is that they are simply gesture, they are easy to learn and therefore less "legitimate" languages, or even that they are detrimental for young children to learn (Krausneker, 2015; see also Hall, 2017). These myths are unsubstantiated and false.

There is a historic precedent to discrimination against signing. It is believed, unsubstantiated, that learning sign language at the same time as learning a spoken language will interfere with both processes. This could not be further from the truth because in reality, "bilinguals are associated with better cognitive outcomes when compared with monolinguals" (Adesope, Lavin, Thompson, & Ungerleider, 2010). This false belief created entire schools of thought perpetuated by some of the most powerful and influential people in society, such as Alexander Graham Bell. Bell studied eugenics, and was heavily against the use of signing or Deaf people even interacting with each other. He believed Deafness could be inherited genetically and spread many false myths about "inbred" and "proliferating" Deaf culture. (Gallaudet University, 2025).

Bell helped lead movements to prevent the use of signing in classrooms designed for Deaf students. His efforts were successful in 1880, causing signing to be banned in classrooms all the way until 1965. This attitude still perpetuates in important communities. For example,

some medical school educations do not address language development for deaf children (Humphries et al., 2014). Once again, there is no evidence language cannot be learned via multiple modalities or that using sign language impairs spoken language development (Lederberg et al., 2013).

The legitimacy of sign languages are widely accepted in the linguistic community. Sign Language users use the same parts of their brain while signing than others do when speaking and signing children learn language at the same speed as speaking children if they are around fluent signers (Lillo-Martin & Henner, 2021). However, it is possible that even to the modern hearing world, ASL is not taken as seriously as spoken languages. One example of this can be seen through the countless fake “interpreters” that get hired by government and private institutions alike (Inside Edition, 2017; see also Harris, 2024). There are seemingly no examples of fake translators of spoken languages while there is an abundance of examples of fake interpreters. This could be because ASL is not taken as seriously as other languages, or even is considered easier to use/learn.

The myths that ASL is easier to use/learn or that it is even directly bad for children's development can have potentially detrimental consequences. Parents of deaf and hard-of-hearing children may be advised to delay access to ASL as they believe it can be either easily picked up later or that their child would be better off without learning it anyway (Hall, Hall & Caselli, 2019; Kraus & Gagne, 2021).

One of the problems that can arise from parents of deaf and hard-of-hearing children not teaching their children ASL is Language Deprivation Syndrome (LDS). LDS is a huge factor when it comes to Deaf mental health. Children that are not exposed to a first language until late in development, “see significant impairment in academic, vocational, social, and independent

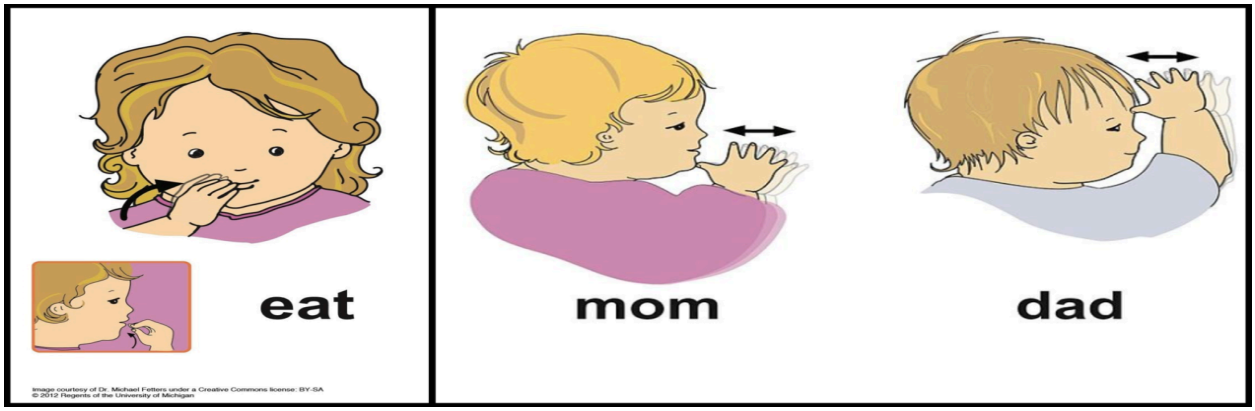
living domains". It is also possible that LDS could confound with another mental issue and make it worse (Glickman et al., 2020, 63-64). Additionally, there is a potential problem with institutional oppression that is correlated with language deprivation which in turn would only worsen mental health outcomes. (Croft et al., 2006, 31). While (hopefully) society is past the days of lawfully required eugenics, there are still potential myths about ASL being easier to learn or guess that people could believe that would prevent them from teaching their child ASL.

One of the potential reasons people could believe a myth that would cause them not to teach their child ASL could be the transparency aspect of ASL. Transparency is, "the ability to infer a given meaning based on the form" (Sehyr & Emmory, 2019, 208). In other words, the more transparent a sign is, the stronger the relationship between its form and its given meaning. An example of a transparent sign is "EAT". See the sign on the left of figure 1. Based on the form of the sign (the closed handshape, the direction of movement toward the mouth) the meaning could be inferred. In other words, the sign looks like someone eating. The opposite of a transparent sign is an arbitrary sign. When a sign is arbitrary, there is no relationship between its meaning and its form. A couple of examples of arbitrary signs are "MOM", and "DAD". See the signs on the right of figure 1. There is nothing about the form of the signs that would indicate that they mean mom and dad respectively.

Figure 1

Example of a transparent sign (eat) and an example of arbitrary signs (mom and dad)

(Campbell, 2020)



It is also possible for signs to have "false" or "perceived" transparency as well. That is, for individuals to think that a sign represents something whenever it really doesn't. Many people think that *all* signs have some level of transparency so it is common for signs to have some level of perceived transparency. An example of a sign with a high level of perceived transparency would be "CREDIT-CARD". See figure 2. Many people may see the sign and falsy think/guess that it means write.

Something that contributes to perceived transparency (and transparency in general) is gesture. The sign "EAT" (see figure 1) looks like the gesture of someone eating. The sign "CREDIT-CARD" (see figure 2) could be seen as someone writing. Someone that does not know ASL, but sees what they believe to be a gesture that they are familiar with may feel more confident in their knowledge of ASL. They may feel like they actually know some ASL and that they could even guess some ASL signs. This could make them subconsciously believe that ASL

is an easier language to learn. The issue with this is that most signs are not transparent, and there is much more to learning ASL than transparency.

Figure 2

Example of a perceived transparent sign (CREDIT-CARD) (American Sign Language University).

To non-signers, transparency may seem like it is the most important aspect to learning a sign and the more transparent a sign is the easier it is to learn. However, most signs are arbitrary and not transparent. Recent studies show that non-signing hearing individuals can only guess signs correctly about 10% of the time, and less than 3% of signs can be guessed reliably (above 70% accuracy) (Sehyr and Emmory, 2019).

According to Caselli and Pyers (2017) transparency is just one of many things that goes into learning ASL. Like other languages, neighborhood density and lexical frequency play huge roles and each aspect is arguably just as important as each other aspect (Caselli & Pyers, 2017).

Linguist consensus is that ASL is a legitimate language with its own structure, rules, ect. Previous studies agree that people are unable to guess signs when prompted (Sehyr and Emmory,

2019). However, there is currently no research as to whether people *think* they can guess signs. In the previous study conducted by Sehyr and Emmory (2019), participants weren't asked how they felt about their guess or how likely they thought it was that their guess was correct. That is, participants were not asked their confidence in their guess. Hence why there is reason to attempt to replicate Sehry and Emmory (2019) with the exception that after each guess participants are also asked for their confidence in said guess.

If confidence is considered to be a measure of belief in guessability and therefore in transparency, information can be gathered that can indicate, on average, whether participants think certain signs are transparent or not. This same measure can also be applied in other experiments that have replaced ASL with a spoken language. This type of study can be used as a control. If people have different beliefs about signed and spoken languages we can use the confidence levels for each language to find out.

Three experiments were constructed, one that is similar to Sehyr and Emmory (2019) but additionally asks people about their confidence in their guess, and two additional experiments that are duplicates of this but with two spoken languages that could duplicate some aspects of ASL's public perception (not linguistic makeup). The languages picked were Portuguese and Russian and those selections will be explained further in those experiments' respective introductions. Then words were selected from each of those languages that were similar to signs used in our ASL experiment (more on this in Experiment 2 and 3 Methods sections). This was done to keep things as consistent as possible across experiments. Lastly, certain properties of ASL were attempted to be replicated, such as transparency. In order to try to simulate transparency in spoken languages, cognates were used.

Cognates are words that have the same linguistic derivation as another. In other words, a word in a language that sounds the same and means the same thing as a word in another language. (Midgley et al., 2012). The concept is much easier to understand with a few examples. There are many examples between English and Spanish such as “invasion” and “invasión”, “explosion” and “explosión”, and “accident” and “accidente”. Cognates were used in place of transparent signs to try to replicate the phenomena. This is because of their apparent similarities in the context of each of their respective types of languages. Both cognates and transparent signs share the feature of guessability even if you don’t know the target language. It is to be noted that transparent signs and cognates are not a perfect one to one comparison. Cognates are the result of linguistic relatedness and transparency could be people using their gesture system or perhaps something even more basic.

The purpose of this project was to assess people’s confidence in their ability to guess the meanings of signs in ASL and to compare those ratings with confidence levels for those guessing the meanings of words in an unknown spoken language (Russian and Portuguese). The results will allow us to see if people are in fact overconfident about their abilities to understand ASL and reveal different attitudes that people have toward the language.

Experiment 1 (ASL)

The first experiment was very similar to Sehyr and Emmory (2019). In that experiment, individuals were tasked with guessing what a random ASL sign meant in English. The key difference was that this experiment also asked people to rank their confidence. We also introduced a new statistic to analyze the results referred to as "Dominant Guess Percentage". Dominant Guess Percentage is described in depth further on (Experiment 2 results section) but in short, it is the percentage of the guess that participants agree most on for a given sign (whether correct or incorrect).

We expected to replicate Sehyr and Emmory's (2019) results of low accuracy of guesses. We also expected individuals to have high confidence in their guesses. We expected this due to the research that was discussed earlier on the perceptions of ASL. We also hypothesized confidence and dominant guess percentage to be highly correlated. It would make sense based on previous assumptions that most people being confident about a certain guess could be linked to how familiar they are with an associated gesture that confidence and dominant guess percentage would be correlated.

And finally we hypothesize accuracy and confidence to have a correlation, but for it not to be as strong as the correlation between confidence and dominant guess percentage. This is because we believe that since participants were not informed whether they got a guess correct or not that dominant guess, or a hidden group consensus could be a better predictor for confidence.

Methods

Participants

English-speaking adults (n = 713; 218 male, 471 female, 24 other) (438 white, 72 African American, 77 Asian, 42 Hispanic, 52 Mixed Race) between the ages of 18 and 88, with a mean

age of 41.4, were recruited at the Center of Science and Industry (COSI) (n = 101) and at Planet Word (n = 612) , a science museum in Columbus, Ohio and a language museum Washington, D.C respectively. Any participant who reported that they knew ASL better than a 2 on a 5 point likert scale (1 being not at all and 5 being fluent) was excluded (N=106) leaving 713 participants. Participants were not offered compensation for participating in the study.

Materials

A demographics survey asked participants their gender identity, race/ethnicity and their age. The visual stimuli in this experiment consisted of 425 short videos. See appendix for the 425 signs used. Each video featured a signer signing a different word in ASL. Each video had a neutral background and differed from each other only in signer and what word was being signed (see figure 3.) The videos were presented through a Qualtrics survey on an Ipad that was given to the participant on the floor of COSI or Planet Word.

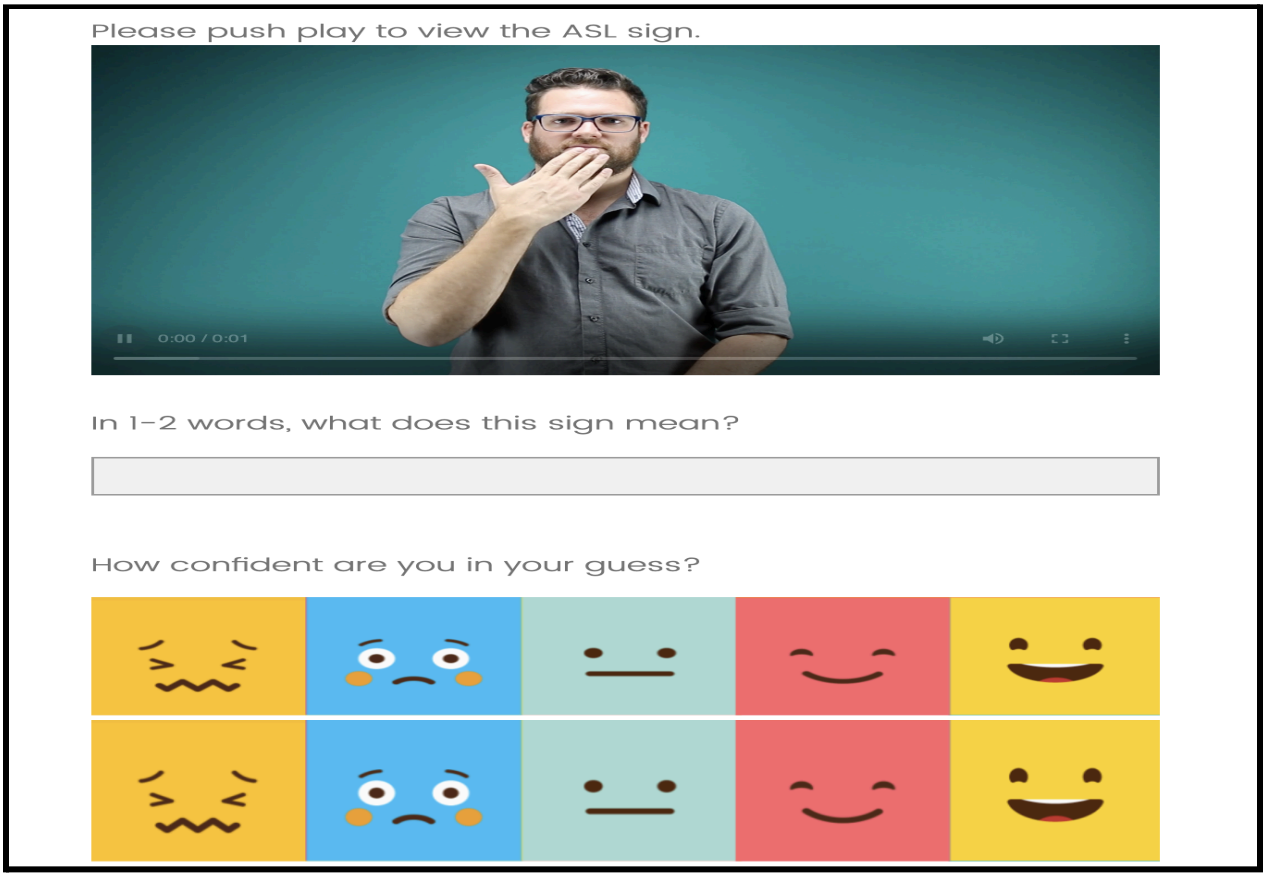
Procedure

A trained researcher asked participants on the floor of COSI or Planet word if they would like to take part in a 10-15 minute survey where they could guess signs in ASL. Participants were asked for verbal consent to take part in the study. Participants were then given an IPad with a Qualtrics survey ready for them to fill out demographic information. Once the demographic information was filled out by the participant the researcher would briefly explain how to watch the sign videos, take a guess, and rank confidence. Participants would watch a random set of 10 of the 425 signs, one at a time, and take a guess on what that sign's English translation was. Participants were allowed to watch a sign as many times as they wanted before taking a guess. After taking a guess, participants ranked their confidence in their guess on a scale of sad-happy faces. The saddest face on the left being a 1, and the happiest face on the right being a 5 (see

figure 3). Participants were never told if they got any guesses correct during the experiment. Participants were given unlimited time to respond to each item and complete the survey, though the whole study typically lasted less than 10 minutes.

Figure 3

Screenshot of the Qualtircs Survey Participants Would See. In this Example, the Signer is Signing "THANK YOU".



Coding

The accuracy ratings were checked for reliability by two coders with a kappa score of .877 and a % agreement of 97.7% (se= .008). Three fluent and/or native signers reviewed the discrepancies and made decisions on whether guesses should be marked as correct or incorrect. Participants' guesses were typically graded with leniency to emphasize that even with the lenient grading scale, accuracy levels were still relatively low. An example of an answer that was given leniency was the guess of "Crash" for the sign "ACCIDENT". This answer was treated as correct because both of these are common terms to describe a vehicular collision. An example of an answer that was not given leniency was the guess of "My right hand" for the sign "ARM". This answer was not treated as correct because even though they are both body parts (even related body parts), it is clear that the guess is guessing something explicitly different from an entire arm.

Results

Accuracy and confidence were recorded at an item level. Each item (each sign) was run approximately 15-20 times because every participant only gets to guess 10 random signs from the set of 425. Therefore each score shown represents the averages for each sign across all of the people that had that sign in their batch of 10.

Calculating the accuracy and confidence on an item level tells us if there were some signs that were more transparent than others. It allows us to see if a more guessable sign actually generates more confidence. The mean accuracy on an item level was .111 (SD = .179) and the mean confidence on the item level was 2.18 (SD = .418).

However, there were only a few signs that were truly transparent, meaning that their accuracy score was at or above 70%. See table 1. These signs along with a handful of signs that

were not considered transparent but still had relatively high accuracy percentages skew the 10% accuracy figure. Some may see that number on its face and assume that any non-signer can guess with 10% accuracy on all signs which is not the case. What's more, a large number of signs had an accuracy percentage of 0%. 165 of our 425 signs did not have a single correct guess, and an additional 133 had a lower than 10% accuracy score.

Table 1

Signs That Had an Accuracy Score of Above 70%

SIGN	ACCURACY
CAMERA	100%
CRY	92.90%
TEAR	92.30%
TWO	88.90%
FOUR	88.50%
BREAK	88%
BABY	86.20%
MIND	82.80%
WRISTWATCH	80.80%
TIME	80.60%
EAT	80%
DRINK	76.90%
DROP	74.10%
VIDEO-GAME	71.40%

There also were 5 signs that were perceived transparent, meaning they had a lower accuracy score with a dominant guess percentage of 60% or higher (adjusted slightly from the

regular transparency as there were, and still are, many right on the cutoff. See table 2). These signs show the power of gesture as each of these signs utilizes a gesture that could be considered commonplace for each signs respective dominant guess

We also calculated a third measure we labeled “Dominant Guess”. A dominant guess was a guess with the highest group consensus among the guesses and was measured as a percentage. For example, the sign TWO had 27 total guesses and 24 of those guesses were correct. Therefore the most frequent (i.e. dominant) guess was “two”. This means that TWO’s dominant guess percentage and its accuracy are the same. However, a dominant guess most times does not have such a high percentage, and it is most times not the correct answer. For example, the sign SOME had 26 total guesses and only 6 of them were correct, giving SOME an accuracy percentage of 23.1%. However, 13 of the guesses for SOME were “cut” making “cut” the dominant guess with a dominant guess percentage of 50%. This measure is taken because we didn’t give feedback on accuracy to the participants, so since people don’t know if they’re accurate we needed to see if there was something else people were seeing in the sign (whether it was right or wrong). It allows us to see if confidence is more about a group consensus than about real accuracy. It also allows us to hesitantly measure the perceived transparency of different signs. The mean dominant guess percentage was 22.3% (SD = .179). This means that on average, about a quarter of participants guessed the same thing for each sign. The range for dominant guess percentage was 100% (0-100%) though only 38 signs had a dominant guess percentage above 50%.

Table 2

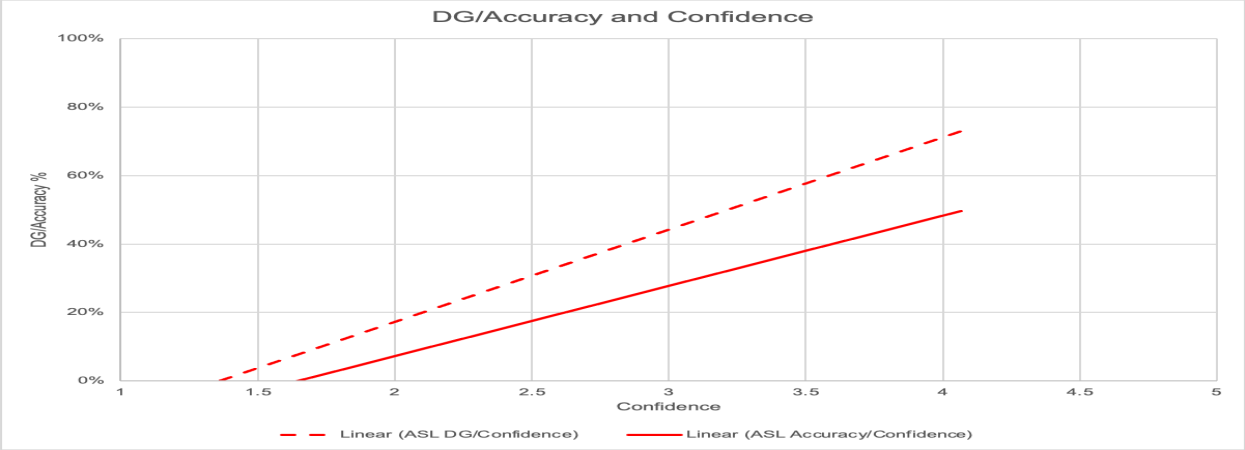
Signs That Had an Dominant Guess Percentage of Above 60%

SIGN	DOMINANT GUESS %	DOMINANT GUESS
HAVE	73%	ME
PAST	67.00%	ME
WHERE	60.70%	NO
EXERCISE	60.00%	STRONG
CREDIT CARD	60%	WRITE

Once this statistic was formed, we looked at the potential relationships between confidence/accuracy/dominant guess. First we ran Pearson's correlation tests to see if there was any relationship between confidence and accuracy/dominant guess. The correlations test revealed that there was a correlation between confidence and accuracy ($r(423) = .469$, $p < .001$) as well as confidence and dominant guess ($r(423) = .769$, $p < .001$). These tests also reveal that the correlation between confidence and dominant guess is higher than the correlation between accuracy and confidence. This is evidence that it isn't accuracy that gives participants confidence, but instead a "group consensus". This makes sense as participants are never told their accuracy. It is important to note however that sometimes this group consensus can predict accuracy (better than confidence actually). A Pearson's correlation test shows this ($r(423) = .628$, $p < .001$).

Figure 4

Correlations between Dominant Guess and Confidence; Accuracy and Confidence



Discussion

The hypothesis for this experiment were that participants would be highly confident in their guesses, their guesses would have a low average accuracy and that there would be significant correlations between accuracy/confidence/and dominant guess. Our results supported our hypothesis' and previous research (Krausneker, 2015; see also, Sehyr & Emmory, 2019). Signers were only able to guess correctly roughly 10% of the time. Some may see that number on its face and assume that any non-signer can guess with 10% accuracy on all signs which is not the case. From our data, the reality would be that only about 1.6% of our signs were considered transparent.

The following takeaways can be gathered from the item analysis. We know there are only a few signs that are truly transparent, and the vast majority of signs are not guessable at all. We learned that there is some false transparency and mislead confidence thanks to our dominant guess statistic. An important piece of information can also be taken from the individual-level analysis. We know that not a *single* participant got more than 3 signs correct with 241 guessing

zero signs correctly. What we gather from this is essentially that if a person does not know ASL, they cannot guess a range of ASL signs.

There were correlations between accuracy and confidence. However, there are stronger correlations between confidence and dominant guess percentage. This would indicate that it is not necessarily the accuracy of a guess that contributes to confidence. There is something more that gives individuals confidence and the group consensus.

Experiment 2 (Portuguese)

If only data pertaining to ASL is collected, no prescription will be able to be made except for confirming that individuals are overconfident in their abilities to understand ASL. There is nothing to compare the data to. With only this information one could make the case that attitudes toward ASL are in no way unique and people actually feel the same way about every language, spoken or signed. However, if data pertaining to foreign spoken languages that replicate individuals feelings toward ASL is collected we could have insight on whether individuals are *disproportionately more* confident in their ability to guess signs in ASL than they are to guess words in a foreign language. This would provide evidence that people have unique feelings toward ASL that they do not have toward spoken languages. The criteria for foreign languages was clear: they had to be spoken languages and they had to have the potential to replicate ASL's social perception.

One of the languages selected to compare the results of the ASL experiment to was Portuguese. Portuguese was selected due to a few similar features that it has in common with ASL. It is a language that most (hopefully all) adult Americans have heard of, many are familiar with it because of its similarities to Spanish, and some perhaps even know a few words. We believe it is possible that individuals may be more confident in their guesses due to these factors.

Someone familiar with ASL may be wondering; why not use French as one of the spoken languages to compare ASL to? After all, there is a lot of French influence on ASL and much of early ASL is based on early French Sign Language (Cagle, 2010). The first response to this is that spoken French isn't really all that similar to French Sign Language just like ASL isn't all that similar to English in many ways. They are all their own unique languages that have different influences like any other language. Secondly, even if ASL and French were very similar

linguistically, that isn't what the goal was when picking languages to compare ASL to. The goal was to try to pick spoken languages who's *perception* was similar to that of ASL.

ASL's social perception was attempted to be replicated through choice of language, but the trait of transparency was attempted to be replicated through choice words. For signs, their transparency is gained through gestures that resemble the meaning of the sign. Think back to the sign for "eat" looking like someone eating something. Because many people may be able to guess this sign's meaning correctly, this sign is thought of as transparent. How can this be replicated without the use of gesture? Well, in spoken language there is something that can also lead to transparency for words of a foreign language. That thing is cognates. Using a few cognates can help attempt to replicate the transparency seen in ASL.

Another way to measure if individuals think ASL is an easier language to learn than other languages would be to simply ask them. There isn't much data on something as simple as this type of question, most likely because researchers assume that with a question with as simple framing as this that participants would be led to some response bias as they don't want to be seen as bigoted toward the Deaf community.

We hypothesize that participants will on average have lower confidence and accuracy ratings for Portuguese than for ASL. We also expect for there to be significant correlations between accuracy/confidence/and dominant guess percentage with the correlation between confidence and dominant guess being the strongest. We finally predict that when asked directly, participants on average will state that ASL is easier to learn than Portuguese and other languages.

Methods

Participants

English-speaking adults (n = 98; 32 male, 64 female, 2 other) (88 white, 1 African American, 3 Asian, 2 Hispanic, 4 mixed race) between the ages of 19 and 67, with a mean age of 30.5, were recruited at the Center of Science and Industry (COSI), a science museum in Columbus, Ohio. One participant reported that they knew Portuguese better than a 2 on a 5 point likert scale (1 being not at all and 5 being fluent) and were excluded from the data leaving 98 adults. Participants were not offered anything as compensation for participating in the study.

Materials

A demographics survey was constructed that asked participants basic questions such as their gender identity, race/ethnicity and their age. As well as their fluency in Portuguese. Instead of visual stimuli, audio stimuli was used for the spoken language experiments. For experiment 2, 30 different audio clips of different words in Portuguese were used. See appendix for the 30 different words. All audio clips were provided by native Portuguese speakers, 15 of them being from 2 different male speakers and 15 of them being from 2 different female speakers. The audios were presented through a Qualtrics survey on an Ipad that was given to the participant on the floor of COSI. There was an additional survey presented at the end of the experiment that presented questions on a 5 point likert scale (1 being hard and 5 being very easy) that asked participants how easy they felt it was to learn languages, Portuguese specifically, and ASL specifically.

Procedure

The procedure for experiment 2 was the same as the procedure for experiment 1 with the exception of the language of choice being Portuguese instead of ASL (and instead of watching signs participants would listen to words).

At the end of the guessing portion, participants had 3 additional questions on a 4 point likert scale (1 being very difficult and 4 being very easy) on how easy it is to learn language, how easy it is to learn Portuguese, and how easy it is to learn ASL. Participants were given unlimited time to respond to each item and complete the survey.

Results

Accuracy and confidence were recorded at item level. This was done for a few reasons. Calculating the accuracy and confidence on an item level tells us if there were some words that were more transparent than others. It allows us to see if a more guessable word actually generates more confidence.

Each item (each word) was run approximately 10 times because every participant only gets to guess 10 random words from the set of 30. Therefore each score shown represents the averages for each word across all of the people that had that word in their batch of 10.

The criteria for accuracy for this experiment was the same as the ASL experiment. However, there was no need for multiple coders for this experiment because there were essentially no guesses that were close to correct that weren't just correct.

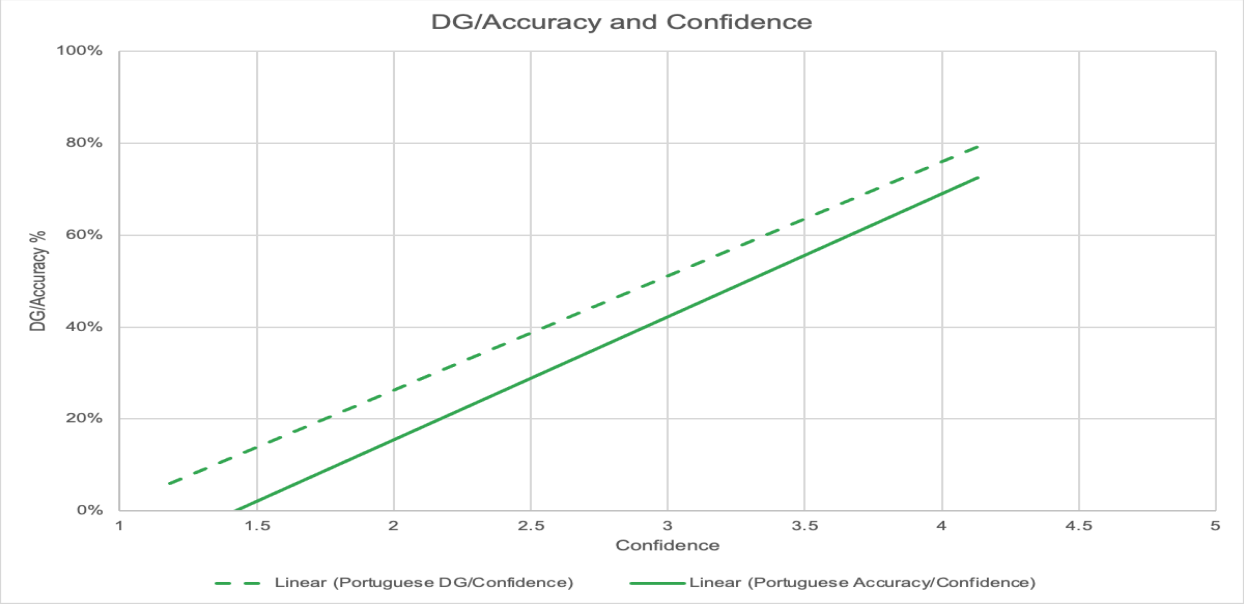
The mean accuracy was .078 (SD = .171) and the mean confidence was 1.69 (SD = .509). The mean dominant guess percentage was .190 (SD = .157).

The criteria for accuracy for this experiment was the same as the ASL experiment. However, there was no need for multiple coders for this experiment because there were essentially no guesses that were close to correct that weren't just correct.

Pearson's correlation tests were run to see the relationship between accuracy or dominant guess percentage and confidence (see figure 5). These tests show that there is a correlation between confidence and dominant guess ($r(28) = .811$, $p < .001$). There is also a significant correlation between confidence and accuracy ($r(28) = .801$, $p < .001$). This is evidence that it isn't accuracy that gives participants confidence, but instead a "group consensus". This makes sense as participants are never told their accuracy. It is important to note however that sometimes this group consensus can predict accuracy. A Pearson's correlation test shows this with there being a correlation between dominant guess and accuracy ($r(28) = .798$, $p < .001$).

Figure 5

Correlations Between Dominant Guess and Confidence; Accuracy and Confidence for Portuguese

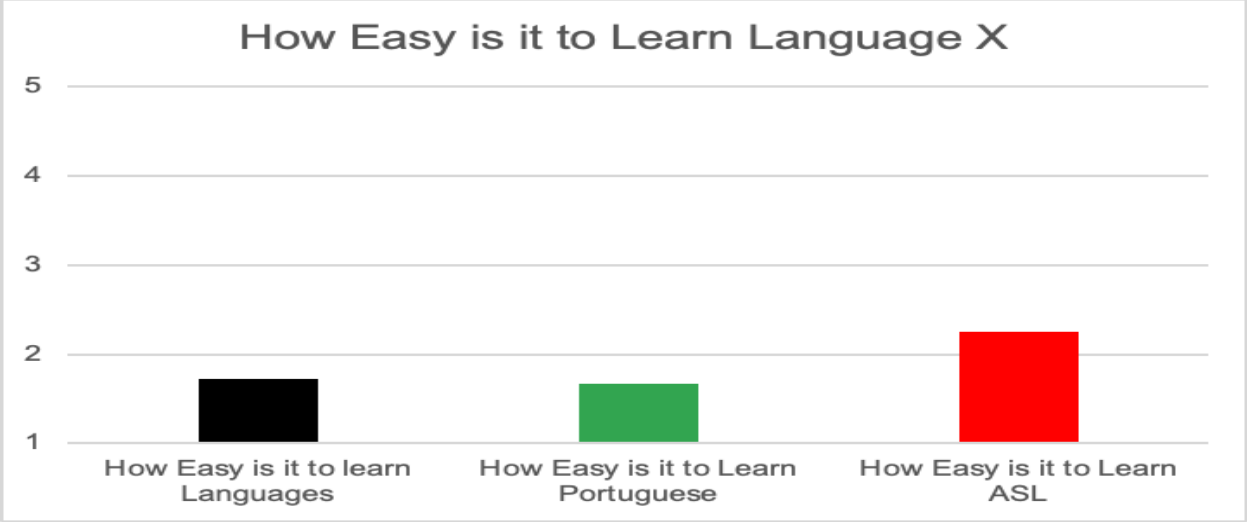


It is worth mentioning that there was a large outlier that could be skewing the Portuguese results, *delicioso*. *Delicioso* finished with an average accuracy and dominant guess rating of 87.1% and an average confidence of 4.13. Because this outlier may be skewing results, the correlations were all run again but this time with *delicioso* removed. While these tests show no significant correlation between confidence and accuracy ($r(27) = .114$, $p = .550$), dominant guess percentage and accuracy ($r(27) = .275$, $p = .141$), or dominant guess percentage and confidence ($r(27) = .329$ $p = .076$), the correlation is still highest for dominant guess percentage and confidence.

In addition to measuring accuracy, confidence, and dominant guess percentage, participants were also asked the direct questions of "How easy is it to learn other languages?", "How easy would it be to learn Portuguese?", and "How easy would it be to learn American Sign Language?" (see figure 6). These questions were measured on a 4 point likert scale, with 1 being quite easy and 4 being quite difficult. On average, participants ranked other languages a 1.73 (.615), Portuguese a 1.67 (.641), and ASL 2.25 (.665). T-tests were conducted to see if these results were significantly different from each other (note that the N is lower here than our total participants. This is because many chose to leave these questions blank). These tests showed that there was a significant difference between how easy participants thought it was to learn ASL and how easy it was to learn other languages ($t(68) = 4.80$, $p < .0001$). There was also a significant difference between how easy participants thought it was to learn ASL and how easy it was to learn Portuguese ($t(68) = 5.25$, $p < .0001$).

Figure 6

Rating of 1-5 on How Easy it is to Learn Different Languages



Discussion

Participants indeed had lower average confidence in the Portuguese experiment than they did in the ASL experiment. They did also however have a lower accuracy as well.

The correlations seen in the Portuguese experiment are very similar (at least in relation to their respective experiment numbers) to the correlations seen in the ASL experiment. All statistics correlated with each other with the correlation between confidence and dominant guess being the strongest. This shows that in this way ASL is no different than a spoken language, however the confidence and accuracy levels are still widely different.

There also was an extreme outlier in the Portuguese experiment in *delicioso*. None of the other Portuguese words had over a 35% accuracy percentage or a 35% dominant guess percentage. If *delicioso* was removed from the experiment, none of the correlations would be significant anymore. While it is important to note this, we did not think it was appropriate to remove *delicioso* from the sample. The entire point of selecting Portuguese as a language was

because we thought participants would be more likely to be familiar with some of the words in the sample. We wanted to attempt to make a similar sample to the ASL words and in the ASL sample there were some signs that were guessed at very high percentages. It seems unfair to then take out a word for doing precisely what we selected Portuguese to do. Additionally, there were 2 other cognates that were included in the Portuguese experiment that for unknown reasons participants were not able to guess at a high (or even passing) percentage (privada and responsavel). This is important because it draws another similarity between the results of the ASL experiment and this one. Participants routinely incorrectly guessed signs that were indeed transparent or incorrectly assumed signs were transparent that weren't.

Participants were flatly asked how easy they thought ASL would be to learn, how easy it would be to learn Portuguese, and how easy it would be to learn other languages. By *far* participants thought ASL would be the easiest to learn. This could be because, like stated before, individuals assume that there is something that they can gather from visual signs that they are unable to gather from spoken words. Like mentioned earlier, it is also possible that even with these significant results, there was still response bias with individuals skewing their answer for how easy ASL is to not appear to be biased against ASL. It is also possible that because this question was asked after individuals were just tested on spoken languages, that they think that spoken languages are just especially hard because their confidence is shot from not knowing any of the Portuguese words.

The ASL experiment was conducted and designed before the spoken language experiments were conceived. Because of this, the question about how easy it is to learn ASL versus other languages was not asked to participants of the ASL experiment. This is unfortunate as we are unable to see how being exposed to guessing signs affects individuals thoughts on how

easy it is to learn ASL and other languages and we can therefore not compare those results to the others. In future studies, this question should be asked.

It is important to note that there were *many* more signs than Portuguese words. There were 425 signs used and 30 Portuguese words. This leaves room for many more "transparent" signs to be guessed. Even though when selecting the 30 words we tried to pick a similar group of words to the ASL sample, 30 words out of an entire language is not a very representative sample.

It was a rigorous process to decide what 30 Portuguese words would be used. I would choose a group of 30-45 words from the list of our 425 ASL signs and translate them to Portuguese and have our team decide if they were okay to be used (too similar to english words, too weird, too common ect.). While choosing which words to use, it was decided that because participants had an overall accuracy of 10% in the ASL experiment that 10% of the Portuguese words should be easier to guess than the others. Therefore, out of the 30 Portuguese words we made 3 of them cognates. While we know that really only about 2-3% of signs are transparent, we interpreted the ASL experiment in this way to be as charitable to the spoken language experiments as possible to see if there would be any sort of replication of transparency.

Experiment 3 (Russian)

One of the languages selected to compare the results of the ASL experiment to was Russian. Russian was selected due to similarities it has to ASL that are different to the similarities that ASL shares with Portuguese. While it is still a language that most (hopefully all) adult Americans have heard of, it is unlikely that most Americans are familiar with it or know any more than a word or two. We believe that individuals will be less confident in their guesses due to these factors. We chose these two languages to try to cover different possibilities of how ASL is perceived by the public. It could be more similar to Portuguese, a language that many may feel they are familiar with and know some words of, or it could be more similar to Russian, a language that many could recognize but not pick any individual words out from.

We hypothesize that participants will on average have lower confidence ratings for Russian than for ASL. We also expect for there to be significant correlations between accuracy/confidence/and dominant guess percentage with the correlation between confidence and dominant guess being the strongest. We finally predict that when asked directly, participants on average will state that ASL is easier to learn than Russian and other languages.

Methods

Participants

English-speaking adults (n = 95; 34 male, 61 female) (73 white, 5 African American, 4 Asian, 5 Hispanic, 6 Mixed Race) between the ages of 18 and 78, with a mean age of 32.9, were recruited at COSI. No participants reported a knowledge of Russian better than a 2 on a 5 point likert scale (1 being not at all and 5 being fluent). Participants were not offered anything as compensation for participating in the study.

Materials

The materials for the Russian experiment are identical to experiment 1 and 2 except with the language of choice being Russian. Just as in experiment 2, three Russian cognates were selected. See appendix for the 30 different Russian words. It is important to note that there were *many* more signs than Russian words. There were 425 signs used and 30 Russian words. This leaves room for many more "transparent" signs to be guessed. Even though when selecting the 30 words we tried to pick a similar group of words to the ASL sample, 30 words out of an entire language is not a very representative sample. Everything that was stated about the process of picking 30 Portuguese words can also be said about picking 30 Russian words.

Procedure

The procedure for the Russian experiment is identical to experiment 1 and 2 except with the language of choice being Russian.

Results

Accuracy and confidence were recorded at an item level. This was done for a few reasons. Calculating the accuracy and confidence on an item level tells us if there were some words that were more transparent than others. It allows us to see if a more guessable word actually generates more confidence.

Each item (each word) was run approximately 10 times because every participant only gets to guess 10 random words from the set of 30. Therefore each score shown represents the averages for each word across all of the people that had that word in their batch of 10.

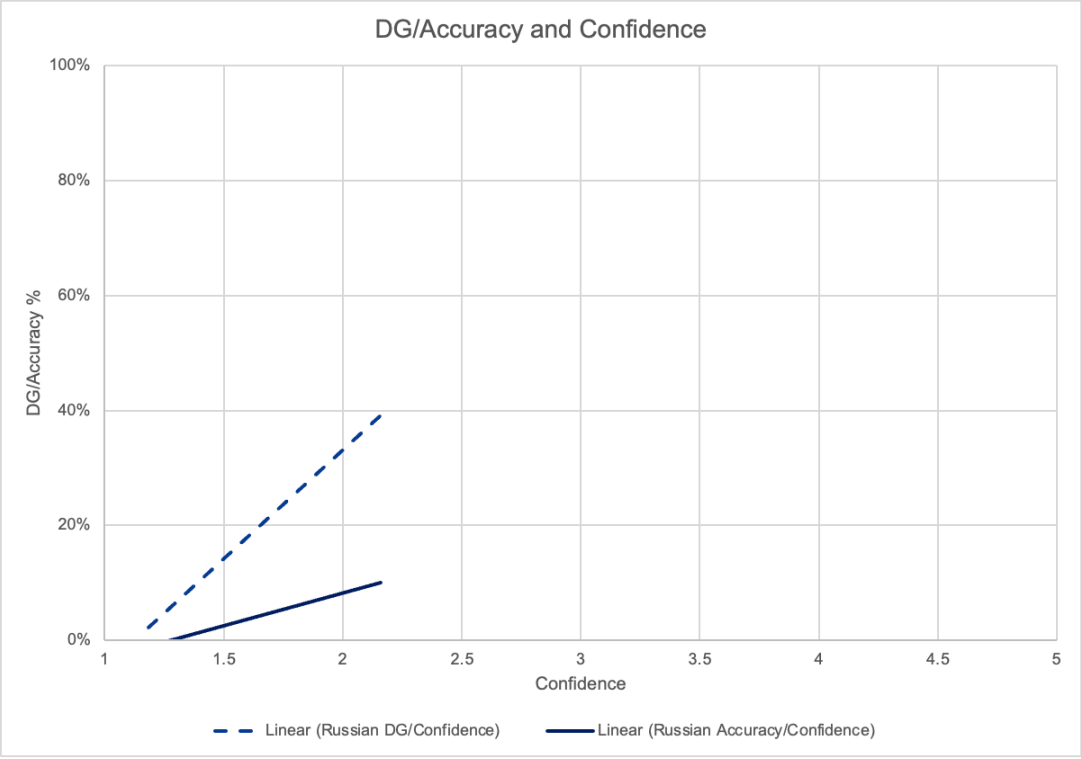
The criteria for accuracy for this experiment was the same as the ASL experiment. However, there was no need for multiple coders for this experiment because there were essentially no guesses that were close to correct that weren't just correct.

The mean accuracy was .0297 (SD = .0783) and the mean confidence was 1.56 (SD = .233). The mean dominant guess percentage was .158 (SD = .128).

Pearson's correlation tests were run to see the relationships between confidence and accuracy and confidence and dominant guess. There was not a significant correlation between confidence and accuracy ($r(28) = .313$ $p = .08$). There was a significant correlation between confidence and dominant guess however ($r(28) = .638$, $p<.001$). This is evidence that it isn't accuracy that gives participants confidence, but instead a "group consensus". It is important to note that for Russian, group consensus was not a good predictor of accuracy. A Pearson's correlation test shows this ($r(28) = .221$, $p = .232$).

Figure 7

Correlations Between Dominant Guess and Confidence; Accuracy and Confidence for Russian

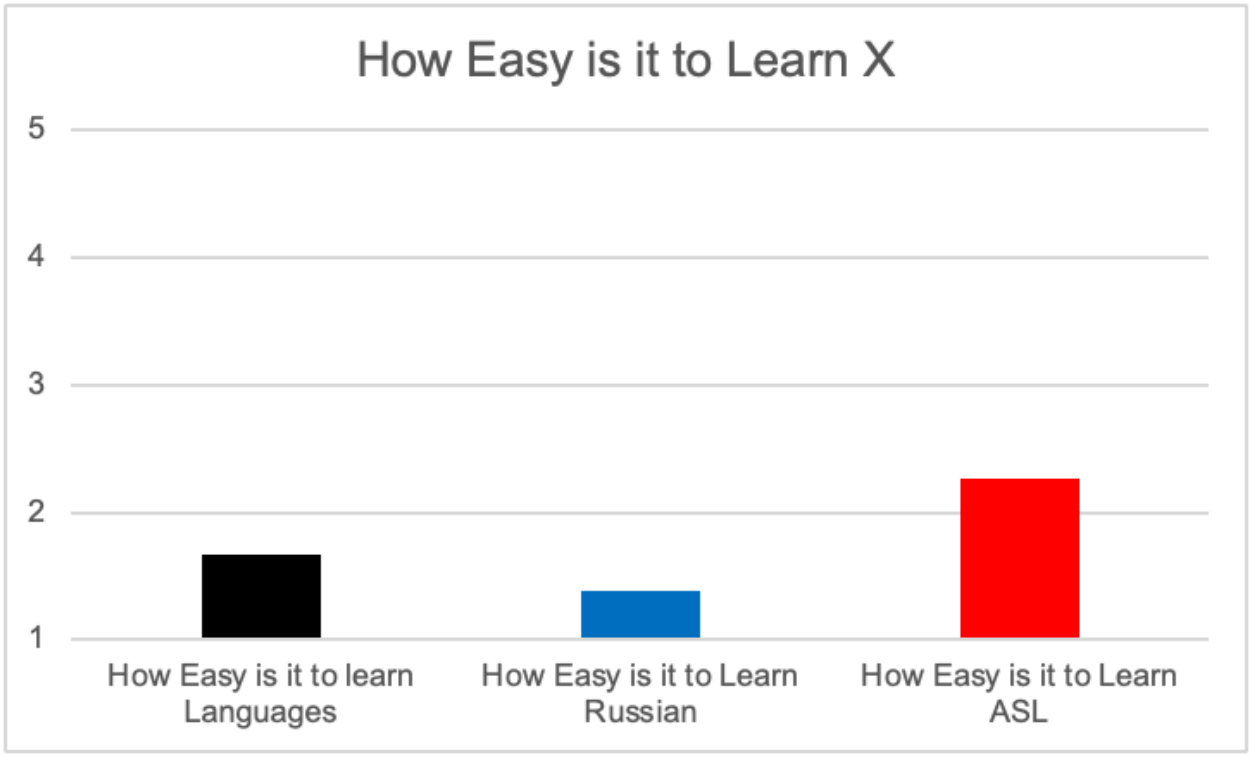


Unlike Portuguese, there were no outliers for the Russian language, even though there were 3 cognates, Медицина (Medicine) - Medicine, Идея (ideya) - Idea, and Сюрприз (syurpriz) - Surprise. In fact, for Russian there was not a single word that had over 40% accuracy or 40% dominant guess percentage. The word with the highest dominant guess percentage was "Honor" with a dominant guess percentage of 38%. The accuracy for this word however was 0%.

In addition to measuring accuracy, confidence, and dominant guess percentage, participants were also asked the direct questions of "How easy is it to learn other languages?", "How easy would it be to learn Russian?", and "How easy would it be to learn American Sign Language?" (see figure 8). These questions were measured on a 4 point likert scale, with 1 being quite easy and 4 being quite difficult (see figure 10). On average, participants ranked other languages a 1.67 (SD = .763), Russian a 1.38 (SD = .546), and ASL 2.26 (SD = .731). T-tests were conducted to see if these results were significantly different from each other (note that the N is lower here than our total participants. This is because many chose to leave these questions blank). These tests showed that there was a significant difference between how easy participants thought it was to learn ASL and how easy it was to learn other languages ($t(83) = 4.54$, $p < .0001$). There was also a significant difference between how easy participants thought it was to learn ASL and how easy it was to learn Russian ($t(83) = 7.84$, $p < .0001$).

Figure 8

Rating of 1-5 on How Easy it is to Learn Different Languages



Discussion

Participants did have a lower average confidence in the Russian experiment than they did in the ASL experiment. They also had a much lower accuracy.

Once again, the correlations seen in the Russian experiment are very similar (at least in relation to their respective experiment numbers) to the correlations seen in the ASL experiment. While the significance of the correlation between confidence and accuracy is no longer there, there is still significance in the correlation between confidence and dominant guess which has been the stronger correlation across the other two experiments. This is further evidence that it is more the hidden group consensus that controls confidence (and therefore the perception of each language) than the accuracy of guess.

Individuals also reported on average that they thought that ASL would be easier to learn than Russian and other languages. They answered this question after they had just guessed the meaning of ten Russian words so there may be a couple reasons for this. It's entirely possible (and likely) that individuals just think that ASL would be easier to learn. This is consistent with previous literature, and the findings from these experiments. Individuals think of ASL as an easier, and therefore a potentially less legitimate, language. However, it is also possible that having just been exposed to the difficulty of guessing Russian words, participants' confidence was shattered. Therefore when asked how easy it would be to learn Russian or other spoken languages, their answers were suppressed, leading to a lower overall score. This does beg the question, why wouldn't that also lead to the difficulty of learning ASL to be increased in the perception of participants? Shouldn't the difficulty of one language demonstrate that all languages are difficult to learn? It's potentially because people don't view ASL in the same category of language as spoken languages.

Even when participants were presented with a clear cognate, they were unable to consistently (or almost at all) guess correctly. This could be a mental aspect of individuals just being overconfident that they are able to guess signs more accurately than spoken words.

Unlike Portuguese, there were no outliers for the Russian language, even though there were 3 cognates, Медицина (Medicine) - Medicine, Идея (ideya) - Idea, and Сюрприз (syurpriz) - Surprise. In fact, for Russian there was not a single word that had over 40% accuracy or 40% dominant guess percentage. This is somewhat unexpected. We knew that Russian would be less familiar to individuals than Portuguese. However, these words are still cognates that are extremely similar in pronunciation to their English counterparts. It is curious that none of them

were able to stick out which could indicate it is more about the *perception* of a Language that could determine someone's ability to guess words in that language.

Cross-analysis

Now that each experiment's data has been laid out and discussed, they can be properly compared to each other. If you go to figure 9, you can see that ASL has the highest accuracy and dominant guess percentage. However, it is important to note that all of the experiments' average accuracy and dominant guess percentages are quite low. The y-axis only goes up to 50%, so none of the accuracy scores go above 11% and none of the dominant guess percentages go above 25%. So while ASL is ahead of the spoken languages in these categories, it is still low and comparatively not much higher than the spoken languages. The ASL experiment also has the highest average confidence (see figure 10).

A one-way ANOVA was performed to compare the effect of language on accuracy. This revealed that there was a statistically significant difference in accuracy between at least two groups ($F(2, 482) = 6.85$, $p < .01$). Unpaired t-tests revealed that there was not a significant difference in accuracy between ASL ($M = .111$, $SD = .179$) and Portuguese ($M = .078$, $SD = .171$); $t(453) = .979$, $p = .328$. There was a significant difference in accuracy between ASL ($M = .111$, $SD = .179$) and Russian ($M = .0297$, $SD = .0783$); $t(453) = 2.47$, $p = .0139$.

A one-way ANOVA was performed to compare the effect of language on confidence. This revealed that there was a statistically significant difference in confidence between at least two groups ($F(2, 482) = 50.8$, $p < .00001$). Unpaired t-tests revealed that there was a significant difference in confidence between ASL ($M = 2.18$, $SD = .418$) and Portuguese ($M = 1.69$, $SD = .509$); $t(453) = 6.11$, $p < .0001$ There was also a significant difference in confidence between ASL ($M = 2.18$, $SD = .418$) and Russian ($M = 1.56$, $SD = .233$); $t(453) = 8.03$, $p < .0001$.

A one-way ANOVA was performed to compare the effect of language on dominant guess. This revealed that there was not a statistically significant difference in dominant guess between at least two groups ($F(2, 482) = 2.35$, $p < .097$).

Figure 9

Accuracy and Dominant Guess of Each Experiment

Note: This figure's Y-axis only goes to 50%. Note how long the accuracy/Dominant guess is for each language, even in the experiments where it is comparatively higher

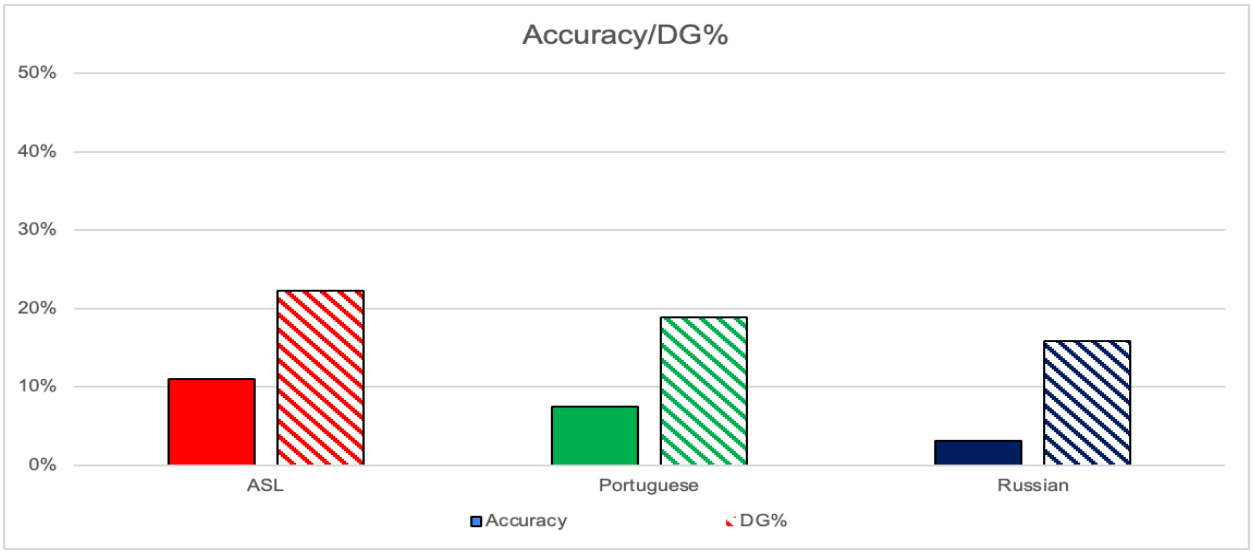
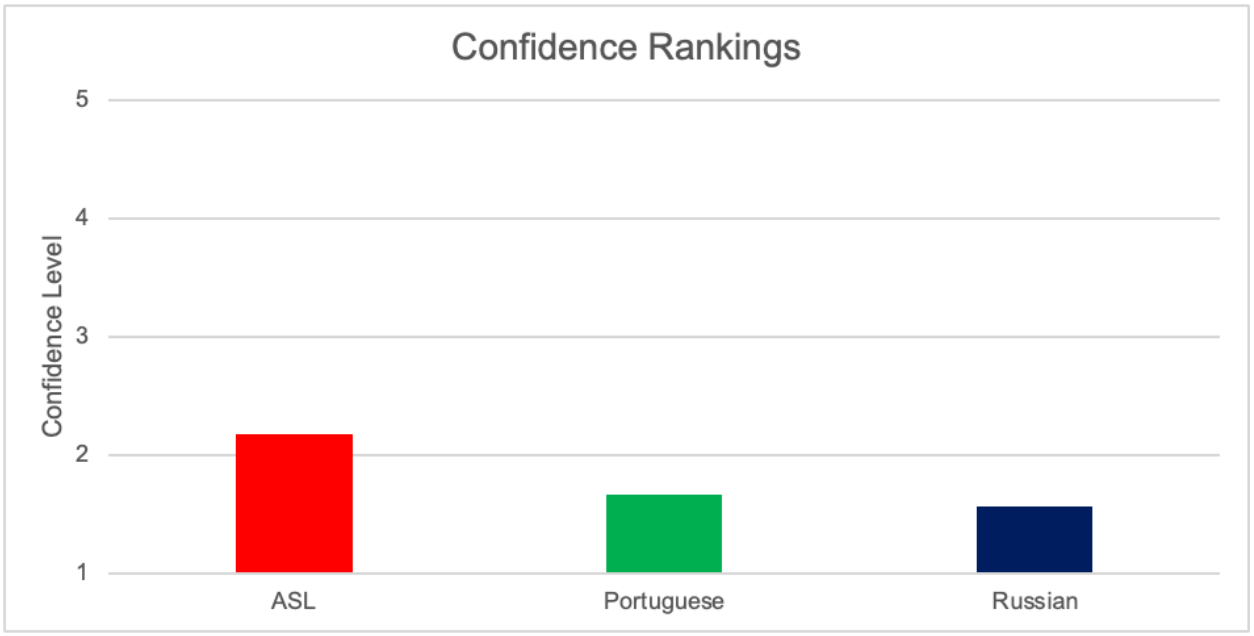


Figure 10

Average Confidence for Each Experiment



Lastly, the correlations. Every experiment's correlation between dominant guess and confidence is higher than that respective experiment's correlation between accuracy and confidence. It can also be noted how much smaller the correlations are for Russian than they are for the other two languages. This is because there were no standout words that had a consistent guessing pattern, let alone any words that had a particularly high accuracy rating.

General Discussion

The goal of this study was to examine people's perception of ASL by comparing their guesses (and confidence in those guesses) in ASL signs with their guesses (and confidence in those guesses) of words in a foreign spoken language (Portuguese and Russian). We expected participants to be overconfident in their abilities to guess signs and to be proportionately confident (aka not confident at all) in their ability to guess foreign spoken words. For the most part, this hypothesis was supported. While participants were slightly more accurate in guessing ASL signs than spoken words, they were also more confident. The true nature of the accuracy statistics have also been discussed, and it is clear that 10% of ASL signs are *not* guessable.

We expected there to be several significant correlations throughout the experiments such as correlations between confidence and accuracy, accuracy and dominant guess, and confidence and dominant guess. This all stood true for the most part, with Russian being the only experiment to not have significant correlations between accuracy/dominant guess and confidence/accuracy. However, the confidence/dominant guess correlation held true. We also expected for there to be the strongest significant correlations (for each experiment) between confidence and dominant guess. This ended up being supported.

Overall, the ASL experiment had the highest confidence, accuracy, and dominant guess percentage. However, every language had a stronger correlation between confidence and dominant guess percentage than confidence and accuracy. This indicates that while participants accuracy was slightly higher for the ASL experiment, that the accuracy isn't alone what caused the higher average confidence. People *believe* that they are able to gather more from signs than from words in spoken languages and are thus more confident.

The ASL experiment had the highest dominant guess percentage (even with Portuguese's outlier in *delicioso*) so participants may not have been completely wrong in this assumption. They may be able to gather something from signs and come together with a hidden group consensus, but this does not make that group consensus correct and oftentimes it is incorrect. For example, the case of the sign HAVE. It had a higher dominant guess percentage than accuracy with its dominant guess being ME with a percentage of 73.3% and its accuracy only being 13%. This is just one example of many signs that there was a false group consensus over. It has also already been discussed that the higher accuracy of the ASL experiment could be down to a few truly transparent signs that are not representative of ASL as a whole.

This leaves the question of what it is about signs that gives people the higher group consensus and therefore higher confidence. It could be the presence of transparent signs and their similarity to gestures, which is something that individuals see in their day to day lives. This level of perceived familiarity could be what gives individuals their confidence and what fuels the group consensus. While spoken languages do have cognates, they are not as present in day to day life as gesture is. People are much more likely to see someone wave goodbye, or make a baby rocking movement, or some other gesture than they are to hear or pick up on a cognate. Whatever it is that gives people their confidence (and group consensus) when it comes to guessing signs, it is usually unfounded and it is not extended to spoken languages. This confidence breeds attitudes that are damaging to the Deaf community.

Another theory could be that individuals don't necessarily think that ASL is easy, they just think that spoken languages are extremely difficult to guess/learn. This is somewhat supported by ASL's confidence numbers and "easiness to learn" numbers still being relatively low with its accuracy being a bit higher. While it is possible that this is the case, the same

problem with perception of ASL would remain. People think ASL is easier to learn and then potentially take it less seriously than spoken languages. This leads to people taking individuals who use Sign Language less seriously than individuals that do not.

The ASL experiment was conducted and designed before the spoken language experiments were conceived. Because of this, the question about how easy it is to learn ASL versus other languages was not asked to participants of the ASL experiment. This is unfortunate as we are unable to see how being exposed to guessing signs affects individuals thoughts on how easy it is to learn ASL and other languages and we can therefore not compare those results to the others. In future studies, this question should be asked.

It is important to note that there were *many* more signs than spoken words. There were 425 signs used and 30 spoken words per experiment. This leaves room for many more "transparent" signs to be guessed. Even though when selecting the 30 words for each experiment we tried to pick a similar group of words to the ASL sample, 30 words out of an entire language is not a very representative sample.

Overall, there are misconceptions of ASL that are damaging to the Deaf community (Krausneker, 2015). People assume that there is a layer of transparency to most signs and it potentially leads to a higher confidence when guessing their meaning. Similar trends exist between the guessing and confidence ratings of ASL signs and foreign spoken words. This shows the similarities between ASL and spoken languages while highlighting the perceptual differences. These misconceptions clearly still need to be fought with further education about ASL and the Deaf community and more research should be done on not only why ASL is viewed in this way but also how public perception can be shifted.

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Appendix

1. Signs Used

1.1. ABOUTb
1.2. ABOUTix
1.3. ACCIDENT
1.4. ACCOMPLISH
1.5. ACT
1.6. ACTION
1.7. AFTER
1.8. AGE
1.9. AGREEMENTix
1.10. ALSO
1.11. AMERICA
1.12. ANDasym
1.13. ANGRY
1.14. ANIMAL
1.15. ANNOUNCE
1.16. APPEAR
1.17. APPOINTMENT
1.18. ARM
1.19. ASKonex
1.20. AUTUMN
1.21. AWKWARD
1.22. BABY
1.23. BAD
1.24. BAKE
1.25. BALANCEbb
1.26. BALL
1.27. BASEMENT
1.28. BATH
1.29. BEARD
1.30. BECAUSEb
1.31. BEER
1.32. BEHAVIOR
1.33. BEHIND
1.34. BENEFIT
1.35. BLACK
1.36. BLOOD
1.37. BLUE
1.38. BODY
1.39. BONE
1.40. BORED
1.41. BORNb
1.42. BORROW
1.43. BOSS
1.44. BOWL
1.45. BOX
1.46. BOY
1.47. BRAGa
1.48. BRAVE
1.49. BREAK
1.50. BREAKDOWN
1.51. BROTHER
1.52. BUG
1.53. CABINET
1.54. CALL
1.55. CALL-TTY.
1.56. CAMERA
1.57. CAN
1.58. CANADA
1.59. CANCELLATION
1.60. CANDLE
1.61. CAPTION
1.62. CAREFUL
1.63. CENTER
1.64. CERTIFICATE
1.65. CHALLENGE
1.66. CHANNEL
1.67. CHARACTERts
1.68. CHARGE
1.69. CHATsym
1.70. CHECK
1.71. CHERRY
1.72. CHILDREN

1.73. CHURCH
1.74. CIGAR
1.75. CIGARETTE
1.76. CITYtap
1.77. CLASS
1.78. COLD
1.79. COLOR
1.80. COMB
1.81. COMMUNICATION
1.82. COMPLEXwig
1.83. COMPUTER
1.84. COMPUTER-MOUSE
1.85. CONGRATULATIONS
1.86. COOKIE
1.87. CORN5
1.88. COUGH
1.89. COUNTRYy
1.90. COUSIN
1.91. COVER-UP
1.92. CRACKER
1.93. CREDIT-CARD
1.94. CROSS
1.95. CRY
1.96. CUTE
1.97. DANCE
1.98. DAY
1.99. DECIDEix
1.100. DEEP
1.101. DELICIOUS
1.102. DEPARTMENT
1.103. DESIRE
1.104. DISAGREEMENT
1.105. DIVORCE
1.106. DON'T-MIND
1.107. DOUBT
1.108. DOWNLOAD
1.109. DOWNSIZEstr
1.110. DREAMix
1.111. DRINKc
1.112. DROP
1.113. DRUNK
1.114. DRYER
1.115. EARN
1.116. EARRINGS
1.117. EAT
1.118. EGYPT
1.119. EIGHT-HOURSneut
1.120. EMAIL
1.121. EMBARRASS
1.122. EMOTION
1.123. EMPEROR
1.124. ENGAGEMENT
1.125. ENGINEERING
1.126. EQUAL
1.127. ERASER
1.128. EUROPEcir
1.129. EXERCISEsup
1.130. EXPENSIVE
1.131. EXPERIENCE
1.132. EXPLANATION
1.133. FACEix
1.134. FALL
1.135. FAMILYf
1.136. FARM
1.137. FASTonexth
1.138. FAT
1.139. FATHER
1.140. FAULT
1.141. FAVORITE
1.142. FEEL
1.143. FEW
1.144. FIGHTs
1.145. FIGURE
1.146. FILMba
1.147. FIND
1.148. FINE
1.149. FINGERSPELL
1.150. FINGERSPELLING
1.151. FINISH
1.152. FIREcir

1.153. FIVE-DOLLARS
1.154. FLAG
1.155. FOR
1.156. FOREIGNERb
1.157. FOREIGNERf
1.158. FOUR
1.159. FRECKLES
1.160. FRIDAY
1.161. FRONT
1.162. FRUITflex
1.163. FRUSTRATED
1.164. FURNITURE
1.165. FUTUREstr
1.166. GALLAUDETrep
1.167. GAME
1.168. GET
1.169. GIRL
1.170. GLASSES
1.171. GOOD
1.172. GOVERNMENT
1.173. GRADUATE
1.174. GRANDFATHER
1.175. GRANDMOTHER
1.176. GREECE
1.177. GREEN
1.178. GROW
1.179. GUESS
1.180. HAIRDRYER
1.181. HAMMER
1.182. HAPPEN
1.183. HAPPY
1.184. HARD
1.185. HAVE
1.186. HEADACHE
1.187. HEADPHONES
1.188. HEALTH
1.189. HEARING
1.190. HEARING-AIDx
1.191. HEART-SHAPE
1.192. HIGH
1.193. HIPPO
1.194. HOCKEY
1.195. HOME
1.196. HONEST
1.197. HONOR
1.198. HORIZONTAL-BLINDS
1.199. HOSPITAL
1.200. HOSPITAL-PATIENT
1.201. HOTDOGs
1.202. HOTEL
1.203. HOURneut
1.204. HS
1.205. HUNTu
1.206. IF
1.207. IMAGINE
1.208. IMPORTANT
1.209. IMPOSSIBLE
1.210. INDIAN
1.211. INTEREST
1.212. INTERNET
1.213. INVITE
1.214. JACKETa
1.215. JEALOUS
1.216. JELLY
1.217. JIGSAW-PUZZLE
1.218. JUMP
1.219. KEY
1.220. KID
1.221. KING
1.222. KNEEL
1.223. KNIFEix
1.224. KNOW
1.225. LAPTOP
1.226. LAST
1.227. LATE
1.228. LAUGH
1.229. LAWNMOWER
1.230. LEARN
1.231. LEAVEsym
1.232. LECTURE

1.233. LETTUCE
1.234. LIE
1.235. LIGHT-WEIGHT
1.236. LIPSTICK
1.237. LIVEa
1.238. LIVEl
1.239. LONELY
1.240. LOOK
1.241. LOSE
1.242. MAGNET
1.243. MAILa
1.244. MAKEstr
1.245. MAN5
1.246. MAYBE
1.247. MCDONALDS
1.248. MEAN
1.249. MEDICINE
1.250. MEETING
1.251. MIND
1.252. MINUTEb
1.253. MISUNDERSTAND
1.254. MOCK
1.255. MONDAY
1.256. MONEYb
1.257. MORE
1.258. MORNING
1.259. MOTHERstr
1.260. MOUTH
1.261. MOVIE
1.262. MUCH
1.263. MUSTACHErep
1.264. NEW
1.265. NEW-YORK
1.266. NO
1.267. NOTHING
1.268. NUMBER
1.269. NURSE
1.270. ORALbv
1.271. ORDER
1.272. OTHER
1.273. OWE
1.274. PAIN
1.275. PARADE
1.276. PARENTS
1.277. PASTbk
1.278. PEABRAINg
1.279. PEACE
1.280. PERSONp
1.281. PILE
1.282. PILL
1.283. PINEAPPLE-CUT
1.284. PIPEy
1.285. PITY
1.286. PLANET
1.287. PLAY
1.288. PLEASE
1.289. POOR
1.290. POSS_1
1.291. POWER
1.292. PRAYER
1.293. PREFER
1.294. PRETTY
1.295. PRINT
1.296. PROBLEMstr
1.297. PROBLEMtwist
1.298. PROTECTION
1.299. PUNISH
1.300. PURPLE
1.301. PUZZLED
1.302. QUIET
1.303. RABBITears
1.304. REAL
1.305. REASON
1.306. RED
1.307. RELATIONSHIP
1.308. RELIGIONthipsi
1.309. REMOTE-CONTROL
1.310. REQUIREMENT
1.311. RESEARCHr
1.312. RESPONSIBILITY

1.313. RUDE
1.314. RUNasym
1.315. SAD
1.316. SALT
1.317. SAME-AS
1.318. SCAN
1.319. SCARCELY
1.320. SCARED5
1.321. SCHOOL
1.322. SCROLL-DOWN
1.323. SEARCH
1.324. SECRET
1.325. SERIOUS
1.326. SET-UProt
1.327. SEW
1.328. SHAVE
1.329. SHOPPING
1.330. SHOW
1.331. SHY
1.332. SICKstr
1.333. SILLY
1.334. SKATE
1.335. SKATEBOARDING
1.336. SLEEPo
1.337. SLOW
1.338. SMOKING
1.339. SOME
1.340. SONb
1.341. SORRY
1.342. SPEAKERS
1.343. SPORTS
1.344. SQUIRREL
1.345. STAFF
1.346. STAMPhbk
1.347. STARBUCKS
1.348. START
1.349. STOMACH
1.350. STRANGE
1.351. STRESS
1.352. STRICT
1.353. STUBBORN
1.354. STUPID
1.355. SUBTRACT
1.356. SUMMER
1.357. SUMMON
1.358. SUNo5
1.359. SUNSETc
1.360. SURPRISE
1.361. SUSPECT
1.362. SWALLOW
1.363. TALK
1.364. TALL
1.365. TALL-PERSON
1.366. TEAR
1.367. TEMPT
1.368. THAT
1.369. THIEF
1.370. THING
1.371. THINsym
1.372. THIRSTY
1.373. THREE
1.374. THROW
1.375. THURSDAYth
1.376. TIME
1.377. TIME-NINE
1.378. TIRED
1.379. TOURNAMENT
1.380. TRAFFIC
1.381. TRAFFIC
1.382. TRAIN
1.383. TRAVEL
1.384. TRYs
1.385. TV+
1.386. TWO
1.387. TYPE
1.388. TYPING
1.389. UGLY
1.390. UNDERSTAND
1.391. UNIVERSITY
1.392. UPLOAD

1.393. VACATION5
1.394. VERTICAL-BLINDS
1.395. VIDEO-GAME
1.396. VIDEOCAMERA
1.397. VIDEOPHONE
1.398. VOICE
1.399. VOTE
1.400. WAIT
1.401. WARM
1.402. WARN
1.403. WARw
1.404. WASH-MACHINE
1.405. WASTE
1.406. WEAK
1.407. WEAR5
1.408. WEATHER
1.409. WEDNESDAY
1.410. WEEK
1.411. WETneut
1.412. WHAT-FOR
1.413. WHERE
1.414. WHICH
1.415. WIN
1.416. WOMAN5
1.417. WONDER
1.418. WORK
1.419. WORLD
1.420. WORM
1.421. WORRYb
1.422. WRISTWATCH
1.423. WRONG
1.424. YEARs
1.425. ZOOM-I

2. Portuguese Words Used

2.1. Action
2.2. Appointment
2.3. Behavior
2.4. Borrow
2.5. Caption
2.6. Cigar
2.7. Cookie
2.8. Cry
2.9. Delicious
2.10. Drop
2.11. Grow
2.12. Guess
2.13. Health
2.14. Jelly
2.15. Key
2.16. Lie
2.17. Morning
2.18. Print
2.19. Private
2.20. Responsible
2.21. Shave
2.22. Silly
2.23. Squirrel
2.24. Thief
2.25. To appear
2.26. To call
2.27. To Summon
2.28. To understand
2.29. Weather
2.30. Where

3. Russian Words Used

3.1. Age
3.2. Animal
3.3. Blue
3.4. Bored
3.5. Boy
3.6. Breakdown

3.7. Cancellation
3.8. Cry R
3.9. Delicious
3.10. Divorce

3.11. Doubt
3.12. Download
3.13. Embarrass
3.14. Honor
3.15. Hospital
3.16. Idea
3.17. Key
3.18. Medicine
3.19. Mock
3.20. Nothing
3.21. Protection
3.22. Scan
3.23. Shave
3.24. Stomach
3.25. Surprise
3.26. Talk
3.27. Time
3.28. Upload
3.29. Voice
3.30. Warm