# Sad or Traurig? Emotion Recognition Accuracy Depending on Bilinguals' Gender and Used Language

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**Abstract**

Recognizing emotions is quite important in our day-to-day lives, and although sophisticated language has been a part of human societies for several thousands of years, we still are not sure how knowing different languages could influence this. In the current study, bilingual individuals were investigated on the differences in emotion recognition accuracy based on the gender of the participant and if the exercise was in their mother tongue (L1) versus their second language (L2). To test this, 93 German-English bilinguals were recruited to do an online questionnaire, and were asked to indicate the emotions of the people depicted in the EU-Emotion Stimulus Set. This questionnaire was either in German for the L1 condition and English for the L2 condition. Results show that between all groups and conditions, the scores were not significantly different. It was concluded that neither gender, nor used language had an effect on the accuracy of emotion recognition, which contradicts past findings regarding this topic.

**Keywords:** bilingualism, emotion recognition, EU-Emotion Stimulus Set, gender differences, online study, psycholinguistics

## 1. Introduction

Emotions are a big part of our day-to-day life and conveying emotions is regarded as a helpful and universal mechanism that we evolved as social animals to better communicate with our fellow humans by conveying and recognizing feelings or opinions behind the words we say (Montgomery, 2012). But being on the receiving end and recognizing emotions is not a single isolated skill. It is a combination of multiple aspects, like tone of voice, facial expression, language, and culture (Kessous et al.,

2009). As previous studies have shown that language is one of the factors that influence emotion perception, it has been noted that emotion can be perceived differently based on which language is used when talking about these emotions (Matsumoto & Assar, 1992; Ożańska-Ponikwia, 2019). One of the first studies where this was observed was a study by Matsumoto and Assar (1992), where 100 Hindi-English bilinguals were shown pictures of peoples' faces and asked to determine what these people were feeling, among other things. In that study of Hindi-English bilingual population, the researchers found significant differences in emotion recognition accuracy between the language conditions when it came to those two languages.

In modern days about half of the world can be considered bilingual (Ansaldo et al., 2008), and this is still increasing. For instance, in America, the number of bilingual children has increased from 22% or 12 million in 2016 to 24% or almost 14 million in 2018 (Racoma, 2019), and similar patterns have been observed in Canada and Germany as well (Gregory, 2020; Pawlik, 2020). The increase in bilingualism or multilingualism means that more and more people speak more than just their mother tongue and can communicate with more people from different cultures. This in combination with, possibly, other factors, such as differences in certain signal intensity in the brain (Kovelman et al., 2008), has shown that bilinguals outperform monolinguals in non-verbal creativity, originality, and adaptability (Kharkhurin, 2009; Kharkhurin, 2010; Kharkhurin 2017). Furthermore, aspects like emotion recognition also have been proposed to be different in bilingual people (Matsumoto & Assar, 1992; Ożańska-Ponikwia, 2019), but some research suggests that not all bilingual research can be generalized to the whole bilingual population (Sauter, 2018).

This raises a problem that not all of language-pairs have been researched when talking about bilinguals, and the ones that have been studied are only a handful. This is further substantiated by some studies that have suggested that research regarding emotion can only be generalized in the language the study is conducted in (Sauter, 2018). This problem has real-life implications as well, since the demands for bilingual workers are increasing around the world (New American Economy, 2018). These bilingual workspaces carry a risk of having miscommunication about everyday actions and situations, including emotions, which can negatively influence the employees' sense of belonging in the workspace and their general mood (Offermann et al., 2014). With this in mind, it becomes important to explore more languages or language pairs when it comes to concepts like emotion recognition and perception. This is also a point that is made often as different languages and thus different emotion vocabularies can have different emotion intricacies (Sauter, 2018). Furthermore, as previously mentioned, more and more people are bilingual, and the number of bilinguals in the

past couple of years has been increasing steadily - by about 1% a year in some countries (Gregory, 2020). Taking all of this in to consideration, a steady increase in the bilingual workforce and population as a whole could demand continuous research to see if the previous findings still hold and what can be done to lessen the miscommunication in workspaces.

In this study, we wanted to investigate whether bilingual people recognize emotions differently based on the language used - mother tongue or learned language. This is important to explore as it could open a window for more research on bilingualism and can provide insight as to whether the current assumptions on the advantages and shortcomings of bilingual people are generalizable for other bilingual populations. Furthermore, conducting this research on bilinguals with not well-explored language pairings would also be important, as it could maybe provide results different from the current theory, which states that people in their second language (L2) are more accurate at emotion recognition than in their first language (L1) (Matsumoto & Assar, 1992; Matsumoto et al., 2008). Finding such diversion from the current theory is certainly possible and by some researchers opinions, important, as the global population of bilinguals is quite diverse ethnically and culturally (Dijk et al., 2019). This is further substantiated by the fact that a group of studies that investigated different bilingual groups, like Farsi-English, Russian-English, and Korean-English bilinguals to name a few, also indicated differences between the samples. Namely, that Korean-English bilinguals showed higher language creativity scores, while Russian-English bilinguals showed better performance in elaboration tasks (Kharkhurin, 2009; Kharkhurin, 2010; Kharkhurin, 2017). All of this increases the importance of researching the generalizability of previous finding mentioned above.

Because most studies of other concepts in different languages have similar results, we hypothesize that for the concept of emotion recognition accuracy, similarly to the research done by Matsumoto and Assar (1992), and Matsumoto et al. (2008), people will be able to recognize emotions better in their L2 than their L1. Furthermore, most studies that investigated emotion recognition and bilingualism, including the study by Matsumoto et al. (2008), also distinguish between genders. Because of this we would like to follow the example and see if the theory and findings of previous studies, that claim that females are more accurate than males at emotion recognition (Matsumoto & Assar, 1992; Biele & Grabowska, 2006), apply to other language pair bilinguals. From this, in turn, one could state a hypothesis of interaction, that females are the most accurate at emotion recognition in their L2 while males are the least accurate at emotion recognition in their L1. Other interactive outcomes, like females in

L1 and males in L2, are hard to hypothesize over, as it is not clear which effect is stronger, gender (male vs. female) or language (L1 vs. L2).

To investigate the hypotheses, we wanted to conduct a study similar to the studies conducted by Matsumoto and Assar (1992) and Matsumoto et al. (2008). Based on the literature, we predict that in general, the L2 condition group will be more accurate than the L1 condition group and that females will be more accurate than males. This would, logically, lead to a prediction that females in the L2 condition will be the most accurate and the males in the L1 condition would be the least accurate.

## 2. Method

Our study was an online study with a between-subject design. For our subjects, we reached out to German-English bilinguals, as this group of bilinguals did not have a lot of recent research conducted on them even though the bilingual population in Germany is growing steadily (Pawlik, 2020).

### *2.1 Participants*

In total, 110 people participated in the study. The sample was selected through online postings of the study on the SONA system at Radboud University and in group chats via WhatsApp. Taking part in the study through SONA held the incentive for some of the participants to receive course credits. The data of 17 participants were excluded from the final analysis due to failing to meet the necessary requirements of being a native (L1) German speaker. The 93 remaining eligible participants (69 female, and 24 male) were self-declared German-English bilinguals. These participants were randomly assigned to one of the two conditions. The L2 condition had 47 (18 male and 29 female) participants assigned to it and the L1 condition had 46 (6 male and 40 female) participants. Ages within the sample ranged from 18 to 51 years old with the total average age being 21.06 ($SD$ = 3.651). The average age within the conditions were 21.021 ($SD$ = 4.735) for the L1 condition and 21.106 ($SD$ = 2.238) for the L2 condition. The ethnic identities of the participants were not recorded. Furthermore, as stated, the participants were self-declared bilinguals and their proficiency in either of the languages was not measured.

*2.2 Materials*

The data of the study was collected with the use of an online questionnaire, through Qualtrics (Provo, UT, https://www.qualtrics.com), which allows participants to participate on their computers as well as on their smartphones or other smart devices. Qualtrics was also chosen as it automatically adapts the questionnaire for smartphone compatibility. To measure the variation of emotional recognition accuracy in German-English bilinguals based on the language given, we constructed two identical surveys; one in English (the participants' second language) and the alternate in German (the participants' mother tongue). This was done because we wanted to expose the participants to lexical material which would activate either their first language system in L1 or their L2 system. Each participant was assigned randomly to one of the conditions.

The beginning of the questionnaire had an information letter and a consent form. After this the questionnaire consisted of demographic questions, such as age, gender and the description of the mother tongue (see Appendix A). The latter question had the purpose to exclude participants who did not fit our criteria of bilinguals, which were only German-English. The last part of the questionnaire was a set of 48 statements which had the aim to investigate the accuracy of the participant emotion recognition. All of the materials were translated from English to German language by a native speaker. Each statement displayed a person acting out one of the basic 6 emotions we used (Ekman et al., 1983) and each emotion had 8 images corresponding to it. This is in line with the stimuli used in the original study by Matsumoto and Assar (1992).

The people in the picture stimuli (see Appendix B) were from different races, ages, and gender. The clothes that the actors in the photos were wearing are neutral, with different colors of their shirts (blue, red, yellow, green). Beneath each picture there was the choice of six emotions: afraid, angry, disgusted, happy, sad and surprised. The participants had to choose the emotion shown in the picture, stating which emotion they could recognize displayed in the picture (see Appendix A). The pictures were taken from The EU-Emotion Stimulus Set (O'Reilly et al., 2012) which had been tested on their validity in the use for European participants by O'Reilly et al. (2016) and were depicted in the same size as seen in Appendix B. This stimulus set was chosen as it was more available to us as well as it seemed more appropriate to use in a study conducted in the EU than the JACFEE used in the original study by Matsumoto et al. (2000). Out of the 7 basic emotions *contempt* did not have valid stimuli available in the EU-Emotion stimulus set so this emotion was not included in the study. Filling out the questionnaire took on average less than 10 minutes.

*2.3 Procedure*

Prior to being granted access to the questionnaire, the participants had to state their age and gender. The age of the participants was asked as the desired sample for this study was adults over the age of 18. We also asked them to state their mother tongue which we used as a control question to see if the participant was in fact a native German speaker.

The questionnaire presented 48 pictures that display the six basic belonging to the EU Emotion Stimulus Set. Each of the pictures was presented just once and in random order. After an image was presented, the participant was asked to indicate if the person in the picture is happy, sad, angry, disgusted, surprised or scared. The pacing of the questions was not controlled, so the participants could take as long as they needed to answer the questions. The participants completed either the English or German version of the questionnaire. The language condition assigned was determined at the very beginning of the study at random and included the information letter, the consent form, the demographic questions and the 48 emotion picture questions in German for the mother-tongue condition and in English for the second language condition. To conclude the study, we measured the total score of correct answers out of 48 and compared them within the variables of gender and language used in the study respectively.

*2.4 Data Analysis*

Not all of the data collected from the total pool of participants was suitable for the requirements of this study. Therefore, as stated in the aforementioned section some data was excluded, the main disqualifier being that the participants were not German-English bilinguals. The total score for the dependent variable of emotion recognition accuracy of all participants was calculated from the remaining suitable responses from the online questionnaire. This variable was measured on a quantitative scale and had a range of 0-48. The first independent variable being Gender was operationalized with the levels Male or Female which were options qualitatively measured during the intake questions. The second independent variable which was labelled as Condition qualitatively measured in which language a participant conducted the questionnaire. The levels for this between-subjects variable being German or English were assigned at random to the participants as mentioned previously.

To assess the interaction and main effect of the variables with respect to emotion recognition accuracy the statistical analysis ANOVA was utilized. Total Score was

used as a measure of the dependent variable and the variables Gender and Condition were used as the independent between-subjects factors. First, the interaction between Gender and Condition on the Total Score was measured. Second, the same data from the ANOVA was used to compare the respective means of Total Score of the levels Male and Female in the variable Gender. Similarly, the levels of the variable Condition were compared using their average Total Score.

## 3. Results

An ANOVA with Emotion recognition accuracy as dependent variable, and Gender (Male, Female) and Condition (German, English) as between-subject factors showed that the interaction between gender and condition on emotion recognition accuracy was non-significant ($F$ (3,89) = .048, $p$ = .826, *eta2* =.001). The mean of the female group ($M$ = 41,87; $SD$ = 2,90) was not significantly different to the mean of the male group ($M$ = 41,38; $SD$ = 2,63); ($F$ (1,89) = .693, $p$ = .407, *eta2* = .008) Likewise, the mean of the English-condition ($M$ = 41,79, $SD$ = 3,24) was not significantly different to the mean of the German-condition ($M$ = 41,70, $SD$ = 2,37); $F$ (1,89) = .192, $p$ = .663, *eta2* = .008).

## 4. Discussion

In this study, we wanted to investigate if people who are bilingual recognize emotions differently in their L1 compared to their L2 (Matsumoto & Assar, 1992; Matsumoto et al., 2008). None of our hypotheses were confirmed. This means that the mean scores of emotion recognition accuracy between the conditions of L1 and L2 and also between genders were not significantly different. The rejection of our interaction hypothesis also means that there is no interactive effect of gender and language (L1, L2) on emotion recognition accuracy, meaning that females in their L1 are not significantly different than females in their L2, males in their L1 or males in their L2 when it comes to emotion recognition accuracy. The results thus suggest that all bilinguals, regardless of their gender, are equally good, in both of their languages, at recognizing emotions.

The present findings are in contrast with the previous research, which suggests that bilinguals are more accurate at emotion recognition in their L2 (Matsumoto & Assar, 1992; Matsumoto et al., 2008) and that females are better at emotion recognition than males (Biele & Grabowska, 2006), whereas the present study has shown that there are no significant differences between these groups. This could quite possibly be

explained by an already discussed idea, namely that effects concerning emotions observed in a language or a language pair cannot be generalized to all of the languages or language pairs. This is because the words for emotions might have different emotional nuances in different languages (Sauter, 2018). It is further substantiated by the idea that different language pairs could provide different results, that do not match the current theories because of nuance and possible cultural differences (Dijk et al., 2019). These results indicate the differences, or the lack thereof, when it comes to emotion recognition between male and female bilinguals and their L1 and L2. This could mean that the previous claims of there being a difference between L1 and L2 are not necessarily true in the whole bilingual population. In turn, this also could hint at German-English bilinguals processing both languages at the same time, without separate systems of processing for each language. This to some extent could mean that concepts like code-switching are not an issue for some bilingual populations. This idea has been discussed by previous research, like the one conducted by Gullifer et al. (2013), but the idea of code-switching in bilinguals for non-linguistic functions like emotion recognition is still more agreed upon (Williams et al., 2020). With this current study and the study by Gullifer et al. (2013) in mind, there could be some reasoning made to revisit the theory of code-switching to explore its validity.

When it comes to the expected gender differences, the results are quite surprising, as females being better than males at emotion recognition is a relationship used in quite a lot of studies (Biele & Grabowska, 2006). The possible explanation could be the fact that out of the 93 participants only 24 were males which were randomly assigned to the conditions - 6 in the German and 18 in the English conditions. This seemingly small sample of males could have been the reason why there was no difference in genders, as the small male sample may not represent the male population of German-English bilinguals. This is somewhat substantiated by a study by Brysbaert (2019), that explored minimum sizes for each type of experiment and concluded that for a study on 2 variables with 2 levels each and an interaction effect, just like our study, the minimum number of participants should be approximately 200, or about 50 people per interaction condition, which for us would mean 50 males and 50 females in both the English and German condition. Unfortunately, we could not control for this, as this was an online study, that used self-selected sampling, which often leads to homogeneous samples like this one (Khazaal et al., 2014). Furthermore, the answer options, when it came to gender, were constricted to the binary, which might have led to some people who identify outside the binary to mark their biological sex. This should be addressed by future research by introducing other answer options for gender identities.

The method of this study somewhat relied on the participants switching the language they are thinking in to either L1 or L2. This was thought to be done by them reading all the information of the study (including the consent form and the information letter) in the appropriate language. Although some participants could have been affected by this as they could have read everything carefully, a lot of participants do not carefully read consent forms and information letters provided by the researcher (McNutt et al., 2008), meaning that there could be a chance that some participants were not as immersed in the particular language as others, which in turn could explain the results being non-significant. We also used the total results of all of the emotions combined instead of analyzing each emotion as a separate dependent variable as some other similar studies about emotions usually do (Ekman et al., 1983; Matsumoto & Assar, 1992; Matsumoto et al., 2008). This choice could have resulted in a Simpson's paradox, which is a feature of data when it is analyzed without differentiating between underlying subgroups that should be differentiated (Kievit et al., 2013). An example of the paradox in relation to this study would be that in past studies happiness and surprise emotions have shown little to no changes in recognition accuracy, but fear and sadness have shown significant differences (Matsumoto & Assar, 1992). Grouping these emotions in one variable may have led to the overall single variable to appear as non-significant, even if parts of this grouped variable would have significant findings.

It is important to point out that our sample was limited to mostly university students from Germany who study in the Netherlands, which is quite a niche sample, meaning that we cannot speculate about the population of German-English bilinguals as a whole, nor can we speculate about these bilinguals of other age groups as most of our respondents (99.09%) were between the ages of 18 and 27. This could be important to keep in mind in future research as the age of a person has been shown to be a contributing factor in both bilingual and monolingual language proficiencies (Friesen et al., 2015).

Furthermore, we did not look into English-German bilinguals, as we did not have access to possible participants of this population. Studying English-German bilinguals in contrast with German-English bilinguals could show how cultural differences influence bilinguals of the same language pairs but different mother tongues, as cultural differences have been shown to influence emotion recognition, but it is not well-known to what extent (Dijk et al., 2019). On top of this, the current study asked for the mother tongue of the participant instead of the country of origin or nationality, meaning that there might be some cultural differences that were not

accounted for between German natives from Austria and Germany or other German-speaking countries.

Something that was overlooked in this study was language similarities. The German and English languages are related, thus have more similarities than Hindi and English used in previous studies (Matsumoto & Assar, 1992). As of right now, the evidence of language similarities and differences affecting cognitive processes is quite mixed (Barac & Bialystok, 2012; Antoniou et al., 2016), thus it is not clear how emotion recognition might have been influenced in this study. In addition, the levels of bilingualism were not measured or accounted for as the participants were self-identified bilinguals. With this, future research should investigate emotion recognition and other cognitive processes with keeping language similarities and language proficiencies in mind.

Another thing to note is that we conducted the study with a between-subject design, because the study was conducted online, and longer online studies, like studies with a within-subject design, have proportionally larger dropout rates (Howell, 2019). This is quite different from the past bilingual studies as most of them used a within-subject design. Thus, conducting an identical study but with a within-subject design, could be meaningful to test if in fact changing the design could influence the result significance. Increasing the male sample of this study could also increase the significance of the current findings, as, like previously discussed, a total number of 100 males (50 per condition) would have been optimal for this study (Brysbaert, 2019).

In conclusion, this study is one of the first studies to explore emotional recognition in German-English bilinguals. By testing the participants on their emotional recognition abilities in their L1 or L2, we can potentially take the first steps in resolving issues like possible miscommunication about emotions at work and other public spaces (Offermann et al., 2014). In addition, we can start to gather a full picture of the worldwide bilingual population as a whole and look at the past findings, like the ones by Matsumoto et al. (2008), and how they fit with the present findings. The results of this study are in contradiction with the past theories, raising a question of whether or not the theories are generalizable to the worldwide population of bilingual people or just the previously studied populations and language pairs.

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**Appendix A – The Questionnaire**

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Information Letter
concerning a study for the course Research Project 2
*Emotional recognition in bilinguals*

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This study is conducted within the second-year course, *Research Project 2*, of the Psychology Programme of Radboud University. In this course, students conduct a study regarding a psychological topic under the supervision of a teacher of the

psychology programme. Specifically, we conduct a study on emotional recognition in bilinguals.

Through conducting this study, we will examine emotional recognition accuracy. You will receive several pictures of people and your task is to answer the following question: what emotion is the subject expressing (happiness, sadness, anger, surprise, disgust, or fear)? This survey will take approximately 15 minutes, after which, we will analyze your responses to the questions.

Throughout the study, you can indicate at any moment in time that you would like to quit participating, without having to give any explanation as to why. Failing to complete the study has no consequences whatsoever.

The information that we collect will be anonymously processed. This means that in the future, the results cannot and will not be traced back to you. While your privacy is valued, this means that unfortunately, we cannot inform you of your personal results once the study has been completed. However, we are able to disclose information about the results of the study as a whole, so if you wish to be informed, please kindly let us know.

Did this study unintentionally prompt unpleasant feelings, thoughts or insecurities for you? Then, please contact the study advisor or the student psychologist and make an appointment. If you have any remarks or complaints after completing the study, you can direct them to the coordinator of this course, Inge Rabeling (i.rabeling@psych.ru.nl). She will then reach out to you as soon as possible for a personal conversation.

Should you have any remaining questions, please email the following address for further clarification: RP2emotioncoginitionbilinguals@bsi.ru.nl

Now, we ask you to think about whether or not you would like to participate in our study.

You are of course free to decide that you do not want to participate in this study. In that case, we thank you for your time.

If you indicate that you wish to participate in this study, we will ask you to sign an informed consent form. By signing this, you indicate that you are sufficiently informed about the study, that you want to participate, and that you do so voluntarily.

Kind regards,

Benedicta Duah, Tom Hertel, Aoife Quinn, Rudolfs Zeitmanis,
Students Research Project 2
Psychology Programme Radboud Universiteit

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Consent form
for participation in a study for the course Research Project 2:
*Emotional recognition in bilinguals*

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This section should be filled out by the participant *prior to the start of the study*.

I hereby confirm that:

- ❑ I was satisfactorily informed about the study and I have read and understand the written information presented in the Information Letter.
- ❑ I was informed that the current study is conducted by psychology students as part of their second-year course, *Research Project 2.*
- ❑ I was given the opportunity to ask any questions I may have in regards to the study and (if applicable) my questions have been answered satisfactorily.
- ❑ I was given sufficient time to consider whether or not to give my consent to participate in this study.
- ❑ I participate by my own free will.

I understand that:

- ❑ I have the right to withdraw my consent at any time without having to give any explanation and that withdrawing has no further consequences.
- ❑ My information will be processed anonymously.
- ❑ The outcome of the study cannot be considered a diagnostic test.
- ❑ I will not be informed about my individual results.

Do you acknowledge the above-mentioned points and agree to participate in the present study?

- ❑ I agree

Questionnaire (English)

What is your age?

- …

What is your gender?

- Male
- Female
- Other: …

What is your mother tongue?

- German
- Other: ...

In the following section, you will see pictures of people. You must indicate what emotion the person in the picture is feeling. *(the following part was repeated a total of 48 times, with different pictures)*

*[a picture from the EU Stimulus set (Appendix B)]*

The person in the picture is expressing…

- Happiness
- Sadness
- Anger
- Surprise
- Disgust
- Fear

Informationsschreiben
zu einer Studie für den Kurs Research Project 2
*Emotionserkennung in zweisprachigen Teilnehmern*

Diese Studie wird im Rahmen des zweiten Studienjahres, *Forschungsprojekt 2*, des Psychologie Programms der Radboud University durchgeführt. In diesem Kurs führen die Studierenden unter der Aufsicht eines Lehrers des Psychologie Programms eine Studie zu einem psychologischen Thema durch. Wir führen eine Studie zur Emotionserkennung in Zweisprachigen durch.

Durch die Durchführung dieser Studie werden wir die Genauigkeit der Emotionserkennung untersuchen. Sie erhalten mehrere Bilder von Menschen und haben die Aufgabe, die folgende Frage zu beantworten: Welche Emotionen drückt das Thema aus (Glück, Traurigkeit, Wut, Überraschung, Ekel oder Angst)? Diese Umfrage dauert ungefähr 15 Minuten. Danach analysieren wir Ihre Antworten auf die Fragen.

Während der gesamten Studie können Sie jederzeit angeben, dass Sie die Teilnahme beenden möchten, ohne eine Erklärung dafür abgeben zu müssen. Wenn die Studie nicht abgeschlossen wird, hat dies keinerlei Konsequenzen.

Die von uns gesammelten Informationen werden anonym verarbeitet. Dies bedeutet, dass die Ergebnisse in Zukunft nicht mehr auf Sie zurückgeführt werden können und werden. Ihre Privatsphäre wird von uns geschätzt und daher, können wir Sie nach Abschluss der Studie leider nicht über Ihre persönlichen Ergebnisse informieren. Wir sind jedoch in der Lage, Informationen über die Ergebnisse der gesamten Studie offenzulegen. Wenn Sie also informiert werden möchten, teilen Sie uns dies bitte mit.

Hat diese Studie unbeabsichtigt unangenehme Gefühle, Gedanken oder Unsicherheiten für Sie ausgelöst? Dann wenden Sie sich bitte an den Studienberater oder den Studenten Psychologen und vereinbaren Sie einen Termin. Wenn Sie nach Abschluss der Studie Anmerkungen oder Beschwerden haben, können Sie diese an die Koordinatorin dieses Kurses, Inge Rabeling (i.rabeling@psych.ru.nl), richten. Sie wird sich dann so schnell wie möglich mit Ihnen in Verbindung setzen.

Sollten Sie noch Fragen haben, senden Sie bitte eine E-Mail an die folgende Adresse, um weitere Informationen zu erhalten: RP2emotioncoginitionbilinguals@bsi.ru.nl

Nun bitten wir Sie, darüber nachzudenken, ob Sie an unserer Studie teilnehmen möchten.

Sie können selbstverständlich frei entscheiden, dass Sie nicht an dieser Studie teilnehmen möchten. In diesem Fall danken wir Ihnen für Ihre Zeit.

Wenn Sie angeben, dass Sie an dieser Studie teilnehmen möchten, bitten wir Sie, eine Einverständniserklärung zu unterzeichnen. Mit Ihrer Unterschrift geben Sie an, dass Sie ausreichend über die Studie informiert sind, dass Sie teilnehmen möchten und dass Sie dies freiwillig tun.

Mit freundlichen Grüßen,

Benedicta Duah, Tom Hertel, Aoife Quinn, Rudolfs Zeitmanis,
Research Project 2
Psychologie-Programm Radboud Universiteit

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Einverständniserklärung
für die Teilnahme an einer Studie für den Kurs Forschungsprojekt 2:
*Emotionserkennung in Zweisprachigen*

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Dieser Teil sollte vom Teilnehmer *vor Beginn der Studie ausgefüllt werden.*

Ich bestätige hiermit:

- ❑ Ich wurde zufriedenstellend über die Studie informiert und habe die schriftlichen Informationen im Informationsschreiben zur Studie gelesen und verstanden.
- ❑ Ich wurde informiert, dass die aktuelle Studie von Psychologiestudenten im Rahmen ihres zweiten Studienjahres für das Forschungsprojekt 2 urchgeführt wird.
- ❑ Ich hatte die Möglichkeit, Fragen zur Studie zu stellen, und falls ersteres zutreffend wurden meine Fragen zufriedenstellend beantwortet
- ❑ Ich hatte genügend Zeit, um zu überlegen, ob ich meine Zustimmung zur Teilnahme an dieser Studie geben möchte.
- ❑ Ich nehme freiwillig teil.

Ich habe das Recht,

- ❑ Meine Einwilligung jederzeit ohne Angabe von Gründen zu widerrufen, und der Widerruf meiner Teilnahme hat keinerlei weitere Konsequenzen.
- ❑ Meine Daten werden anonym verarbeitet.
- ❑ Die Ergebnisse der Studie können nicht als diagnostischer Test angesehen werden.
- ❑ Ich werde nicht über meine individuellen Ergebnisse informiert.

Erkennen Sie die oben genannten Punkte an und stimmen Sie der Teilnahme an dieser Studie zu?

- ❑ Ich stimme hiermit zu.

Fragebogen (Deutsch)

Was ist Ihr Alter?

- …

Was ist ihr Geschlecht?

- Mann
- Frau
- Divers

Was ist ihre Muttersprache?

- Deutsch
- andere: ...

Im folgenden Teil sehen Sie Bilder von Personen. Sie müssen angeben, welche Art von Emotion die Person auf dem Bild empfindet. *(the following part was repeated a total of 48 times, with different pictures)*

*[a picture from the EU Stimulus set (Appendix B)]*

Die Person im Bild zeigt…

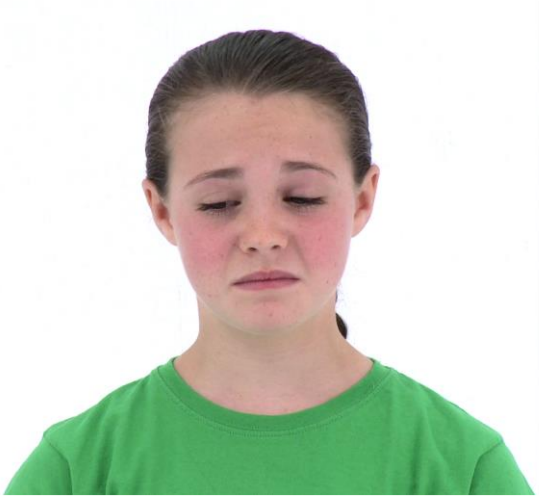
- Glücklichkeit
- Traurigkeit
- Wut
- Überraschung
- Ekel
- Angst

**Appendix B – Pictures from the EU Stimulus Set**

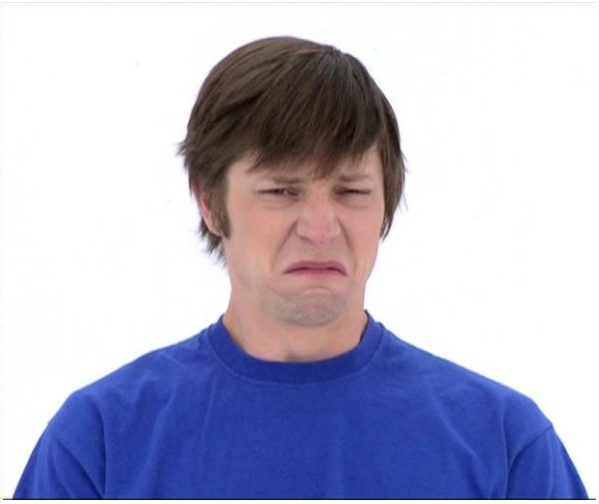
Sad pictures

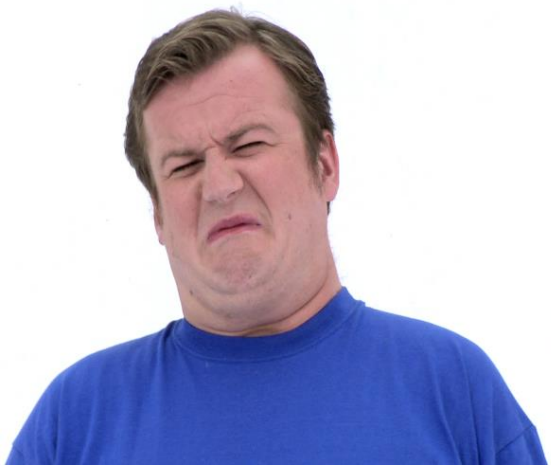






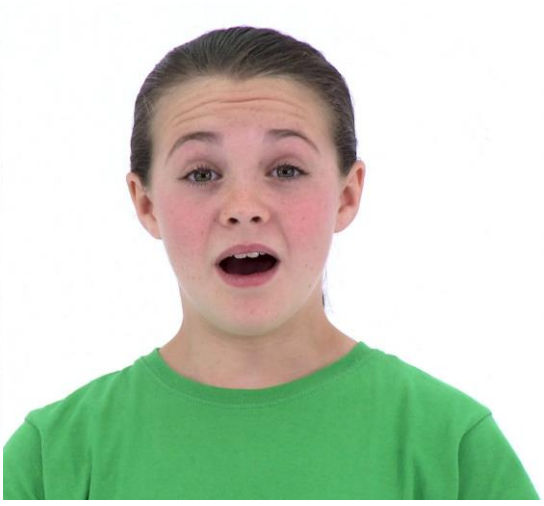
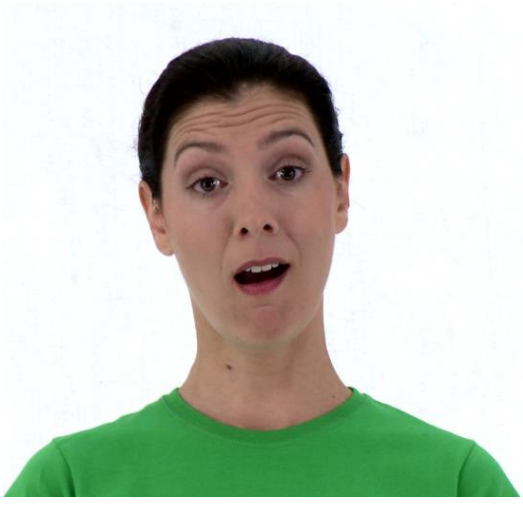

Disgusted pictures





Surprised pictures




Angry pictures

Scared pictures