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Extramural vocabulary acquisition: A survey of students in  
Viennese vocational business middle schools (HAS)

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# ***Extramural vocabulary acquisition: A survey of students in Viennese vocational business middle schools (HAS)***

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Due to globalisation and the media, young learners of English frequently get into contact with English outside school. This article presents the main findings of a study examining the relation between out-of-class contact with English and the vocabulary knowledge of Austrian learners. Learners who frequently engage with English outside school are found to have larger receptive and productive vocabularies. In addition, observations about gender-specific differences made in other studies were confirmed: Male participants report more English activities in their free time, which correlates with larger vocabularies. A qualitative analysis of the words produced in the productive vocabulary test reveals a close connection between the English language and mass media, further supporting the hypothesis that learners can benefit considerably from out-of-school contact with English.

## **1. Introduction**

*[S]chool is but one source of contact with English-  
and at least for some groups not the most important one.*

(Hasebrink et al. 2007: 115)

While foreign language acquisition used to be mainly restricted to educational institutions, learners have now gained access to a wide range of sources of English through globalisation and technical advancements. English has not only become the language of international communication (Berns et al. 2007: 34; Seidlhofer 2005: 339), but is also the dominant language on the internet (Jenkins 2015: 55-56) and the radios (Berns et al. 2007: 34; Grau 2009: 162). In addition, television programmes are aired in English, especially in smaller linguistic communities (Berns & de Bot 2005: 200; Koolstra & Beentjes 1999: 52), and English is the default language of many popular computer games (Sundqvist & Sylvén 2012: 190). Resulting from the wide use of English in numerous spheres of public and private life, students are likely to get into contact with the language outside school, as Hasebrink et al. (2007: 115) express in the quote above. Studies around Europe have revealed a positive impact of increased contact time with English in the learners' free time

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on their language skills, especially on vocabulary knowledge (cf. Berns, de Bot & Hasebrink 2007; Kuppens 2010; Sundqvist 2009). However, in Austria research on this topic is scarce, which is why this empirical investigation, together with a larger study conducted by Schwarz (2016a), offers important insights both into the English media use of Austrian teenagers and its relation to vocabulary acquisition<sup>1</sup>.

The present study is exceptional in terms of the learner group it investigates: while most existent research focuses on schools that prepare students for an academic career (Schwarz 2013, 2016a; Sundqvist & Sylvén 2012; Uuskoski 2011) or compulsory schools (Koolstra & Beentjes 1999; Kuppens 2010; Sundqvist 2009), the learner group in this study set in Vienna are students of the non-academic track, namely students attending vocational business middle schools (HAS). Thus, the study provides insights on SLA of a rarely studied group of learners and points towards the need to consider a wide range of school types in research, since studying only one type of school cannot provide an exhaustive representation of learners. In the following, an overview of international research devoted to vocabulary acquisition outside school will be provided. After a brief introduction to the research design, the main results of the study will be presented and discussed in the light of previous research findings.

## 2. Extramural English

European learners have been found to frequently engage with English outside school. This section presents some of the insights into English-language media use and the effects on vocabulary learning gained in other studies, but first the term ‘extramural English’ needs to be clarified.

### 2.1 Definition of the term ‘Extramural English’

Frequently, descriptions like ‘out-of-school learning’, ‘out-of-class learning’, or ‘learning outside school/ the classroom’ are used to refer to language development in students’ free time. These terms are somewhat problematic in that they are often implicitly associated with incidental, unplanned learning. However, learning outside school can also be intentional. Thus, when talking about all kinds of learning processes that can occur in the free time, a more general notion is required. In 2009, Sundqvist (2009) coined the more encompassing term ‘extramural English’ (EE), which literally translates as ‘English outside the walls’ and refers to all kinds of contact students have with English outside the classroom, be it intentional or unintentional (Sundqvist 2009: 25). Thus, in the following, this article will use the term ‘extramural English’ (EE) to refer to the various English activities learners engage in outside school.

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<sup>1</sup> This article is a condensed and adapted version of my MA thesis (Hahn 2017), which was written at the Department of English in Vienna under the supervision of Prof. Ute Smit. Special thanks are due to Marlene Schwarz, who kindly allowed me to use parts of her data collection instruments, which renders a comparison of the results possible once both studies are completed.

## 2.2 Extramural English and language proficiency

Due to the spread of English-language media all over Europe, contact with English is no longer restricted to schools. This increased exposure to and engagement with the language has caught researchers' interest and has led to a number of investigations of the type and amount of contact learners have with English in their free time and its effects on language learning.

The largest European study on extramural English so far was conducted by Berns et al. (2007), who investigated the English-language media use of over 2,200 15-year-old learners from a variety of school types in France, Germany, the Netherlands, and the Dutch-speaking part of Belgium. Music provided most English input across all countries, as radio stations primarily played English-language songs in the observed countries. In contrast, other media types, especially television, were linguistically less homogenous. Whereas films and series on German and French channels were almost exclusively in the national languages, they tended to be aired in English with subtitles in the smaller linguistic communities of the Netherlands and Belgium due to high dubbing costs. Thus, German and French participants received less English input through TV than their Dutch-speaking peers. To investigate the effects of English-language media on language proficiency, a receptive vocabulary test was conducted. The researchers concluded that the Dutch and Belgian participants' larger vocabularies were due to an earlier onset of English lessons at school and the subtitled TV programmes.

In Sweden, Sundqvist (2009) studied the effects of extramural English on vocabulary knowledge and found an average contact time of 18.4 weekly hours with large within-sample variation. Among the 15- to 16-year-old participants, who attended the ninth grade in three comprehensive schools, some reported as many as 57.1 hours per week, while others engaged in no EE activities at all. However, even among the low-frequency users, the mean time spent with English outside school was 13 hours, thus supporting the findings of Berns et al. (2007) about European teenagers' extensive contact with EE. Furthermore, the male participants scored significantly higher on the receptive vocabulary test, which was explained by longer exposure times to EE. Based on her findings, Sundqvist (2009: 156) suggested the following ranking of activities in terms of efficacy: playing video games was most effective for vocabulary acquisition, followed by surfing the internet, watching TV, reading, listening to music, and watching films. This suggests that learners benefit most from activities that not only offer English input but also demand active engagement. After investigating other variables including motivation, attitudes towards English, and parents' educational background, Sundqvist concluded that EE activities were the only explanation for higher language proficiencies in her sample.

As research showed that music was one of the most common sources of English, some research specifically focussed on vocabulary acquisition through English-language songs. An earlier study on extramural English in Austria examined 13- to 15-year-old students from general and academic secondary schools ('Hauptschule' and 'Gymnasium') and confirmed the Europe-wide trend that young people preferred listening to English-language music to music in other languages (Schwarz 2013). The frequent exposure in combination

with characteristics of songs, such as the repetition of certain words and the rhythm, can increase retention rate (Milton 2008: 227; Salcedo 2010: 21). Although the majority of learners did not focus consciously on the lyrics, they could still benefit from listening to English-language music, both in terms of vocabulary acquisition and increased motivation to learn and use the language (Schwarz 2013).

In addition to music, films and series offer a common source of English input. In 1996, US productions constituted 70% of the European film market (Berns et al. 2007: 31); however, as already mentioned above, they are dubbed in most countries including Austria. Nevertheless, learners now have access to English-language films and series via online streaming services, which is why findings from the following research projects are of profound interest to the present study. Research in smaller linguistic communities where TV programmes tend to be subtitled has established positive effects of watching English-language TV on vocabulary knowledge: compared to music, films and series have the advantage of providing multimodal (visual and aural) input which facilitates comprehension (Milton 2009: 228). In addition, viewers can often choose whether to add another dimension of input through subtitles thereby supporting vocabulary learning. Furthermore, the range of dialects and registers presented in TV programmes can be a valuable supplement to the rather formal English students learn and use at school (Richards 2015: 18-19). These positive aspects of films and series in regard to language learning have led to a large collection of SLA research in this area, some of which will be presented here. In films and series, as in most media types, learners are likely to encounter a large amount of unknown vocabulary. Some argue that learners must pass a threshold, i.e. they need to have a certain level of vocabulary knowledge, in order to be able to infer the meaning of unknown words<sup>2</sup> (Hsueh-Chao & Nation 2000; Laufer 1997; Nation 2006). Although this might hold true for most texts, Kuppens (2010) provided counter-evidence for TV programmes. The study found that primary school students aged 11 in the Flemish part of Belgium, who had not received formal education in English yet, had considerably larger vocabularies in English if they frequently watched English-language programmes. This suggests that a large vocabulary, though undoubtedly helpful, is not necessarily a prerequisite for vocabulary acquisition from EE activities. Similar findings were reported by Koolstra and Beentjes (1999), who examined vocabulary gains through watching TV in the Netherlands, where about half of the TV programmes are in English with Dutch subtitles. The study compared two groups, one before and one after the onset of English classes at school, aged 10 and 12 respectively. The participants were divided into three groups, one watching an English-language documentary, another watching the same documentary with Dutch subtitles, and the third watching a Dutch documentary, thus functioning as a control group. A vocabulary test showed that all participants who watched the documentary in English could increase

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<sup>2</sup> Nation (2006: 59), for example, proposes a required text coverage of 98% for text comprehension, which, depending on the text type, equals 6,000-7,000 word families in spoken and 8,000-9,000 word families in written texts.

their vocabulary, with those who watched the programme with subtitles scoring highest<sup>3</sup>. The authors assume that this is due to the additional input channel that was provided through the subtitles. In line with Kuppen's (2010) study, the children who had not learnt English at school also displayed signs of vocabulary acquisition.

While learners remain rather passive in the activities described above, they are actively engaged when playing computer games. Consequently, depth of processing is generally high and more language skills can be developed, which makes computer games effective language learning tools. Some game types, especially massively multiplayer online role-playing games (MMORPG), demand interaction with other international players (Reinders & Wattana 2010: 6; Sundqvist & Sylvén 2012: 191) where English serves as a lingua franca. In addition, players are often less intimidated to use the LX because of the anonymity that the games provide (Gee 2012: xii). All of these aspects inherent to computer games appear to facilitate vocabulary acquisition. Sundqvist and Sylvén's (2012) study on EE habits of Swedish students attending compulsory and grammar schools ('Gymnasium') identified computer games as the favourite EE activity. The study examined students from different age groups: 11- to 12-year-olds, 15- to 16-year olds and 16- to 18-year-olds. Gender differences were observable with boys not only playing significantly more (4.4 hours per week) than girls (1.1 hours per week), but also preferring different kinds of games. In contrast to the female participants who reported *The Sims* as their favourite game, the male participants favoured *World of Warcraft*, *Counter Strike* and *Call of Duty*, which are MMORPGs that demand more linguistic engagement. Despite the fact that girls tend to outperform boys in languages (Ellis & Barkhuizen 2005; Lekholm 2008), the male participants in this study scored better on both the receptive and the productive vocabulary tests, which could be a result of longer gaming times and the more active game types they played. In line with these findings, Uuskoski (2011) established positive correlations between Finnish upper secondary school students' English vocabulary sizes and their gaming time. Again, boys scored higher than girls, although they tended to be academically less successful in other language domains. According to Uuskoski (2011: 56), "[p]laying video games was [...] found to be the single best predictor of good English grades when all other variables were held constant."

To conclude, all of the studies described above found positive relations between EE activities and vocabulary knowledge. Reasons for this phenomenon are the increased exposure time and motivation that result from EE activities, as well as the lowered fear of losing face, which creates a relaxed learning environment. In addition, vocabulary tends to be frequently recycled, thus raising the chances of retention.

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<sup>3</sup> The positive effects of subtitles were also established in other studies (d'Ydewalle & Pavakanun 1997; Danan et al. 2004; Koolstra et al. 2002), which found that the simultaneous presence of aural and visual input increases the depth of processing and consequently leads to better retention.

### 3. Research design

The present article focuses on the following research questions:

- Which EE activities do 16-year-old Austrian HAS students report doing and how much time do they spend on these?
- What is the relationship between the amount and type of English media the participants use and their vocabulary size?

In order to answer these questions, a survey was conducted in three Viennese vocational business middle schools (HAS) in December 2016. In total, 142 students participated in the survey, however, a considerable proportion of the testees had to be excluded due to missing consent forms or incomplete data, which reduced the sample size to 83. The 47 female and 33 male participants<sup>4</sup> were aged 15 to 18 and attended grade 10. At the time of data collection, the students had learnt English for nine years and should have reached a proficiency level of A1-A2 according to the curriculum (BMBF 2014: 16). Linguistically, the sample was diverse with a large number of L1s and L2s; only 9 of the 83 participants described themselves as monolinguals. With a proportion of 89% bi- or multilinguals, the sample lies significantly above the average for Vienna, where, according to the Austrian ministry for education (BMBF 2015: 29-34), 57% of students in intermediate vocational education are bi- or multilingual. The sample confirms that monolingualism is no longer the norm in Austrian schools, particularly in vocational schools in Vienna. Three testees reported speaking mainly English at home, however, this had no visible effect on their vocabulary sizes and thus the testees could be included in the main analysis.

One of the biggest challenges with testing vocabulary knowledge is that it cannot be accessed directly. Researchers have to apply methods to elicit signs of vocabulary knowledge on the side of the testees. Consequently, test results are always influenced by the test task and it has to be kept in mind that learners' actual vocabulary knowledge can never be 100% accurately measured. Nevertheless, there are tests that deliver good estimates. Since vocabulary knowledge is too complex to be measured by a single method (Cohen et al. 2007: 141; Dörnyei 2007: 45), a multi-method approach was chosen. A questionnaire and two vocabulary tests were combined for data collection. The questionnaire, which was provided by Schwarz (2016b) gathered information about the students' free time activities, their socio-economic background, their language level and their attitudes towards English. In addition, a receptive (*V\_Yes/No*, Meara 2015) and a productive vocabulary test (*Lex30*, Meara & Fitzpatrick 2000) were employed as measures of vocabulary knowledge. Although a large proportion of EE input is oral (e.g. music, films and series without subtitles), the vocabulary tests used in this study test written receptive and productive knowledge, since written tests have several advantages over oral tests: first, there are few phonological tests. Second, variation in pronunciation exceeds that of spelling, thus, it is more difficult to choose which variants should be presented in an oral test. Third, written tests are usually easier and faster to administer and render quantitative studies feasible (Milton et al. 2014: 16-18).

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<sup>4</sup> Three participants did not indicate gender.

The first test (*V\_YesNo*, Meara 2015) uses a checklist format that consists of a list of 200 words, half of which are real English words, the other half are pseudowords, that is, words that follow the phonological constraints of the English language but do not carry meaning (Huibregtse et al. 2002: 227). These pseudowords were introduced as an adjustment for guessing, since the participants did not have to prove that they indeed knew the words (e.g. by using them in a meaningful sentence). The target words belong to different frequency bands and are presented without context so that the testees cannot infer meaning from context and a large number of words can be tested. For each word, the participants have to indicate whether they know the word or not, which leads to four possible outcomes: recognizing a real word (hit), ticking a pseudoword (false alarm), omitting a real word (miss) or rejecting a pseudoword (correct rejection). For every hit, the testees receive one point, leading to a theoretical maximum score of 100 points, and for every false alarm, a point is subtracted. The test developers (Meara & Miralpeix 2017) introduced a correction factor (A) that scores false alarms depending on the number of produced hits (H). With the help of the following formula, an estimated receptive vocabulary size can be calculated.

$$V_{size} = H \cdot 100 \cdot A$$

Vocabulary scores can thus range from 0 to 10,000 words. Since high false-alarm rates compromise validity (Miralpeix & Meara 2014: 33), tests with more than 20 false alarms had to be excluded, reducing the number of valid tests to 67.

The second test (*Lex30*, Meara & Fitzpatrick 2000) uses a word association task consisting of 30 cue words taken from the most frequent 1,000 English words. For each word the participants are asked to write down up to four other English words, resulting in a maximum of 120 responses. Association tasks have several advantages over other tasks typically applied in written productive vocabulary tests (Meara 2009: 131): topic-wise, participants are guaranteed high freedom in production, the tests generate a high proportion of low-frequency words compared to written texts where the majority of words are high-frequency items, they are fast to administer and considered valid and reliable. The stimulus items were chosen for two reasons (Meara & Fitzpatrick 2000: 142): first, they are common English words, which renders the test suitable for all language levels. Second, they are known to trigger high proportions of low-frequency associations, which is important for estimating the vocabulary size since the test is based on the assumption that a high number of infrequent words signals profound vocabulary knowledge.

For the scoring, each participant's answers were entered into a separate excel spreadsheet. Subsequently, German and unrecognizable words as well as proper nouns and acronyms were deleted and spelling mistakes corrected. British variants were replaced by their American counterparts since the JACET list (JACET Basic Words Revision Committee: 2003), which was used in the analysis, follows American spelling conventions. In multi-word units, the least frequent word was kept. As suggested by the test developers (Meara 2009: 138), this revised list of responses was then compared to the JACET list<sup>5</sup> and all words outside the most frequent 1,000 word band scored one point, re-

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<sup>5</sup> For this part of the scoring, the programme *Ant Word Profiler* (Anthony 2014) was used.



sulting in a maximum score of 120<sup>6</sup>. Half a point was subtracted for spelling mistakes since this was regarded as a sign of partial word knowledge (Meara 2009: 138)<sup>7</sup>. This score allows a within-sample comparison of the productive vocabulary size.

In order to filter out words that were potentially learnt outside the classroom, the samples the informants produced in the Lex30 task were also compared against vocabulary lists established from the schools books used in class (Clarke et al. 2014), which were considered the most reliable and comprehensive collection of ‘school vocabulary’ available. All words that were produced in the tests but also occurred in the schoolbooks were removed, as they were probably, although not exclusively, learnt at school. The remaining words were considered results of extramural vocabulary acquisition. Eventually, this list was qualitatively analysed to determine common semantic fields in extramural vocabulary acquisition.

For data analysis, the test results and information from the questionnaire was entered into SPSS (SPSS Inc. 2016). Following the ex post facto research design, the results of the vocabulary tests formed the starting point of the analysis. Subsequently, information from the questionnaire was consulted to examine which variables relate to the students’ vocabulary size.

Using the test scores, two types of statistical tests were performed: correlation tests and tests of group differences. Since the data was ordinal, Spearman’s rank order correlations and Mann-Whitney U tests were used. For each test, the following information will be provided: the significance level, the effect size, the confidence interval and an a posteriori power analysis. In addition, correlation coefficients will be given for Spearman’s rank order tests. However, this information alone does not reveal whether the relation is statistically significant or not. Traditionally, studies reported the p-value as an indication of significance ( $p < 0.05$ ), but p-values depend on sample sizes and the coefficient, which is why the effect size is regarded as a more suitable indication of statistical significance (Cohen et al. 2007: 520; Larson-Hall 2016: 114). The effect size ( $r$ ) shows how important the observed relation (correlation tests) or difference (tests of group differences) is. The following categorizations apply (Cohen et al. 2007):  $0 \leq r \leq 0.1$  small effect size,  $0.1 \leq r \leq 0.3$  modest effect size,  $0.3 \leq r \leq 0.5$  moderate effect size,  $0.5 \leq r \leq 0.8$  strong effect size,  $0.8 \leq r \leq 1$  very strong effect size. The correlation coefficient RHO is an effect size in itself, thus, no further measure will be provided. In addition, the 95% confidence interval (CI) will be reported. If the CI contains 0, there is no correlation or group difference (Larson-Hall 2016: 57). The last parameter that will be provided is the power, which indicates how likely it is that a given test finds correlations or differences. Thus, if a test with low power yields no significant results, this does not necessarily mean that no differences or relations exist. The power level should be above 0.8, however, this is rarely achieved in research, which is why power levels of 0.5 or higher are considered acceptable (Larson-Hall 2016: 105).

<sup>6</sup> Thus, this test does not offer an estimated vocabulary size but it allows for within-sample ranking.

<sup>7</sup> This procedure is debatable as word knowledge is always a continuum (Eyckmans et al. 2007: 62; Schmitt 2010: 20) and spelling mistakes might be less relevant in measuring EE vocabulary considering that a large proportion of the input is oral. Non-adjusted scores can be provided on request.

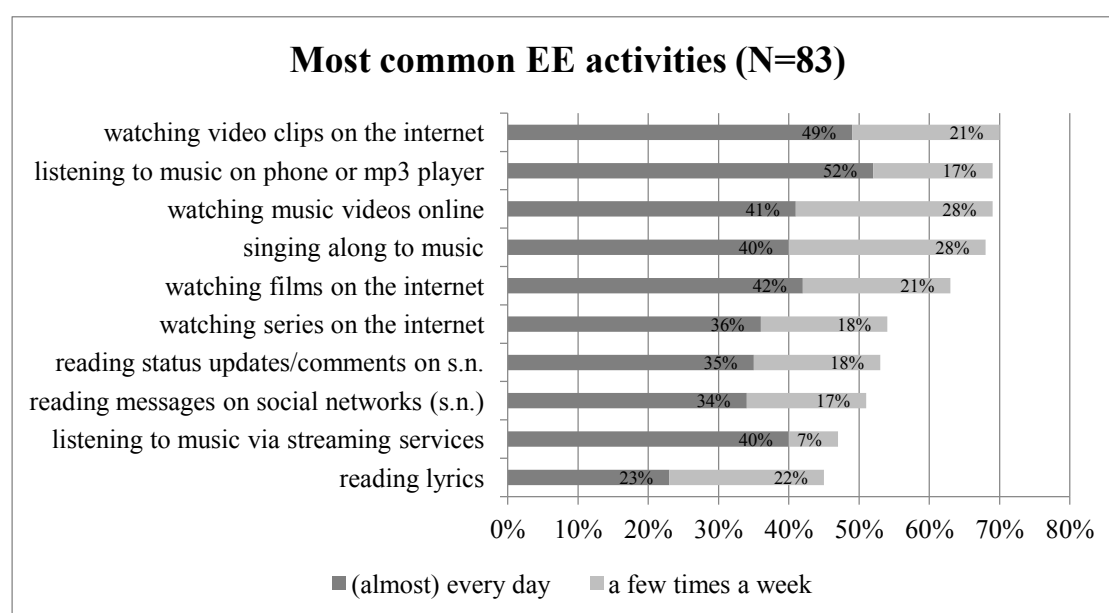
## 4. Results

Due to the scope of this article, the following section will only present a selection of the study's main findings. For a detailed account of the results, the reader is referred to Hahn (2017). Before the participants' EE habits could be investigated, their access to different media types at home had to be established. Subsequently, information about the type and amount of EE contact the participants reported was compared to their scores on the two vocabulary tests to investigate correlations. In addition, male and female groups were compared, as other studies have revealed gender differences, both in EE habits and vocabulary breadth. Furthermore, the word lists produced in the productive test were analysed qualitatively to shed light on the type of vocabulary students are likely to acquire outside school.

### 4.1 Extramural English and vocabulary breadth

Internet access at home is granted for 95% of the 83 participants and all but one use the internet on a daily basis. All participants have a smartphone and a TV and 8 in 10 own a computer. Thus, the majority of the participants have access to a variety of media types at home, which provides them with a wide choice of EE activities and, as the results show, the participants frequently make use of this offer.

Contact with English outside school is generally high. Only three boys and nine girls do not report any daily EE activities. On average, the participants engage in 5 daily and 13 weekly activities, but the sample displays large variation with some participants reporting up to 27 EE activities daily and others none. Figure 1 presents a list of the ten most common EE activities; the category of weekly activities includes the daily activities.



**Figure 1 Most common EE activities (N = 83)**

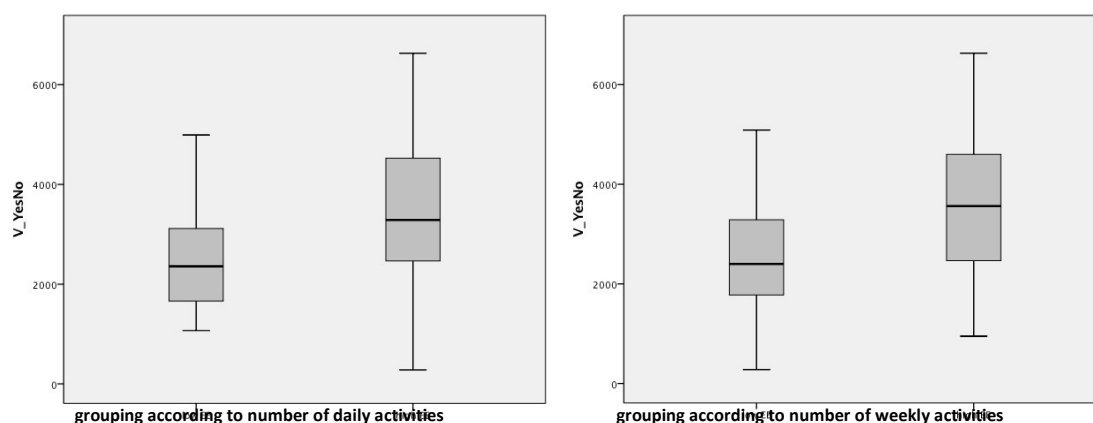
As can be seen, listening to music, watching audiovisual material on the internet and communication on social networks are the most popular EE activities. Almost 70% listen to music several times a week and more than 50% do so daily. Additionally, 70% frequently watch music videos online and about half of the participants enjoy singing along to music. Almost 50% use online streaming services and another 50% actively engage with lyrics several times a week. When looking at weekly activities, watching video clips on the internet is the most common EE activity. In total, over 60% watch films or series in English several times a week and almost half of the participants engage in English-language audiovisual activities on a daily basis. The third most popular group of EE activities involves social networks. It becomes apparent that reading English messages or status updates is preferred to writing. Although reading in the traditional sense (books, articles, etc.) is not among the most popular activities, a proportion of more than 50% reading English texts on social media several times a week shows that the participants still frequently engage with English texts through messages on social media and lyrics.

Regarding the skills these activities train, the participants mostly develop listening and reading skills in their free time, whereas speaking and writing skills are used less frequently. Listening activities rank highest in both daily and weekly activities, followed by reading activities. The participants rarely engage in productive activities on a weekly basis and most participants do not report any daily writing activities. This shows that the participants apply considerably more receptive than productive skills in their free time.

With the amount and type of EE activities established, this information can be related to the scores the participants achieved on the two vocabulary tests. First, effects on receptive vocabulary will be investigated. The mean estimated vocabulary size is 3041.43, which suggests an intermediate proficiency level according to Meara and Miralpeix (2017: 118). However, variation within the sample is large with scores ranging from 280 to 6631. Regarding proficiency levels, seven testees fall into the beginner group and 20 into the next level not labelled by Meara and Miralpeix (2017: 118). Furthermore, 28 are categorized as intermediate learners and 12 as learners with good levels of proficiency. According to the test results, none of the participants belongs to the very high level or native-like groups, which is not expected at this educational level.

Spearman's rank-order test shows a positive relation between the number of daily EE activities and the participants' receptive vocabulary size ( $\rho = 0.398$ ,  $N = 67$ ,  $p = 0.001$ ,  $CI = [0.17, 0.59]$ , power = 0.924). Also the number of weekly EE activities correlates positively with receptive vocabulary size ( $\rho = 0.430$ ,  $N = 67$ ,  $p < 0.001$ ,  $CI = [0.21, 0.61]$ , power = 0.959). Thus, the assumption that learners who frequently engage with English outside school have larger receptive vocabularies is confirmed.

To examine whether the differences between frequent and less frequent EE users are statistically significant, a Mann-Whitney U test of group differences was conducted. For this test, the sample was split into two groups at the median values of the daily and weekly EE activities ('high' and 'low' EE groups). Figure 2 presents boxplots of the scores in relation to daily and weekly activities.

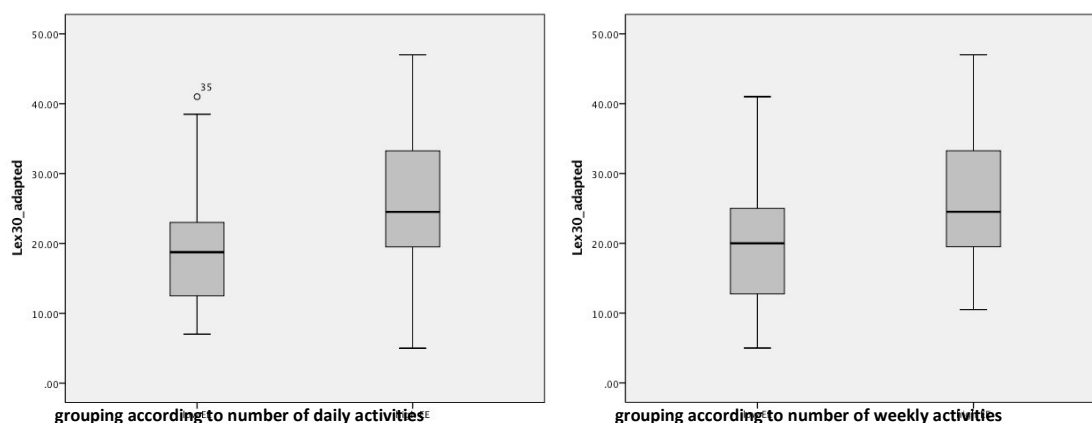


**Figure 2** *V\_YesNo* scores in Low and High EE groups (N = 83)

The figure above indicates that the median scores of both high EE groups ( $m_{\text{high\_daily}} = 3670$ ,  $m_{\text{high\_weekly}} = 3562$ ) lie above those of the low EE groups ( $m_{\text{low\_daily}} = 2200$ ,  $m_{\text{low\_weekly}} = 2400$ ) and that the maximum scores are reached by members of the high EE group. These observations are confirmed by the Mann-Whitney U test which shows that members of the low EE group have indeed significantly lower scores than those of the high EE group (daily:  $p = 0.006$ ,  $N = 67$ ,  $U = 320$ ,  $r = 0.333$ , power = 0.813, CI = [327; 1657]; weekly:  $p < 0.001$ ,  $N = 67$ ,  $U = 343.5$ ,  $r = 0.494$ , power = 0.9917, CI = [733, 1983]). Thus, learners who have extensive contact with English have significantly larger receptive vocabularies.

After showing positive relations between EE and receptive vocabulary size, the effects on productive vocabulary knowledge will be examined. All 83 Lex30 tests were considered reliable and could therefore be used for the analysis. As already mentioned in section 3, Lex30 does not allow the computation of an estimated vocabulary size, but yields numbers that render a ranking within the sample possible (Meara 2009: 136-137). Theoretically, scores can range between 0 and 120; however, 60 is considered a good native speaker score (Meara 2009: 136). Thus, the participants in this sample were expected to display lower scores, which is confirmed by the results: on average, the participants score 23.6 points. Again, variation is large with scores ranging from 5 to 47, which shows that the participants differ considerably in their productive vocabulary sizes.

When relating EE activities to productive vocabulary, a slightly higher correlation is found for daily ( $\rho = 0.341$ ,  $p = 0.002$ ,  $N = 83$ , power = 0.891, CI = [0.13, 0.52]) than for weekly activities ( $\rho = 0.286$ ,  $p = 0.009$ ,  $N = 83$ , power = 0.753, CI = [0.07, 0.48]). Mann-Whitney U tests to compare high and low EE groups were conducted for daily and weekly EE activities. As can be seen in Figure 3, the mean scores of the high EE group are higher than those of the low EE group.



**Figure 3** *Lex30* scores in Low and High EE groups (N = 83)

Similarly to the tests on receptive vocabulary size, both tests confirmed that the members of the low and high EE groups differ significantly in their productive vocabulary sizes (daily:  $p = 0.003$ ,  $N = 83$ ,  $U = 493.5$ ,  $r = 0.331$ , power = 0.868, CI = [2.00, 11.00]; weekly:  $p = 0.005$ ,  $N = 83$ ,  $U = 550$ ,  $r = 0.309$ , power = 0.830, CI = [2.50, 11.50]).

In addition to these descriptive and inferential statistics, an exploratory data analysis of the words produced in the *Lex30* test was conducted. Since media functions as the participants' main source of contact with English, the aim was to investigate whether the elicited samples of vocabulary could be linked to the media. This procedure does not assert the claim of a scientific data analysis but should serve as an illustration for the close connection of English with the media in the participants' minds resulting from EE activities. For this endeavour, a list of words that were potentially acquired outside school had to be established. The most feasible option was to eliminate all produced words that occurred in the course books as these had assumedly been learnt at school. The result was a list of potential extramural vocabulary, which was then examined for thematic regularities. In other words, it is attempted to attribute the words to themes common in popular media including films, series, music, and computer games. It should be pointed out that this procedure entails several limitations: first, comparing the list of produced words to the course book does not ensure that all the words that did not occur in the books' vocabulary lists were indeed learnt outside school. Second, I chose the categories, which makes the selection rather subjective and by no means exhaustive. Third, the close relatedness between English and German posed several challenges: the participants produced a number of words that are loanwords from English and now part of the German language, all of which were highlighted in Table 1. Furthermore, there are several words that share the same spelling in English and German (underlined in Table 1). It could be argued that all of these words should be excluded from the list of potential extramural vocabulary, because the participants might know them from German. However, the fact that the participants were asked to list English words in the test suggests that these words are perceived as being English. Keeping these limitations in mind, the results presented in Table 1 serve as an illustration that the participants closely associate English with the media.

**Table 1 Common themes in EE vocabulary**

Theme	Examples
Violence & warfare	aggressive, assault, bullet, corpse, defence <sup>8</sup> , exposed, harassment, homeless, <b>hooligan</b> , inquiry, jab, killer, <b>loyal</b> , <b>mobbing</b> , offensive, psycho, punch, stronghold, sword, terrorism, veteran
Colloquial and offensive language	ass, asshole, bum, butt, crap, dick, dumb, moron, shit, slut, whore
Drugs & science	alcohol, antidote, chemical, chemistry, cocaine, conscious, <b>element</b> , <b>heroin</b> , laboratory, marijuana, <b>meth</b> , pharmacy, physics, <b>plasma</b> , toxic, <b>weed</b>
Magic & fantasy	destiny, faith, fate, <b>monster</b> , supernatural, wizard, <b>zombie</b>
Sports	defence, rebound, <b>wrestle</b>
Fashion	accessory, bra, brace, glove
Medicine	anorexia, carbohydrate, caries, conscious, diarrhoea, disease, flu, obese, obesity, rabid
Computer technology	<b>controller</b> , genre, <b>software</b>

Violence and warfare are popular themes in digital games such as *World of Warcraft* and *Call of Duty* and colloquial language is frequently part of films and series. The word field of drugs and science might be associated with series like *Breaking Bad*, and magic and fantasy are common topics in books, games, and films. Similar links to popular media can be found for the other semantic fields. Another piece of evidence for the fact that students associate English with the media is the high number of names of films, series, books (e.g. *Harry Potter*, *Big Bang Theory*, *The Simpsons*, *The Walking Dead*) and computer games (e.g. *Minecraft*, *Skyrim*, *GTA*) they produced as responses in Lex30. In addition, they listed names of famous English-speaking musicians (e.g. *Tupac*, *Eminem*, *50 cent*). On the basis of these words, it can be concluded that English is closely connected to popular media in the minds of young learners.

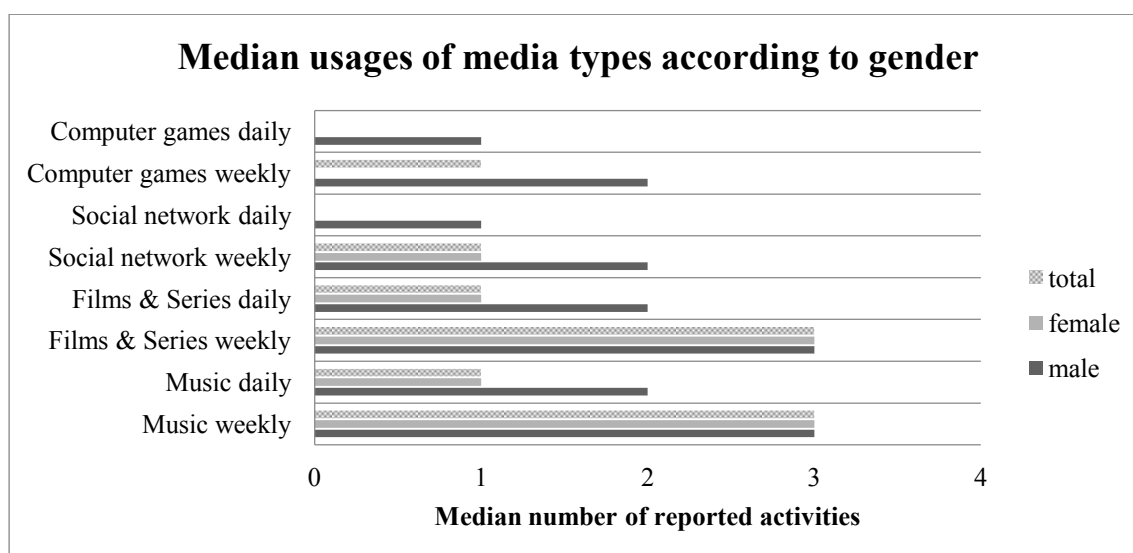
## 4.2 Gender differences

Similar to other studies, gender differences regarding the type and amount of engagement with extramural English can be observed. On average, the male participants report 10 daily and 18 weekly and the female participants 5 daily and 12 weekly activities. Since the data is non-normally distributed, two Mann-Whitney U tests were run for daily and weekly activities respectively to determine whether these observed differences are statistically sig-

<sup>8</sup> The word *defence* could not be attributed to a single semantic field, which is why it occurs twice in this categorization.

nificant. The results show that boys indeed report significantly more daily ( $p = 0.003$ ,  $N = 80^9$ ,  $U = 467.5$ ,  $r = 0.338$ ,  $\text{power} = 0.877$ ,  $CI = [0.12, 0.52]$ ) and weekly EE activities ( $p = 0.019$ ,  $N = 80$ ,  $U = 535.5$ ,  $r = 0.263$ ,  $\text{power} = 0.658$ ,  $CI = [1.00, 10.00]$ ).

In the present study, there are no discrepancies when looking at the median numbers (min=0, max=4) of music and audiovisual activities boys and girls engage in weekly, as Figure 4 shows. However, the daily numbers of activities displayed in Figure 5 show that boys listen to music and watch films and series twice as often every day. With two daily activities in both categories, the male participants lie above the sample median ( $m=1$ ). Gender differences become particularly apparent when looking at social networks and computer games. On average, girls encounter English on social networks once a week and report no daily encounters, whereas boys report one daily and two weekly encounters with English. Gaming habits are an interesting example of gender differences, as the male and female participants differ greatly in this respect. On average, girls do not play any English-language computer games, while their male peers play once daily and twice weekly.

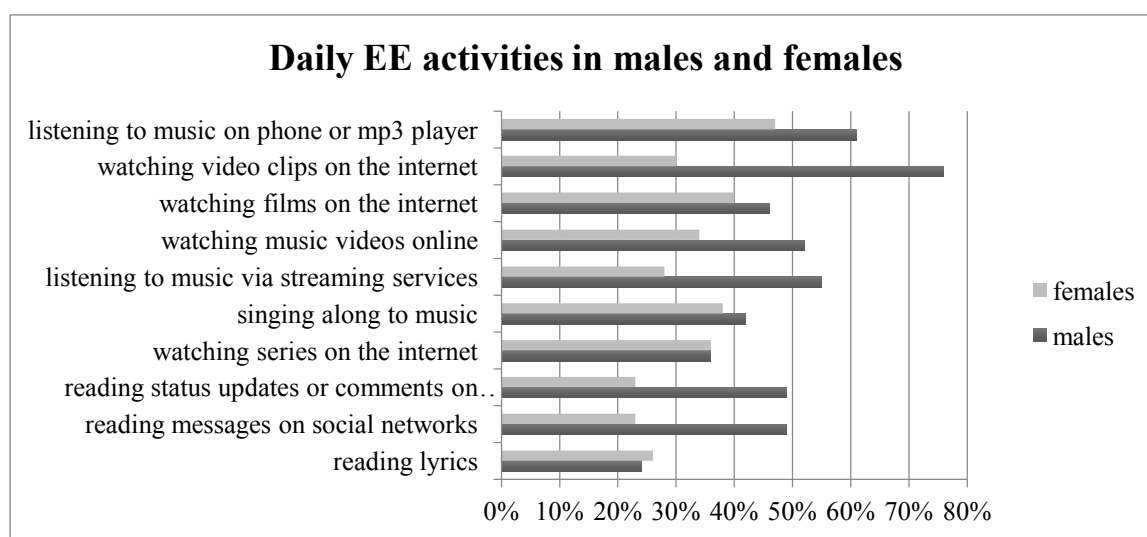


**Figure 4** Median usages of media types according to gender ( $N = 80$ )

To ascertain the statistical significance of these observed gender differences, Mann-Whitney U tests were conducted for all the media types displayed in Figure 4. The first numbers that will be presented always refer to tests involving daily and the second to tests involving weekly activities. Significant differences are found for computer games and social networks. The test results for the other activities are provided in the appendix. Boys report to read and write significantly more English on social media than girls ( $p = 0.02$ ,  $N = 80$ ,  $U = 545.5$ ,  $r = 0.260$ ,  $\text{power} = 0.648$ ,  $CI = [0.04, 0.46]$ ;  $p = 0.011$ ,  $N = 80$ ,  $U = 554.5$ ,  $r = 0.283$ ,  $\text{power} = 0.728$ ,  $CI = [0.06, 0.48]$ ) and also play significantly more computer games ( $p < 0.01$ ,  $N = 80$ ,  $U = 425$ ,  $r = 0.452$ ,  $\text{power} = 0.993$ ,  $CI = [0.25, 0.61]$ ;  $p < 0.01$ ,  $N = 80$ ,  $U = 424.5$ ,  $r = 0.412$ ,  $\text{power} = 0.976$ ,  $CI = [0.21, 0.58]$ ).

<sup>9</sup> Three participants did not indicate their gender and thus had to be excluded from this part of the analysis.

In addition to varying contact time with extramural English, boys and girls also display differences in their preferences for media types, as Figure 5 shows.



**Figure 5 Gender differences in media preferences (N = 80)**

The variables in Figure 5 are ordered according to cumulative percentages. As apparent in the graph, boys list watching video clips on the internet, listening to music on different devices as their favourite daily EE activities. Girls, on the other hand, rank listening to music first, followed by watching films on the internet and singing along to music. In general, boys engage in more EE activities than girls across all media types. When looking at specific activities, the male participants listen to music via streaming twice as often as girls and watch video clips online three times as often. Similar to other studies (Grau 2009; Sundqvist & Sylvén 2012; Uuskoski 2011), the gender gap is particularly apparent with computer games: while only 19% of the girls play English-language computer games daily and 38% weekly, 58% of the boys play every day and 70% several times a week.

Further tests showed that boys not only engage in more EE activities, but also in more productive ones ( $p = 0.001$ ,  $N = 80$ ,  $U = 452$ ,  $r = 0.360$ , power = 0.918, CI = [0.15, 0.54];  $p = 0.009$ ,  $N = 80$ ,  $U = 511$ ,  $r = 0.291$ , power = 0.753, CI = [0.07, 0.48]). Another major finding was that boys have significantly larger receptive vocabularies ( $p = 0.002$ ,  $N = 80$ ,  $U = 254$ ,  $r = 0.380$ , power = 0.875, CI = [0.17, 0.56]), whereas differences on productive vocabularies are not significant ( $p = 0.155$ ,  $N = 67$ ,  $r = 0.159$ , power = 0.289, CI = [-0.07, 0.37]). Thus, despite common beliefs that girls perform better in languages than boys, these results show that this is not the case across all language domains. Findings from other studies support the fact that boys tend to have larger vocabularies and that EE is an important factor in this respect. Implications of this intriguing discovery will be elaborated on in the discussion below.

## 5. Discussion



Contact with extramural English is a widespread phenomenon among the participants of this study with almost 90% encountering English daily. Similar to other studies, music, films, and series are listed as the most frequent sources of English outside school (Grau 2009; Kuppens 2010). The ranking of music as most common EE activity across several international studies is clearly linked to the fact that songs in English constitute a large part of radio broadcasts in Europe (Berns et al. 2007: 34; Grau 2009: 162), whereas other media types display larger linguistic heterogeneity across countries. Concerning the second most popular media type in the present study, 60% of the participants report watching English-language films or series daily and 80% several times a week. Although the impact of films and series on vocabulary size was not investigated separately, it can be assumed that they have a positive effect on language proficiency based on the findings of other studies. Sundqvist (2009) and de Bot et al. (2007: 59) argue that vocabulary acquisition from audiovisual material is higher than from music, as the additional visual channel supports comprehension and increases attention, whereas lyrics often do not receive conscious attention. In addition, music can be enjoyed without understanding the lyrics, while language comprehension is an essential aspect when watching films and series. Consequently, cognitive activation tends to be higher in the latter activity. Considering that music and films are the two most common EE activities in this as well as in other studies, learners receive extensive oral and possibly also written input through subtitles. Hence, these two media types primarily require and develop receptive skills. Ranking third in the list of most popular EE activities, interactions on social media demand the use of both receptive and productive skills. Still, the study has shown that English is mostly used receptively when reading English messages or status updates. This is in line with other observations of learners preferring receptive over productive activities (Grau 2009; Hasebrink et al. 1997).

Cross-study comparisons regarding the amount of time learners spend with English outside school are complicated by the different measures applied in the research projects. The present study, for instance, counts the number of activities. Grau (2009) used a similar method when counting the number of so-called ‘episodes’ without specifying the time span of an episode, while Sundqvist (2009) reported daily and weekly contact hours with EE. Despite these different calculations, a cautious comparison to provide a general impression of the time European teenagers spend with English outside school is possible. In the present study, participants report an average of 5 daily and 13 weekly EE activities. Sundqvist (2009) reported a mean weekly contact time of 18.4 weekly hours and Grau (2009) found an average 1.62 episodes per week, which relates to a mean of slightly more than one activities per week. This seems quite low compared to Sundqvist’s (2009) study, but in contrast to Sundqvist, Grau (2009: 165) excluded less intensive activities such as “mere channel surfing, browsing, or scanning of texts”, which probably reduced the number of weekly episodes. While the impact of these ‘less intensive’ activities might have been negligible nine years ago, the internet and social media have undergone considerable change since then, which is why the present study includes a wider range of EE activities. Based on these findings, it can be concluded that nowadays teenagers all across Europe spend extensive amounts of time with English outside school.

The main objective of this study was the investigation of the relationship between EE and vocabulary knowledge. For this purpose, the information on EE habits from the questionnaire was compared to the scores on the two vocabulary tests. It has been shown that the number of EE activities correlates positively with receptive and productive vocabulary size. In other words, learners who frequently engage with English in their free time are likely to have larger vocabularies. Correlations for the productive vocabulary test were smaller than for the receptive one, which suggests that learners can mainly increase their receptive knowledge through EE activities. This finding is in line with the fact that the participants generally favour receptive activities, which are unlikely to develop productive vocabulary, since being able to use a word productively presupposes multiple encounters with the word and practice opportunities (Milton 2009: 117-119; Nation 2013: 50-53).

In addition, the male participants outperform the female participants on the receptive vocabulary test. This is a major finding considering that girls usually perform higher on language proficiency tasks than boys. The male participants' larger vocabularies might be caused by the extensive contact they have with EE and the fact that they engage in more productive activities with higher cognitive activation including computer games and messaging on social media. These results are relatable to other studies: both Sundqvist (2009) and Uuskoski (2011) observed that their male participants displayed larger vocabularies and tests showed that EE activities serve as the most likely explanation for this phenomenon.

Although extramural contact with English is common among all the participants of this sample, boys report more EE activities than girls. This is just one of the gender-specific differences found in this study, a selection of which will be discussed in the following. On average, boys report more daily and weekly activities than girls. Furthermore, the participants do not only differ regarding the number of EE activities, but also in terms of activity types: while all participants favour receptive activities such as listening to music and watching TV, the male participants also enjoy productive activities including communication on social networks and gaming. Similar gender-related preferences were observed by Grau (2009): girls preferred watching TV and films and boys playing computer games. Sundqvist (2009) found that the male and female participants of her sample spent roughly the same amount of time on all media types except for computer games. Since boys displayed more gaming time and favoured games that demanded active use of the language, Sundqvist (2009: 196) argues that this has considerably contributed to their better test scores. In fact, Sundqvist regards computer games as the most successful media type in extramural vocabulary acquisition. This assumption is supported by Uuskoski (2011) who found that gaming was - to a large extent - responsible for boys' higher scores on vocabulary tests. Not only do games demand higher cognitive involvement compared to music or films; language is often a key factor in succeeding in the game. In addition, the use of all four skills might be required, depending on the game type, whereas films and music only stimulate the development of receptive skills. Several studies have shown that frequent players not only knew more genre-specific vocabulary, but also scored higher on general vocabulary tests (Sundqvist & Sylén 2012; Uuskoski 2011). In the present study, 60% of

the boys play English-language computer games daily and 70% weekly. The proportions for girls are considerably lower (19% and 38% respectively).

A qualitative analysis of words produced in the Lex30 revealed that English seems to be closely associated with popular media in the minds of the participants. After all the words that the participants had probably learnt at school had been removed, a large proportion of the remaining items could be contributed to common themes of popular media, such as violence and warfare, drugs and science, colloquial language, and magic and fantasy. Furthermore, many of the stimulus words in the association test triggered names of famous musicians, TV series and computer games. This might be another indication that English-language media plays a crucial role in the language development of young Austrian learners.

To sum up, this study investigated the relation between contact with English outside school and vocabulary knowledge among Viennese teenagers attending vocational business middle schools (HAS). The data suggests that nowadays young learners receive a large proportion of their contact time with English outside rather than inside the classroom. In line with other studies (cf. e.g. Berns, de Bot & Hasebrink 2007; Sundqvist 2009), learners who frequently engage with English outside the classroom have larger vocabularies, which supports the assumption that extramural English contributes significantly to the development of language skills, particularly vocabulary knowledge.

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## Appendix

Non-significant gender differences

Variable	p	N	r	power	CI
Music daily	0.082	80	0.0869	0.0665	[-0.14, 0.3]
Music weekly	0.437	80	0.1944	0.4068	[-0.03, 0.4]
Films & series daily	0.076	80	0.199	0.4220	[-0.03, 0.4]
Films & series weekly	0.518	80	0.072	0.097	[-0.15, 0.29]

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