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HONORS THESIS

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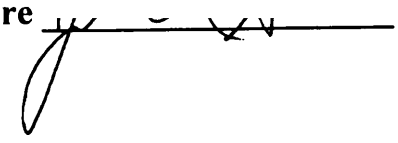
Signature 

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Jordan Storey

Human capital can be defined as the benefit gained from education, training, or just living life that actually enhances workers' productivity (Becker). It is important to consider the most efficient ways of producing human capital if society is to allocate resources in a manner that maximizes economic value. Investments in human capital are likely to be more efficient when the target of the investment is youngest because young people are able to reap the benefits for a longer period of time. Furthermore, early childhood investments tend to be more effective at preventing undesirable outcomes, such as crime, when compared to investments later in life (Heckman et al.). A highly skilled young person is an extremely valuable asset from an economic value standpoint because they will continue to enhance their output and will be a productive member of the work force for a longer period of time.

Many parents and educators instinctively believe that watching television is bad for their students (Gentile et al.). Whether it is the result of high human capital opportunity costs of watching TV, or an outright negative effect on human capital, watching television has a reputation for adversely impacting student learning. Educators and parents often claim that time spent watching TV could be better spent on more productive activities such as socializing, reading, doing homework, or sleeping (Glaeser). They argue that these activities are more conducive to human capital accumulation than watching television. Although they may not argue that watching television actually decreases human capital, TV still has undesirable effects on student learning. Others argue watching television excessively actually reduces a student's ability to perform at certain activities as opposed to merely inhibiting ability (Winn). Regardless which of the two arguments, if either, is closer to the truth, the implications are largely the same. In the case that television has an

inhibiting effect, or in the case that it has a negative effect, students would be better off reducing or altogether eliminating their television watching time.

In general, economic studies of the effects of television viewing tend to conclude that watching television has a negative impact on student learning as measured by test scores (Williams et al.). However, this effect is consistently measured to make up only a small portion of the variation in students' test scores and is often found to be statistically insignificant. Furu and Gadberry have found that the effect of television depends largely on the amount of television watched. There have also been a number of studies that look at the effects of television within different demographic groups. For example, Perney et al. finds that television tends to affect women more negatively than men and Haertel et al. finds it affects African Americans more negatively than non-African Americans. There have been few studies that look at the effects of television specifically on students whose first language is not English (Gentzkow et al., Tan et al.). Gentzkow et al. looks only at pre-school students and finds that non-English speaking preschoolers experience a non-trivial positive effect from television viewing that is greater than the positive effect found for other students. Tan et al. observes Mexican American high school students and finds that television viewing is not statistically significant in predicting test scores.

Although the adverse effects of television may be true of students at large, they may not be true of specific subgroups of students. In particular, it seems plausible that students who come from a family whose primary language in not English may benefit from, or at very least suffer less from the negative effects of television. These students most likely do not receive the same level of exposure to the English language as the rest of the population of students due to the fact that English is not the primary language spoken at home. Other

students get far more opportunities to practice their English through interactions with their family and community.

Because many television channels are broadcast in the English language, watching television may, at least in part, be an appropriate substitute for exposure to the English language via family interactions. Students whose primarily language is not English are likely to have access to television even though they may not have access to fluent English speaking family members. By watching TV, students could become accustomed to listening to, and in general communicating in, English. Watching television therefore could present an opportunity for human capital accumulation that would otherwise not exist.

If the case can be made that watching television improves communication skills and thus human capital for students who don't speak English at home, it would seem plausible that watching television could also benefit students whose first language is English. Communication skills are valuable to people from all backgrounds and if television improves communications skills for one group, it is important to consider whether it does so for all groups. However, as previously mentioned, students whose families speak English at home are likely to receive the benefits to communication provided by television through other means, namely through interactions with their family. If predominantly English-speaking students are already receiving training in communication, the marginal benefit they receive for an additional hour of television may be less than the marginal benefit for students who are not already receiving that training. As a result, it is expected that students with very little exposure to English, students whose first language is not English, would benefit more from watching TV than students who are frequently exposed to communicating in English.

It seems unlikely that an hour of watching television is as efficient as an hour of interacting in English with a family member. While watching TV allows the viewer to observe English communication and listen to English being spoken, TV does not offer the speaking practice or the practical application that first hand communication in English does. This would imply that watching television and speaking with family members are not perfect substitutes. However, since students who speak English as a second language do not have the same type of access to English speaking family members, and since they do have access to television, TV could be the most efficient use of time for learning English.

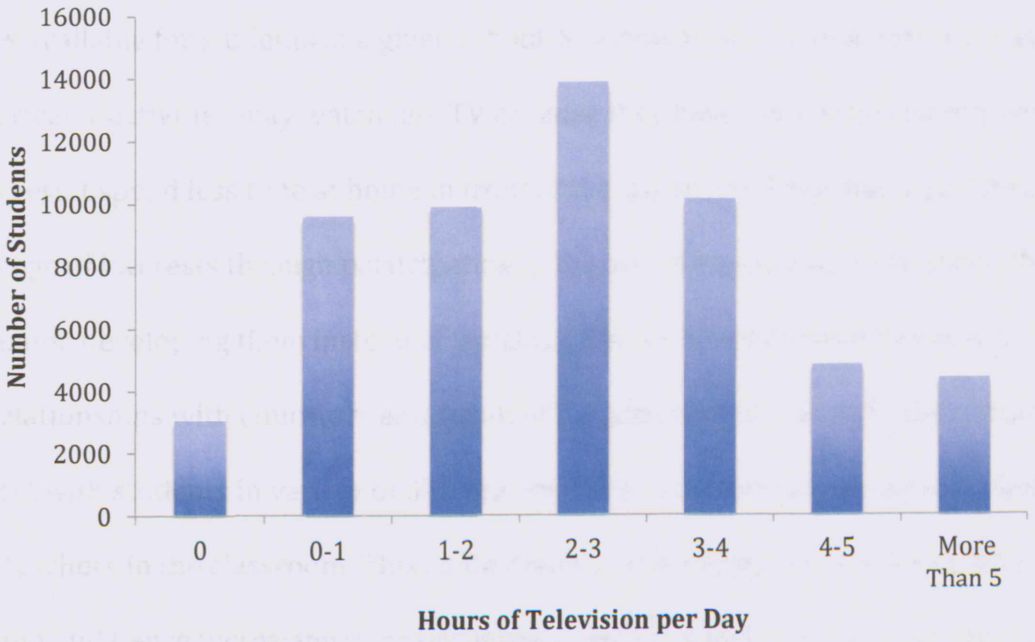
There are certainly students who, despite living in a non-English speaking home, are great English speakers. These students, like English speaking students, may not benefit as much from watching television as their poor English speaking peers. Students that speak English as a second language proficiently may have had a variety of additional opportunities to practice their English speaking skills, such as fluent parents, involved neighbors, church members, or English speakers from other social groups. The benefit of watching TV for these students, like fluent English students, may be less due to the existence of the more valuable alternative opportunities. It is also possible that TV programming does not provide more advanced language learning opportunities so that students who are already proficient at English basics do not have as much to gain. The potential differences, based on existing English ability, in the effect of TV on these students implies that high performing students and low performing students must be considered separately to accurately analyze the effect of TV.

The data that is used in this investigation is one complete year of 10th graders' Washington Assessment of Student Learning (WASL) scores. The WASL is a standardized

test given to public school students in Washington State. This particular year includes 55,656 observations after removing observations which omitted information on key variables. Students were asked an array of questions including information about the primary language spoken at their home and their television watching habits. Students were also asked several questions regarding their family background, their personal traits, and other uses of time. One noteworthy variable also recorded in this data set is each student's Iowa Test of Basic Skills (ITBS) test scores from the year before. The ITBS is another standardized test, similar to the WASL that all Washington State students were required to take. The ITBS consists of five sections: reading, vocabulary, literary skills, math, and quantitative skills. The vocabulary ITBS score, which is recorded as a student's percentile score is considered as an independent variable in this regression. The dependent variable in this study is students' test scores on the listening portion of the WASL exam. While watching television may have an impact on the reading and math exam scores, this impact most likely is an indirect result of an improvement in listening skills. The WASL listening test scores have been altered to have a mean of zero and a standard deviation of 1.

Of the students observed in the data, 14,398, or approximately 26% of students reported primarily speaking a language other than English at home. The median level of television watching was 2 hours each day for both English and non-English speaking students. The distribution of students across the different levels of television watching is reported in *Figure 1*.

Figure 1: Distribution of Students TV Watching Habits



Before proceeding, it is important here to address a potential issue within the data. It is possible that any potential correlation between watching TV and test scores could be a result of selection issues. If students who watch TV tend to be students with some unobserved characteristic, such as a lack of motivation to challenge themselves, it is possible that any relationship found between TV watching and test scores is actually a result of an underlying relationship between that characteristic and test scores. In other words, even though the data could appear to imply a relationship between TV and test scores, observing this relationship could be a result of that by choosing to look at students who watch a certain amount of TV, only students with some characteristic that impacts test scores are observed.

One example of a characteristic that is likely correlated with television watching and test scores, and thus could produce such a problem is the number of extracurricular activities available for students at a given school. Students from a school with a variety of extracurricular activities may watch less TV because they have more time commitments and as a result spend less time at home in front of the television. They may also develop a wider range of interests through participating in the activities and choose to spend their time at home developing them instead of watching TV. Additionally, students may develop better relationships with educators as a result of the activities available. If teachers are able to connect with students in variety of different contexts, students may be more inclined to respect teachers in the classroom. This could result in students being more receptive to the curriculum and hence increasing their test scores. Since low levels of TV watching and high test scores are observed together for these students, and since the number of extracurricular activities is not observed, the potential inference that watching less television actually causes higher test scores is unsound, since both are actually caused by the availability of activities.

To correct for school-wide selection issues, where all students in a given school share some unobserved characteristic such as their access to extracurricular activities, this study takes advantage of the building variable in the data. The building variable simply specifies which school a student attended. By treating the data as panel data, the observations of students within the same building (school) are considered separately from observations of students in a different building. A Hausman test was used to determine that a fixed-effects model is appropriate for this panel data. By using a fixed-effects model, dummy variables for each school are implicitly created and thus the effects of all

characteristics common to the students at each particular school, such as any family inputs, school inputs or neighborhood characteristics, are separated from the effects of the other variables included in the regression.

There are however many examples of characteristics that are specific to the individual that are not observed and that cannot be controlled for by using this panel data. One example is parental involvement. It seems reasonable that parents who are very involved with their children, whether English speaking or not, would, by spending time with their children, limit their children's opportunities to watch television. It is also reasonable that parents who are very involved with their children's education may help their children increase their test scores. These parents could potentially do this by encouraging their children to study more, offering incentives to their children for good grades, tutoring their children, or engaging in a variety of other activities that could positively impact their children's test scores. Because parental involvement is likely correlated with both TV watching and test scores, a boost in test scores could be potentially falsely attributed to watching less TV, when in reality the boost is a result of parental involvement. To correct for this in the regression, variables that measure how often parents help their children with schoolwork are included as substitutes for parental involvement. As a result, the effects of parental involvement and television watching are, at least in part, separated.

There are a number of other individual characteristics that may also cause selection problems in the data. Some of these are observable such as other extracurricular activities that a child participates in. Others are not observable such as an individual's private returns to human capital (how much a student benefits from being educated) or, as

mentioned, parental involvement. To account for such characteristics in general, as many variables measuring these effects as the data allows are included in the regression. Additionally, utilizing the students test scores from the ITBS the year before, even the unobservable characteristics can be controlled to a high degree. All of a student's characteristics that caused him or her to do well or poorly on the ITBS are implicitly used to predict that students score on the WASL. Since the characteristics that influence students ITBS scores are likely the same characteristics that influence their WASL scores, the ITBS score is an extremely powerful predictor. As long as a student retains their characteristics during the one-year period between tests, a relatively short amount of time, the ITBS variable accounts for them. There certainly may be some instances of students' skills or traits changing substantially over the one year period. Ultimately however, these methods likely control for the characteristics to a sufficient degree to measure with some certainty the effects of watching television on test scores.

Econometric Model

To measure the effects of television on English Second students at various ability levels, consider the following regression:

$$
\begin{aligned}
&Listening \\
&= \alpha EnglishSecond + \sum_{j=less}^{5} \beta_j Watch_j + \sum_{k=1}^{3} \gamma_k ITBSVocab^k + \sum_{j=0}^{5} \delta_j EnglishSecond * Watch_j \\
&+ \sum_{k=1}^{3} \tau_k EnglishSecond * ITBSVocab^k + \sum_{j=0}^{5}\sum_{k=1}^{3} \mu_{j,k} Watch_j * ITBSVocab^k \\
&+ \sum_{j=0}^{5}\sum_{k=1}^{3} \varphi_{j,k} EnglishSecond * Watch_j * ITBSVocab^k + \boldsymbol{\omega X} + C + \varepsilon
\end{aligned}
$$

Where **X** is a matrix of demographic control variables gathered from the WASL questionnaire and where *EnglishSecond* is a composite of several dummy variables that describe the language spoken at home by the student's family. *EnglishSecond* is equal to one if English is never or only occasionally spoken at home and zero if English is always spoken at home. By considering all of the possible interactions of the *Watch*, *ITBS* and *English Second* variables, the effects of watching various levels of television are separated by a student's language status and ability.

Additionally, the squares and cubes of the ITBS score variables were found to be statistically significant in preliminary regressions. This indicates that the relationship between ITBS scores and WASL scores is not linear. Accordingly, these are used as additional explanatory variables and each of these is similarly interacted with the *English Second* and *Watch* variables. To account for potential heteroskedasticity in the data, all standard errors are adjusted using the Newey-West standard errors.

The results of this study give insight to several significant phenomena regarding the effects of TV watching on WASL scores. The entirety of the results from the regression is displayed in the Appendix of this paper and only the synthesis of the relevant information is included here.

The model is used to predict test scores for students who watch TV and students who do not watch TV for each possible ITBS score. The two levels of television considered are a moderate amount of television viewing (3-4 hours daily), and a large amount of television viewing (5+hours daily). All of the explanatory variables other than TV watching and English speaking status are held constant to focus on the effects of these variables.

Each pair of predictions is then tested to be statistically different from each other using a difference-of-two-means test. The results are displayed graphically as follows.

Figure 2: No TV vs. Moderate Amount of TV for English Students

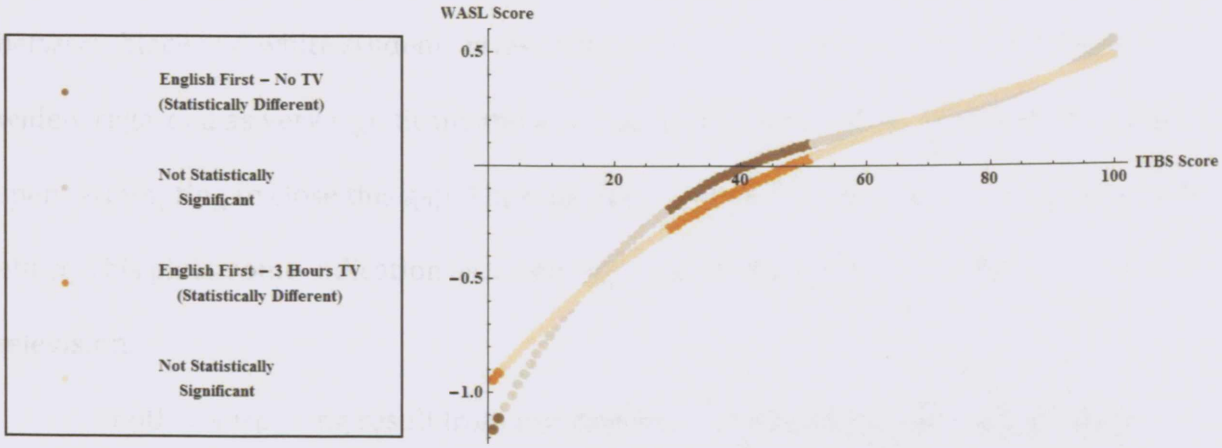
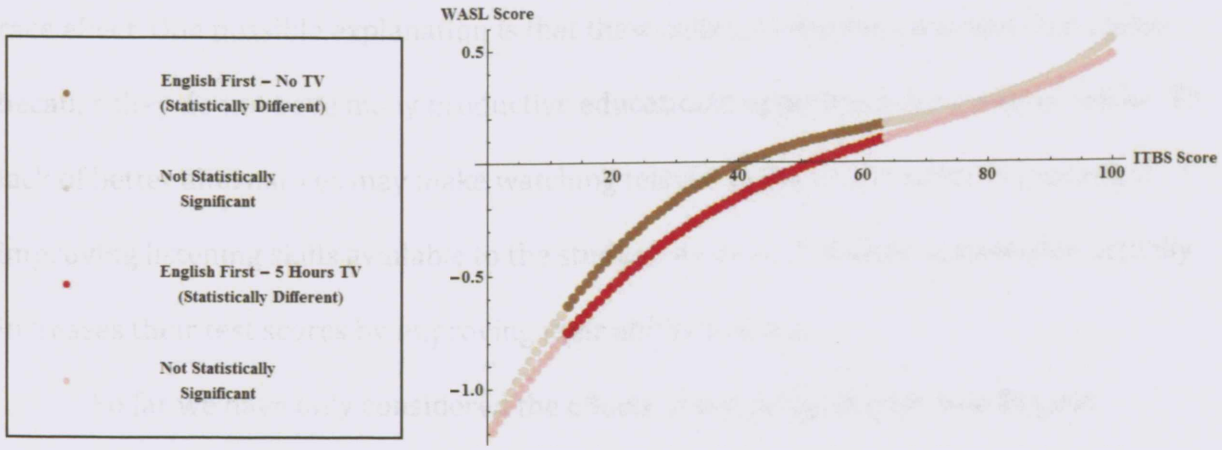


Figure 3: No TV vs. Large Amount of TV for English Students



Using ITBS scores as a measure for ability, it is clear from the graphs that it is primarily the middle and lower ability students that are impacted most by television

watching (Figures 2, 3). Not surprisingly, for the middle range students, watching TV has a negative effect on test scores. Students in the statistically significant middle ranges that do not watch TV score .1 to .15 standard deviations better on average than students who watch TV. To understand the magnitude of this effect, consider the average difference between black and white students. Our regression shows that the difference in coefficients between black and white students is less than .1 standard deviations. This difference is widely regarded as very significant and a substantial amount of resources and energy are spent attempting to close this gap. The magnitude of the TV effect is even greater than this effect. This gives some indication as to the importance of understanding the impact of television.

Another surprising result from this graphical analysis is that very low scoring students can substantially improve their test scores by watching a moderate amount of television (Figure 2). The magnitude of the effect of watching 3 hours of TV each day for low ability students is approximately .2 standard deviations. That is more than twice the race effect. One possible explanation is that these poor scoring students have low scores because they do not have many productive educational opportunities outside of school. The lack of better alternatives may make watching television the most productive means of improving listening skills available to the student. As a result, watching television actually increases their test scores by improving their ability to listen.

So far we have only considered the effects of watching television on English speaking students. A similar graphical analysis is implemented to compare the effects of TV watching for students whose first language is not English. The results are as follows,

Figure 4: No TV vs. Moderate Amount of TV for Non-English Students

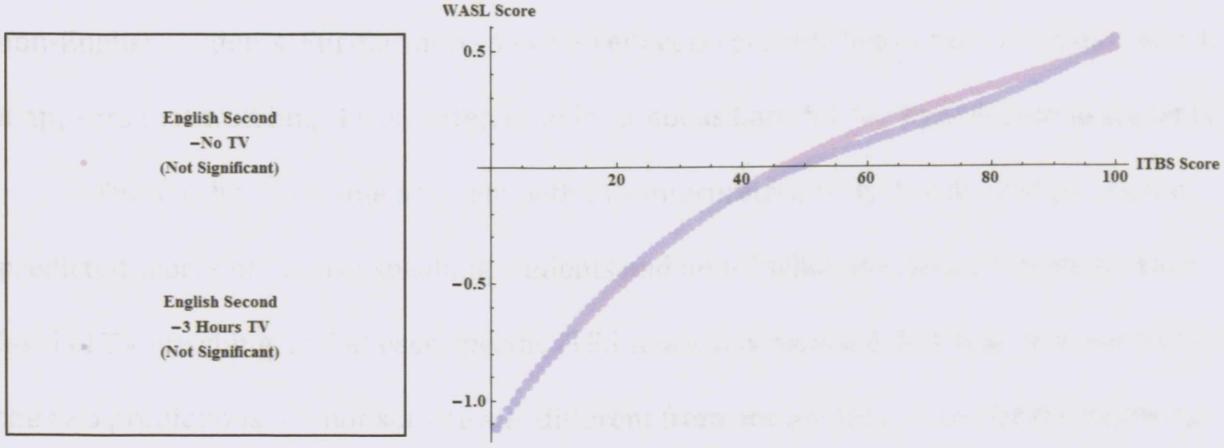
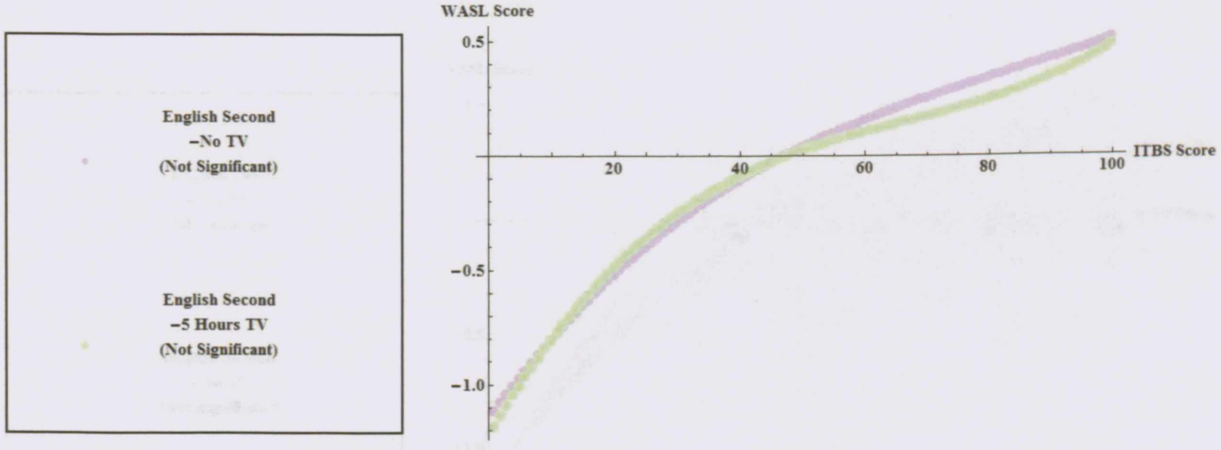


Figure 5: No TV vs. Large Amount of TV for Non-English Students



Unlike the case for English speaking students, there is no statistically significant relationship between watching TV and test scores for English second students (Figures 4,5). This implies that as far as WASL listening scores are concerned, watching TV provides no benefit or harm. This is very important in contrast with English speaking students. Whereas the middle ability English students were harmed by watching television (Figures

2,3), there is no such effect for students whose first language is not English (Figures 4,5). Therefore it appears watching TV has a different effect on English students than it does on non-English students. Furthermore, since no effect is certainly better than a negative effect, it appears that watching TV is better, or at least not as harmful, for English second students.

There is however one problem with this interpretation. By directly comparing the predicted scores of English speaking students and non-English speaking students for each level of TV watching, and at each specific ITBS score, it is revealed that in almost every case the two predictions are not statistically different from one another. Consider the following comparisons,

Figure 6: No TV for English vs. Non-English Students

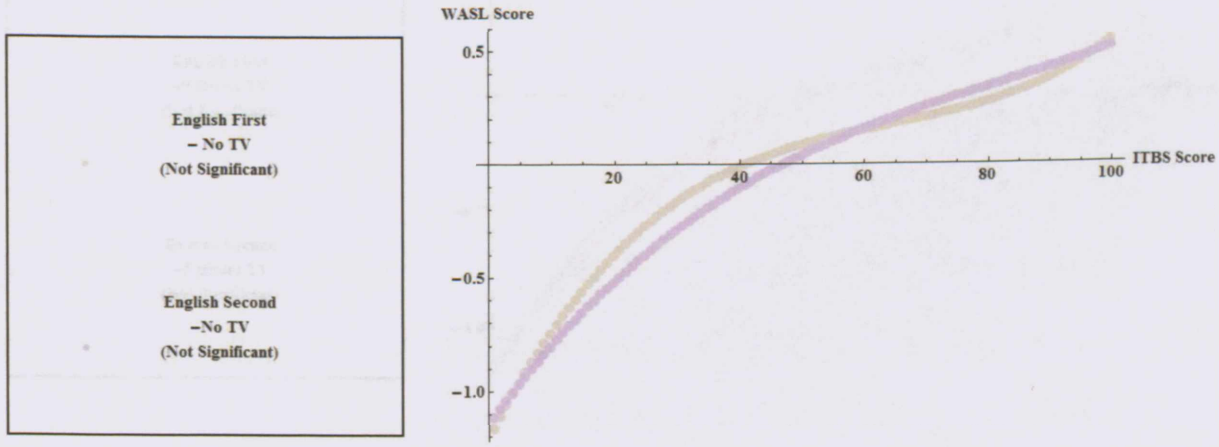


Figure 7: Moderate Amount of TV for English vs. Non-English Students

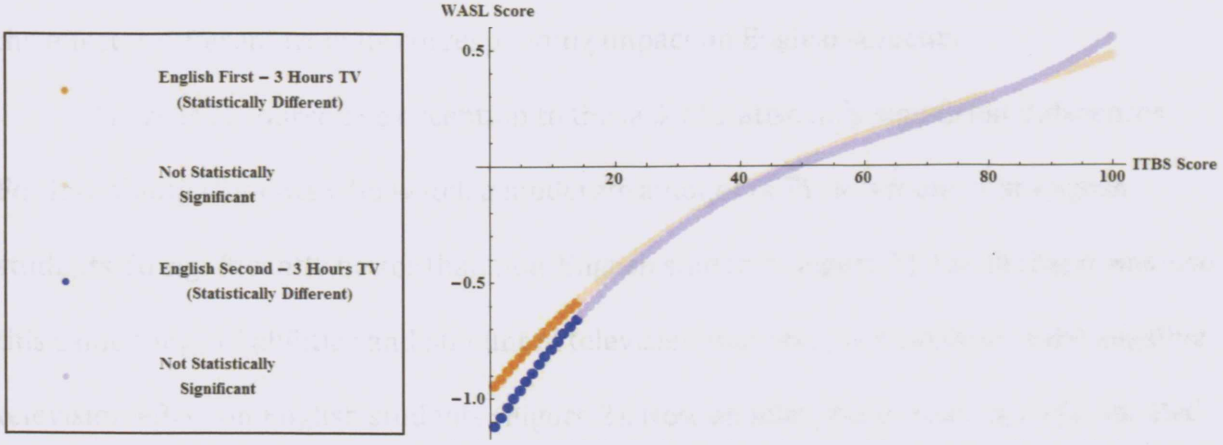
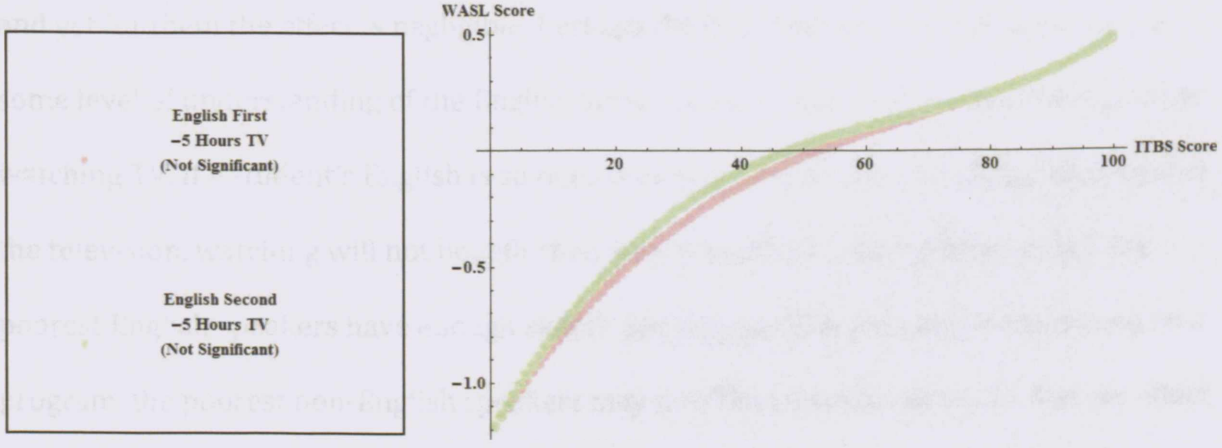


Figure 8: Large Amount of TV for English vs. Non-English Students



In each of these comparisons, with the exception of the low ability moderate TV watching cases (Figure 7), the predictions are not statistically different. Despite the fact that for certain cases watching TV has a statistically significant negative effect on English speakers, whereas for non-English speakers it does not, the difference in these effects is not substantial enough to say with sufficient certainty that the effects on these two groups are

different. In other words, even though being an English second student reduces the negative effect of watching TV, it does not do so to a sufficient extent to say definitively that the effect is different from its corresponding impact on English students.

There is of course one exception to the lack of statistically significant differences. For low ability students who watch a moderate amount of TV, it is found that English students do significantly better than non-English students (Figure 7). Recall that it was also this same range of abilities and amount of television that was the exception to the negative television effect on English students (Figure 2). Now an interpretation must be formulated that takes both of these factors into account. As mentioned before, it may be that the lack of superior alternatives for the English students causes the effect of watching TV to be positive. However, it seems likely that this would also be the case for non-English students and yet for them the effect is negligible. Perhaps the discrepancy arises because there is some level of understanding of the English language that is necessary to benefit at all from watching TV. If a student's English is so poor that they cannot understand anything said on the television, watching will not benefit their listening ability. Hence whereas even the poorest English speakers have enough skill to partially understand what is happening on a program, the poorest non-English speakers may not. Thus it seems plausible that the effect on English students is greater and statistically different from its effect on students whose first language is not English for this ability group.

One possible limitation with this investigation is that WASL test scores may not be an accurate way to measure human capital. It seems likely that an individual's work ethic, perseverance or other personality traits are elements of their human capital, yet cannot necessarily be measured with WASL test scores. By using WASL scores as the dependent

variable in the regressions, this study runs the risk of only measuring a portion of an individual's human capital. Furthermore, it seems likely that watching television may be correlated with some of these traits and thus the effects of TV on human capital observed in the results may be misleading. Unfortunately, these traits are extremely difficult to observe and quantify and thus test scores are the best option available for measuring human capital. Despite this, it is expected that a person's ability to communicate is a significant component of their human capital and therefore this investigation still provides valuable information.

Another possible limitation is that the results may not apply to students outside of Washington. One major reason this may be so is that TV broadcasting is not the same across states. For example, in Texas there are substantially more Spanish channels than in Washington State. Students whose first language is Spanish are able to watch Spanish television and therefore may not receive the benefits of learning to communicate in English by watching TV. As a result the relationship between television and test scores for Spanish students may not be as strong in Texas as in Washington.

In conclusion, this study found that only in one specific instance is television's effect on English speaking students' listening test scores different from its effect on non-English speaking students' scores. Despite discovering that TV has a statistically significant negative effect for low and moderate ability English students, whereas its effect is negligible for English second students, the effects were only found to be truly different for low scoring students watching a moderate amount of television. Surprisingly, this effect was found to be significantly positive for English speaking students. This implies that it may actually be in the best interest of educators to promote TV watching to their lowest

ability English speaking students. Additionally, since it was found that watching television has no statistically significant effect on test scores for student whose first language is not English, educators need not worry about spending energy to discourage these students from watching TV. On the other hand, by discouraging moderate ability English speaking students to not watch TV, their test scores may be improved.

Perhaps the most significant result of this study, however, is that it demonstrates that TV has a different effect on different groups of students. The significance of the effect of watching TV varied substantially depending on the student's ability and also in one case on their language status. It is therefore not sensible for educators to consider solutions that treat every student identically. Care must be taken in deciphering which students in particular will benefit and which students will be harmed by any policy. Furthermore, studies which claim universal effects of explanatory variables such as TV ought to be considered with scrutiny since it is likely the case that the effects vary across different student demographics. By taking care to isolate the effects of factors which determine success in school to specific groups of students, a much more efficient means of improving the quality of education can be employed.

Complete Regression Results

```
. xtreg  listening goalnohs - itbsvocab3englishsecondwatch5, fe robust

Fixed-effects (within) regression               Number of obs      =     53051
Group variable: bldg                            Number of groups   =       460

R-sq:  within  = 0.3653                         Obs per group: min =         1
       between = 0.6315                                        avg =     115.3
       overall = 0.3904                                        max =       559

                                                F(147,459)         =    309.25
corr(u_i, Xb)  = 0.0721                         Prob > F           =    0.0000

                                               (Std. Err. adjusted for 460 clusters in bldg)
```

listening	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
goalnohs	-.0228132	.0862713	-0.26	0.792	-.192349	.1467226
goalhs	-.0784964	.0742714	-1.06	0.291	-.2244505	.0674577
goalts	.0493183	.073203	0.67	0.501	-.0945364	.1931729
goalcol	.0753712	.074804	1.01	0.314	-.0716296	.2223719
goalcolgrad	.123219	.072664	1.70	0.091	-.0195764	.2660143
goalgradscl	.1233366	.0729923	1.69	0.092	-.020104	.2667772
moednohs	-.015612	.0181483	-0.86	0.390	-.0512761	.0200521
moedhs	-.0028291	.0101281	-0.28	0.780	-.0227323	.017074
moedts	.0027636	.0102502	0.27	0.788	-.0173795	.0229068
moedns	-.0437502	.0145937	-3.00	0.003	-.0724289	-.0150715
faednohs	-.0457699	.0166832	-2.74	0.006	-.0785548	-.012985
faedhs	-.0253609	.0109377	-2.32	0.021	-.0468551	-.0038666
faedts	-.0256908	.0111039	-2.31	0.021	-.0475117	-.0038699
faedns	-.0338272	.0126079	-2.68	0.008	-.0586036	-.0090508
hworknone	-.1118999	.0743703	-1.50	0.133	-.2580484	.0342485
hworkless1	-.0560454	.0741648	-0.76	0.450	-.2017901	.0896992
hwork1	-.0085399	.073203	-0.12	0.907	-.1523944	.1353146
hwork2	.0309425	.0725938	0.43	0.670	-.1117148	.1735998
hwork3	.0497838	.0734293	0.68	0.498	-.0945154	.1940831
hwork46	.0670787	.0735167	0.91	0.362	-.0773924	.2115498
hwork79	.0781726	.074139	1.05	0.292	-.0675213	.2238665
hwork10	.0677743	.0735697	0.92	0.357	-.0768008	.2123495
gpaa	.2747818	.0724615	3.79	0.000	.1323843	.4171793
gpabplus	.1332952	.0721112	1.85	0.065	-.0084138	.2750043
gpab	.0187465	.0717925	0.26	0.794	-.1223363	.1598293
gpacplus	-.0669811	.0718976	-0.93	0.352	-.2082704	.0743081
gpac	-.1393945	.0736214	-1.89	0.059	-.2840713	.0052824
gpadplus	-.1864915	.0727103	-2.56	0.011	-.3293778	-.0436052
gpad	-.2414654	.0779896	-3.10	0.002	-.3947263	-.0882045
gpaf	-.0751551	.0827774	-0.91	0.364	-.2378247	.0875146
gpadna	-.0947743	.0961156	-0.99	0.325	-.2836556	.0941069
cutserious	.0191626	.0940757	0.20	0.839	-.1657098	.2040351
cutmoderate	.0691236	.0938501	0.74	0.462	-.1153056	.2535527
cutminor	.083397	.0931426	0.90	0.371	-.0996417	.2664357
cutno	.0624121	.0937397	0.67	0.506	-.1218001	.2466242
safealways	.024647	.0589686	0.42	0.676	-.0912349	.1405288
safeusual	.0212953	.0589654	0.36	0.718	-.0945804	.1371709
safesome	-.0575445	.0600138	-0.96	0.338	-.1754804	.0603913
safenever	-.0948374	.0618573	-1.53	0.126	-.216396	.0267211
helpnever	-.0124006	.096398	-0.13	0.898	-.2018369	.1770356
helpmonth	-.0110335	.0960169	-0.11	0.909	-.1997207	.1776536
helpweek	-.0729451	.0967241	-0.75	0.451	-.263022	.1171318
helpday	-.1586984	.0975927	-1.63	0.105	-.3504822	.0330854

absentseri~s	-.0429948	.0784994	-0.55	0.584	-.1972576	.1112679
absentmode~e	-.0016555	.0778291	-0.02	0.983	-.154601	.1512901
absentminor	.0139223	.078515	0.18	0.859	-.1403711	.1682158
absentno	-.0235254	.0788744	-0.30	0.766	-.178525	.1314743
alcoholser~s	-.1063009	.0739704	-1.44	0.151	-.2516636	.0390618
alcoholmod~e	-.0942092	.0734285	-1.28	0.200	-.2385069	.0500886
alcoholminor	-.1008801	.0740556	-1.36	0.174	-.2464101	.0446499
alcoholno	-.1283108	.0736447	-1.74	0.082	-.2730334	.0164118
drugserious	.1103256	.0752272	1.47	0.143	-.0375069	.2581581
drugmoderate	.110843	.0754935	1.47	0.143	-.0375128	.2591988
drugminor	.1239378	.0756874	1.64	0.102	-.024799	.2726746
drugno	.1063806	.0761902	1.40	0.163	-.0433442	.2561054
behaveseri~s	-.0191762	.0754296	-0.25	0.799	-.1674063	.1290538
behavemode~e	.0055404	.0740501	0.07	0.940	-.1399789	.1510597
behaveminor	-.0164862	.0743025	-0.22	0.825	-.1625014	.129529
behaveno	-.0079482	.0754709	-0.11	0.916	-.1562596	.1403632
spiritseri~s	.0896623	.0610115	1.47	0.142	-.0302342	.2095589
spiritmode~e	.0983988	.0586006	1.68	0.094	-.0167599	.2135575
spiritminor	.1123991	.0595864	1.89	0.060	-.0046968	.229495
spiritno	.0954244	.0587255	1.62	0.105	-.0199798	.2108287
violencese~s	-.0750508	.0638666	-1.18	0.241	-.200558	.0504564
violencemo~e	-.0693403	.0620846	-1.12	0.265	-.1913455	.0526649
violencemi~r	-.0553025	.0613666	-0.90	0.368	-.1758969	.0652919
violenceno	-.0641289	.0609682	-1.05	0.293	-.1839402	.0556825
respectser~s	-.048732	.0550553	-0.89	0.377	-.1569237	.0594597
respectmod~e	-.0245569	.0539078	-0.46	0.649	-.1304937	.0813798
respectminor	-.0129017	.054601	-0.24	0.813	-.1202005	.0943971
respectno	-.0337369	.0547688	-0.62	0.538	-.1413656	.0738919
planwork	-.0250916	.0165204	-1.52	0.129	-.0575567	.0073735
plants	-.0381945	.0184977	-2.06	0.040	-.0745452	-.0018438
plancc	.0208117	.0160543	1.30	0.196	-.0107374	.0523609
plancol	.0623673	.0138879	4.49	0.000	.0350754	.0896591
planmilit	-.027282	.019901	-1.37	0.171	-.0663904	.0118265
planhome	-.0702234	.0291236	-2.41	0.016	-.1274555	-.0129913
compuse	-.0241821	.0142656	-1.70	0.091	-.052216	.0038519
emailwww	.0219286	.0120671	1.82	0.070	-.001785	.0456422
holdback	-.1118228	.0153526	-7.28	0.000	-.141993	-.0816526
sports0	.12336	.0809441	1.52	0.128	-.035707	.282427
sports1	.1544458	.0815232	1.89	0.059	-.0057591	.3146507
sports2	.1668106	.081725	2.04	0.042	.0062091	.3274121
sports3	.1979186	.0809429	2.45	0.015	.038854	.3569831
sports4	.1799379	.0809455	2.22	0.027	.0208682	.3390075

watchless	.1750882	.1185897	1.48	0.141	-.0579577	.4081342
watch1	.2340347	.1140419	2.05	0.041	.0099257	.4581437
watch2	.2389977	.1095377	2.18	0.030	.0237402	.4542553
watch3	.2430951	.1107007	2.20	0.029	.0255521	.4606381
watch4	.0531498	.1182015	0.45	0.653	-.1791333	.2854329
watch5	-.0102465	.1119734	-0.09	0.927	-.2302905	.2097975
amindian	-.1117849	.0532254	-2.10	0.036	-.2163806	-.0071893
black	-.1250253	.0517067	-2.42	0.016	-.2266365	-.0234142
asian	.0153525	.0487676	0.31	0.753	-.0804829	.111188
hispanic	-.0332638	.0485747	-0.68	0.494	-.1287203	.0621926
white	-.0398408	.0472455	-0.84	0.400	-.132685	.0530035
multiracial	-.0569497	.0601778	-0.95	0.344	-.1752078	.0613085
male	-.2143109	.0086081	-24.90	0.000	-.2312272	-.1973947
englishsec~d	.0661221	.1485764	0.45	0.657	-.2258522	.3580964
englishsec~s	-.2378845	.1717002	-1.39	0.167	-.5753005	.0995315
englishsec~1	-.209312	.1694933	-1.23	0.217	-.542391	.123767
englishsec~2	-.2194342	.1751746	-1.25	0.211	-.5636779	.1248094
englishsec~3	-.2530226	.1732112	-1.46	0.145	-.5934078	.0873626
englishsec~4	.0146948	.1859839	0.08	0.937	-.3507908	.3801804
englishsec~5	-.069444	.16229	-0.43	0.669	-.3883676	.2494796
itbsvocab	.0542916	.0069987	7.76	0.000	.0405381	.0680451
itbsvocab2	-.0007606	.0001452	-5.24	0.000	-.0010459	-.0004753
itbsvocab3	3.94e-06	8.75e-07	4.50	0.000	2.22e-06	5.66e-06
itbsvocabw~s	-.0167991	.0082341	-2.04	0.042	-.0329803	-.0006179
i~2watchless	.0003542	.0001686	2.10	0.036	.0000229	.0006856
i~3watchless	-2.07e-06	1.01e-06	-2.05	0.041	-4.06e-06	-8.86e-08
itbsvocabw~1	-.0211829	.0080387	-2.64	0.009	-.03698	-.0053857
itbs~2watch1	.0004492	.0001672	2.69	0.007	.0001207	.0007777
itbs~3watch1	-2.69e-06	1.01e-06	-2.65	0.008	-4.68e-06	-6.98e-07
itbsvocabw~2	-.0218947	.0078653	-2.78	0.006	-.0373511	-.0064383
itbs~2watch2	.0004344	.000163	2.66	0.008	.000114	.0007548
itbs~3watch2	-2.46e-06	9.82e-07	-2.51	0.013	-4.39e-06	-5.32e-07
itbsvocabw~3	-.0225138	.0078796	-2.86	0.004	-.0379985	-.0070292
itbs~2watch3	.0004599	.0001651	2.79	0.006	.0001355	.0007844
itbs~3watch3	-2.66e-06	1.01e-06	-2.63	0.009	-4.65e-06	-6.74e-07
itbsvocabw~4	-.0111726	.0089411	-1.25	0.212	-.0287432	.006398
itbs~2watch4	.0002283	.0001935	1.18	0.239	-.000152	.0006086
itbs~3watch4	-1.23e-06	1.20e-06	-1.03	0.306	-3.59e-06	1.13e-06
itbsvocabw~5	-.0114672	.0088934	-1.29	0.198	-.0289441	.0060097
itbs~2watch5	.0002684	.0001946	1.38	0.169	-.000114	.0006508
itbs~3watch5	-1.59e-06	1.22e-06	-1.30	0.193	-4.00e-06	8.08e-07
itbsvocabe~d	-.0162105	.0119753	-1.35	0.177	-.0397437	.0073226
itbsvocab2~d	.000404	.0002632	1.54	0.125	-.0001131	.0009212
itbsvocab3~d	-2.52e-06	1.63e-06	-1.54	0.124	-5.72e-06	6.89e-07
itbsvocabe~s	.0236234	.0134251	1.76	0.079	-.0027588	.0500056
itbsvocab2..	-.0005302	.0002934	-1.81	0.071	-.0011068	.0000464
itbsvocab3..	3.19e-06	1.82e-06	1.76	0.080	-3.78e-07	6.77e-06
itbsvocabe~1	.0332784	.0138423	2.40	0.017	.0060762	.0604805
itbsvocab2..	-.0008045	.0003065	-2.62	0.009	-.0014069	-.0002021
itbsvocab3..	5.10e-06	1.91e-06	2.67	0.008	1.35e-06	8.84e-06
itbsvocabe~2	.0250763	.0140719	1.78	0.075	-.0025771	.0527296
itbsvocab2..	-.0005328	.0003136	-1.70	0.090	-.001149	.0000835
itbsvocab3..	3.04e-06	1.97e-06	1.55	0.123	-8.24e-07	6.91e-06
itbsvocabe~3	.0269487	.0140998	1.91	0.057	-.0007594	.0546567
itbsvocab2..	-.0006147	.0003153	-1.95	0.052	-.0012344	5.02e-06
itbsvocab3..	3.81e-06	1.99e-06	1.91	0.057	-1.09e-07	7.73e-06
itbsvocabe~4	.0117864	.0155742	0.76	0.450	-.0188192	.042392
itbsvocab2..	-.0003025	.0003568	-0.85	0.397	-.0010037	.0003987
itbsvocab3..	1.81e-06	2.30e-06	0.79	0.430	-2.70e-06	6.33e-06
itbsvocabe~5	.0218096	.0143522	1.52	0.129	-.0063945	.0500137
itbsvocab2..	-.0005324	.0003328	-1.60	0.110	-.0011864	.0001217
itbsvocab3..	3.25e-06	2.17e-06	1.50	0.134	-1.01e-06	7.51e-06
_cons	-1.47144	.1874237	-7.85	0.000	-1.839754	-1.103125
sigma_u	.34435766					
sigma_e	.76877308					
rho	.16711268	(fraction of variance due to u_i)				

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